Appendix G
Confirmation Sampling Data Quality Evaluation

Data Quality Evaluation for Great Lakes Legacy Act Lower Menominee River at the Tyco Fire Products LP Marinette Facility

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Introduction

The objective of this Data Quality Evaluation (DQE) report is to assess the data quality of analytical results for confirmation soil samples collected from the Lower Menominee River area adjacent to Tyco Fire Products LP (Tyco) facility in Marinette, Wisconsin. CH2M HILL collected confirmation samples September 19 through November 12, 2014. Guidance for this DQE report came from the *U.S. Environmental Protection Agency (USEPA) Contract Laboratory National Functional Guidelines (NFG) for Inorganic Review, October 2013,* and individual method requirements.

The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability and completeness (PARCC) as presented in the *Quality Assurance Project Plan* (QAPP), Great Lakes Legacy Act Lower Menominee River Tyco Site, September 2014. This report is intended as a general data quality assessment designed to summarize data issues.

Analytical Data

This DQE report covers 252 native and field duplicate samples for arsenic analysis by SW-846 method 6020A, *Inductively Coupled Plasma-Mass Spectrometry* (ICPMS). Samples were collected and delivered to the on-site laboratory, Environmental Chemistry Consulting Services, Inc. (ECCS) on the same day as sample collection. The confirmation sample results were reported in 45 sample delivery groups (SDG).

The sample delivery groups were assessed by reviewing the following: (1) the chain of custody documentation; (2) holding-time compliance; (3) internal standard response; (4) matrix spike/matrix spike duplicate recoveries (MS/MSD); (5) laboratory control sample (LCS) recoveries; (6) method blanks; (7) laboratory duplicate (LD)/field duplicate (FD) precision; (8) quantitation limits.

Data flags were assigned after the data review process/validation. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will only be one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts.

The data flags routinely used are listed and defined below:

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- JB = The analyte was positively identified; however the associated numerical value is considered estimated due to blank contamination.
- U = The analyte was analyzed for but was not detected above the reported sample quantitation limit. Value was detected in the blank sample.
- UB = The analyte was reported as not detected at an elevated detection limit due to blank contamination.
- 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 actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R = The sample result was rejected due to serious deficiencies in the ability to analyze the sample and meet the QC criteria. The presence or absence of the analyte could not be verified.

Findings

The overall summary of the data validation is contained in the following sections and in Table A1-1.

Chain of Custody

The required chain of custody (COC) procedures were followed by the field team and laboratory personnel and were free of errors.

Holding Time/Preservation

All holding time acceptance criteria were met with for all confirmation soil samples submitted to ECCS for arsenic analysis September through November 2014.

Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were collected and analyzed as required. Arsenic data associated with MS/MSD recoveries and/or relative percent differences (RPD) reported outside acceptable criteria were "J" qualified in Table A1-1 to indicate that the reported value is considered a quantitative estimate.

Laboratory Control Sample

LCSs were analyzed as required with accuracy criteria were met for all samples.

Calibration/Internal Standards

All QC criteria were met for initial and continuing calibration verification and internal standard samples.

Blanks

Laboratory method blanks were analyzed at the required frequency and were reported as not detected for most samples. For those method blanks reported above the reporting limit, the associated sample results were greater than 5 times the blank concentration, therefore no qualifying flags were applied.

Negative continiuing calibration blank results were noted during numerous arsenic ICP/MS analyses. These results were less than the reporting limit and/or less than five times the sample concentration and did not affect the reported value, therefore data qualifiers were not applied.

Field and Laboratory Duplicates

Laboratory and field duplicate samples were analyzed as required. Native and duplicate sample results were compared and those samples with relative percent differences (RPD) greater than 20% were "J" quailifed as extimated concentrations. Native and duplicate results with RPDs outside acceptable criteria are listed in Table A1-2. Sample results associated with these duplicate samples were "J" qualified in Table A1-1 to inidicate that the reported values are considered quantitative estimates due to duplicate precision exceedances.

TABLE A1-2
Duplicate Precision Exceedances
Great Lakes Legacy Act Lower Menominee River, Tyco Fire Products, LP Facility, Marinette, Wisconsin

Sample ID	Field or Lab Duplicate	Parameter	Unit	Sample Concentration	Duplicate Concentration	RDP
GT-L03-C-00/00.5	LD	Arsenic	mg/kg	4.75	3.48	30.7
SD-L30-0.0/0.5	LD	Arsenic	mg/kg	8.49	5.66	40.0
SD-L27-0.0/0.5	LD	Arsenic	mg/kg	7.79	11.1	35.3
GT-L06-B-00/00.5	LD	Arsenic	mg/kg	183	84.8	73.4
GT-L06-C-00/00.5	LD	Arsenic	mg/kg	1130	569	65.9
GT-L04-D-0.4/0.8	LD	Arsenic	mg/kg	82.9	110	28.0
GT-L07-D-0.0/0.5	LD	Arsenic	mg/kg	55.3	36.7	40.5
SD-L10-0.0/0.5	LD	Arsenic	mg/kg	24.5	31.8	26.1
SD-L10-0.0/0.5	FD	Arsenic	mg/kg	24.5	33.5	31.0
SD-L08-D-1.0/1.5	LD	Arsenic	mg/kg	250	2.39 U	200.0
SD-L08-0.0/0.5	FD	Arsenic	mg/kg	56.4	86.7	42.3
SD-L14-B-0.5/1.0	LD	Arsenic	mg/kg	8.26	10.6	24.9

Quantitation Limits

Analytical results reported above the method detection limit and below the reporting limit were qualified "J" as estimated concentrations.

Sample dilutions were required to prevent saturation of the instrument, to allow quantitation of the compounds within the linear range of the calibration curve, and/or to reduce the effects of the matrix on the target analytes.

Due to the sensitivity of SW-846 method 6020A (ICP/MS), all soil samples were diluted prior to analysis for arsenic. For those samples reported as not detected, elevated method detection and reporting limits were compared to the project specific reporting limit (10 mg/kg) to verify that the project requirements were met.

Overall Assessment

The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected and the resulting analytical data can be used to support the decision making process. The following summary highlights the PARCC findings for the above-defined events:

Precision of the data was verified through the review of the field and laboratory data quality indicators that include: FD, LD, and MS/MSD RPDs. Precision was generally acceptable with 26 results qualified as estimated due to FD and/or laboratory duplicate RPD exceedances.

Accuracy of the data was verified through the review of the LCS and MS/MSD recoveries. Accuracy was generally acceptable with sample results for 19 results being "J" qualified as estimated due to MS/MSD accuracies exceedances.

Representativeness of the data was verified through the sample's collection, storage and preservation procedures, verification of holding-time compliance and evaluation of method blank data. All requirements were met.

Comparability of the data was ensured through the use of standard USEPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.

Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected and that can be used in the project decision making process. During data validation, no results reported for this sampling event were rejected. The percent completeness for this data set was 100 percent which met the QAPP completeness goal of 95 percent for this project.

Table A1-1
ECCS - Confirmation Sampling Analytical Results - 2014
Great Lakes Legacy Act Lower Menominee River Tyco Site, Marinette, WI

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Analyzed	Analytical Method	Dilution Factor	Analyte	Result	Q	UNITS	MDL	RL	% Solids	Qual Code	DV Notes	
GT-L02-B-00/00.5	Z143813-01	Soil	9/19/2014	9/19/2014	SW6020	10	Arsenic	17.4		mg/kg	0.154	1.19	82.7			
GT-L02-D-00/00.5	Z143813-02	Soil	9/19/2014	9/20/2014	SW6020	10	Arsenic	7.70		mg/kg	0.177	1.36	73.3			
GT-L03-B-001/00.5	Z143817-01	Soil	9/20/2014	9/22/2014	SW6020	10	Arsenic	17.6		mg/kg	0.172	1.32	75.8			
GT-L01-D-00/00.5	Z143817-02	Soil	9/20/2014	9/22/2014	SW6020	10	Arsenic	65.4		mg/kg	0.174	1.33	74.9			
GT-L03-C-00/00.5	Z143906-01	Soil	9/22/2014	9/23/2014	SW6020	20	Arsenic	4.75	J	mg/kg	0.288	2.21	87.8	DU	Dup precision = 30.7	
GT-L03-D-00/00.5	Z143906-02	Soil	9/22/2014	9/23/2014	SW6020	20	Arsenic	15.5	J	mg/kg	0.326	2.51	79.0	DU	Dup precision = 30.7	
GT-L01-A-00/00.5	Z144002-01	Soil	9/29/2014	9/30/2014	SW6020	10	Arsenic	ND		mg/kg	0.144	1.11	90.2			
GT-L01-C-00/00.5	Z144005-01	Soil	9/30/2014	10/1/2014	SW6020	10	Arsenic	ND		mg/kg	0.143	1.10	90.9			
GT-L02-A-00/00.5	Z144015-01	Soil	9/30/2014	10/3/2014	SW6020	20	Arsenic	15.6		mg/kg	0.303	2.33	85.8			
GT-L03-A-00/00.5	Z144015-02	Soil	10/1/2014	10/3/2014	SW6020	20	Arsenic	4.06		mg/kg	0.295	2.27	88.0			
GT-L04-B-00/00.5	Z144015-03	Soil	10/1/2014	10/3/2014	SW6020	20	Arsenic	ND		mg/kg	0.295	2.27	88.1			
GT-L04-C-00/00.5	Z144015-04	Soil	10/1/2014	10/3/2014	SW6020	20	Arsenic	100		mg/kg	0.308	2.37	84.4			
GT-L02-C-00/00.5	Z144102-01	Soil	10/4/2014	10/6/2014	SW6020	10	Arsenic	7.68		mg/kg	0.148	1.14	87.8			
GT-L04-A-00/00.5	Z144102-02	Soil	10/4/2014	10/6/2014	SW6020	10	Arsenic	1.89		mg/kg	0.149	1.15	87			
GT-L01-B-00/00.5	Z144108-01	Soil	10/7/2014	10/8/2014	SW6020	10	Arsenic	1.71	J	mg/kg	0.157	1.21	82.6	DU	Batch Specific (Z144106-01) Dup precision = 31.1	
SD-L31-0.0/0.5	Z144110-01	Soil	10/8/2014	10/8/2014	SW6020	10	Arsenic	6.37		mg/kg	0.184	1.41	70.8			
SD-L31-0.0/0.5-D	Z144110-02	Soil	10/8/2014	10/8/2014	SW6020	10	Arsenic	6.75		mg/kg	0.182	1.40	71.5		Field Duplicate	
SD-L24-A-0.0/0.5	Z144111-01	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	13.2		mg/kg	0.518	3.99	50.7			
SD-L24-A-0.5/1.0	Z144111-02	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	8.67		mg/kg	0.392	3.02	65			
SD-L24-A-1.0/1.5	Z144111-03	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.32	2.47	81.9			
SD-L24-A-1.5/2.0	Z144111-04	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	83.5			
SD-L24-A-2.0/2.5	Z144111-05	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.303	2.33	84.1			
SD-L24-A-2.5/3.0	Z144111-06	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.309	2.38	83.3			
SD-L24-B-0.0/0.5	Z144111-07	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	3.34		mg/kg	0.333	2.57	78			
SD-L24-B-0.5/1.0	Z144111-08	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.317	2.44	82.7			
SD-L24-B-1.0/1.5	Z144111-09	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.315	2.42	83.3			
SD-L24-B-1.5/2.2	Z144111-10	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.322	2.47	82.5			
SD-L24-C-0.0/0.5	Z144114-01	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	5.29		mg/kg	0.339	2.61	75.9			
SD-L24-C-0.5/1.0	Z144114-02	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.313	2.41	83.8			
SD-L24-C-1.0/1.5	Z144114-03	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.304	2.34	86.3			
SD-L24-C-1.5/2.0	Z144114-04	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.36	84.9			
SD-L24-C-2.0/2.7	Z144114-05	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.4			
SD-L24-D-0.0/0.5	Z144114-06	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	8.34		mg/kg	0.784	6.03	33.5			
SD-L24-D-0.5/1.0	Z144114-07	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.395	3.04	65.9			
SD-L24-D-1.0/1.5	Z144114-08	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.311	2.4	84.3			
SD-L24-D-1.5/2.0	Z144114-09	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.311	2.39	83.7			
SD-L24-0.0/0.5	Z144114-10	Soil	10/8/2014	10/8/2014	SW6020	10	Arsenic	24.1		mg/kg	0.211	1.63	61.5			
SD-L24-E-0.0/0.5	Z144114-11	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	4.15		mg/kg	0.372	2.86	69.2			
SD-L24-E-0.5/1.0	Z144114-12	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.36	83.2			
SD-L24-E-1.0/1.5	Z144114-13	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.317	2.44	82			
SD-L24-E-1.5/2.1	Z144114-14	Soil	10/8/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.319	2.45	81.6			
SD-L31-0.0/0.5	Z144110-01	Soil	10/8/2014	10/8/2014	SW6020	10	Arsenic	6.37		mg/kg	0.184	1.41	70.8			
SD-L31-0.0/0.5-D	Z144110-02	Soil	10/8/2014	10/8/2014	SW6020	10	Arsenic	6.75		mg/kg	0.182	1.40	71.5		Field Duplicate	
SD-L30-0.0/0.5	Z144116-01	Soil	10/8/2014	10/9/2014	SW6020	10	Arsenic	8.49	J	mg/kg	0.191	1.47	68.2	DU	Dup precision = 40.0	
SD-L25-0.0/0.5	Z144118-29	Soil	10/9/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.309	2.38	84.0			
SD-L25-0.0/0.5-D	Z144118-30	Soil	10/9/2014	10/9/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.5		Field Duplicate	
SD-L26-0.0/0.5	Z144119-21	Soil	10/9/2014	10/9/2014	SW6020	10	Arsenic	4.15		mg/kg	0.182	1.40	71.5			
SD-L28-0.0/0.5	Z144121-07	Soil	10/9/2014	10/9/2014	SW6020	10	Arsenic	5.26		mg/kg	0.212	1.63	61.3			
SD-L29-0.0/0.5	Z144122-06	Soil	10/9/2014	10/9/2014	SW6020	10	Arsenic	3.13		mg/kg	0.167	1.28	77.9			
SD-L27-0.0/0.5	Z144125-01	Soil	10/10/2014	10/10/2014	SW6020	10	Arsenic	7.79	J	mg/kg	0.174	1.34	74.7	DU	Dup precision = 35.3	
GT-L06-B-00/00.5	Z144219-01	Soil	10/17/2014	10/17/2014	SW6020	10	Arsenic	183	J	mg/kg	0.148	1.14	88	MS, DU	MS 41.7%Rec/Dup precision = 73.4	
GT-L06-A-00/00.5	Z144219-02	Soil	10/17/2014	10/17/2014	SW6020	100	Arsenic	263	J	mg/kg	1.45	11.2	89.4	MS, DU	MS 41.7%Rec/Dup precision = 73.4	
GT-L06-C-00/00.5	Z144302-01	Soil	10/19/2014	10/20/2014	SW6020	100	Arsenic	1130	J	mg/kg	1.50	11.6	86.5	DU	Dup precision = 65.9	
SD-L04-D-0.0/0.4	Z144312-01	Soil	10/21/2014	10/21/2014	SW6020	10	Arsenic	90.5		mg/kg	0.159	1.22	81.7			
GT-L04-D-0.4/0.8	Z144312-02	Soil	10/21/2014	10/23/2014	SW6020	10	Arsenic	82.9	J	mg/kg	0.148	1.14	86.8	MS, DU	MS 144%Rec/Dup precision = 28	
SD-L05--0.0/0.5	Z144313-24	Soil	10/21/2014	10/21/2014	SW6020	10	Arsenic	1.22		mg/kg	0.157	1.21	83			
SD-L18-0.0/0.5	Z144316-09	Soil	10/22/2014	10/22/2014	SW6020	10	Arsenic	6.62		mg/kg	0.173	1.33	74.9			
SD-L18-0.0/0.5-D	Z144316-10	Soil	10/22/2014	10/22/2014	SW6020	10	Arsenic	6.57		mg/kg	0.177	1.36	72.9		Field Duplicate	
SD-L05-0.0/0.5	Z144317-06	Soil	10/22/2014	10/22/2014	SW6020	10	Arsenic	4.73		mg/kg	0.157	1.21	81.0			

Table A1-1
ECCS - Confirmation Sampling Analytical Results - 2014
Great Lakes Legacy Act Lower Menominee River Tyco Site, Marinette, WI

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Analyzed	Analytical Method	Dilution Factor	Analyte	Result	Q	UNITS	MDL	RL	% Solids	Qual Code	DV Notes	
SD-L19-0.0/0.5	Z144322-28	Soil	10/22/2014	10/22/2014	SW6020	10	Arsenic	4.36		mg/kg	0.189	1.45	68.8			
SD-L17-0.0/0.5	Z144324-31	Soil	10/22/2014	10/22/2014	SW6020	10	Arsenic	1.98	J	mg/kg	0.164	1.26	79.2	MS, DU	Batch Specific (Z144312) MS 144%Rec/Dup precision = 28	
SD-L15-0.0/0.5	Z144325-33	Soil	10/22/2014	10/22/2014	SW6020	10	Arsenic	1.84	J	mg/kg	0.176	1.35	73.8	DU	Batch Specific (A144323-01) Dup precision = 62.9	
SD-L16-0.0/0.5	Z144327-26	Soil	10/23/2014	10/23/2014	SW6020	10	Arsenic	2.65	J	mg/kg	0.151	1.16	86.1	MS, DU	Batch Specific (Z144312) MS 144%Rec/Dup precision = 28	
SD-L06-C-0.0/0.2	Z144329-01	Soil	10/23/2014	10/24/2014	SW6020	20	Arsenic	182		mg/kg	0.310	2.38	83.1			
GT-L06-C-0.2/0.7	Z144329-02	Soil	10/23/2014	10/24/2014	SW6020	100	Arsenic	313		mg/kg	1.40	10.8	90.9			
SD-L06-D-0.0/0.3	Z144329-03	Soil	10/23/2014	10/24/2014	SW6020	20	Arsenic	53.5		mg/kg	0.314	2.41	82.8			
GT-L06-D-0.3/0.8	Z144329-04	Soil	10/23/2014	10/24/2014	SW6020	20	Arsenic	85.0		mg/kg	0.280	2.15	91.2			
SD-L22-0.0/0.5	Z144405-27	Soil	10/28/2014	10/28/2014	SW6020	20	Arsenic	ND		mg/kg	0.494	3.80	52.1			
SD-L23-0.0/0.5	Z144407-29	Soil	10/28/2014	10/28/2014	SW6020	20	Arsenic	6.23		mg/kg	0.455	3.50	57.1			
GT-L07-C-00/00.5	Z144412-01	Soil	10/29/2014	10/29/2014	SW6020	20	Arsenic	6.81		mg/kg	0.299	2.30	87.0			
GT-L07-D-0.0/0.5	Z144507-07	Soil	11/4/2014	11/4/2014	SW6020	20	Arsenic	55.3	J	mg/kg	0.282	2.17	89.6	DU	Dup precision = 40.5	
GT-L07-E-0.0/0.5	Z144507-08	Soil	11/4/2014	11/4/2014	SW6020	20	Arsenic	ND		mg/kg	0.280	2.16	90.9			
SD-L07-0.0/0.5	Z144507-09	Soil	11/4/2014	11/4/2014	SW6020	20	Arsenic	ND		mg/kg	0.312	2.40	83.3			
SD-L07-0.0/0.5-D	Z144507-10	Soil	11/4/2014	11/4/2014	SW6020	20	Arsenic	ND		mg/kg	0.305	2.35	85.3		Field Duplicate	
SD-L21-0.0/0.5	Z144510-26	Soil	11/4/2014	11/5/2014	SW6020	20	Arsenic	2.61		mg/kg	0.313	2.41	83.1			
SD-L21-0.0/0.5-D	Z144510-27	Soil	11/4/2014	11/5/2014	SW6020	20	Arsenic	ND		mg/kg	0.318	2.44	81.8		Field Duplicate	
SD-L20-0.0/0.5	Z144514-30	Soil	11/5/2014	11/5/2014	SW6020	20	Arsenic	19.1		mg/kg	0.312	2.40	83.3			
SD-L20-0.0/0.5-D	Z144514-31	Soil	11/5/2014	11/5/2014	SW6020	20	Arsenic	16.4		mg/kg	0.310	2.39	83.9		Field Duplicate	
SD-L10-A-0.0/0.5	Z144515-01	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.303	2.33	84.2			
SD-L10-A-0.5/1.0	Z144515-02	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.302	2.33	85.1			
SD-L10-A-1.0/1.5	Z144515-03	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.291	2.24	86.8			
SD-L10-A-1.5/2.0	Z144515-04	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.302	2.32	85.2			
SD-L10-A-2.0/2.5	Z144515-05	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.293	2.26	86.9			
SD-L10-A-2.5/3.0	Z144515-06	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.292	2.25	88.2			
SD-L10-A-3.0/3.5	Z144515-07	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.35	86.8			
SD-L10-A-3.5/4.2	Z144515-08	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.311	2.39	84.5			
SD-L10-B-0.0/0.5	Z144515-09	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	11.5		mg/kg	0.297	2.28	87.7			
SD-L10-B-0.5/1.0	Z144515-10	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	10.3		mg/kg	0.297	2.29	88.4			
SD-L10-B-1.0/1.5	Z144515-11	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.295	2.27	85.6			
SD-L10-B-1.5/2.0	Z144515-12	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.35	84.2			
SD-L10-B-2.0/2.5	Z144515-13	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.303	2.33	85.9			
SD-L10-B-2.5/3.0	Z144515-14	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.37	85.4			
SD-L10-B-3.0/3.5	Z144515-15	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	85.6			
SD-L10-B-3.5/3.8	Z144515-16	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.304	2.34	85.5			
SD-L10-C-0.0/0.5	Z144515-17	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	59.9	J	mg/kg	0.306	2.35	85.9	MS	MS 72.8 % Rec	
SD-L10-C-0.5/1.0	Z144515-18	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	376	J	mg/kg	0.303	2.33	83.3	MS	MS 72.8 % Rec	
SD-L10-C-1.0/1.5	Z144515-19	Soil	11/5/2014	11/7/2014	SW6020	200	Arsenic	693	J	mg/kg	3.23	24.9	81.3	MS	MS 72.8 % Rec	
SD-L10-C-1.5/2.0	Z144515-20	Soil	11/5/2014	11/7/2014	SW6020	200	Arsenic	922	J	mg/kg	3.35	25.7	76.2	MS	MS 72.8 % Rec	
SD-L10-C-2.0/2.5	Z144515-21	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	264	J	mg/kg	0.302	2.32	83.7	MS	MS 72.8 % Rec	
SD-L10-C-2.5/3.0	Z144515-22	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	232	J	mg/kg	0.319	2.45	82.3	MS	MS 72.8 % Rec	
SD-L10-C-3.0/3.5	Z144515-23	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	181	J	mg/kg	0.301	2.32	84.6	MS	MS 72.8 % Rec	
SD-L10-D-0.0/0.5	Z144515-24	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	51.2		mg/kg	0.314	2.42	82.8			
SD-L10-D-0.5/1.0	Z144515-25	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	90.6		mg/kg	0.298	2.29	84.6			
SD-L10-D-1.0/1.5	Z144515-26	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	61.5		mg/kg	0.310	2.38	83.9			
SD-L10-D-1.5/2.0	Z144515-27	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	6.48		mg/kg	0.331	2.55	79.3			
SD-L10-D-2.0/2.5	Z144515-28	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.321	2.47	78.6			
SD-L10-D-2.5/3.0	Z144515-29	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.322	2.47	79.3			
SD-L10-D-3.0/3.5	Z144515-30	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.319	2.45	79.2			
SD-L10-D-3.5/4.0	Z144515-31	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.301	2.32	83.7			
SD-L10-D-4.0/4.6	Z144515-32	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.303	2.33	84.8			
SD-L10-0.0/0.5	Z144515-33	Soil	11/5/2014	11/6/2014	SW6020	20	Arsenic	24.5	J	mg/kg	0.304	2.34	85.5	FD, DU	Field Duplicate = 31.0 RPD; Duplicate 26.1 RPD	
SD-L10-0.0/0.5-D	Z144515-34	Soil	11/5/2014	11/6/2014	SW6020	20	Arsenic	33.5	J	mg/kg	0.304	2.34	85.5	FD, DU	Field Duplicate; Field Duplicate = 31.0 RPD; Duplicate 26.1 RPD	
SD-L08-A-0.0/0.5	Z144516-01	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.35	85.0			
SD-L08-A-0.5/1.0	Z144516-02	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.301	2.32	86.4			
SD-L08-A-1.0/1.5	Z144516-03	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	84.7			
SD-L08-A-1.5/2.0	Z144516-04	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.36	84.8			
SD-L08-A-2.0/2.5	Z144516-05	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.304	2.34	85.7			
SD-L08-A-2.5/3.0	Z144516-06	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	84.6			

Table A1-1
ECCS - Confirmation Sampling Analytical Results - 2014
Great Lakes Legacy Act Lower Menominee River Tyco Site, Marinette, WI

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Analyzed	Analytical Method	Dilution Factor	Analyte	Result	Q	UNITS	MDL	RL	% Solids	Qual Code	DV Notes	
SD-L08-A-3.0/3.5	Z144516-07	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.35	85.1			
SD-L08-A-3.5/4.1	Z144516-08	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.310	2.39	83.8			
SD-L08-B-0.0/0.5	Z144516-09	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.3			
SD-L08-B-0.5/1.0	Z144516-10	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.3			
SD-L08-B-1.0/1.5	Z144516-11	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.36	84.9			
SD-L08-B-1.5/2.0	Z144516-12	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.287	2.21	90.6			
SD-L08-B-2.0/2.5	Z144516-13	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.305	2.35	85.2			
SD-L08-B-2.5/3.0	Z144516-14	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	84.7			
SD-L08-B-3.0/3.5	Z144516-15	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.309	2.38	84.1			
SD-L08-B-3.5/4.0	Z144516-16	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	84.8			
SD-L08-B-4.0/4.6	Z144516-17	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.36	84.8			
SD-L08-C-0.0/0.5	Z144516-18	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	46.2		mg/kg	0.309	2.38	84.1			
SD-L08-C-0.5/1.0	Z144516-19	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.303	2.33	85.9			
SD-L08-C-1.0/1.5	Z144516-20	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.298	2.29	87.2			
SD-L08-C-1.5/2.0	Z144516-21	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.298	2.29	87.3			
SD-L08-C-2.0/2.5	Z144516-22	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.302	2.33	86.0			
SD-L08-C-2.5/2.9	Z144516-23	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.313	2.41	83.1			
GT-L08-C-2.9/3.4	Z144516-24	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	ND		mg/kg	0.287	2.21	90.5			
SD-L08-D-0.0/0.5	Z144516-25	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	498		mg/kg	0.354	2.72	73.5			
SD-L08-D-0.5/1.0	Z144516-26	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	456		mg/kg	0.322	2.47	80.8			
SD-L08-D-1.0/1.5	Z144516-27	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	250	J	mg/kg	0.311	2.39	83.6	DU	Dup precision = 200.0	
GT-L08-D-1.5/2.0	Z144516-28	Soil	11/5/2014	11/7/2014	SW6020	20	Arsenic	49.9		mg/kg	0.298	2.29	87.3			
SD-L08-0.0/0.5	Z144516-29	Soil	11/5/2014	11/6/2014	SW6020	20	Arsenic	56.4	J	mg/kg	0.310	2.39	83.8	FD	Field Duplicate = 42.3 RPD	
SD-L08-0.0/0.5-D	Z144516-30	Soil	11/5/2014	11/6/2014	SW6020	20	Arsenic	86.7	J	mg/kg	0.311	2.39	83.5	FD	Field Duplicate; Field Duplicate = 42.3 RPD	
SD-L09-0.0/0.5	Z144521-16	Soil	11/6/2014	11/7/2014	SW6020	20	Arsenic	16.4		mg/kg	0.319	2.45	81.5			
SD-L09-0.0/0.5-D	Z144521-17	Soil	11/6/2014	11/7/2014	SW6020	20	Arsenic	20.1		mg/kg	0.325	2.50	79.9		Field Duplicate	
SD-L11-A-0.0/0.5	Z144524-01	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	26.0		mg/kg	0.313	2.41	82.9			
SD-L11-A-0.5/1.0	Z144524-02	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	24.7		mg/kg	0.310	2.38	83.9			
SD-L11-A-1.0/1.5	Z144524-03	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	6.39		mg/kg	0.333	2.56	78.2			
SD-L11-A-1.5/2.0	Z144524-04	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	2.89		mg/kg	0.328	2.52	78.4			
SD-L11-A-2.0/2.5	Z144524-05	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.312	2.40	83.4			
SD-L11-A-2.5/2.8	Z144524-06	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.330	2.54	78.1			
GT-L11-A-2.8/3.4	Z144524-07	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.327	2.51	80.4			
SD-L11-B-0.0/0.5	Z144524-08	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	17.3		mg/kg	0.332	2.56	77.4			
SD-L11-B-0.5/1.0	Z144524-09	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	6.63		mg/kg	0.305	2.35	84.4			
GT-L11-B-1.0/1.5	Z144524-10	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.297	2.28	86.7			
SD-L11-C-0.0/0.5	Z144524-11	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	13.8		mg/kg	0.313	2.41	83.8			
SD-L11-C-0.5/1.2	Z144524-12	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.305	2.34	85.3			
GT-L11-C-1.2/1.7	Z144524-13	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	85.2			
SD-L11-D-0.0/0.5	Z144524-14	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	199		mg/kg	0.304	2.34	84.7			
SD-L11-D-0.5/1.0	Z144524-15	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	200		mg/kg	0.309	2.38	84.9			
SD-L11-D-1.0/1.5	Z144524-16	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	109		mg/kg	0.302	2.33	85.1			
SD-L11-D-1.5/2.0	Z144524-17	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	74.2		mg/kg	0.316	2.43	82.4			
SD-L11-D-2.0/2.5	Z144524-18	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	45.7		mg/kg	0.310	2.38	83.2			
SD-L11-D-2.5/3.0	Z144524-19	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	33.4		mg/kg	0.313	2.41	83.8			
SD-L11-D-3.0/3.5	Z144524-20	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	14.2		mg/kg	0.314	2.42	81.2			
SD-L11-D-3.5/4.0	Z144524-21	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	8.00		mg/kg	0.337	2.59	77.2			
SD-L11-D-4.0/4.8	Z144524-22	Soil	11/7/2014	11/8/2014	SW6020	20	Arsenic	4.68		mg/kg	0.335	2.58	77.6			
SD-L11-0.0/0.5	Z144524-23	Soil	11/7/2014	11/7/2014	SW6020	20	Arsenic	63.3		mg/kg	0.313	2.41	83.0			
SD-L10-C-3.5/4.0	Z144529-01	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	2.39		mg/kg	0.298	2.29	87.4			
SD-L10-C-3.5/4.0-D	Z144529-02	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	2.82		mg/kg	0.300	2.31	87.5		Field Duplicate	
SD-L10-C-4.0/4.5	Z144529-03	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.310	2.39	83.0			
SD-L10-C-4.5/5.0	Z144529-04	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.322	2.48	79.9			
SD-L10-C-5.0/5.5	Z144529-05	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.323	2.49	81.2			
SD-L10-C-5.5/6.0	Z144529-06	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.328	2.52	78.5			
SD-L10-C-6.0/6.7	Z144529-07	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.317	2.44	82.8			
GT-L10-C-7.0/7.5	Z144529-08	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.292	2.25	88.0			
GT-L10-C-7.0/7.5-D	Z144529-09	Soil	11/8/2014	11/8/2014	SW6020	20	Arsenic	ND		mg/kg	0.293	2.26	88.6		Field Duplicate	
SD-L12-A-0.0/0.5	Z144530-01	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	4.55		mg/kg	0.309	2.38	84.2			

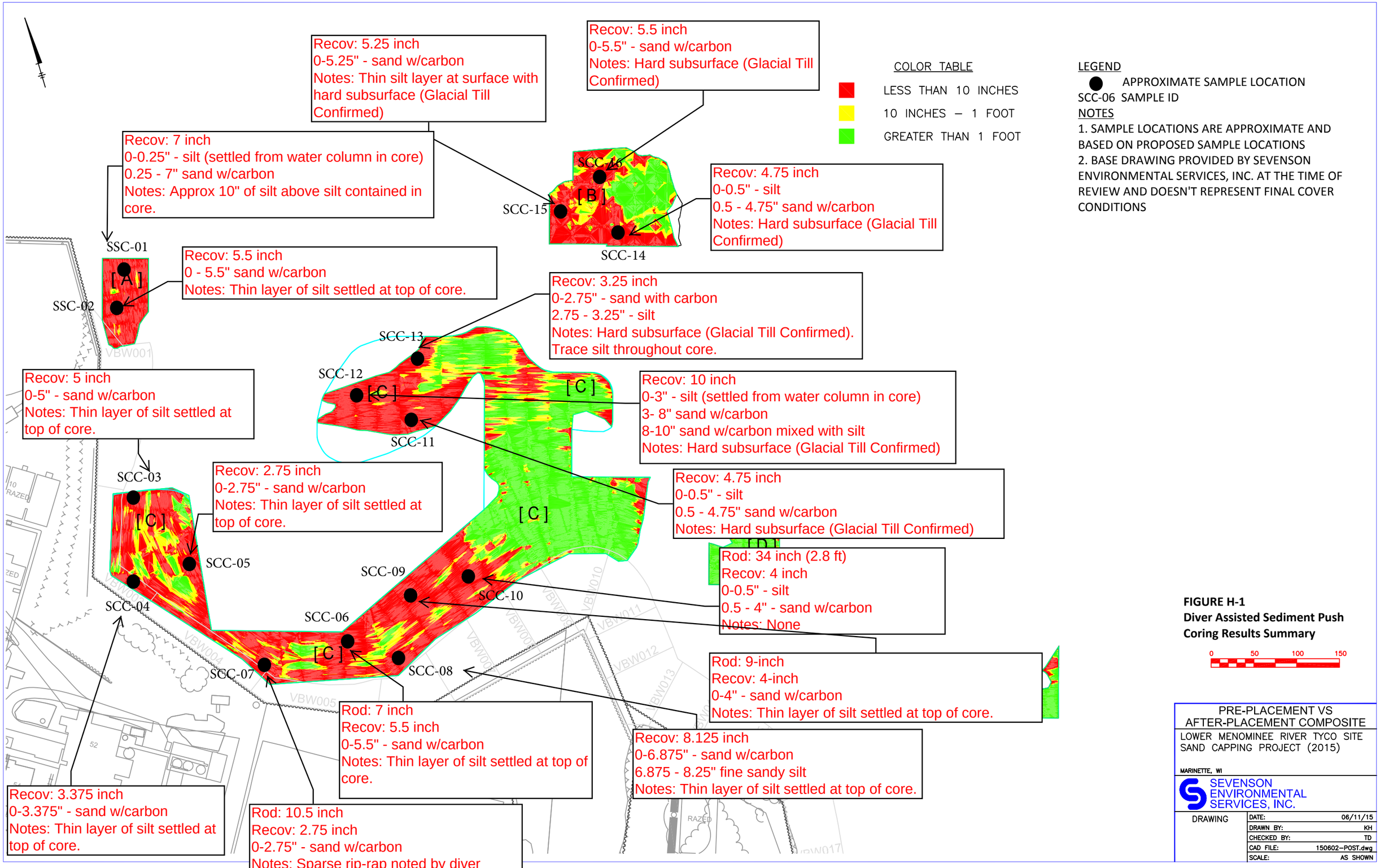
Table A1-1
ECCS - Confirmation Sampling Analytical Results - 2014
Great Lakes Legacy Act Lower Menominee River Tyco Site, Marinette, WI

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Analyzed	Analytical Method	Dilution Factor	Analyte	Result	Q	UNITS	MDL	RL	% Solids	Qual Code	DV Notes	
SD-L12-A-0.0/0.5-D	Z144530-02	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	4.38		mg/kg	0.310	2.38	84.0		Field Duplicate	
SD-L12-A-0.5/1.0	Z144530-03	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.309	2.38	84.0			
SD-L12-A-1.0/1.5	Z144530-04	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	84.6			
SD-L12-A-1.5/2.0	Z144530-05	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.309	2.38	84.1			
SD-L12-A-2.0/2.5	Z144530-06	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.303	2.33	85.8			
SD-L12-A-2.5/3.0	Z144530-07	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.304	2.34	84.7			
SD-L12-A-3.0/3.5	Z144530-08	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	84.6			
SD-L12-A-3.5/4.0	Z144530-09	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.3			
SD-L12-A-4.0/4.6	Z144530-10	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.5			
SD-L12-B-0.0/0.5	Z144530-11	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	79.8		mg/kg	0.313	2.41	83.0			
SD-L12-B-0.5/1.0	Z144530-12	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	72.8		mg/kg	0.304	2.34	85.4			
SD-L12-B-1.0/1.5	Z144530-13	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	30.4		mg/kg	0.306	2.36	84.9			
SD-L12-B-1.5/2.0	Z144530-14	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	32.5		mg/kg	0.308	2.37	84.3			
SD-L12-B-2.0/2.5	Z144530-15	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	9.47		mg/kg	0.308	2.37	84.4			
SD-L12-B-2.5/3.0	Z144530-16	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.306	2.36	84.9			
SD-L12-B-3.0/3.5	Z144530-17	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.301	2.32	86.3			
SD-L12-B-3.5/4.0	Z144530-18	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.298	2.29	87.4			
SD-L12-B-4.0/4.6	Z144530-19	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.299	2.30	86.9			
SD-L12-C-0.0/0.5	Z144530-20	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	51.1	J	mg/kg	0.301	2.32	86.3	MS	MS 65.1 % Rec	
SD-L12-C-0.5/1.0	Z144530-21	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	147	J	mg/kg	0.329	2.53	79.0	MS	MS 65.1 % Rec	
SD-L12-C-1.0/1.5	Z144530-22	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	77.8	J	mg/kg	0.306	2.36	84.8	MS	MS 65.1 % Rec	
SD-L12-C-1.5/2.0	Z144530-23	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	92.2	J	mg/kg	0.304	2.34	85.5	MS	MS 65.1 % Rec	
SD-L12-C-2.0/2.5	Z144530-24	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	102	J	mg/kg	0.306	2.36	84.9	MS	MS 65.1 % Rec	
SD-L12-C-2.5/3.0	Z144530-25	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	115	J	mg/kg	0.307	2.36	84.6	MS	MS 65.1 % Rec	
SD-L12-C-3.0/3.6	Z144530-26	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	131	J	mg/kg	0.312	2.40	83.3	MS	MS 65.1 % Rec	
SD-L12-D-0.0/0.5	Z144530-27	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.301	2.32	86.3			
SD-L12-D-0.5/1.0	Z144530-28	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	2.94		mg/kg	0.296	2.28	87.7			
SD-L12-D-1.0/1.5	Z144530-29	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	2.44		mg/kg	0.297	2.28	87.6			
SD-L12-D-1.5/2.0	Z144530-30	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.278	2.14	93.5			
SD-L12-D-2.0/2.5	Z144530-31	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	ND		mg/kg	0.299	2.30	87.0			
SD-L12-0.0/0.5	Z144530-32	Soil	11/8/2014	11/10/2014	SW6020	20	Arsenic	37.0		mg/kg	0.314	2.41	83.7			
SD-L14-A-0.0/0.5	Z144609-01	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	48.7		mg/kg	0.298	2.29	87.4			
SD-L14-A-0.5/1.0	Z144609-02	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	56.8		mg/kg	0.297	2.28	87.6			
SD-L14-A-1.0/1.5	Z144609-03	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	78.5		mg/kg	0.306	2.35	84.9			
SD-L14-A-1.5/2.0	Z144609-04	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	77.9		mg/kg	0.306	2.35	85.0			
SD-L14-A-2.0/2.5	Z144609-05	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	73.0		mg/kg	0.310	2.38	84.0			
SD-L14-A-2.5/3.0	Z144609-06	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	74.4		mg/kg	0.310	2.39	83.8			
SD-L14-A-3.0/3.5	Z144609-07	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	56.6		mg/kg	0.305	2.34	85.3			
SD-L14-A-3.5/4.0	Z144609-08	Soil	11/10/2014	11/12/2014	SW6020	20	Arsenic	45.2		mg/kg	0.308	2.37	84.5			
SD-L14-B-0.0/0.5	Z144609-09	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	9.31	J	mg/kg	0.302	2.33	86.0	DU	Dup precision = 24.9	
SD-L14-B-0.0/0.5-D	Z144609-10	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	7.67	J	mg/kg	0.297	2.29	86.6	DU	Field Duplicate; Field Duplicate; Dup precision = 24.9	
SD-L14-B-0.5/1.0	Z144609-11	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	8.26	J	mg/kg	0.296	2.28	86.9	DU	Dup precision = 24.9	
SD-L14-B-1.0/1.5	Z144609-12	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	9.05	J	mg/kg	0.298	2.29	87.4	DU	Dup precision = 24.9	
SD-L14-B-1.5/2.0	Z144609-13	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	26.2	J	mg/kg	0.299	2.30	87.0	DU	Dup precision = 24.9	
SD-L14-B-2.0/2.5	Z144609-14	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	33.4	J	mg/kg	0.308	2.37	84.5	DU	Dup precision = 24.9	
SD-L14-B-2.5/3.0	Z144609-15	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	4.28	J	mg/kg	0.304	2.34	85.5	DU	Dup precision = 24.9	
SD-L14-B-3.0/3.5	Z144609-16	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	7.16	J	mg/kg	0.306	2.36	84.9	DU	Dup precision = 24.9	
SD-L14-B-3.5/4.0	Z144609-17	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.3			
SD-L14-B-4.0/4.4	Z144609-18	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.302	2.32	85.4			
SD-L14-C-0.0/0.5	Z144609-19	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.333	2.56	78.1			
SD-L14-C-0.5/1.0	Z144609-20	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.335	2.58	77.6			
SD-L14-C-1.0/1.4	Z144609-21	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	84.5			
SD-L14-D-0.0/0.5	Z144609-22	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.329	2.53	79.0			
SD-L14-D-0.0/0.5-D	Z144609-23	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.332	2.55	77.6		Field Duplicate	
SD-L14-D-0.5/1.0	Z144609-24	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.312	2.40	83.3			
SD-L14-D-1.0/1.5	Z144609-25	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.307	2.36	83.9			
SD-L14-D-1.5/2.0	Z144609-26	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.301	2.31	86.4			
SD-L14-D-2.0/2.8	Z144609-27	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	3.26		mg/kg	0.330	2.54	79.5			
SD-L14-0.0/0.5	Z144609-28	Soil	11/11/2014	11/11/2014	SW6020	20	Arsenic	37.0		mg/kg	0.297	2.28	85.0			

Table A1-1
ECCS - Confirmation Sampling Analytical Results - 2014
Great Lakes Legacy Act Lower Menominee River Tyco Site, Marinette, WI

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Analyzed	Analytical Method	Dilution Factor	Analyte	Result	Q	UNITS	MDL	RL	% Solids	Qual Code	DV Notes	
SD-L12-C-3.5/4.0	Z144611-01	Soil	11/11/2014	11/11/2014	SW6020	20	Arsenic	ND		mg/kg	0.314	2.42	84.4			
SD-L12-C-3.5/4.0-D	Z144611-02	Soil	11/11/2014	11/11/2014	SW6020	20	Arsenic	ND		mg/kg	0.309	2.37	84.2		Field Duplicate	
SD-L12-C-4.0/4.5	Z144611-03	Soil	11/11/2014	11/11/2014	SW6020	20	Arsenic	ND		mg/kg	0.299	2.30	84.5			
SD-L12-C-4.5/5.0	Z144611-04	Soil	11/11/2014	11/11/2014	SW6020	20	Arsenic	ND		mg/kg	0.291	2.23	86.0			
SD-L12-C-5.0/5.5	Z144611-05	Soil	11/11/2014	11/11/2014	SW6020	20	Arsenic	6.60		mg/kg	0.310	2.38	84.0			
SD-L12-C-5.5/6.0	Z144611-06	Soil	11/11/2014	11/11/2014	SW6020	20	Arsenic	13.4		mg/kg	0.303	2.33	85.9			
SD-L12-C-6.0/6.5	Z144611-07	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.304	2.34	85.5			
SD-L12-C-6.5/7.0	Z144611-08	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.303	2.33	85.7			
SD-L12-C-7.0/7.5	Z144611-09	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.300	2.31	85.8			
SD-L12-C-7.5/8.0	Z144611-10	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.321	2.47	82.7			
SD-L12-C-8.0/8.5	Z144611-11	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.308	2.37	83.6			
SD-L12-C-8.5/9.0	Z144611-12	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.301	2.32	83.1			
SD-L12-C-9.0/9.5	Z144611-13	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.311	2.40	82.7			
GT-L12-C-9.5/10.0	Z144611-14	Soil	11/11/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.288	2.21	86.9			
SD-L13-0.0/0.5	Z144615-01	Soil	11/12/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.313	2.41	83.1			
GT-L10-C-00/00.5	Z144617-01	Soil	11/12/2014	11/12/2014	SW6020	20	Arsenic	ND		mg/kg	0.298	2.29	87.3			
ND = non-detect																
J = result is an estimate																
mg/kg = milligrams per kiligram																

Appendix H
Cover Area Coring Results Summary


Recov: 5.25 inch
0-5.25" - sand w/carbon
Notes: Thin silt layer at surface with hard subsurface (Glacial Till Confirmed)
Recov: 5.5 inch
0-5.5" - sand w/carbon
Notes: Hard subsurface (Glacial Till Confirmed)
COLOR TABLE
LESS THAN 10 INCHES
10 INCHES – 1 FOOT
GREATER THAN 1 FOOT
LEGEND
APPROXIMATE SAMPLE LOCATION
SCC-06 SAMPLE ID
NOTES
1. SAMPLE LOCATIONS ARE APPROXIMATE AND BASED ON PROPOSED SAMPLE LOCATIONS
2. BASE DRAWING PROVIDED BY SEVENSON ENVIRONMENTAL SERVICES, INC. AT THE TIME OF REVIEW AND DOESN'T REPRESENT FINAL COVER CONDITIONS
Recov: 7 inch
0-0.25" - silt (settled from water column in core)
0.25 - 7" sand w/carbon
Notes: Approx 10" of silt above silt contained in core.
SCC-16
SCC-15
[B]
SCC-14
Recov: 4.75 inch
0-0.5" - silt
0.5 - 4.75" sand w/carbon
Notes: Hard subsurface (Glacial Till Confirmed)
SSC-01
[A]
SSC-02
Recov: 5.5 inch
0 - 5.5" sand w/carbon
Notes: Thin layer of silt settled at top of core.
Recov: 3.25 inch
0-2.75" - sand with carbon
2.75 - 3.25" - silt
Notes: Hard subsurface (Glacial Till Confirmed).
Trace silt throughout core.
SCC-13
SCC-12
[C]
SCC-11
[C]
Recov: 5 inch
0-5" - sand w/carbon
Notes: Thin layer of silt settled at top of core.
Recov: 10 inch
0-3" - silt (settled from water column in core)
3- 8" sand w/carbon
8-10" sand w/carbon mixed with silt
Notes: Hard subsurface (Glacial Till Confirmed)
SCC-03
Recov: 2.75 inch
0-2.75" - sand w/carbon
Notes: Thin layer of silt settled at top of core.
Recov: 4.75 inch
0-0.5" - silt
0.5 - 4.75" sand w/carbon
Notes: Hard subsurface (Glacial Till Confirmed)
[C]
[C]
SCC-05
SCC-09
SCC-10
Rod: 34 inch (2.8 ft)
Recov: 4 inch
0-0.5" - silt
0.5 - 4" - sand w/carbon
Notes: None
SCC-04
SCC-06
[C]
SCC-07
SCC-08
Rod: 9-inch
Recov: 4-inch
0-4" - sand w/carbon
Notes: Thin layer of silt settled at top of core.
Rod: 7 inch
Recov: 5.5 inch
0-5.5" - sand w/carbon
Notes: Thin layer of silt settled at top of core.
Recov: 8.125 inch
0-6.875" - sand w/carbon
6.875 - 8.25" fine sandy silt
Notes: Thin layer of silt settled at top of core.
Recov: 3.375 inch
0-3.375" - sand w/carbon
Notes: Thin layer of silt settled at top of core.
Rod: 10.5 inch
Recov: 2.75 inch
0-2.75" - sand w/carbon
Notes: Sparse rip-rap noted by diver
FIGURE H-1
Diver Assisted Sediment Push Coring Results Summary
0 50 100 150
PRE-PLACEMENT VS AFTER-PLACEMENT COMPOSITE
LOWER MENOMINEE RIVER TYCO SITE SAND CAPPING PROJECT (2015)
MARINETTE, WI
SEVENSON ENVIRONMENTAL SERVICES, INC.
DRAWING
DATE: 06/11/15
DRAWN BY: KH
CHECKED BY: TD
CAD FILE: 150602-POST.dwg
SCALE: AS SHOWN