St Marys River
Federal Navigation Channel
Sediment Sampling and Analysis Report
Chippewa County, Michigan

September 2015

REVISED

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Prepared For:

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- 1410A92
- 1411615
- 1505725

1.0 INTRODUCTION

The U.S. Army Corps of Engineers, Detroit District (USACE) retained RTI Laboratories, Inc. (RTI) as a contractor to perform sediment sampling services within the Federal Navigation channels of the Thunder Bay River in Alpena, Michigan (Site) in response to and in accordance with the Detroit District's Request for Proposal (RFP) and Statement of Work (SOW) received on 24 July 2014 and modified on 30 December 2014. This project is part of an assessment of sediment quality within the navigation channel of the site. This project involves collection of sediment samples from shoaling within the Navigation Channel of the River. This information will be used by the District and its clients to select the proper sediment dredging practices as well as monitor any potential migration of contaminants. RTI provided sediment sampling services using both Gravity-core sampling devices mounted on a V-hulled boat and Macro-core sampling using a push type coring device mounted on a pontoon boat and barge at this Site.

The scope of the work was to sample predetermined locations within the navigation channels along the Site as shown in Figure 3. The sampling crew (RTI team) mobilized three different times for this work. The first mobilization was on 20 October 2014 to begin work at the site on the morning of 21 October to collect the gravity core samples. After preparing all equipment for the day, the team launched and began sampling through the end of the day on 22 October 2014. This RTI team consisted of three (3) people: Andy Mrazik, Jerry Lalonde and Fred Hoitash from RTI. Seventeen samples were to be collected from the navigation channel of the Site over two to three days.

The second mobilization was on the morning of 11 November 2014. Only two samples were collected during this mobilization. The river and launch site had iced and components of the steering on the boat were breaking due to ice. Due to the extreme cold and early freezing conditions the work was cancelled for safety reasons and rescheduled for the spring of 2015.

The crew mobilized again on 19 May 2015 in order to start early in the morning on 20 May. The crew consisted of two operators from Coleman Engineering Company and Fred Hoitash from RTI. Eleven stations were sampled during this mobilization using vessels both upstream of Neebish

Island and downstream of Neebish Island (for the Moon Island stations). Station SM-14-02 had 2 distinct layers and through conversation with the USACE Project Officer, it was decided to proceed with the station core as two samples.

Sampling, sample handling, and analytical procedures were conducted in accordance with the Scope of Work (SOW) and specifications of the current USACE Contract W912P4-12-D-0002 Delivery Order DC01, in addition to "Methods for Evaluating Solid Waste", 3rd ED, U.S. EPA No. SW-846, DoD Quality Systems Manual v4.2/5.0, and "Description of Soils (Visual-Manual Procedure)", ASTM D 2488-69. An additional requirement to call into the St Marys shipping traffic control station was done every morning and every evening. Specific instructions were provided to the RTI team vessel operators every day.

A total of thirty-one (31) discreet sediment samples were collected from thirty (30) stations during the events. All samples were collected within the designated navigation channel from locations identified in the maps supplied by the District and included in Appendix A. Two of the samples closest to the Rock cut were cores to resistance in an attempt to locate the beginning of the bedrock below the shoaling. Final sample locations are provided in Appendix A, showing the actual sample locations.

This report provides documentation of the field survey and describes the field activities that occurred, the samples collected, and the conditions encountered during the survey. This report also includes the overview maps, proposed and final sample locations in **Appendix A**. **Appendix B** – Table 1 presents the sediment chemistry analysis for the sediment samples collected. Table 2 presents the sediment grain size analysis for the sediment samples.

RTI Team maintained a field logbook for this project. A typed copy of the field logbook form and the compiled notes are included as **Appendix C**. The compiled boring logs are presented in **Appendix D**. Photographs of the samples and activities are included in **Appendix E.**

Appendix F contains the RTI and Level 2 QC Analytical Reports, with chain-of-custody forms. The Grain size reports for the sediments are also included in this appendix.

All related bench notebooks and data are retained for this Delivery Order. The raw analytical data, electronic bench sheets and narratives, electronic data deliverables (EDD), a complete data package with associated quality control data and quality assurance summary, along with the detailed review of the data are presented as a supplement to this report on a separate CD.

2.0 SITE DESCRIPTION

The Federal Navigation Channel for the St Marys River, relevant to this SOW is located in Chippewa County, MI. The station locations span from about the up and down bound channel split southeast toward the entrance of the rock cut, just northwest of the Neebish Island Ferry crossing. There are four stations located downstream of the Rock cut, on the north side of Moon Island. The River has one of the highest traffic flows of all the Great Lakes connecting rivers. The current flows in a southeasterly direction from Sault Ste Marie between 3 and 5 Knots. The up and down bound split in Lake Nicolet is approximately 11 miles southeast of downtown Sault Ste Marie, Michigan and 3 miles north northwest of the north tip of Sand Island. The River is used for recreational, commercial and freighter traffic.

3.0 SAMPLE COLLECTION – SEDIMENT SAMPLES

The field survey and sampling activities were conducted according to the SOW for the Site, as prepared, refined and modified based on discussions with the USACE Detroit District Project officer, Ms. Pam Horner.

3.1 Survey Preparation

The SOW developed by the USACE required sediment sampling at thirty (30) locations along the navigation channel and Moon Island entrance site. The locations were identified on the maps in **Appendix A** within the navigation channel of the Site. RTI proposed that these 30 sediment samples would be collected over several days using multiple vessels and multiple types of

sampling equipment. The samples were to be collected from the locations described in **Appendix A**, Figure 3. In order to organize the sampling effort and prepare the sample containers, RTI developed a sampling plan based on the SOW and the sampling crew had preplanned the supply of containers and sampling supplies. Due to the nature of the samples, the plan called for samples to be stored on ice and delivered to the laboratory following the completion of the collection effort.

The sampling plan summarized the channel dredge depth elevation, estimated amount of sediment required for analysis; sampling equipment, sample locations, analysis parameters, containers required, sampling preservation requirements, chain-of-custody, health and safety plans, and delivery of the samples. All samples were handled as composite samples from each core except for station SR-14-02. This core was split into two samples due to the distinct layers in the core. Stations SR-14-29 and 30 were added to determine where the bedrock begins under the river bed and to determine the chemical and physical characteristics of the overburden above the bedrock. This information is detailed in the Field logs of Appendix C. All samples were photographed, documented, well mixed, decanted and placed into sample containers immediately after the sample was retrieved.

Proposed analytical parameters for the harbor sediment samples included the Physical kit (including grain size analysis (sieve analysis w/o hydrometer), Metals kit, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), Chlorinated Pesticides, Nutrients kit and Organic Indicators. Summary tables for these samples are provided in **Appendix B**. The DoD QSM based Level 2 (QA Level) reports for the sediment data are presented in **Appendix F**.

RTI Team first mobilized on Monday 20 October 2014 with all equipment and materials required for collecting and processing sediment samples collected using gravity coring equipment from the Site. The team began the collection event on the morning of 21 October 2014. All of the supplies were transported to the site for the event's activities. At the end of the day the samples were iced or re-iced in the coolers until the conclusion of the sampling event and delivery to the laboratory at the end of the event. Samples from 18 stations were collected over the two days of sampling.

The team mobilized again using a light barge from Coleman Engineering, on the morning of 11 November 2014. After the first sample was collected, a decision was made to move the barge down toward the rock cut where it would be more protected from the escalating winds and waves. There was some equipment problems on the third station and the sampling had to be suspended. The launch and Charlotte River had frozen overnight. The boats steering system broke as we were attempting to launch after clearing the launch area of ice. The air temperatures had dropped to 20 F by the morning of 12 November. The work was cancelled due to concerns over safety. Two samples were collected on one day of sampling for this mobilization effort.

Another mobilization began on the morning of 20 May 2015, using a light barge with spuds for the remaining samples in Lake Nicolet and a pontoon boat to collect the samples from the Moon Island proposed loading area. All of these samples were collected using a Macro-core sampler and push rig. The weather conditions were almost ideal and the boat traffic was light for the full day of sampling. Cores were collected from the remaining ten stations during the one day of sampling.

3.2 Field Documentation

Field conditions, activities, and field data were documented in a field logbook. Information recorded in the logbook includes:

- Station identification number, using a unique prefix for each site.
- Sample collection date and names of the sampling team
- Depth at each sampling location
- Depth of each core retrieved
- A description, measurement and identification of the material of each core retrieved according to ASTM D 2488-69, "Description of Soils (Visual Manual Procedure)"
- Types of sampling equipment used
- Latitude and Longitude of station locations
- Time of sample collection
- Identification number of the sample photographs

Prior to collecting sediment samples, sample coordinates were determined from the maps supplied by the USACE. The proposed Latitude and Longitudes were manually entered into a Global Positioning System (GPS) unit to locate each proposed sampling site. The water depth was measured by using a depth finder, calibrated by a second measuring device and recorded the nearest one tenth foot increment. Proposed sample locations at the Site were relocated if no shoaling was apparent, as presented in previous sections. Reference water level data (in feet) were obtained from the NOAA/NOS Web site to correct for subsurface levels. The nearest NOAA water level reference station for the Site was the Rock Cut station at West Neebish Island, MI (9076027).

Digital, color photographs **(Appendix E)** were taken of some activities and all sediment samples prior to and after mixing them, to indicate color, texture and homogeneity of the sediment.

3.3 Weather/Climatic Conditions

The climatic conditions are presented in the summary table below for the day of sampling. The winds were light to moderate with mostly clear skies during the first and third mobilization.. The weather conditions for the second mobilization began with increasing winds on the leading edge of a cold front, 6 inches of snow overnight and early morning temperatures around 20 F both days. The water turbidity level was low and current swift in all areas of the river as the channel progressed downstream.

The following chart illustrates the climatic conditions during the events:

Date	Avg/Max Temp (F)	Wind Speed, mph (gusts)	Wind Direction
10/21/2014	41/48	7-13(20)	N to NNE
10/22/2014	39/50	3-7(11)	Variable N to S
11/11/2014	27/30	11-17(27)	E to NE
05/20/2015	45/59	8/17(23)	NW

The Low Water Datum (LWD) for the St Marys River at the West Neebish Island station is listed as 577.8 feet from the International Great Lakes Datum 1985 (IGLD 1985). The corrected sediment elevation is presented on the typed field logs for each site **(Appendix C)**.

Data obtained from National Ocean-Atmosphere Administration's (NOAA) website stated:

- Station 9076027, W Neebish Island, MI recorded that water levels fluctuated between 579.134 and 579.898 feet during the days of sampling. Specific six minute interval observances were obtained for the individual sample times to correct for the fluctuating water levels.

The Low Water Datum (LWD) for the St Marys River at the Rock Cut, MI station, used for the Moon Island water level corrections, is listed as 577.5 feet from the International Great Lakes Datum 1985 (IGLD 1985). The corrected sediment elevation is presented on the typed field logs for each site **(Appendix C)**.

Data obtained from National Ocean-Atmosphere Administration's (NOAA) website stated:

- Station 9076024, Rock Cut, MI recorded that water levels fluctuated between 578.993 and 579.629 feet during the one day of sampling at the Moon Island site. Specific six minute interval observances were obtained for the individual sample times to correct for the fluctuating water levels.

3.4 Sample Locations

Prior to launching, the team reviewed the sample locations and maps supplied by the District Project Officer. Once underway the depth sounder was calibrated using a fixed metal rod. Sampling activity was initiated by navigating to the coordinates of the predetermined sample locations. Once the sampling vessel was located at each site, time, depth, and GPS information

was recorded. There were some proposed locations that were relocated due to shoaling that had shifted.

3.5 Sample Collection

The navigation channel samples were collected on 21-22 October 2014, 11 November 2014 and 20 May 2015 using a V-hulled boat with a crane mounted Gravity core sampling system and/or Ponar dredge sampler, light barge with push rig type macro-coring unit or pontoon boat with a push rig type macro-coring unit. Stations SM-14-01, 07-08, and 10-24 were collected using a gravity-core sampler. Stations SR-14-02-06, 09, and 25-30 were collected using the push rig and macro-coring system. The samples were collected from the boat with all the sampling equipment, locating anchors/spuds, and sample compositing materials on board. Samples were processed on the boat and equipment cleaned as the pilot moved the boat to the next location. Once the samples were mixed and placed into bottles, all measurements, documentation and photographs were recorded. Once it was determined that all of the sample and field information was complete, excess sample was dumped and the sampling and mixing equipment was cleaned and made ready for the next sample.

3.5.1 Sampling Procedures

Samples were collected using Gravity core and Ponar sampling equipment. For this Site, the Gravity core sampling equipment was lowered at a near freefall rate to the sediment level. A winch and crane was used to raise the sampling device to the surface and then the device was maneuvered into the boat to retrieve the core. The core depth was measured prior to dewatering the core and removing the core from the remaining tube. The samples were all processed by extracting the sample from the core tube, dewatering, documenting and mixing prior to putting the sample into sample containers.

The push-rig samples were collected by advancing the macro-core sampling unit using 5 rods to reach the surface of the sediment. The macro-core sampler is them pushed through the sediment to obtain the correct core length. Before lifting the Macro-core unit, a check valve is placed at the

top of the Macro-core unit. The rods are removed and the Macro-core unit is opened, to remove the Lexan liner. The liner is cut and the material documented and processed.

All samples were some combination of gravel, sand and silt. Some samples had clay or clay mixtures in them. All of the samples had layers of coarse to fine sand in the core. All of this information is recorded in the logs presented in **Appendix C**.

Sampling equipment was decontaminated after each sample by using a phosphate free surfactant, followed by a river water rinse. The decontamination procedure included scrubbing and rinsing sampling equipment with site water and using new gloves for each sample location.

3.5.2 Field Logbook

The field forms and the logbook were filled out completely, recording each sample before leaving each sample location. The NOAA reference water levels were confirmed upon return to the field office. The typed field form and logs are included in **Appendix C**. Compiled boring logs are also presented in **Appendix D**.

3.5.3 Photographic Log

Digital color photographs were taken of the core and aggregate samples as needed for documentation. The photographs were made to best document the core or sample based on the ambient lighting. The photographs and captions are included in **Appendix E**.

3.5.4 Sample Containers and Sample Preservation

All samples were collected and stored in laboratory supplied HDPE or glass containers with tight fitting closures. All sample containers were cooled using ice stored in zip-lock bags to less than 6°C, and stored in darkness, except transiently during handling operations. Chain-of-custody was maintained during sampling activities. Based upon the proposed analysis parameters, none of the sediment samples required additional chemical or physical preservation other than ice.

Sediment samples were kept on ice and delivered to RTI laboratories at the conclusion of the sampling event. The sediment samples were processed by the laboratory the following morning after receipt.

3.5.5 Sample Custody

Chain-of-custody over samples was maintained at all times. These documents are part of the laboratory reports presented in **Appendix F**. Procedures for sample packaging, shipping, and chain-of-custody followed the guidelines as listed in the U.S Army Corps of Engineers Sample Handling Protocol for Low, Medium and High Concentration Samples of Hazardous Waste, dated October 1986. Samples for this project were considered to be low level samples environmental samples for safety, packaging and shipping purposes.

Sample containers were carefully packed to prevent breakage. The samples were placed in sturdy leak-proof coolers with ice stored in zip-lock bags. Each signed chain-of-custody was stored in a zip-lock bag and place inside each cooler.

4.0 SEDIMENT ANALYTICAL RESULTS

The sediment samples were delivered under chain-of-custody to RTI Laboratories in Livonia, Michigan at the end of the sampling event. RTI analyzed the sediment samples for Physical kit (including grain size analysis (sieve analysis w/o hydrometer), Metals kit, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), Nutrients kit and Organic Indicators. All chemical and physical analytical testing was completed at RTI laboratories, a DoD certified Laboratory. The analytical results are summarized in Tables 1 and 2 in **Appendix B** for the chemical and physical analytical results of the river sediment samples. The detailed laboratory analytical report and chain-of-custody documentation for all these tests are included in **Appendix F**. A complete DoD QSM Level 4 CLP like data and QA report is included on a separate CD.

4.1 Quality Assurance / Quality Control

Data quality refers to the level of uncertainty associated with a particular data point. All of the elements of the sampling event, from the sampling design through the laboratory analysis and reporting, affect the quality of the data. Data quality associated with environmental measurement is a function of the sampling plan rationale and procedures used to collect and homogenize the samples, as well as, the analytical methods and instrumentation used in procuring the measurements. Uncertainty cannot be eliminated from environmental data. However, quality assurance programs effective in measuring uncertainty in data are employed to monitor and control deviations from the desired data quality objectives.

Sources of uncertainty that can be traced to the sampling component include poor sampling plan design, incorrect sample handling, faulty sample transportation, and inconsistent use of standard operating procedures. The most common sources of uncertainty that can be traced to the analytical component of the total measurement system are problems associated with calibration, non-target matrix interference and external contamination.

Laboratory terms concerning quality control include:

- BLK – Method Blank (prepared with batch of samples)
- ICV - Initial calibration verification standard
- CCV - Continuing calibration verification (ongoing calibration standard)
- CCB - Continuing calibration blank (ongoing blank verification)
- LCS – Laboratory Control Sample (prepared with batch of samples)
- LCSD – Laboratory Control Sample Duplicate (prepared with batch of samples)
- MS – Matrix Spike (only applies to the spiked sample and its parent)
- MSD – Matrix Spike Duplicate (only applies to the spiked sample and its parent)
- % R - % Recovery (a measure of accuracy or known recovery)
- RPD – Relative Percent Difference (a measure of precision between samples)

For a spiked QC sample (LCS, LCSD, MS, and MSD), the sample or blank material is spiked with a known concentration prior to extraction. This is a test of accuracy based on the recovery of the known spike concentration. The percent recovery equals the amount of the spiked concentration detected divided by the amount added or spiked. If any of the analyte added or spiked in the QC samples is found in the unspiked sample, that concentration is taken into account. The Relative Percent Difference (RPD) is used as a measure of precision between two similar samples. This is usually determined as the relative percent difference between the MS and the MSD or LCS and LCSD. The RPD is the absolute value of the difference between the two measurements, divided by the average of the two measurements, reported in percent. The precision and accuracy of the LCS/LCSD pair is more critical to the batch quality. Anomalies to QC acceptance criteria of the MS/MSD pair are most likely indicators of matrix or chemical interferences of the samples.

Quality is assured by the laboratory setting control limits for the Accuracy and Precision data generated. Any concerns or data that is not compliant based on the guidelines of the DoD QSM version 4.2 will be narrated in the final Level 4 data package.

4.2 Data Qualifiers

A case narrative is presented as part of the entire laboratory report, and is summarized below. The detailed laboratory Quality Control Results are documented on the QC Summary Report for each of the RTI workorders presented in **Appendix F**.

- There were no critical data qualifiers for the report of the sediment samples. Critical qualifiers are ones that would make the data unacceptable by standards outlined in the DOD QSM v5.0, which is based on the NELAC standards.
- Upon review of the data for RTO Work Order 1410A92, RTI was made aware that the cadmium data presented did not match historic data. The analyst and QA staff reviewed the data from the original wavelength and determined that there were interferences at the original wavelength used for the analysis. The equipment used for this testing has the ability to collect data from all wavelengths, so the data was reprocessed using a wavelength that did not exhibit interferences.
- Some compounds failed either recovery limits or %RPD limits. These compounds are listed in the case narrative.

4.3 Quality Assurance/Quality Control Review

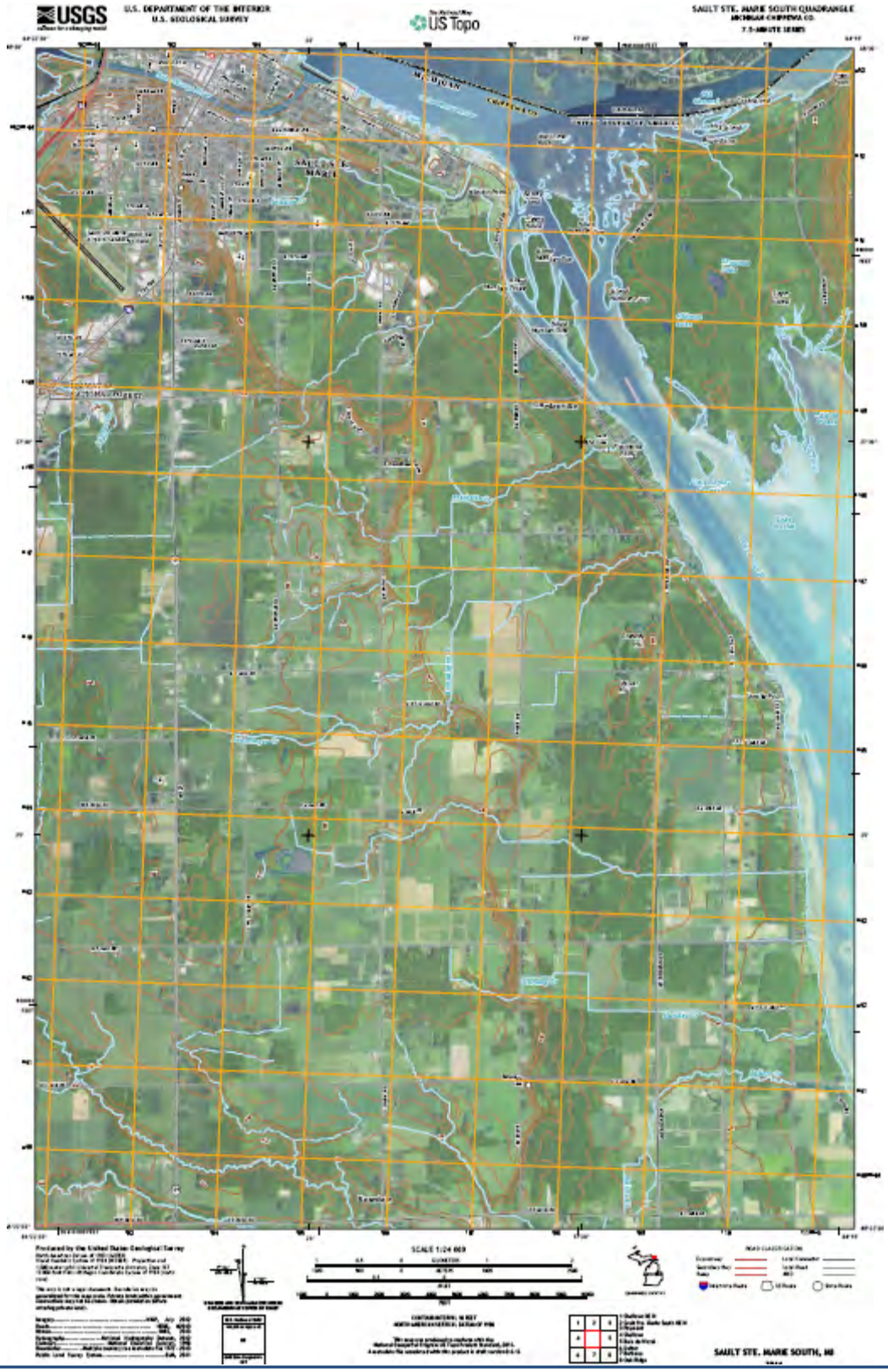
RTI performed a QA review regarding the laboratory QC data and the reports. These Case Narratives are documented in **Appendix F** and the QSM level 4 QA report.

In summary, the data and QC are all within acceptable criteria for this report and there are no potential indicators that negatively affected any of the data for this Delivery Order.

Revision Note:
The original data for cadmium was reported using the 226.502 wavelength on the ICP/AES instrument. All of the internal standards and associated QC responded in a fashion typical for dredged materials. This wavelength has been the primary wavelength for soils at RTI and has not previously had known positive bias from interferences.
During the client's review of the data a request was made for RTI to investigate the cadmium reported at the 226.502 wavelength. The data reported by RTI indicated positive concentrations at levels an order of magnitude higher than past data at this site.
The data, calibration curves and all associated QC was reprocessed using the 228.802 wavelength for cadmium. Several of the prepared samples were also analyzed on the ICP/MS instrument. The cadmium concentration of the data reprocessed at the 228.802 wavelength matched the concentrations from the ICP/MS analyses and the historic data.
Based on RTI's internal investigation and the historic data at this site, RTI has reprocessed all of the cadmium data, calibration and QC using the 228.802 wavelength. All of the cadmium data and QC in this work order has been revised.
For reference, the 228.802 wavelength was used to process the most recent round of Performance evaluation samples and both soil and water samples passed. RTI had previously passed all of these samples using the 226.502 wavelength.

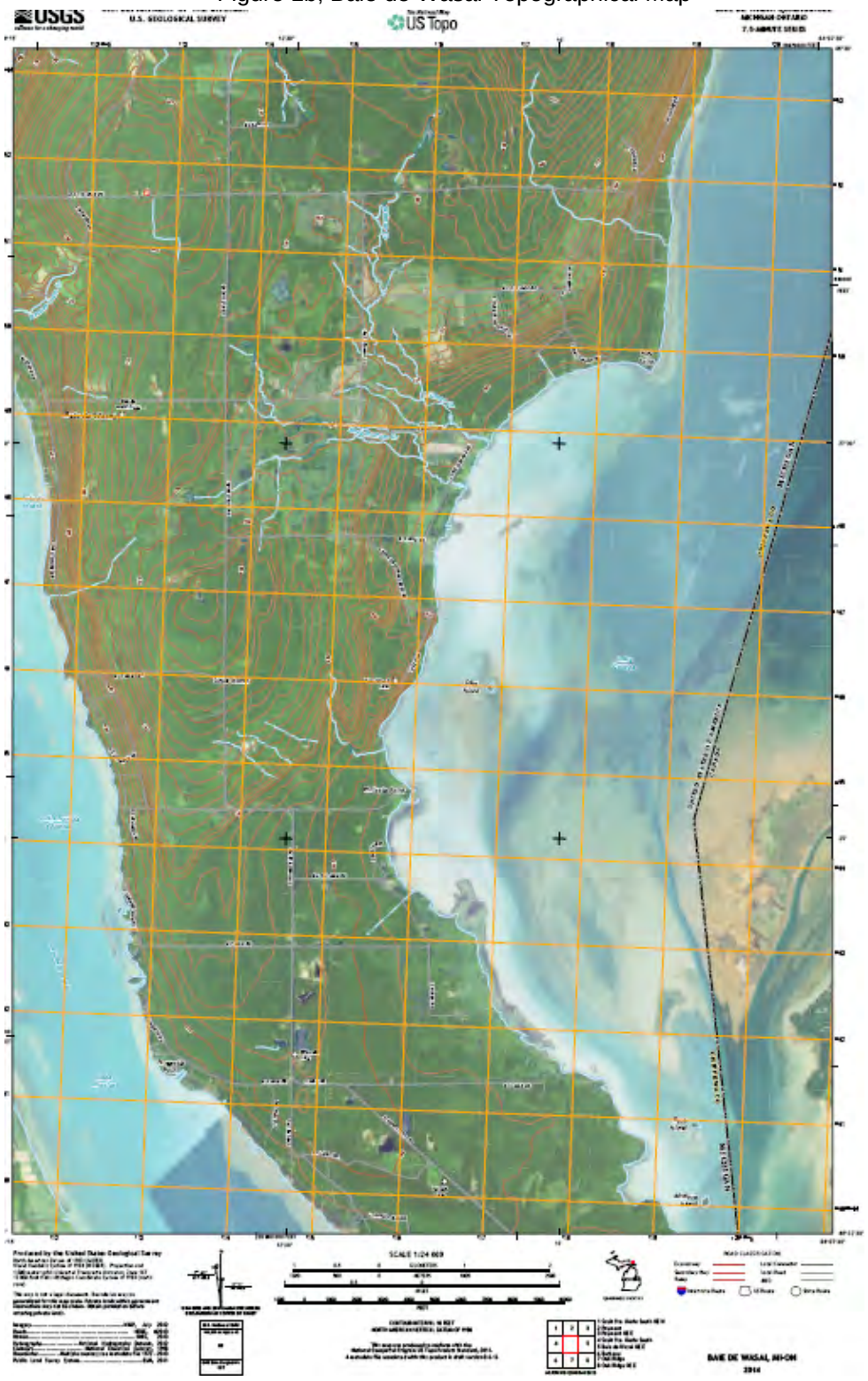
Appendix A

Figure 1a, Sault Ste Marie South Topographical Map



Appendix A

Figure 1b, Baie de Wasai Topographical Map



Appendix A

Figure 1c, Oak Ridge Topographical Map

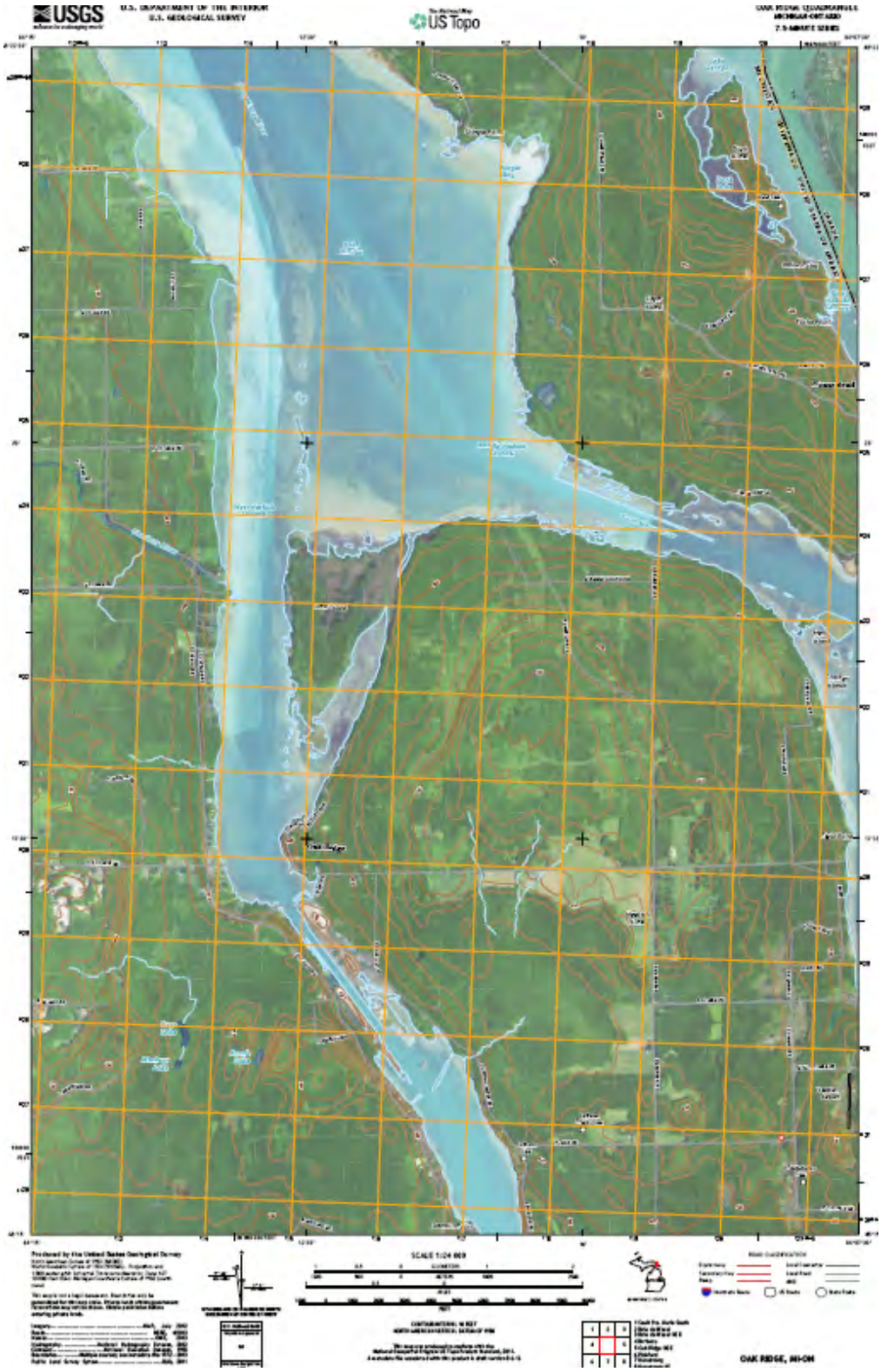


Figure 2 Aerial Photo Lower St Mays River

Appendix A

Figure 3a: St Marys River, Proposed Locations Overview

Appendix A

Figure 3b: St Marys River, Proposed Locations-Stations 1-9

Appendix A

Figure 3c: St Marys River, Proposed Locations-Stations 10-18, 29-30

Appendix A

Figure 3d: St Marys River, Proposed Locations-Stations 19-24

Appendix A

Figure 3e: St Marys River, Proposed Locations-Stations 25-28

Appendix A

Figure 4a: St Marys River, Final Locations Overview

Appendix A

Figure 4b: St Marys River, Final Locations-Stations 1-8

Appendix A

Figure 4c: St Marys River, Final Locations-Stations 9-12

Appendix A

Figure 4d: St Marys River, Final Locations-Stations 13-17

Appendix A

Figure 4e: St Marys River, Final Locations-Stations 18, 29-30

Appendix A

Figure 4f: St Marys River, Final Locations-Stations 19-24

Appendix A

Figure 4g: St Marys River, Final Locations-Stations 25-28

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-01	SM-14-02 (0-21)	SM-14-02 (21-41)	SM-14-03	SM-14-04	SM-14-05
	Lab ID		1411615-001	1505725-001	1505725-002	1505725-003	1505725-004	1505725-005
	Date Collected		11/11/2014	5/20/2015	5/20/2015	5/20/2015	5/20/2015	5/20/2015
Physical Kit	**Method**	**Units**						
Density		20C	**24.3**	**17.6**	**16.8**	**20.6**	**18.8**	**18.1**
Specific Density		Cu Ft	**2.91**	**2.12**	**2.01**	**2.47**	**2.26**	**2.18**
% Moisture	ASTM D2216	% by Wt.	**23**	**24**	**41**	**23**	**25**	**25**
% Solids *	ASTM D2216	% by Wt.	**77**	**76**	**59**	**77**	**75**	**75**
Nutrients Kit								
Phosphorus, total	SM 4500 P-F	mg/Kg dry	**63**	**86**	**130**	**66**	**84**	**210**
Nitrogen, Ammonia	EPA 350.1	mg/Kg dry	**17**	**140**	**250**	**240**	**170**	**130**
Nitrogen, Kjeldahl, total	EPA 351.2	mg/Kg dry	**86**	**220**	**610**	**500**	**410**	**280**
Organic Indicators Kit								
Oil & Grease, total	SW 9071	mg/Kg dry	<130	<130	<160	<130	<130	<130
Cyanide, total	SW 9012	mg/Kg dry	<0.66	<0.58	<0.88	1.1	<0.55	<0.61
Chemical Oxygen Demand	EPA 410.4	mg/Kg dry	390	**1,400**	**1,300**	310	**1,700**	**630**
Total Volatile Solids	SM 2540 G	% by Wt	**0.17**	**0.27**	**2.2**	**0.17**	**0.73**	**0.14**
Total Organic Carbon	SW 9060	mg/Kg dry	<1,400	1,300	**2,800**	<1,500	920	<1,600
PCBs	**Method**	**Units**						
Aroclor-1016	SW 8082	µg/kg dry	<8.5	<8.6	<11	<8.6	<8.8	<8.7
Aroclor-1221	SW 8082	µg/kg dry	<3.8	<8.6	<11	<8.6	<8.8	<8.7
Aroclor-1232	SW 8082	µg/kg dry	<5.7	<8.6	<11	<8.6	<8.8	<8.7
Aroclor-1242	SW 8082	µg/kg dry	<4.7	<8.6	<11	<8.6	<8.8	<8.7
Aroclor-1248	SW 8082	µg/kg dry	<4.5	<8.6	<11	<8.6	<8.8	<8.7
Aroclor-1254	SW 8082	µg/kg dry	<5.4	<8.6	<11	<8.6	<8.8	<8.7
Aroclor-1260	SW 8082	µg/kg dry	<8.5	<8.6	<11	<8.6	<8.8	<8.7
Aroclor-1262	SW 8082	µg/kg dry	<5.0	<8.6	<11	<8.6	<8.8	<8.7
Total PCBs	SW 8082	µg/kg dry	<3.7	<8.6	<11	<8.6	<8.8	<8.7
Organochlorine Pesticides	**Method**	**Units**						
4,4'-DDD	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
4,4'-DDE	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
4,4'-DDT	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Aldrin	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
alpha-BHC	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
alpha-Chlordane	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
beta-BHC	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Chlordane (Technical)	SW8081	µg/kg dry	<17	<17	<22	<17	<18	<17
delta-BHC	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Dieldrin	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Endosulfan I	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-01	SM-14-02 (0-21)	SM-14-02 (21-41)	SM-14-03	SM-14-04	SM-14-05
	Lab ID		1411615-001	1505725-001	1505725-002	1505725-003	1505725-004	1505725-005
	Date Collected		11/11/2014	5/20/2015	5/20/2015	5/20/2015	5/20/2015	5/20/2015
Endosulfan II	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Endosulfan sulfate	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Endrin	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Endrin aldehyde	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Endrin ketone	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
gamma-BHC	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
gamma-Chlordane	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Heptachlor	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Heptachlor epoxide	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Methoxychlor	SW8081	µg/kg dry	<0.85	<0.87	<1.1	<0.86	<0.88	<0.88
Toxaphene	SW8081	µg/kg dry	<17	<17	<22	<17	<18	<17
Metals Kit	**Method**	**Units**						
Arsenic	SW 6010	µg/kg dry	1,100	<980	<1,600	<1,200	1,200	<980
Barium	SW 6010	µg/kg dry	7,200	**11,000**	**230,000**	9,000	9,400	8,700
Cadmium	SW 6010	µg/kg dry	67	<49	<81	<62	<63	<49
Chromium	SW 6010	µg/kg dry	**3,300**	**13,000**	**61,000**	**3,400**	**4,000**	**4,100**
Copper	SW 6010	µg/kg dry	1,500	4,300	**33,000**	2,100	2,000	1,800
Iron	SW 6010	µg/kg dry	**3,300,000**	**5,500,000**	**36,000,000**	**3,100,000**	**3,400,000**	**3,700,000**
Lead	SW 6010	µg/kg dry	750	1,300	**8,400**	1,000	1,300	1,200
Manganese	SW 6010	µg/kg dry	**33,000**	**58,000**	**590,000**	**36,000**	**41,000**	**47,000**
Mercury	SW 7471A	µg/kg dry	<5.8	6.0	17	4.6	3.7	3.3
Nickel	SW 6010	µg/kg dry	**2,000**	**4,400**	**48,000**	1,700	2,100	1,900
Selenium	SW 6010	µg/kg dry	<1,200	<1,500	<2,400	<1,900	<1,900	<1,500
Silver	SW 6010	µg/kg dry	<200	83	250	<310	110	110
Zinc	SW 6010	µg/kg dry	**4,800**	**6,500**	**47,000**	3,600	4,600	4,100
Semi-Volatile Organic Compounds/PAH	**Method**	**Units**						
2-Methylnaphthalene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Acenaphthene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Acenaphthylene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Anthracene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Benzo(a)anthracene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Benzo(a)pyrene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Benzo(b)fluoranthene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Benzo(g,h,i)perylene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Benzo(k)fluoranthene	SW 8270	µg/kg dry	<43	<43	<56	<43	<44	<44
Chrysene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Dibenzo (a,h) anthracene	SW 8270	µg/kg dry	43	<43	<56	<43	<44	<44

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-01	SM-14-02 (0-21)	SM-14-02 (21-41)	SM-14-03	SM-14-04	SM-14-05
	Lab ID		1411615-001	1505725-001	1505725-002	1505725-003	1505725-004	1505725-005
	Date Collected		11/11/2014	5/20/2015	5/20/2015	5/20/2015	5/20/2015	5/20/2015
Fluoranthene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Fluorene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Indeno(1,2,3-cd)pyrene	SW 8270	µg/kg dry	<43	<43	<56	<43	<44	<44
Naphthalene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Phenanthrene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22
Pyrene	SW 8270	µg/kg dry	<21	<22	<28	<21	<22	<22

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* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-06	SM-14-07	SM-14-08	SM-14-09	SM-14-10	SM-14-11	SM-14-12
	Lab ID		1505725-006	1410A92-001	1410A92-002	1505725-007	1410A92-003	1410A92-004	1410A92-005
	Date Collected		5/20/2015	10/22/2014	10/22/2014	5/20/2015	10/22/2014	10/22/2014	10/22/2014
Physical Kit	**Method**	**Units**							
Density		20C	**20.3**	**23.2**	**23.6**	**21.4**	**24.9**	**26.3**	**22.3**
Specific Density		Cu Ft	**2.44**	**2.79**	**2.83**	**2.57**	**3.00**	**3.16**	**2.67**
% Moisture	ASTM D2216	% by Wt.	**21**	**26**	**18**	**23**	**23**	**19**	**27**
% Solids *	ASTM D2216	% by Wt.	**79**	**74**	**82**	**77**	**77**	**81**	**73**
Nutrients Kit									
Phosphorus, total	SM 4500 P-F	mg/Kg dry	**170**	**150**	**32**	**210**	**31**	**38**	**46**
Nitrogen, Ammonia	EPA 350.1	mg/Kg dry	**64**	**16**	**15**	**63**	**11**	**12**	**16**
Nitrogen, Kjeldahl, total	EPA 351.2	mg/Kg dry	**200**	**61**	**63**	**240**	**32**	**31**	**80**
Organic Indicators Kit									
Oil & Grease, total	SW 9071	mg/Kg dry	<130	<130	<120	<130	<130	<120	<140
Cyanide, total	SW 9012	mg/Kg dry	<0.48	<0.67	<0.62	<0.59	**1.5**	<0.62	1.1
Chemical Oxygen Demand	EPA 410.4	mg/Kg dry	**1,000**	**1,400**	**2,000**	**1,100**	**1,600**	**520**	**4,200**
Total Volatile Solids	SM 2540 G	% by Wt	**0.28**	**0.26**	**0.46**	**0.76**	**0.27**	**0.24**	**0.95**
Total Organic Carbon	SW 9060	mg/Kg dry	1,100	<1,600	<1,400	1,400	<1,700	<1,500	<2,500
PCBs	**Method**	**Units**							
Aroclor-1016	SW 8082	µg/kg dry	<8.4	<8.8	<8.0	<8.6	<8.5	<8.0	<9.0
Aroclor-1221	SW 8082	µg/kg dry	<8.4	<3.9	<3.6	<8.6	<3.8	<3.6	<4.0
Aroclor-1232	SW 8082	µg/kg dry	<8.4	<5.9	<5.4	<8.6	<5.7	<5.4	<6.1
Aroclor-1242	SW 8082	µg/kg dry	<8.4	<4.9	<4.4	<8.6	<4.7	<4.5	<5.0
Aroclor-1248	SW 8082	µg/kg dry	<8.4	<4.6	<4.2	<8.6	<4.5	<4.2	<4.8
Aroclor-1254	SW 8082	µg/kg dry	<8.4	<5.5	<5.0	<8.6	<5.4	<5.1	<5.7
Aroclor-1260	SW 8082	µg/kg dry	<8.4	<8.8	<8.0	<8.6	<8.5	<8.0	<9.0
Aroclor-1262	SW 8082	µg/kg dry	<8.4	<5.2	<4.7	<8.6	<5.0	<4.8	<5.4
Total PCBs	SW 8082	µg/kg dry	<8.4	<3.8	<3.5	<8.6	<3.7	<3.5	<4.0
Organochlorine Pesticides	**Method**	**Units**							
4,4'-DDD	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
4,4'-DDE	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
4,4'-DDT	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Aldrin	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
alpha-BHC	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
alpha-Chlordane	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
beta-BHC	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Chlordane (Technical)	SW8081	µg/kg dry	<17	<17	<16	<17	<17	<16	<18
delta-BHC	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Dieldrin	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Endosulfan I	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
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* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-06	SM-14-07	SM-14-08	SM-14-09	SM-14-10	SM-14-11	SM-14-12
	Lab ID		1505725-006	1410A92-001	1410A92-002	1505725-007	1410A92-003	1410A92-004	1410A92-005
	Date Collected		5/20/2015	10/22/2014	10/22/2014	5/20/2015	10/22/2014	10/22/2014	10/22/2014
Endosulfan II	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Endosulfan sulfate	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Endrin	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Endrin aldehyde	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Endrin ketone	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
gamma-BHC	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
gamma-Chlordane	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Heptachlor	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Heptachlor epoxide	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Methoxychlor	SW8081	µg/kg dry	<0.85	<0.88	<0.80	<0.87	<0.85	<0.81	<0.91
Toxaphene	SW8081	µg/kg dry	<17	<17	<16	<17	<17	<16	<18
Metals Kit	**Method**	**Units**							
Arsenic	SW 6010	µg/kg dry	870	1,100	1,200	<1,000	970	**2,000**	**1,700**
Barium	SW 6010	µg/kg dry	**15,000**	**12,000**	**12,000**	**12,000**	**9,600**	6,200	**54,000**
Cadmium	SW 6010	µg/kg dry	<49	34	49	<51	100	60	150
Chromium	SW 6010	µg/kg dry	**13,000**	**5,300**	**6,400**	**7,800**	**5,100**	**3,500**	**18,000**
Copper	SW 6010	µg/kg dry	4,700	**5,200**	**5,700**	3,100	**4,800**	**4,900**	**10,000**
Iron	SW 6010	µg/kg dry	**4,900,000**	**4,200,000**	**5,000,000**	**4,300,000**	**4,700,000**	**3,200,000**	**15,000,000**
Lead	SW 6010	µg/kg dry	3,200	1,200	1,700	2,200	1,500	1,300	3,500
Manganese	SW 6010	µg/kg dry	**67,000**	**64,000**	**67,000**	**62,000**	**66,000**	**54,000**	**210,000**
Mercury	SW 7471A	µg/kg dry	5.7	1.2	2.1	6.1	1.6	1.2	4.4
Nickel	SW 6010	µg/kg dry	3,900	3,600	**4,000**	2,900	3,400	2,600	**12,000**
Selenium	SW 6010	µg/kg dry	<1,500	<1,300	<1,100	<1,500	<1,000	<1,300	<1,100
Silver	SW 6010	µg/kg dry	100	<220	<190	100	<170	<210	<180
Zinc	SW 6010	µg/kg dry	**10,000**	**7,200**	**9,100**	**7,500**	**6,600**	**4,200**	**24,000**
Semi-Volatile Organic Compounds/PAH	**Method**	**Units**							
2-Methylnaphthalene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Acenaphthene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Acenaphthylene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Anthracene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Benzo(a)anthracene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Benzo(a)pyrene	SW 8270	µg/kg dry	<21	<22	<20	13	<21	<20	<23
Benzo(b)fluoranthene	SW 8270	µg/kg dry	<21	<22	<20	16	<21	<20	<23
Benzo(g,h,i)perylene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Benzo(k)fluoranthene	SW 8270	µg/kg dry	<42	<44	<40	<42	<42	<40	<45
Chrysene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Dibenzo (a,h) anthracene	SW 8270	µg/kg dry	<42	<44	<40	<42	<42	<40	<45

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-06	SM-14-07	SM-14-08	SM-14-09	SM-14-10	SM-14-11	SM-14-12
	Lab ID		1505725-006	1410A92-001	1410A92-002	1505725-007	1410A92-003	1410A92-004	1410A92-005
	Date Collected		5/20/2015	10/22/2014	10/22/2014	5/20/2015	10/22/2014	10/22/2014	10/22/2014
Fluoranthene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Fluorene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Indeno(1,2,3-cd)pyrene	SW 8270	µg/kg dry	<42	<44	<40	<42	<42	<40	<45
Naphthalene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Phenanthrene	SW 8270	µg/kg dry	<21	<22	<20	<21	<21	<20	<23
Pyrene	SW 8270	µg/kg dry	<21	<22	<20	14	<21	<20	<23

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-13	SM-14-14	SM-14-15	SM-14-16	SM-14-17	SM-14-18
	Lab ID		1410A92-006	1410A92-007	1410A92-008	1410A92-009	1410A92-010	1410A92-011
	Date Collected		10/21/2014	10/22/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
Physical Kit	**Method**	**Units**						
Density		20C	**19.2**	**24.6**	**16.9**	**25.1**	**20.5**	**21.3**
Specific Density		Cu Ft	**2.31**	**2.96**	**2.03**	**3.01**	**2.47**	**2.56**
% Moisture	ASTM D2216	% by Wt.	**34**	**23**	**45**	**22**	**25**	**26**
% Solids *	ASTM D2216	% by Wt.	**66**	**77**	**55**	**78**	**75**	**74**
Nutrients Kit								
Phosphorus, total	SM 4500 P-F	mg/Kg dry	**110**	**22**	**200**	**36**	**40**	**64**
Nitrogen, Ammonia	EPA 350.1	mg/Kg dry	**26**	**11**	**23**	**11**	**18**	**25**
Nitrogen, Kjeldahl, total	EPA 351.2	mg/Kg dry	**160**	**36**	**130**	**52**	**76**	**180**
Organic Indicators Kit								
Oil & Grease, total	SW 9071	mg/Kg dry	<150	<130	<180	<130	<130	<130
Cyanide, total	SW 9012	mg/Kg dry	0.66	0.82	<0.89	<0.63	<0.67	<0.68
Chemical Oxygen Demand	EPA 410.4	mg/Kg dry	**3,800**	360	**3,900**	**730**	**1,600**	**2,300**
Total Volatile Solids	SM 2540 G	% by Wt	**1.7**	<0.10	**1.7**	**0.20**	**0.50**	**0.82**
Total Organic Carbon	SW 9060	mg/Kg dry	<2,400	<1,300	<2,500	<1,600	<1,600	**2,600**
PCBs	**Method**	**Units**						
Aroclor-1016	SW 8082	µg/kg dry	<9.9	<8.5	<12	<8.4	<8.8	<9.0
Aroclor-1221	SW 8082	µg/kg dry	<4.4	<3.8	<5.4	<3.8	<4.0	<4.0
Aroclor-1232	SW 8082	µg/kg dry	<6.6	<5.8	<8.1	<5.7	<5.9	<6.0
Aroclor-1242	SW 8082	µg/kg dry	<5.5	<4.8	<6.7	<4.7	<4.9	<5.0
Aroclor-1248	SW 8082	µg/kg dry	<5.2	<4.5	<6.3	<4.4	<4.6	<4.7
Aroclor-1254	SW 8082	µg/kg dry	<6.3	<5.4	<7.6	<5.3	<5.6	<5.7
Aroclor-1260	SW 8082	µg/kg dry	<9.9	<8.5	<12	<8.4	<8.8	<9.0
Aroclor-1262	SW 8082	µg/kg dry	<5.9	<5.1	<7.1	<5.0	<5.2	<5.3
Total PCBs	SW 8082	µg/kg dry	<4.3	<3.7	<5.3	<3.7	<3.9	<3.9
Organochlorine Pesticides	**Method**	**Units**						
4,4'-DDD	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
4,4'-DDE	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
4,4'-DDT	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Aldrin	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
alpha-BHC	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
alpha-Chlordane	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
beta-BHC	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Chlordane (Technical)	SW8081	µg/kg dry	<20	<17	<24	<17	<18	<18
delta-BHC	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Dieldrin	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Endosulfan I	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-13	SM-14-14	SM-14-15	SM-14-16	SM-14-17	SM-14-18
	Lab ID		1410A92-006	1410A92-007	1410A92-008	1410A92-009	1410A92-010	1410A92-011
	Date Collected		10/21/2014	10/22/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
Endosulfan II	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Endosulfan sulfate	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Endrin	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Endrin aldehyde	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Endrin ketone	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
gamma-BHC	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
gamma-Chlordane	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Heptachlor	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Heptachlor epoxide	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Methoxychlor	SW8081	µg/kg dry	<0.99	<0.86	<1.2	<0.85	<0.89	<0.90
Toxaphene	SW8081	µg/kg dry	<20	<17	<24	<17	<18	<18
Metals Kit	**Method**	**Units**						
Arsenic	SW 6010	µg/kg dry	**3,800**	1,400	**5,500**	**1,800**	**1,600**	**1,600**
Barium	SW 6010	µg/kg dry	**100,000**	4,300	**150,000**	7,600	**24,000**	**17,000**
Cadmium	SW 6010	µg/kg dry	280	68	190	100	140	150
Chromium	SW 6010	µg/kg dry	**36,000**	**2,000**	**36,000**	**3,800**	**11,000**	**9,200**
Copper	SW 6010	µg/kg dry	**21,000**	**5,100**	**28,000**	3,700	**6,700**	**7,100**
Iron	SW 6010	µg/kg dry	**23,000,000**	**1,800,000**	**23,000,000**	**3,400,000**	**7,500,000**	**6,600,000**
Lead	SW 6010	µg/kg dry	4,800	910	5,900	1,400	**3,300**	2,400
Manganese	SW 6010	µg/kg dry	**420,000**	**32,000**	**440,000**	**51,000**	**100,000**	**93,000**
Mercury	SW 7471A	µg/kg dry	11	1.9	10	1.3	4.0	5.4
Nickel	SW 6010	µg/kg dry	**27,000**	1,400	**28,000**	2,800	**7,200**	**5,900**
Selenium	SW 6010	µg/kg dry	<1,700	<1,300	<2,100	<1,300	<930	<1,100
Silver	SW 6010	µg/kg dry	<280	<210	<360	<220	<160	<180
Zinc	SW 6010	µg/kg dry	**32,000**	3,200	**41,000**	**5,000**	**12,000**	**10,000**
Semi-Volatile Organic Compounds/PAH	**Method**	**Units**						
2-Methylnaphthalene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Acenaphthene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Acenaphthylene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Anthracene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Benzo(a)anthracene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Benzo(a)pyrene	SW 8270	µg/kg dry	23	<21	<30	<21	<22	<22
Benzo(b)fluoranthene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Benzo(g,h,i)perylene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Benzo(k)fluoranthene	SW 8270	µg/kg dry	<49	<43	<60	<42	<44	<45
Chrysene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Dibenzo (a,h) anthracene	SW 8270	µg/kg dry	<49	<43	<60	<42	<44	<45

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-13	SM-14-14	SM-14-15	SM-14-16	SM-14-17	SM-14-18
	Lab ID		1410A92-006	1410A92-007	1410A92-008	1410A92-009	1410A92-010	1410A92-011
	Date Collected		10/21/2014	10/22/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
Fluoranthene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Fluorene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Indeno(1,2,3-cd)pyrene	SW 8270	µg/kg dry	<49	<43	<60	<42	<44	<45
Naphthalene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Phenanthrene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22
Pyrene	SW 8270	µg/kg dry	<25	<21	<30	<21	<22	<22

Non-detected results = "<" Limit of Quantitation
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* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-19	SM-14-20	SM-14-21	SM-14-22	SM-14-23	SM-14-24
	Lab ID		1410A92-012	1410A92-013	1410A92-014	1410A92-015	1410A92-016	1410A92-017
	Date Collected		10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
Physical Kit	**Method**	**Units**						
Density		20C	**17.9**	**18.4**	**17.1**	**16.6**	**34.1**	**25.0**
Specific Density		Cu Ft	**2.15**	**2.21**	**2.05**	**2.00**	**4.09**	**3.01**
% Moisture	ASTM D2216	% by Wt.	**38**	**27**	**33**	**43**	**24**	**18**
% Solids *	ASTM D2216	% by Wt.	**62**	**73**	**67**	**57**	**76**	**82**
Nutrients Kit								
Phosphorus, total	SM 4500 P-F	mg/Kg dry	**140**	**120**	**110**	**170**	**20**	**24**
Nitrogen, Ammonia	EPA 350.1	mg/Kg dry	**31**	**20**	**19**	**31**	**15**	**13**
Nitrogen, Kjeldahl, total	EPA 351.2	mg/Kg dry	**290**	**180**	**150**	**180**	**140**	**76**
Organic Indicators Kit								
Oil & Grease, total	SW 9071	mg/Kg dry	<160	<130	<150	<170	<130	<120
Cyanide, total	SW 9012	mg/Kg dry	<0.79	<0.67	<0.75	1.0	<0.65	<0.61
Chemical Oxygen Demand	EPA 410.4	mg/Kg dry	**6,200**	**3,400**	**4,300**	**5,000**	**2,500**	**1,400**
Total Volatile Solids	SM 2540 G	% by Wt	**2.0**	**1.5**	**1.1**	**2.1**	**1.1**	**0.23**
Total Organic Carbon	SW 9060	mg/Kg dry	1,800	<2,600	<2,300	<2,400	**5,400**	<1,600
PCBs	**Method**	**Units**						
Aroclor-1016	SW 8082	µg/kg dry	<11	<8.9	<9.7	<11	<8.6	<8.1
Aroclor-1221	SW 8082	µg/kg dry	<4.8	<4.0	<4.4	<5.1	<3.9	<3.6
Aroclor-1232	SW 8082	µg/kg dry	<7.1	<6.0	<6.5	<7.7	<5.8	<5.4
Aroclor-1242	SW 8082	µg/kg dry	<5.9	<5.0	<5.4	<6.4	<4.8	<4.5
Aroclor-1248	SW 8082	µg/kg dry	<5.6	<4.7	<5.1	<6.0	<4.5	<4.3
Aroclor-1254	SW 8082	µg/kg dry	<6.7	<5.7	<6.2	<7.3	<5.4	<5.1
Aroclor-1260	SW 8082	µg/kg dry	<11	<8.9	<9.7	<11	<8.6	<8.1
Aroclor-1262	SW 8082	µg/kg dry	<6.3	<5.3	<5.8	<6.8	<5.1	<4.8
Total PCBs	SW 8082	µg/kg dry	<4.6	<3.9	<4.3	<5.0	<3.8	<3.5
Organochlorine Pesticides	**Method**	**Units**						
4,4'-DDD	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
4,4'-DDE	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
4,4'-DDT	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Aldrin	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
alpha-BHC	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
alpha-Chlordane	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
beta-BHC	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Chlordane (Technical)	SW8081	µg/kg dry	<21	<18	<19	<23	<17	<16
delta-BHC	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Dieldrin	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Endosulfan I	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81

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* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-19	SM-14-20	SM-14-21	SM-14-22	SM-14-23	SM-14-24
	Lab ID		1410A92-012	1410A92-013	1410A92-014	1410A92-015	1410A92-016	1410A92-017
	Date Collected		10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
Endosulfan II	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Endosulfan sulfate	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Endrin	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Endrin aldehyde	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Endrin ketone	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
gamma-BHC	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
gamma-Chlordane	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Heptachlor	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Heptachlor epoxide	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Methoxychlor	SW8081	µg/kg dry	<1.1	<0.90	<0.98	<1.2	<0.86	<0.81
Toxaphene	SW8081	µg/kg dry	<21	<18	<19	<23	<17	<16
Metals Kit	Method	Units						
Arsenic	SW 6010	µg/kg dry	**5,400**	**2,800**	**4,300**	**6,500**	1,400	1,400
Barium	SW 6010	µg/kg dry	**220,000**	**86,000**	**170,000**	**270,000**	**21,000**	**11,000**
Cadmium	SW 6010	µg/kg dry	**330**	220	**290**	**410**	160	110
Chromium	SW 6010	µg/kg dry	**73,000**	**32,000**	**54,000**	**78,000**	**12,000**	**5,700**
Copper	SW 6010	µg/kg dry	**46,000**	**19,000**	**34,000**	**49,000**	**8,700**	**4,200**
Iron	SW 6010	µg/kg dry	**41,000,000**	**20,000,000**	**30,000,000**	**41,000,000**	**9,200,000**	**4,400,000**
Lead	SW 6010	µg/kg dry	**9,500**	4,200	**7,500**	**10,000**	**5,400**	2,500
Manganese	SW 6010	µg/kg dry	**740,000**	**440,000**	**560,000**	**740,000**	**110,000**	**110,000**
Mercury	SW 7471A	µg/kg dry	**26**	12	16	**22**	**21**	4.0
Nickel	SW 6010	µg/kg dry	**57,000**	**25,000**	**40,000**	**60,000**	**6,700**	**3,700**
Selenium	SW 6010	µg/kg dry	<1,600	<1,300	<1,600	<1,800	<1,200	<1,100
Silver	SW 6010	µg/kg dry	<270	<220	<270	<300	<200	<180
Zinc	SW 6010	µg/kg dry	**82,000**	**30,000**	**68,000**	**81,000**	**20,000**	**7,400**
Semi-Volatile Organic Compounds/PAH	Method	Units						
2-Methylnaphthalene	SW 8270	µg/kg dry	<27	<22	<25	<29	13	<20
Acenaphthene	SW 8270	µg/kg dry	<27	<22	<25	<29	<21	<20
Acenaphthylene	SW 8270	µg/kg dry	<27	<22	<25	<29	<21	<20
Anthracene	SW 8270	µg/kg dry	<27	<22	<25	<29	16	<20
Benzo(a)anthracene	SW 8270	µg/kg dry	<27	<22	<25	<29	52	<20
Benzo(a)pyrene	SW 8270	µg/kg dry	<27	<22	<25	<29	46	<20
Benzo(b)fluoranthene	SW 8270	µg/kg dry	<27	<22	<25	<29	57	<20
Benzo(g,h,i)perylene	SW 8270	µg/kg dry	<27	<22	<25	<29	35	<20
Benzo(k)fluoranthene	SW 8270	µg/kg dry	<53	<45	<50	<58	28	<40
Chrysene	SW 8270	µg/kg dry	<27	<22	<25	<29	55	<20
Dibenzo (a,h) anthracene	SW 8270	µg/kg dry	<53	<45	<50	<58	<43	<40

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-19	SM-14-20	SM-14-21	SM-14-22	SM-14-23	SM-14-24
	Lab ID		1410A92-012	1410A92-013	1410A92-014	1410A92-015	1410A92-016	1410A92-017
	Date Collected		10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
Fluoranthene	SW 8270	µg/kg dry	<27	<22	<25	<29	96	<20
Fluorene	SW 8270	µg/kg dry	<27	<22	<25	<29	<21	<20
Indeno(1,2,3-cd)pyrene	SW 8270	µg/kg dry	<53	<45	<50	<58	28	<40
Naphthalene	SW 8270	µg/kg dry	<27	<22	<25	<29	65	<20
Phenanthrene	SW 8270	µg/kg dry	<27	<22	<25	<29	61	<20
Pyrene	SW 8270	µg/kg dry	<27	<22	<25	<29	78	<20

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-25	SM-14-26	SM-14-27	SM-14-28	SM-14-29	SM-14-30
	Lab ID		1505725-009	1505725-010	1505725-011	1505725-012	1411615-002	1505725-008
	Date Collected		5/20/2015	5/20/2015	5/20/2015	5/20/2015	11/11/2014	5/20/2015
Physical Kit	**Method**	**Units**						
Density		20C	**15.6**	**15.8**	**15.8**	**15.1**	**20.8**	**17.5**
Specific Density		Cu Ft	**1.87**	**1.89**	**1.90**	**1.81**	**2.50**	**2.10**
% Moisture	ASTM D2216	% by Wt.	**39**	**24**	**24**	**29**	**23**	**35**
% Solids *	ASTM D2216	% by Wt.	**61**	**76**	**76**	**71**	**77**	**65**
Nutrients Kit								
Phosphorus, total	SM 4500 P-F	mg/Kg dry	**200**	**200**	**170**	**180**	**130**	**230**
Nitrogen, Ammonia	EPA 350.1	mg/Kg dry	**110**	**56**	**55**	**48**	**36**	**130**
Nitrogen, Kjeldahl, total	EPA 351.2	mg/Kg dry	**360**	**180**	**270**	**160**	**270**	**380**
Organic Indicators Kit								
Oil & Grease, total	SW 9071	mg/Kg dry	<160	<130	<130	<140	<130	<150
Cyanide, total	SW 9012	mg/Kg dry	<0.78	<0.60	<0.60	<0.53	<.65	<0.55
Chemical Oxygen Demand	EPA 410.4	mg/Kg dry	**1,000**	**980**	**290**	430	**3,100**	<340
Total Volatile Solids	SM 2540 G	% by Wt	**2.1**	**2.0**	**2.3**	**1.6**	**0.99**	**1.6**
Total Organic Carbon	SW 9060	mg/Kg dry	**5,400**	**9,100**	<3,400	2,700	**3,800**	**7,400**
PCBs	**Method**	**Units**						
Aroclor-1016	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<8.4	<10
Aroclor-1221	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<3.8	<10
Aroclor-1232	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<5.7	<10
Aroclor-1242	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<4.7	<10
Aroclor-1248	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<4.4	<10
Aroclor-1254	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<5.3	<10
Aroclor-1260	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<8.4	<10
Aroclor-1262	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<5.0	<10
Total PCBs	SW 8082	µg/kg dry	<11	<8.8	<8.5	<9.1	<3.7	<10
Organochlorine Pesticides	**Method**	**Units**						
4,4'-DDD	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
4,4'-DDE	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
4,4'-DDT	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Aldrin	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
alpha-BHC	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
alpha-Chlordane	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
beta-BHC	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Chlordane (Technical)	SW8081	µg/kg dry	<21	<18	<17	<18	<17	<20
delta-BHC	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Dieldrin	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Endosulfan I	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-25	SM-14-26	SM-14-27	SM-14-28	SM-14-29	SM-14-30
	Lab ID		1505725-009	1505725-010	1505725-011	1505725-012	1411615-002	1505725-008
	Date Collected		5/20/2015	5/20/2015	5/20/2015	5/20/2015	11/11/2014	5/20/2015
Endosulfan II	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Endosulfan sulfate	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Endrin	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Endrin aldehyde	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Endrin ketone	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
gamma-BHC	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
gamma-Chlordane	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Heptachlor	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Heptachlor epoxide	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Methoxychlor	SW8081	µg/kg dry	<1.1	<0.89	<0.85	<0.91	<0.85	<1.0
Toxaphene	SW8081	µg/kg dry	<21	<18	<17	<18	<17	<20
Metals Kit	**Method**	**Units**						
Arsenic	SW 6010	µg/kg dry	1,800	1,200	1,300	<1,100	**1,800**	<1,200
Barium	SW 6010	µg/kg dry	**210,000**	**190,000**	**180,000**	**140,000**	**21,000**	**49,000**
Cadmium	SW 6010	µg/kg dry	<69	<56	<52	<55	160	<61
Chromium	SW 6010	µg/kg dry	**65,000**	**61,000**	**54,000**	**46,000**	**11,000**	**23,000**
Copper	SW 6010	µg/kg dry	**32,000**	**31,000**	**32,000**	**24,000**	**5,800**	**14,000**
Iron	SW 6010	µg/kg dry	**36,000,000**	**34,000,000**	**33,000,000**	**26,000,000**	**8,700,000**	**14,000,000**
Lead	SW 6010	µg/kg dry	**7,200**	**7,500**	**7,100**	**5,800**	2,600	4,700
Manganese	SW 6010	µg/kg dry	**650,000**	**630,000**	**570,000**	**500,000**	**88,000**	**180,000**
Mercury	SW 7471A	µg/kg dry	**24**	**17**	**13**	**24**	8.4	**17**
Nickel	SW 6010	µg/kg dry	**48,000**	**46,000**	**41,000**	**34,000**	**6,500**	**13,000**
Selenium	SW 6010	µg/kg dry	<2,100	<1,700	<1,600	<1,600	<1,200	<1,800
Silver	SW 6010	µg/kg dry	220	140	130	120	<190	130
Zinc	SW 6010	µg/kg dry	**47,000**	**42,000**	**38,000**	**32,000**	**12,000**	**20,000**
Semi-Volatile Organic Compounds/PAH	**Method**	**Units**						
2-Methylnaphthalene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Acenaphthene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Acenaphthylene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Anthracene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Benzo(a)anthracene	SW 8270	µg/kg dry	<27	<22	<21	<23	16	<25
Benzo(a)pyrene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Benzo(b)fluoranthene	SW 8270	µg/kg dry	<27	<22	<21	<23	17	16
Benzo(g,h,i)perylene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Benzo(k)fluoranthene	SW 8270	µg/kg dry	<54	<44	<43	<47	<43	<51
Chrysene	SW 8270	µg/kg dry	<27	<22	<21	<23	14	<25
Dibenzo (a,h) anthracene	SW 8270	µg/kg dry	<54	<44	<43	<47	<43	<51

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 1: ST. MARYS SOIL ANALYTICAL RESULTS

Parameter	Sample ID		SM-14-25	SM-14-26	SM-14-27	SM-14-28	SM-14-29	SM-14-30
	Lab ID		1505725-009	1505725-010	1505725-011	1505725-012	1411615-002	1505725-008
	Date Collected		5/20/2015	5/20/2015	5/20/2015	5/20/2015	11/11/2014	5/20/2015
Fluoranthene	SW 8270	µg/kg dry	<27	<22	<21	<23	24	<25
Fluorene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Indeno(1,2,3-cd)pyrene	SW 8270	µg/kg dry	<54	<44	<43	<47	<43	<51
Naphthalene	SW 8270	µg/kg dry	<27	<22	<21	<23	<21	<25
Phenanthrene	SW 8270	µg/kg dry	<27	<22	<21	<23	15	<25
Pyrene	SW 8270	µg/kg dry	<27	<22	<21	<23	21	<25

Non-detected results = "<" Limit of Quantitation
results with "J" qualifier reported as estimated number
Bold type = results above LOQ

* % Solids calculated from % Moisture

TABLE 2: ST. MARYS GRAIN SIZE ANALYSIS RESULTS

Parameter	Sample ID		SM-14-01	SM-14-02 (0-21)	SM-14-02 (21-41)	SM-14-03	SM-14-04	SM-14-05	SM-14-06	SM-14-07
	Lab ID		1411615-001	1505725-001	1505725-002	1505725-003	1505725-004	1505725-005	1505725-006	1410A92-001
	Date Collected		11/11/2014	5/20/2015	5/20/2015	5/20/2015	5/20/2015	5/20/2015	5/20/2015	10/22/2014
	Latitude, ° ' N		46° 21.361'	46° 21.325'		46° 21.275'	46° 21.214'	46° 21.147'	46° 21.079'	46° 21.221'
	Longitude, ° ' W		084° 12.984'	084° 12.969'		084° 12.358'	084° 12.942'	084° 12.924'	084° 12.911'	084° 12.910'
	Method									
Percent Moisture, wt%	ASTM D2216		23	24	41	23	25	25	21	26
Grain Size Analysis	Method									
% Coarse Gravel	ASTM D422		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Fine Gravel	ASTM D422		0.0	0.0	**13.0**	0.0	0.0	0.0	0.0	0.0
% Coarse Sand	ASTM D422		0.0	**0.8**	**26.6**	**0.1**	**0.8**	**0.1**	**0.5**	**0.2**
% Medium Sand	ASTM D422		**0.1**	**2.3**	**35.2**	**0.3**	**2.2**	**0.1**	**2.0**	**1.7**
% Fine Sand	ASTM D422		**98.0**	**89.5**	**19.8**	**84.2**	**84.3**	**95.1**	**83.1**	**95.7**
% Fines	ASTM D422		**1.9**	**7.4**	**5.4**	**15.4**	**12.7**	**4.7**	**14.4**	**2.4**
Total Percent	ASTM D422		**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Non-detected results = "<" Limit of Detection
Results with "J" qualifier reported as estimated number
Bold type = results above Limit Of Quantitation

TABLE 2: ST. MARYS GRAIN SIZE ANALYSIS RESULTS

Parameter	Sample ID		SM-14-08	SM-14-09	SM-14-10	SM-14-11	SM-14-12	SM-14-13	SM-14-14	SM-14-15
	Lab ID		1410A92-002	1505725-007	1410A92-003	1410A92-004	1410A92-005	1410A92-006	1410A92-007	1410A92-008
	Date Collected		10/22/2014	5/20/2015	10/22/2014	10/22/2014	10/22/2014	10/21/2014	10/22/2014	10/21/2014
	Latitude, ° ' N		46° 21.174'	46° 21.018'	46° 20.420'	46° 20.155'	46° 19.825'	46° 19.124'	46° 18.712'	46° 19.346'
	Longitude, ° ' W		084° 12.768'	084° 12.899'	084° 12.779'	084° 12.848'	084° 12.808'	084° 12.931'	084° 12.858'	084° 12.880'
	Method									
Percent Moisture, wt%	ASTM D2216		18	23	23	19	27	34	23	45
Grain Size Analysis	Method									
% Coarse Gravel	ASTM D422		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Fine Gravel	ASTM D422		0.0	**0.1**	0.0	0.0	**2.9**	**2.3**	0.0	0.0
% Coarse Sand	ASTM D422		**1.0**	**2.2**	**0.7**	0.0	**11.2**	**28.1**	0.0	**19.9**
% Medium Sand	ASTM D422		**5.7**	**3.5**	**3.9**	**2.3**	**26.1**	**39.7**	**18.1**	**36.7**
% Fine Sand	ASTM D422		**88.5**	**81.5**	**94.9**	**97.5**	**57.4**	**26.5**	**81.8**	**39.8**
% Fines	ASTM D422		4.8	**12.7**	**0.5**	**0.2**	**2.4**	**3.4**	**0.1**	**3.6**
Total Percent	ASTM D422		**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Non-detected results = "<" Limit of Detection
Results with "J" qualifier reported as estimated number
Bold type = results above Limit Of Quantitation

TABLE 2: ST. MARYS GRAIN SIZE ANALYSIS RESULTS

Parameter	Sample ID		SM-14-16	SM-14-17	SM-14-18	SM-14-19	SM-14-20	SM-14-21	SM-14-22	SM-14-23
	Lab ID		1410A92-009	1410A92-010	1410A92-011	1410A92-012	1410A92-013	1410A92-014	1410A92-015	1410A92-016
	Date Collected		10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
	Latitude, ° ' N		46° 17.999'	46° 17.673'	46° 17.329'	46° 26.918'	46° 20.805'	46° 26.520'	46° 26.786'	46° 25.151'
	Longitude, ° ' W		084° 12.945'	084° 12.963'	084° 12.799'	084° 16.366'	084° 16.271'	084° 15.976'	084° 15.914'	084° 15.385'
	Method									
Percent Moisture, wt%	ASTM D2216		22	25	26	38	27	33	43	24
Grain Size Analysis	Method									
% Coarse Gravel	ASTM D422		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Fine Gravel	ASTM D422		0.0	0.0	0.0	6.5	1.8	2.0	4.7	0.0
% Coarse Sand	ASTM D422		0.2	1.6	1.3	39.0	24.3	22.4	36.7	2.1
% Medium Sand	ASTM D422		3.1	8.5	7.0	37.2	45.2	39.5	40.5	13.9
% Fine Sand	ASTM D422		96.5	81.6	80.2	14.3	21.2	31.7	15.3	77.5
% Fines	ASTM D422		0.2	8.3	11.5	3.0	7.5	4.4	2.8	6.5
Total Percent	ASTM D422		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Non-detected results = "<" Limit of Detection
Results with "J" qualifier reported as estimated number
Bold type = results above Limit Of Quantitation

TABLE 2: ST. MARYS GRAIN SIZE ANALYSIS RESULTS

Parameter	Sample ID		SM-14-24	SM-14-25	SM-14-26	SM-14-27	SM-14-28	SM-14-29	SM-14-30
	Lab ID		1410A92-017	1505725-009	1505725-010	1505725-011	1505725-012	1411615-002	1505725-008
	Date Collected		10/21/2014	5/20/2015	5/20/2015	5/20/2015	5/20/2015	11/11/2014	5/20/2015
	Latitude, ° ' N		46° 25.905'	46° 13.016'	46° 12.994'	46° 12.967'	46° 12.948'	46° 17.327'	46° 17.314'
	Longitude, ° ' W		084° 15.437'	084° 09.888'	084° 09.873'	084° 09.863'	084° 09.844'	084° 12.802'	084° 12.960'
	Method								
Percent Moisture, wt%	ASTM D2216		18	39	24	24	29	23	35
Grain Size Analysis	Method								
% Coarse Gravel	ASTM D422		0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Fine Gravel	ASTM D422		0.0	15.7	3.4	3.9	7.6	0.0	4.5
% Coarse Sand	ASTM D422		0.0	30.1	23.6	22.6	19.7	5.2	23.1
% Medium Sand	ASTM D422		11.2	33.9	41.1	39.3	35.5	19.1	21.5
% Fine Sand	ASTM D422		84.9	16.3	24.4	27.3	30.6	61.1	24.9
% Fines	ASTM D422		3.9	4.0	7.5	6.9	6.6	14.6	26.0
Total Percent	ASTM D422		100.0	100.0	100.0	100.0	100.0	100.0	100.0

Non-detected results = "<" Limit of Detection
Results with "J" qualifier reported as estimated number
Bold type = results above Limit Of Quantitation

Station #	SM-14-01	SM-14-02	SM-14-03	SM-14-04	SM-14-05	SM-14-06	SM-14-07
Latitude, N	46° 21.361'	46° 21.324'	46° 21.276'	46° 21.214'	46° 21.147'	46° 21.080'	46° 21.221'
Longitude, W	084° 12.984'	084° 12.967'	084° 12.958'	084° 12.942'	084° 12.927'	084° 12.912'	084° 12.910'
Collection Method	Grav Core/ Ponar	Macro-core	Macro-core	Macro-core	Macro-core	Macro-core	Ponar
Date, Sample collected	11/11/2014	5/20/2015	5/20/2015	5/20/2015	5/20/2015	5/20/2015	10/22/2014
Time, Sample collected	10:26	9:02	10:16	10:32	10:52	11:09	13:41
Core Tube diameter, in	2	4	4	4	4	4	NA
Core Recovery length, in	16	41	39	50	44	46	3
Water Depth, ft.	23	26	26	27	28	24	29.0
Project depth, ft.	28.5	28.5	28.5	28.5	28.5	28.5	28.5
Water Depth adjusted to MLW Datum, ft.	21.26	24.09	24.13	25.14	26.15	22.14	27.27
Shoaling above Project Depth, ft.	7.24	4.41	4.38	3.36	2.35	6.36	1.23
Elevation sediment, ft.	556.54	553.71	553.68	552.66	551.65	555.66	550.53
LWD Delta, ft	1.74	1.91	1.88	1.86	1.85	1.86	1.73
Current Water Datum, ft.	579.54	579.71	579.68	579.66	579.65	579.66	579.53

Mean Low Water Datum, ft. = **577.8** Reference Station - W Neebish Isl., MI (9076027)

Station #	Classification of retrieved sediment
SM-14-01	0-1.33' (SP/ML) medium to fine sand, little silt
SM-14-02	0-1.75' (SP) sand; 1.75'-3.42' (CH) clay, appears to be native
SM-14-03	0-3.25' (ML/CH) medium fine sand, some clay
SM-14-04	0-4.17' (ML/CH) fine to medium sand, some clay inclusions
SM-14-05	0-3.67' (SP/ML) medium to fine sand, no clay
SM-14-06	0-3.83' (ML) fine sand
SM-14-07	(CL/ML) reddish brown sandy clay, tan fine to medium grained sand mixed well together, small fragments of coal and rocks,
	little to no vegitation in handful *(2 grabs)*

Station #	SM-14-08	SM-14-09	SM-14-10	SM-14-11	SM-14-12	SM-14-13	SM-14-14
Latitude, N	46° 21.174'	46° 21.019'	46° 20.420'	46° 20.155'	46° 19.825'	46° 19.124'	46° 18.714'
Longitude, W	084° 12.768'	084° 12.897'	084° 12.779'	084° 12.848'	084° 12.808'	084° 12.931'	084° 12.853'
Collection Method	Grav Core/Ponar	Macro-core	Grav Core/Ponar	Ponar	Grav Core/Ponar	Gravity Core	Ponar
Date, Sample collected	10/22/2014	5/20/2015	10/22/2014	10/22/2014	10/22/2014	10/21/2014	10/22/2014
Time, Sample collected	13:15	11:32	12:37	12:10	11:40	16:27	10:55
Core Tube diameter, in	NA	4	2	NA	2	2	NA
Core Recovery length, in	4	56	6	3	8	24	3
Water Depth, ft.	29.6	25.5	30.4	30.3	29.2	30.8	29.8
Project depth, ft.	28.5	28.5	28.5	28.5	28.5	28.5	28.5
Water Depth adjusted to MLW Datum, ft.	27.88	23.65	28.65	28.57	27.49	29.20	28.14
Shoaling above Project Depth, ft.	0.62	4.85	-0.15	-0.07	1.01	-0.70	0.36
Elevation sediment, ft.	549.92	554.15	549.15	549.23	550.31	548.60	549.66
LWD Delta, ft	1.72	1.85	1.75	1.73	1.71	1.60	1.66
Current Water Datum, ft.	579.52	579.65	579.55	579.53	579.51	579.40	579.46

Mean Low Water Datum, ft. = 577.8 Reference Station - W Neebish Isl., MI (9076027)

Station #	Classification of retrieved sediment
SM-14-08	0-0.25' (ML) tan fine to medium grained sand mixed well together, small fragments of coal and rocks; 0.25'-0.33' (CL) reddish
	brown sandy clay, little to no vegitation in handful. *Sandy clay collected w. Grav Core, sand collected w/ Ponar (1 grab)*
SM-14-09	0-4.25' (ML) fine to medium sand; 4.25-4.67' (CH) clay
SM-14-10	0-0.25' (ML) tan fine to mostly medium grained sand on top; 0.25'-0.5'(CL) reddish brown sandy clay on bottom, sand is mixed
	with fragments of coal and rocks. *Sandy clay collected w. Grav Core, sand collected w/ Ponar (2 grabs)*
SM-14-11	0.25 (ML) tan fine to mostly medium grained sand on sand is mixed with fragments of coal and rocks. (2 grabs)
SM-14-12	0-0.25' (ML) tan fine to mostly medium grained sand on top; 0.25'-0.67' (CL) reddish brown sandy clay on bottom with, sand is
	mixed with fragments of coal and rocks. *Sandy clay collected w. Grav Core, sand collected w/ Ponar (3 grabs)*
SM-14-13	0-2' (SC) reddish brown medium soft clay w/ intermixed coarse grained sand (<5%) and bits of rock and coal fragments
SM-14-14	0-0.25' (SP) tan medium to coarse grained sand intermixed w/ other fine to medium grained coal and rock fragments *(3 grabs)*

Station #	SM-14-15	SM-14-16	SM-14-17	SM-14-18	SM-14-19	SM-14-20	SM-14-21
Latitude, N	46° 18.346'	46° 17.999'	46° 17.673'	46° 17.329'	46° 26.918'	46° 26.805'	46° 26.520'
Longitude, W	084° 12.880'	084° 12.945'	084° 12.963'	084° 12.799'	084° 16.366'	084° 16.271'	084° 15.976'
Collection Method	Gravity Core	Ponar	Grav Core/Ponar	Grav Core/Ponar	Gravity Core	Grav Core/Ponar	Gravity Core
Date, Sample collected	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014	10/21/2014
Time, Sample collected	18:35	18:07	17:33	17:05	12:58	12:27	11:58
Core Tube diameter, in	2	NA	2	2	2	2	2
Core Recovery length, in	15	3	7	10	18	18	18
Water Depth, ft.	30.31	28.8	27.4	29.0	30.4	30.2	29.9
Project depth, ft.	28.5	28.5	28.5	28.5	28.5	28.5	29.0
Water Depth adjusted to MLW Datum, ft.	28.65	27.14	25.74	27.37	28.84	28.59	28.34
Shoaling above Project Depth, ft.	-0.15	1.36	2.76	1.13	-0.34	-0.09	0.66
Elevation sediment, ft.	549.15	550.66	552.06	550.43	548.96	549.21	549.46
LWD Delta, ft	1.66	1.66	1.66	1.63	1.56	1.61	1.56
Current Water Datum, ft.	579.46	579.46	579.46	579.43	579.36	579.41	579.36

Mean Low Water Datum, ft. = 577.8 Reference Station - W Neebish Isl., MI (9076027)

Station #	Classification of retrieved sediment
SM-14-15	0-1.25' (CL/ML) 20% reddish brown sandy clay w/ fine to medium grained sand intermixed w/ fine soft to medium soft coal fragments
	and other rocks; (CH) 80% red brown dominant color clay, has extremely high affinity for self, can make fibrous strands out of it
SM-14-16	0-0.25' (ML) very fine to fine grained tan sand w/ little coal and other fragments intermixed throughout *(2 grabs)*
SM-14-17	0-0.58' (CL/ML) reddish brown sandy clay w/ fine to medium grained sand intermixed w/ fine soft to medium soft coal fragments
	and other rocks *(2 grabs)*
SM-14-18	0-0.83' (CL/ML) reddish brown sandy clay w/ fine to medium grained sand intermixed w/ fine soft to medium soft coal fragments
	and other rocks *(4 grabs)*
SM-14-19	0-1.5' (OH) clay mixed greenish odd grey color with red brown as dominant color has extremely high affinity for self, can make
	fibrous strands out of it.
SM-14-20	0-1.5' (OH) clay mixed greenish odd grey color with red brown as dominant color has extremely high affinity for self, can make
	fibrous strands out of it.
SM-14-21	0-1.33' (OH) densely to firmly packed greenish odd grey and w/ red brown colored clay, consistant throughout middle of core, (SP)
	outer ring of sample is medium to coarse grained sand w/ intermixed coal, ferrous, and other debris fragments; 1.33'-1.5' (OH)
	~2" plug of densely to firmly packed greenish odd grey and w/ red brown colored clay

Station #	SM-14-22	SM-14-23	SM-14-24	SM-14-29	SM-14-30
Latitude, N	46° 26.486'	46° 26.151'	46° 25.905'	46° 17.327'	46° 17.315'
Longitude, W	084° 15.914'	084° 15.385'	084° 15.437'	084° 12.802'	084° 12.958'
Collection Method	Grav Core/Ponar	Ponar	Ponar	Gravity Core	Macro-core
Date, Sample collected	10/21/2014	10/21/2014	10/21/2014	11/11/2014	5/20/2015
Time, Sample collected	11:13	10:40	10:13	12:18	12:29
Core Tube diameter, in	2	NA	NA	2	2
Core Recovery length, in	26	3	3	26	49
Water Depth, ft.	30.0	30.4	30.6	30	33.5
Project depth, ft.	29.0	29.0	29.0	28.5	28.5
Water Depth adjusted to MLW Datum, ft.	28.41	28.74	28.88	28.19	31.69
Shoaling above Project Depth, ft.	0.59	0.26	0.12	0.31	-3.19
Elevation sediment, ft.	549.39	549.06	548.92	549.61	546.11
LWD Delta, ft	1.59	1.66	1.72	1.81	1.81
Current Water Datum, ft.	579.39	579.46	579.52	579.61	579.61

Mean Low Water Datum, ft. = 577.8 Reference Station - W Neebish Isl., MI (9076027)

Station #	Classification of retrieved sediment
SM-14-22	(OH/SP) greenish/odd grey and reddish grey very dense clay causing water beading when tube removed, very little to no (≤5%)
	fine to medium grained sand
SM-14-23	0-0.25 (ML/CL) fine to medium grained tan sand w/ moderate (+15%) clay content intermixed (clumping present), has small
	amount of smaller pebbles, rocks and coal fragments *(2 grabs)*
SM-14-24	0-0.25 (ML/CL) fine to medium grained tan sand w/ moderate to little clay intermixed (clumping present), has little to some smaller
	pebbles, rocks and possible coal fragments *(2 grabs)*
SM-14-29	0-2.17' (SC) medium to fine sand w/ clay
SM-14-30	0-1.33 (SP) sand; 1.33'-4' (CH) clay 4'-4.08' (SP) sand with rock chips

Station #	SM-14-25	SM-14-26	SM-14-27	SM-14-28
Latitude, N	46° 13.016'	46° 12.992'	46° 12.966'	46° 12.949'
Longitude, W	084° 09.887'	084° 09.874'	084° 09.861'	084° 09.842'
Collection Method	Macro-core	Macro-core	Macro-core	Macro-core
Date, Sample collected	5/20/2015	5/20/2015	5/20/2015	5/20/2015
Time, Sample collected	14:40	15:22	15:34	15:58
Core Tube diameter, in	2	2	2	2
Core Recovery length, in	7	41	40	34
Water Depth, ft.	6.0	5.0	5.8	6.4
Project depth, ft.	10.0	10.0	10.0	10.0
Water Depth adjusted to MLW Datum, ft.	4.11	3.18	4.00	4.61
Shoaling above Project Depth, ft.	5.89	6.82	6.00	5.39
Elevation sediment, ft.	573.39	574.32	573.50	572.90
LWD Delta, ft	1.89	1.82	1.80	1.79
Current Water Datum, ft.	579.39	579.32	579.30	579.30

Mean Low Water Datum, ft. = 577.5 Reference Station (Stations 25-28) - Rock Cut, MI (9076024)

Station #	Classification of retrieved sediment
SM-14-25	0-0.08' (ML) fine grained sand; 0.08'-0.42' (CL) dense light brown clay; 0.42-0.5 (ML) fine grained sand; 0.5'-0.58' (CL) dense light brown clay
SM-14-26	0-3.42' (CL) very dry crumbly light brown clay
SM-14-27	0-3.33' (CL) very dry crumbly, light brown clay note: very hard refusal & difficult to retrieve, pulling boat into water.
SM-14-28	0-0.33' (SP) sand; 0.33'-2.83' (CH) clay

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 11/11/2015

Drillers: Coleman / RTI Laboratories

Sampling Method: GC/Ponar

Boring Number: SM-14-01
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 556.54
Sediment Elevation: 579.54
State Plane Coordinates: 4,863,442.834 ft E
NAD83 2111 - Michigan North 404,349.659 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.5	SM-14-01			1.33	(SP/ML) medium to fine sand, little silt	578.21	
1					Bottom of Sample		
1.5							
2							
2.5							

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015
Drillers: Coleman / RTI Laboratories
Sampling Method: Macro Core

Boring Number: SM-14-02
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.71
Sediment Elevation: 553.71
State Plane Coordinates: 4,863,530.657 ft E
NAD83 2111 - Michigan North 404,139.477 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-02				(SP) sand		
				1.75		551.96	
2					(CH) clay, appears to be native		
3				3.42		550.29	
4					Bottom of Sample		
5							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015

Drillers: Coleman / RTI Laboratories

Sampling Method: Macro Core

Boring Number: SM-14-03
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.68
Sediment Elevation: 553.68
State Plane Coordinates: 4,866,120.581 ft E
NAD83 2111 - Michigan North 404,132.621 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-03				(ML/CH) medium fine sand, some clay		
2							
3				3.25		550.43	
4					Bottom of Sample		
5							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015
Drillers: Coleman / RTI Laboratories
Sampling Method: Macro Core

Boring Number: SM-14-04
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.66
Sediment Elevation: 552.66
State Plane Coordinates: 4,863,720.955 ft E
NAD83 2111 - Michigan North 403,482.127 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-04				(ML/CH) medium fine sand, some clay inclusions		
2							
3							
4				4.17		548.49	
5					Bottom of Sample		

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015

Drillers: Coleman / RTI Laboratories

Sampling Method: Macro Core

Boring Number: SM-14-05
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.65
Sediment Elevation: 551.65
State Plane Coordinates: 4,863,842.944 ft E
NAD83 2111 - Michigan North 403,086.171 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-05			3.67	(SP/ML) medium to fine sand, no clay	547.98	
2							
3							
4					Bottom of Sample		
5							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015

Drillers: Coleman / RTI Laboratories

Sampling Method: Macro Core

Boring Number: SM-14-06
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.66
Sediment Elevation: 555.66
State Plane Coordinates: 4,863,944.723 ft E
NAD83 2111 - Michigan North 402,681.761 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-06				ML fine sand		
2							
3				3.83		551.83	
4					Bottom of Sample		
5							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/22/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Ponar (2 grabs)

Boring Number: SM-14-07
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.53
Sediment Elevation: 550.53
State Plane Coordinates: 4,863,849.895 ft E
NAD83 2111 - Michigan North 403,539.852 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-07			0.25	(CL/ML) reddish brown sandy clay, tan fine to medium grained sand mixed well together, small fragments of coal and rocks, little to no vegitation in handful	550.28	
0.2					Bottom of Sample		
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/22/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: GC/Ponar (1 grab)

Boring Number: SM-14-08
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.52
Sediment Elevation: 549.92
State Plane Coordinates: 4,864,476.499 ft E
NAD83 2111 - Michigan North 403,324.563 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-08				(ML) tan fine to medium grained sand mixed well together , small fragments of coal and rocks, little to no vegitation in handful		
0.2					*sand collected w/ Ponar*		
				0.25		549.67	
					(CL) reddish brown sandy clay		
0.3				0.33	*Sandy clay collected w. Grav Core*	549.59	
0.4					Bottom of Sample		
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015
Drillers: Coleman / RTI Laboratories
Sampling Method: Macro Core

Boring Number: SM-14-09
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.65
Sediment Elevation: 554.15
State Plane Coordinates: 4,864,037.441 ft E
NAD83 2111 - Michigan North 402,319.146 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-09				(ML) fine to medium sand		
2							
3							
4				4.25		549.90	
5					(CH) clay		
				4.67		549.48	
					Bottom of Sample		

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/22/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: GC/Ponar (2 grabs)

Boring Number: SM-14-10
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.55
Sediment Elevation: 549.15
State Plane Coordinates: 4,864,956.359 ft E
NAD83 2111 - Michigan North 398,765.478 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-10			0.25	(ML) tan fine to mostly medium grained sand on top; *sand collected w/ Ponar*	548.90	
0.2							
0.3				0.50	(CL) reddish brown sandy clay on bottom, sand is mixed with fragments of coal and rocks. *Sandy clay collected w. Grav Core*	548.65	
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/22/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Ponar

Boring Number: SM-14-11
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.53
Sediment Elevation: 549.23
State Plane Coordinates: 4,864,852.534 ft E
NAD83 2111 - Michigan North 397,131.681 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-11			0.25	(ML) tan fine to mostly medium grained sand on sand is mixed with fragments of coal and rocks	548.98	
0.2					Bottom of Sample		
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/22/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: GC/Ponar (3 grabs)

Boring Number: SM-14-12
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.51
Sediment Elevation: 550.31
State Plane Coordinates: 4,865,250.004 ft E
NAD83 2111 - Michigan North 395,157.962 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-12			0.25	(ML) tan fine to mostly medium grained sand *sand collected w/ Ponar*	553.46	
0.2				0.67	(CL) reddish brown sandy clay on bottom with, sand is mixed with fragments of coal and rocks. *sandy clay collected w. Grav Core*	549.64	
0.3					Bottom of Harbor		
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Gravity Core

Boring Number: SM-14-13
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.40
Sediment Elevation: 548.60
State Plane Coordinates: 4,865,224.172 ft E
NAD83 2111 - Michigan North 390,864.827 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-13			2.00	(SC) reddish brown medium soft clay w/ intermixed coarse grained sand (<5%) and bits of rock and coal fragments	546.60	
2					Bottom of Sample		
3							
4							
5							

Gravity Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/22/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Ponar (3 grabs)

Boring Number: SM-14-14
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.46
Sediment Elevation: 549.66
State Plane Coordinates: 4,865,816.949 ft E
NAD83 2111 - Michigan North 388,411.800 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-14			0.25	(SP) tan medium to coarse grained sand intermixed w/ other fine to medium grained coal and rock fragments	549.41	
0.2					Bottom of Sample		
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Gravity Core

Boring Number: SM-14-15
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.46
Sediment Elevation: 549.15
State Plane Coordinates: 4,865,282.786 ft E
NAD83 2111 - Michigan North 392,230.244 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.5	SM-14-15			1.25	(CL/ML) 20% reddish brown sandy clay w/ fine to medium grained sand intermixed w/ fine soft to medium soft coal fragments and other rocks; CH 80% red brown dominant color clay, has extremely high affinity for self, can make fibrous strands out of it	547.90	
1					Bottom of Sample		
1.5							
2							
2.5							

Gravity Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Ponar (2 grabs)

Boring Number: SM-14-16
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.46
Sediment Elevation: 550.66
State Plane Coordinates: 4,865,949.960 ft E
NAD83 2111 - Michigan North 384,063.543 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-16			0.25	(ML) very fine to fine grained tan sand w/ little coal and other fragments intermixed throughout	550.41	
0.2					Bottom of Sample		
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: GC/Ponar (2 grabs)

Boring Number: SM-14-17
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.46
Sediment Elevation: 552.06
State Plane Coordinates: 4,866,101.897 ft E
NAD83 2111 - Michigan North 382,085.936 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-17			0.58	(CL/ML) reddish brown sandy clay w/ fine to medium grained sand intermixed w/ fine soft to medium soft coal fragments and other rocks	551.48	
0.2							
0.3							
0.4							
0.5							
0.6					Bottom of Sample		
0.7							
0.8							
0.9							
1.0							

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014
Drillers: Coleman / RTI Laboratories
Sampling Method: GC/Ponar (4 grabs)

Boring Number: SM-14-18
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.43
Sediment Elevation: 550.43
State Plane Coordinates: 4,867,028.391 ft E
NAD83 2111 - Michigan North 380,087.590 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-18			0.83	(CL/ML) reddish brown sandy clay w/ fine to medium grained sand intermixed w/ fine soft to medium soft coal fragments and other rocks	549.60	
0.2							
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0					Bottom of Sample		

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Gravity Core

Boring Number: SM-14-19
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.36
Sediment Elevation: 548.96
State Plane Coordinates: 4,845,450.145 ft E
NAD83 2111 - Michigan North 436,286.228 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.5	SM-14-19			1.50	(OH) clay mixed greenish odd grey color with red brown as dominant color has extremely high affinity for self, can make fibrous strands out of it.	547.46	
1							
1.5					Bottom of Sample		
2							
2.5							

Gravity Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: GC/Ponar

Boring Number: SM-14-20
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 549.21
Sediment Elevation: 579.41
State Plane Coordinates: 4,850,082.278 ft E
NAD83 2111 - Michigan North 399,409.630 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.5	SM-14-20			1.50	(OH) clay mixed greenish odd grey color with red brown as dominant color has extremely high affinity for self, can make fibrous strands out of it.	577.91	
1							
1.5					Bottom of Sample		
2							
2.5							

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name:	St. Marys River	Boring Number:	SM-14-21
Project Location:	St. Marys River	NOAA Station:	W Neebish Isl., MI (9076027)
Drilling Date:	10/21/2014	Water Elevation:	579.36
		Sediment Elevation:	549.46
Drillers:	Coleman / RTI Laboratories	State Plane Coordinates:	4,847,354.226 ft E
		NAD83 2111 - Michigan North US fleet	434,069.193 ft N
Sampling Method:	Gravity Core		

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.5	SM-14-21			1.33	(OH) densely to firmly packed greenish odd grey and w/ red brown colored clay, consistant throughout middle of core, (SP) outer ring of sample is medium to coarse grained sand w/ intermixed coal, ferrous, and other debris fragments	548.13	
1							
1.5				1.50	(OH) ~2" plug of densely to firmly packed greenish odd grey and w/ red brown colored clay	547.96	
2					Bottom of Sample		
2.5							

Gravity Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014
Drillers: Coleman / RTI Laboratories
Sampling Method: GC/Ponar

Boring Number: SM-14-22
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.39
Sediment Elevation: 549.39
State Plane Coordinates: 4,847,428.668 ft E
NAD83 2111 - Michigan North 435,705.496 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.5	SM-14-22			2.17	(OH/SP) greenish/odd grey and reddish grey very dense clay causing water beading when tube removed, very little to no (<5%) fine to medium grained sand Bottom of Sample	547.22	
1							
1.5							
2							
2.5							

Gravity Core/Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 10/21/2014
Drillers: Coleman / RTI Laboratories
Sampling Method: Ponar (2 grabs)

Boring Number: SM-14-23
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.46
Sediment Elevation: 549.06
State Plane Coordinates: 4,850,771.917 ft E
NAD83 2111 - Michigan North 426,084.167 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-23			0.25	(ML/CL) fine to medium grained tan sand w/ moderate (+15%) clay content intermixed (clumping present), has small amount of smaller pebbles, rocks and coal fragments	548.81	
0.2					Bottom of Harbor		
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name:	St. Marys River	Boring Number:	SM-14-24
Project Location:	St. Marys River	NOAA Station:	W Neebish Isl., MI (9076027)
Drilling Date:	10/21/2014	Water Elevation:	579.52
		Sediment Elevation:	548.92
Drillers:	Coleman / RTI Laboratories	State Plane Coordinates:	4,850,031.471 ft E
		NAD83 2111 - Michigan North US fleet	430,613.190 ft N
Sampling Method:	Ponar (2 grabs)		

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-24			0.25	(ML/CL) fine to medium grained tan sand w/ moderate to little clay intermixed (clumping present), has little to some smaller pebbles, rocks and possible coal fragments	548.67	
0.2					Bottom of Harbor		
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							
0.9							
1.0							

Ponar

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015
Drillers: Coleman / RTI Laboratories
Sampling Method: Macro Core

Boring Number: SM-14-25
NOAA Station: Rock Cut, MI (9076024)
Water Elevation: 579.39
Sediment Elevation: 573.39
State Plane Coordinates: 4,882,240.421 ft E
NAD83 2111 - Michigan North 355,451.705 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
0.1	SM-14-25			0.08	(ML) fine grained sand	573.31	
0.2					(CL) dense light brown clay		
0.3							
0.4				0.42		572.97	
0.5				0.50	(ML) fine grained sand	572.89	
0.6				0.58	(CL) dense light brown clay	572.81	
0.7					Bottom of Sample		
0.8							
0.9							
1.0							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015

Drillers: Coleman / RTI Laboratories

Sampling Method: Macro Core

Boring Number: SM-14-26
NOAA Station: Rock Cut, MI (9076024)
Water Elevation: 579.32
Sediment Elevation: 574.32
State Plane Coordinates: 4,882,318.732 ft E
NAD83 2111 - Michigan North 355,326.143 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-26			3.42	(CL) very dry crumbly light brown clay Bottom of Sample	570.90	
2							
3							
4							
5							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015
Drillers: Coleman / RTI Laboratories
Sampling Method: Macro Core

Boring Number: SM-14-27
NOAA Station: Rock Cut, MI (9076024)
Water Elevation: 579.30
Sediment Elevation: 573.50
State Plane Coordinates: 4,882,379.589 ft E
NAD83 2111 - Michigan North 355,167.950 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-27			3.33	(CL) very dry crumbly, light brown clay note: very hard refusal & difficult to retrieve, pulling boat into water.	570.17	
2					Bottom of Sample		
3							
4							
5							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015

Drillers: Coleman / RTI Laboratories

Sampling Method: Macro Core

Boring Number: SM-14-28
NOAA Station: Rock Cut, MI (9076024)
Water Elevation: 579.30
Sediment Elevation: 572.90
State Plane Coordinates: 4,882,472.567 ft E
NAD83 2111 - Michigan North 355,062.453 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-28			0.33	(SP) sand	572.57	
2				2.83	(CH) clay	570.07	
3					Bottom of Sample		
4							
5							

Macro Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 11/11/2014

Drillers: Coleman / RTI Laboratories

Sampling Method: Gravity Core

Boring Number: SM-14-29
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.61
Sediment Elevation: 549.61
State Plane Coordinates: 4,867,017.225 ft E
NAD83 2111 - Michigan North 380,074.061 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-29			2.17	(SC) medium to fine sand w/ clay	547.44	
2					Bottom of Sample		
3							
4							
5							

Gravity Core

Sediment Log

Client: U.S. Army Corps of Engineers - Detroit District

Project Name: St. Marys River
Project Location: St. Marys River
Drilling Date: 5/20/2015

Drillers: Coleman / RTI Laboratories

Sampling Method: Macro Core

Boring Number: SM-14-30
NOAA Station: W Neebish Isl., MI (9076027)
Water Elevation: 579.61
Sediment Elevation: 546.11
State Plane Coordinates: 4,866,364.753 ft E
NAD83 2111 - Michigan North 379,919.167 ft N
US fleet

Depth (ft)	Sample Type Number	Environmental Data	Graphic Log	Depth (ft)	Material Description	Elev. (ft)	Picture
1	SM-14-30				(SP) sand		
				1.33		544.78	
2					(CH) clay 2.5'-3.92' rock chips		
3							
4				4.00		542.11	
5				4.08	(SP) sand with rock chips	542.03	
					Bottom of Sample		

Macro Core

Appendix D

Appendix D presents photos of samples collected using a Gravity-core and Macro-core devices and mixed samples collected from St Marys River during the event in October 2014 and May 2015.

St Marys Shoreline

St Marys River Joseph A Block

SM-14-02

SM-14-03

SM-14-04 pic 1

SM-14-04 pic 2

Appendix D

SM-14-05 pic 1

SM-14-05 pic 2

SM-14-05 pic 3

SM-14-06 pic 1

SM-14-06 pic 2

SM-14-07 pic 1

Appendix D

SM-14-07 pic 2

SM-14-08

SM-14-09 pic 1

SM-14-09 pic 2

SM-14-10 pic 1

SM-14-10 pic 2

Appendix D

SM-14-11 pic 1

SM-14-11 pic 2

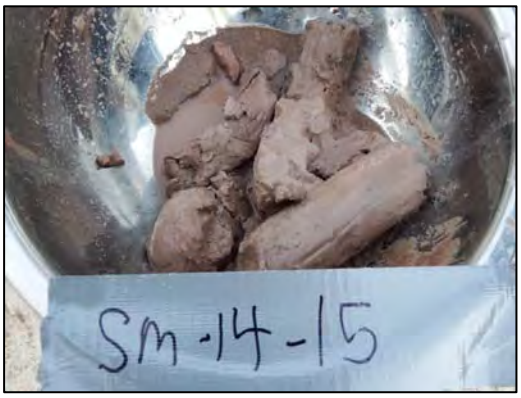
SM-14-12 pic 1

SM-14-12 pic 2

SM-14-14

SM-14-15 pic 1

Appendix D

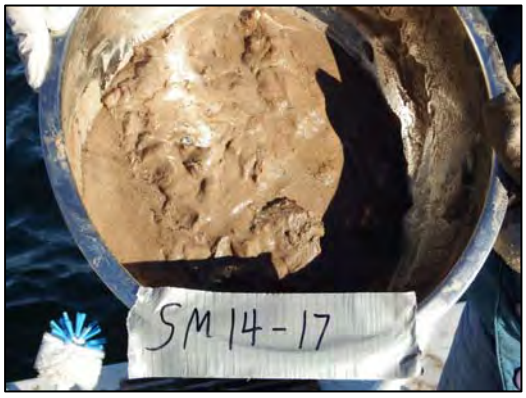


SM-14-15 pic 2

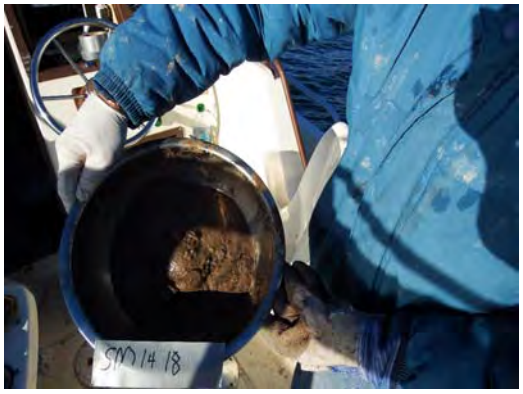
SM-14-16 pic 1

SM-14-16 pic 2

SM-14-17 pic 1



SM-14-17 pic 2



SM-14-18 pic 1

Appendix D

SM-14-18 pic 2

SM-14-19 pic 1

SM-14-19 pic 2

SM-14-20 pic 1

SM-14-20 pic 2

SM-14-20 pic 3

Appendix D

SM-14-21 pic 1

SM-14-21 pic 2

SM-14-22 pic 1

SM-14-22 pic 2

SM-14-22 pic 3

SM-14-23 pic 1

Appendix D

SM-14-23 pic 2

SM-14-24

SM-14-25 (0-5) & (5-6.5) pic 1

SM-14-25 (0-5) & (5-6.5) pic 2

SM-14-25 (0-5) & (5-6.5) pic 3

SM-14-26 (0-3.5) pic 1

Appendix D

SM-14-26 (0-3.5) pic 1 close up

SM-14-26 (0-3.5) pic 2

SM-14-27

SM-14-27 close up

SM-14-28 pic 1

SM-14-28 pic 1 close up

Appendix D

SM-14-28 pic 2

SM-14-30 pic 1

SM-14-30 pic 2

SM-14- unidentified core clay

SM-14- unidentified core sandy clay

SM-14- unidentified core sand

Appendix D

St Marys Crew pic 1

St Marys Crew pic 2

St Marys River car ferry pic 1

St Marys River car ferry pic 2

St Marys River Buoy

St Marys River Ironmaster ship

Appendix F

The following pages represent the completed Level 2 Data/Quality Control laboratory report(s) from RTI Laboratories and any subcontract laboratory. The laboratory work order number(s) are:

1410A92 - RTI

1411615 - RTI

1505725 - RTI

RTI LABORATORIES, INC.

RTI Laboratories
31628 Glendale St.
Livonia, MI 48150
TEL: (734) 422-8000
Website: www.rtilab.com

Monday, February 22, 2016

Pam Horner
USACE- Detroit District
Environmental Analysis Branch
477 Michigan Ave.
Detroit, MI 48226
TEL: (313) 226-6748
FAX:

RE: St Marys Sampling

Work Order #: 1410A92

Dear Pam Horner:

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

This report may only be reproduced in its entirety. Individual pages, reproduced without supporting documentation, do not contain related information and may be misinterpreted by other data reviewers.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Fred Hoitash

Fred Hoitash

Director, Sales and Field Services

RTI Laboratories - Workorder Sample Summary

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Lab Sample ID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
1410A92-001A	SM-14-07		10/22/2014 1:41 PM	10/23/2014 11:00 AM	Soil
1410A92-001B	SM-14-07		10/22/2014 1:41 PM	10/23/2014 11:00 AM	Soil
1410A92-001C	SM-14-07		10/22/2014 1:41 PM	10/23/2014 11:00 AM	Soil
1410A92-002A	SM-14-08		10/22/2014 1:15 PM	10/23/2014 11:00 AM	Soil
1410A92-002B	SM-14-08		10/22/2014 1:15 PM	10/23/2014 11:00 AM	Soil
1410A92-002C	SM-14-08		10/22/2014 1:15 PM	10/23/2014 11:00 AM	Soil
1410A92-003A	SM-14-10		10/22/2014 12:34 PM	10/23/2014 11:00 AM	Soil
1410A92-003B	SM-14-10		10/22/2014 12:34 PM	10/23/2014 11:00 AM	Soil
1410A92-003C	SM-14-10		10/22/2014 12:34 PM	10/23/2014 11:00 AM	Soil
1410A92-004A	SM-14-11		10/22/2014 12:10 PM	10/23/2014 11:00 AM	Soil
1410A92-004B	SM-14-11		10/22/2014 12:10 PM	10/23/2014 11:00 AM	Soil
1410A92-004C	SM-14-11		10/22/2014 12:10 PM	10/23/2014 11:00 AM	Soil
1410A92-005A	SM-14-12		10/22/2014 11:40 AM	10/23/2014 11:00 AM	Soil
1410A92-005B	SM-14-12		10/22/2014 11:40 AM	10/23/2014 11:00 AM	Soil
1410A92-005C	SM-14-12		10/22/2014 11:40 AM	10/23/2014 11:00 AM	Soil
1410A92-006A	SM-14-13		10/21/2014 4:27 PM	10/23/2014 11:00 AM	Soil
1410A92-006B	SM-14-13		10/21/2014 4:27 PM	10/23/2014 11:00 AM	Soil
1410A92-006C	SM-14-13		10/21/2014 4:27 PM	10/23/2014 11:00 AM	Soil
1410A92-007A	SM-14-14		10/22/2014 10:55 AM	10/23/2014 11:00 AM	Soil
1410A92-007B	SM-14-14		10/22/2014 10:55 AM	10/23/2014 11:00 AM	Soil
1410A92-007C	SM-14-14		10/22/2014 10:55 AM	10/23/2014 11:00 AM	Soil
1410A92-008A	SM-14-15		10/21/2014 6:35 PM	10/23/2014 11:00 AM	Soil
1410A92-008B	SM-14-15		10/21/2014 6:35 PM	10/23/2014 11:00 AM	Soil
1410A92-008C	SM-14-15		10/21/2014 6:35 PM	10/23/2014 11:00 AM	Soil
1410A92-009A	SM-14-16		10/21/2014 6:07 PM	10/23/2014 11:00 AM	Soil
1410A92-009B	SM-14-16		10/21/2014 6:07 PM	10/23/2014 11:00 AM	Soil
1410A92-009C	SM-14-16		10/21/2014 6:07 PM	10/23/2014 11:00 AM	Soil
1410A92-010A	SM-14-17		10/21/2014 5:33 PM	10/23/2014 11:00 AM	Soil
1410A92-010B	SM-14-17		10/21/2014 5:33 PM	10/23/2014 11:00 AM	Soil
1410A92-010C	SM-14-17		10/21/2014 5:33 PM	10/23/2014 11:00 AM	Soil
1410A92-011A	SM-14-18		10/21/2014 5:05 PM	10/23/2014 11:00 AM	Soil
1410A92-011B	SM-14-18		10/21/2014 5:05 PM	10/23/2014 11:00 AM	Soil
1410A92-011C	SM-14-18		10/21/2014 5:05 PM	10/23/2014 11:00 AM	Soil
1410A92-012A	SM-14-19		10/21/2014 12:58 PM	10/23/2014 11:00 AM	Soil
1410A92-012B	SM-14-19		10/21/2014 12:58 PM	10/23/2014 11:00 AM	Soil
1410A92-012C	SM-14-19		10/21/2014 12:58 PM	10/23/2014 11:00 AM	Soil
1410A92-013A	SM-14-20		10/21/2014 12:27 PM	10/23/2014 11:00 AM	Soil
1410A92-013B	SM-14-20		10/21/2014 12:27 PM	10/23/2014 11:00 AM	Soil
1410A92-013C	SM-14-20		10/21/2014 12:27 PM	10/23/2014 11:00 AM	Soil
1410A92-014A	SM-14-21		10/21/2014 11:58 AM	10/23/2014 11:00 AM	Soil
1410A92-014B	SM-14-21		10/21/2014 11:58 AM	10/23/2014 11:00 AM	Soil
1410A92-014C	SM-14-21		10/21/2014 11:58 AM	10/23/2014 11:00 AM	Soil
1410A92-015A	SM-14-22		10/21/2014 11:12 AM	10/23/2014 11:00 AM	Soil
1410A92-015B	SM-14-22		10/21/2014 11:12 AM	10/23/2014 11:00 AM	Soil
1410A92-015C	SM-14-22		10/21/2014 11:12 AM	10/23/2014 11:00 AM	Soil

RTI Laboratories - Workorder Sample Summary

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Lab Sample ID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
1410A92-016A	SM-14-23		10/21/2014 10:40 AM	10/23/2014 11:00 AM	Soil
1410A92-016B	SM-14-23		10/21/2014 10:40 AM	10/23/2014 11:00 AM	Soil
1410A92-016C	SM-14-23		10/21/2014 10:40 AM	10/23/2014 11:00 AM	Soil
1410A92-017A	SM-14-24		10/21/2014 10:13 AM	10/23/2014 11:00 AM	Soil
1410A92-017B	SM-14-24		10/21/2014 10:13 AM	10/23/2014 11:00 AM	Soil
1410A92-017C	SM-14-24		10/21/2014 10:13 AM	10/23/2014 11:00 AM	Soil

RTI Laboratories - Case Narrative

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Concentrations reported with a J flag in the Qual field are values below the reporting limit (RL) but greater than the established method detection limit (MDL). There is greater uncertainty associated with these results and data should be considered as estimated. These analytes are not routinely reviewed nor narrated below as to their potential for being laboratory artifacts.

Concentrations reported with an E flag in the Qual field are values that exceed the upper quantification range. There is greater uncertainty associated with these results and data should be considered as estimated.

Any comments or problems with the analytical events associated with this report are noted below.

Sample Analysis:
Samples were analyzed at the RTI Laboratories
- Particle Size Analysis - ASTM-D422
- Soil Density/Specific Gravity - ASTM D854
- Ammonia - EPA350.1
- TKN (Total Kjeldahl Nitrogen) - EPA351.2
- Chemical Oxygen Demand, COD - EPA410.4M
- Percent Moisture - ASTM-D2216
- Total, Fixed and Volatile Solids in Solids - SM2540G
- Total Phosphorus - A4500-P-F
- Metals, ICP/OES - SW6010C
- Mercury - SW7471A
- Organochlorine Pesticides - SW8081B
- Polychlorinated Biphenyls - SW8082A
- Semi-Volatile Organic Compounds - SW8270D
- Cyanide - SW9012B
- Organic Carbon - SW9060A
- Hexane Extractable Materials (HEM) - SW9071B

Revision 02/15/16:
The original data for cadmium was reported using the 226.502 wavelength on the ICP/AES instrument. All of the internal standards and associated QC responded in a fashion typical for dredged materials. This wavelength has been the primary wavelength for soils at RTI and has not previously had known positive bias from interferences.
During the client's review of the data a request was made for RTI to investigate the cadmium reported at the 226.502 wavelength. The data reported by RTI indicated positive concentrations at levels an order of magnitude higher than past data at this site.
The data, calibration curves and all associated QC was reprocessed using the 228.802 wavelength for cadmium. Several of the prepared samples were also analyzed on the ICP/MS instrument. The cadmium concentration of the data reprocessed at the 228.802 wavelength matched the concentrations from the ICP/MS analyses and the historic data.
Based on RTI's internal investigation and the historic data at this site, RTI has reprocessed all of the cadmium data, calibration and QC using the 228.802 wavelength. All of the cadmium data and QC in this work order has been revised.
For reference, the 228.802 wavelength was used to process the most recent round of Performance evaluation samples and both soil and water samples passed. RTI had previously passed all of these samples using the 226.502 wavelength.

Revision 02/18/15:
a) During the Level IV QA review, it was discovered that the data entries for the grain size plotting software did not have a leading sieve size entered for Sample ID 1410A92-005A. This is required for the software to plot 100% of the weight used. Some samples were originally reported with total weights of less than 100%. These have been corrected in the software and may have different % passing data than the original report.
b) During the Level IV QA review, it was discovered that the longitude and latitude data were missing from the original report generated. The data has been entered and is now appearing on the revised report.

Revision 12/24/14:
On data review it was noted that the original analysis for Zinc exhibited a QC exceedance on the batch QC for LCS-34936 (Batch ID 34936, Analytical Sequence ID 72985). All samples were re-prepped and reanalyzed with accepting QC. All Zinc data was similar to original analysis except for Sample IDs 1410A92-004C (Original analysis 6993; Secondary analysis 4188) and -005C (Original analysis 17990; Secondary analysis 24160).

Analytical Comments for Test SW_6010S, Analytical RunNo 72985, Batch ID 34936:
Sample 1410A92-008CMS: Recoveries for several analytes exceeded control limits. Possible matrix interference for Chromium, Copper and Selenium.
Sample 1410A92-008CMSD: Recoveries for Bariium, Iron, Manganese, Selenium exceeded control limits. Possible matrix interference for Chromium, Copper and Selenium.

Analytical Comments for Test SW_6010S, Analytical RunNo 72985, Batch ID R72985:
Sample CRQL-110414: Recovery for Cadmium exceeded control limits..

Analytical Comments for Test SW_8081S, Analytical RunNo 73329, Batch ID 34997:
Sample LCS-34997: Endosulfan II and endosulfan sulfate exceeded control limits.

Analytical Comments for Test SW_8081S, Analytical RunNo 73329, Batch ID 35028:
Sample LCS-35028: Endosulfan II and endosulfan sulfate exceeded control limits.

Analytical Comments for Test SW_8081S, Analytical RunNo 73498, Batch ID 34997:
Sample LCS-34997: Endosulfan sulfate exceeded control limits.
Analytical Comments for SW6010C, Sample CRQL-110414, Batch ID R84182 : Cadmium exceeded control limit.
Analytical Comments for SW6010C, Sample CRQL-110414, Batch ID R84182 : Cadmium exceeded control limit.

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 1:41:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-001	**Matrix:**	Soil
Client Sample ID:	SM-14-07		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.221					deg min		
Longitude	-084 12.910					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.88	U	0.71	0.88	2.2	µg/Kg-dry	1	11/13/2014 3:23 AM
4,4'-DDE	0.88	U	0.41	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
4,4'-DDT	0.88	U	0.46	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Aldrin	0.88	U	0.44	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
alpha-BHC	0.88	U	0.38	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
alpha-Chlordane	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
beta-BHC	0.88	U	0.47	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Chlordane (Technical)	17	U	4.6	17	22	µg/Kg-dry	1	11/13/2014 3:23 AM
delta-BHC	0.88	U	0.38	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Dieldrin	0.88	U	0.47	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Endosulfan I	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Endosulfan II	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Endosulfan sulfate	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Endrin	0.88	U	0.50	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Endrin aldehyde	0.88	U	0.51	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Endrin ketone	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
gamma-BHC	0.88	U	0.40	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
gamma-Chlordane	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Heptachlor	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Heptachlor epoxide	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Methoxychlor	0.88	U	0.50	0.88	1.1	µg/Kg-dry	1	11/13/2014 3:23 AM
Toxaphene	17	U	6.6	17	22	µg/Kg-dry	1	11/13/2014 3:23 AM
Surr: Decachlorobiphenyl	92.1			55-130		%Rec	1	11/13/2014 3:23 AM
Surr: Tetrachloro-m-xylene	81.9			42-129		%Rec	1	11/13/2014 3:23 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.8	U	3.9	8.8	43	µg/Kg-dry	1	11/7/2014 5:10 AM
Aroclor 1221		U	3.9		43	µg/Kg-dry	1	11/7/2014 5:10 AM
Aroclor 1232		U	5.9		43	µg/Kg-dry	1	11/7/2014 5:10 AM
Aroclor 1242		U	4.9		43	µg/Kg-dry	1	11/7/2014 5:10 AM
Aroclor 1248		U	4.6		43	µg/Kg-dry	1	11/7/2014 5:10 AM
Aroclor 1254		U	5.5		43	µg/Kg-dry	1	11/7/2014 5:10 AM
Aroclor 1260	8.8	U	3.8	8.8	43	µg/Kg-dry	1	11/7/2014 5:10 AM
Aroclor 1262		U	5.2		43	µg/Kg-dry	1	11/7/2014 5:10 AM
Total PCBs		U	3.8		43	µg/Kg-dry	1	11/7/2014 5:10 AM
Surr: Tetrachloro-m-xylene	80.1			44-130		%Rec	1	11/7/2014 5:10 AM
Surr: Decachlorobiphenyl	91.0			60-125		%Rec	1	11/7/2014 5:10 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 1:41:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-001	**Matrix:**	Soil
Client Sample ID:	SM-14-07		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	150		1.9	2.7	14	mg/Kg-dry	20	11/18/2014 8:57 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.67	U	0.44	0.67	1.3	mg/Kg-dry	1	11/4/2014 2:53 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,100	J	650	900	1,800	µg/Kg-dry	1	11/4/2014 11:23 AM
Barium	12,000		270	4,500	9,000	µg/Kg-dry	1	11/4/2014 11:23 AM
Cadmium	34	J	30	45	220	µg/Kg-dry	1	11/4/2014 11:23 AM
Chromium	5,300		74	360	450	µg/Kg-dry	1	11/4/2014 11:23 AM
Copper	5,200		370	900	4,500	µg/Kg-dry	1	11/4/2014 11:23 AM
Iron	4,200,000		28,000	45,000	130,000	µg/Kg-dry	10	11/4/2014 12:19 PM
Lead	1,200	J	560	900	4,500	µg/Kg-dry	1	11/4/2014 11:23 AM
Manganese	64,000		170	220	900	µg/Kg-dry	1	11/4/2014 11:23 AM
Nickel	3,600	J	250	900	4,500	µg/Kg-dry	1	11/4/2014 11:23 AM
Selenium	1,300	U	1,000	1,300	1,800	µg/Kg-dry	1	11/4/2014 11:23 AM
Silver	220	U	73	220	900	µg/Kg-dry	1	11/4/2014 11:23 AM
Zinc	7,200		360	460	4,600	µg/Kg-dry	1	12/23/2014 2:19 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	1.2	J	0.85	6.0	12	µg/Kg-dry	1	11/4/2014 7:22 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Acenaphthene	22	U	9.7	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Acenaphthylene	22	U	9.3	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Benzo(a)anthracene	22	U	14	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Benzo(a)pyrene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Benzo(g,h,i)perylene	22	U	15	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Benzo(k)fluoranthene	44	U	23	44	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Chrysene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Dibenzo (a,h) anthracene	44	U	35	44	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Fluoranthene	22	U	21	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Fluorene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Indeno(1,2,3-cd)pyrene	44	U	11	44	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Naphthalene	22	U	8.4	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Phenanthrene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Pyrene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 11:50 AM
Surr: 2-Fluorobiphenyl	87.0			44-115		%Rec	1	11/12/2014 11:50 AM
Surr: Nitrobenzene-d5	82.6			37-122		%Rec	1	11/12/2014 11:50 AM
Surr: Terphenyl-d14	96.4			54-127		%Rec	1	11/12/2014 11:50 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 1:41:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-001	**Matrix:**	Soil
Client Sample ID:	SM-14-07		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	25		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	2.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	1.2		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	1.2		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	0.20		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	1.7		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	96		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	2.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	23.2					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.79						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	16		5.1	5.1	5.1	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	61		25	25	25	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,400		230	320	650	mg/Kg-dry	24.038 46154	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	26		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	74		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.26		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,600	U	720	1,600	2,000	mg/Kg-dry	1	11/6/2014 10:06 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 1:15:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-002	**Matrix:**	Soil
Client Sample ID:	SM-14-08		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.174					deg min		
Longitude	-084 12.768					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	120	U	120	120	120	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.80	U	0.65	0.80	2.0	µg/Kg-dry	1	11/13/2014 3:47 AM
4,4'-DDE	0.80	U	0.38	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
4,4'-DDT	0.80	U	0.42	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Aldrin	0.80	U	0.40	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
alpha-BHC	0.80	U	0.35	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
alpha-Chlordane	0.80	U	0.45	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
beta-BHC	0.80	U	0.43	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Chlordane (Technical)	16	U	4.2	16	20	µg/Kg-dry	1	11/13/2014 3:47 AM
delta-BHC	0.80	U	0.35	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Dieldrin	0.80	U	0.43	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Endosulfan I	0.80	U	0.45	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Endosulfan II	0.80	U	0.44	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Endosulfan sulfate	0.80	U	0.45	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Endrin	0.80	U	0.46	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Endrin aldehyde	0.80	U	0.47	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Endrin ketone	0.80	U	0.44	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
gamma-BHC	0.80	U	0.36	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
gamma-Chlordane	0.80	U	0.45	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Heptachlor	0.80	U	0.44	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Heptachlor epoxide	0.80	U	0.44	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Methoxychlor	0.80	U	0.46	0.80	0.99	µg/Kg-dry	1	11/13/2014 3:47 AM
Toxaphene	16	U	6.0	16	20	µg/Kg-dry	1	11/13/2014 3:47 AM
Surr: Decachlorobiphenyl	88.7			55-130		%Rec	1	11/13/2014 3:47 AM
Surr: Tetrachloro-m-xylene	80.0			42-129		%Rec	1	11/13/2014 3:47 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.0	U	3.6	8.0	39	µg/Kg-dry	1	11/7/2014 5:34 AM
Aroclor 1221		U	3.6		39	µg/Kg-dry	1	11/7/2014 5:34 AM
Aroclor 1232		U	5.4		39	µg/Kg-dry	1	11/7/2014 5:34 AM
Aroclor 1242		U	4.4		39	µg/Kg-dry	1	11/7/2014 5:34 AM
Aroclor 1248		U	4.2		39	µg/Kg-dry	1	11/7/2014 5:34 AM
Aroclor 1254		U	5.0		39	µg/Kg-dry	1	11/7/2014 5:34 AM
Aroclor 1260	8.0	U	3.5	8.0	39	µg/Kg-dry	1	11/7/2014 5:34 AM
Aroclor 1262		U	4.7		39	µg/Kg-dry	1	11/7/2014 5:34 AM
Total PCBs		U	3.5		39	µg/Kg-dry	1	11/7/2014 5:34 AM
Surr: Tetrachloro-m-xylene	74.5			44-130		%Rec	1	11/7/2014 5:34 AM
Surr: Decachlorobiphenyl	87.2			60-125		%Rec	1	11/7/2014 5:34 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 1:15:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-002	**Matrix:**	Soil
Client Sample ID:	SM-14-08		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	32		1.6	2.4	12	mg/Kg-dry	20	11/18/2014 8:57 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.62	U	0.40	0.62	1.2	mg/Kg-dry	1	11/4/2014 2:53 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,200	J	550	750	1,500	µg/Kg-dry	1	11/4/2014 11:24 AM
Barium	12,000		220	3,800	7,500	µg/Kg-dry	1	11/4/2014 11:24 AM
Cadmium	49	J	25	38	190	µg/Kg-dry	1	11/4/2014 11:24 AM
Chromium	6,400		62	300	380	µg/Kg-dry	1	11/4/2014 11:24 AM
Copper	5,700		310	750	3,800	µg/Kg-dry	1	11/4/2014 11:24 AM
Iron	5,000,000		24,000	38,000	110,000	µg/Kg-dry	10	11/4/2014 12:21 PM
Lead	1,700	J	470	750	3,800	µg/Kg-dry	1	11/4/2014 11:24 AM
Manganese	67,000		140	190	750	µg/Kg-dry	1	11/4/2014 11:24 AM
Nickel	4,000		210	750	3,800	µg/Kg-dry	1	11/4/2014 11:24 AM
Selenium	1,100	U	880	1,100	1,500	µg/Kg-dry	1	11/4/2014 11:24 AM
Silver	190	U	62	190	750	µg/Kg-dry	1	11/4/2014 11:24 AM
Zinc	9,100		340	440	4,400	µg/Kg-dry	1	12/23/2014 2:20 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	2.1	J	0.92	6.5	13	µg/Kg-dry	1	11/4/2014 7:23 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	20	U	9.8	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Acenaphthene	20	U	8.9	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Acenaphthylene	20	U	8.5	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Anthracene	20	U	9.7	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Benzo(a)anthracene	20	U	13	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Benzo(a)pyrene	20	U	12	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Benzo(b)fluoranthene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Benzo(g,h,i)perylene	20	U	14	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Benzo(k)fluoranthene	40	U	21	40	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Chrysene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Dibenzo (a,h) anthracene	40	U	32	40	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Fluoranthene	20	U	19	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Fluorene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Indeno(1,2,3-cd)pyrene	40	U	10	40	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Naphthalene	20	U	7.8	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Phenanthrene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Pyrene	20	U	12	20	190	µg/Kg-dry	1	11/12/2014 1:02 PM
Surr: 2-Fluorobiphenyl	81.0			44-115		%Rec	1	11/12/2014 1:02 PM
Surr: Nitrobenzene-d5	76.6			37-122		%Rec	1	11/12/2014 1:02 PM
Surr: Terphenyl-d14	90.0			54-127		%Rec	1	11/12/2014 1:02 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 1:15:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-002	**Matrix:**	Soil
Client Sample ID:	SM-14-08		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	99		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	97		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	93		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	29		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	4.8		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	2.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	2.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	1.0		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	5.7		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	88		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	4.8		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	23.6					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.83						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	15		4.8	4.8	4.8	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	63		23	23	23	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	2,000		170	240	480	mg/Kg-dry	19.455 25292	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	18		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	82		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.46		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,400	U	660	1,400	1,800	mg/Kg-dry	1	11/6/2014 10:34 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 12:34:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-003	**Matrix:**	Soil
Client Sample ID:	SM-14-10		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 20.420					deg min		
Longitude	-084 12.779					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.85	U	0.69	0.85	2.2	µg/Kg-dry	1	11/13/2014 5:02 AM
4,4'-DDE	0.85	U	0.40	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
4,4'-DDT	0.85	U	0.45	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Aldrin	0.85	U	0.43	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
alpha-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
alpha-Chlordane	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
beta-BHC	0.85	U	0.45	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Chlordane (Technical)	17	U	4.4	17	21	µg/Kg-dry	1	11/13/2014 5:02 AM
delta-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Dieldrin	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Endosulfan I	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Endosulfan II	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Endosulfan sulfate	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Endrin	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Endrin aldehyde	0.85	U	0.50	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Endrin ketone	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
gamma-BHC	0.85	U	0.39	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
gamma-Chlordane	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Heptachlor	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Heptachlor epoxide	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Methoxychlor	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	11/13/2014 5:02 AM
Toxaphene	17	U	6.4	17	21	µg/Kg-dry	1	11/13/2014 5:02 AM
Surr: Decachlorobiphenyl	90.9			55-130		%Rec	1	11/13/2014 5:02 AM
Surr: Tetrachloro-m-xylene	75.3			42-129		%Rec	1	11/13/2014 5:02 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.5	U	3.8	8.5	42	µg/Kg-dry	1	11/7/2014 5:58 AM
Aroclor 1221		U	3.8		42	µg/Kg-dry	1	11/7/2014 5:58 AM
Aroclor 1232		U	5.7		42	µg/Kg-dry	1	11/7/2014 5:58 AM
Aroclor 1242		U	4.7		42	µg/Kg-dry	1	11/7/2014 5:58 AM
Aroclor 1248		U	4.5		42	µg/Kg-dry	1	11/7/2014 5:58 AM
Aroclor 1254		U	5.4		42	µg/Kg-dry	1	11/7/2014 5:58 AM
Aroclor 1260	8.5	U	3.7	8.5	42	µg/Kg-dry	1	11/7/2014 5:58 AM
Aroclor 1262		U	5.0		42	µg/Kg-dry	1	11/7/2014 5:58 AM
Total PCBs		U	3.7		42	µg/Kg-dry	1	11/7/2014 5:58 AM
Surr: Tetrachloro-m-xylene	66.6			44-130		%Rec	1	11/7/2014 5:58 AM
Surr: Decachlorobiphenyl	81.1			60-125		%Rec	1	11/7/2014 5:58 AM

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 12:34:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-003	**Matrix:**	Soil
Client Sample ID:	SM-14-10		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	31		1.8	2.6	13	mg/Kg-dry	20	11/18/2014 8:57 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	1.5		0.42	0.64	1.3	mg/Kg-dry	1	11/4/2014 2:53 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	970	J	490	680	1,400	µg/Kg-dry	1	11/4/2014 11:26 AM
Barium	9,600		200	3,400	6,800	µg/Kg-dry	1	11/4/2014 11:26 AM
Cadmium	100	J	22	34	170	µg/Kg-dry	1	11/4/2014 11:26 AM
Chromium	5,100		56	270	340	µg/Kg-dry	1	11/4/2014 11:26 AM
Copper	4,800		280	680	3,400	µg/Kg-dry	1	11/4/2014 11:26 AM
Iron	4,700,000		21,000	34,000	100,000	µg/Kg-dry	10	11/4/2014 12:22 PM
Lead	1,500	J	420	680	3,400	µg/Kg-dry	1	11/4/2014 11:26 AM
Manganese	66,000		130	170	680	µg/Kg-dry	1	11/4/2014 11:26 AM
Nickel	3,400	J	190	680	3,400	µg/Kg-dry	1	11/4/2014 11:26 AM
Selenium	1,000	U	790	1,000	1,400	µg/Kg-dry	1	11/4/2014 11:26 AM
Silver	170	U	56	170	680	µg/Kg-dry	1	11/4/2014 11:26 AM
Zinc	6,600		400	510	5,100	µg/Kg-dry	1	12/23/2014 2:21 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	1.6	J	0.93	6.6	13	µg/Kg-dry	1	11/4/2014 7:25 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	21	U	10	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Acenaphthene	21	U	9.3	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Acenaphthylene	21	U	9.0	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Anthracene	21	U	10	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Benzo(a)anthracene	21	U	14	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Benzo(a)pyrene	21	U	13	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Benzo(b)fluoranthene	21	U	11	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Benzo(g,h,i)perylene	21	U	15	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Benzo(k)fluoranthene	42	U	22	42	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Chrysene	21	U	12	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Dibenzo (a,h) anthracene	42	U	33	42	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Fluoranthene	21	U	20	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Fluorene	21	U	12	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Indeno(1,2,3-cd)pyrene	42	U	11	42	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Naphthalene	21	U	8.2	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Phenanthrene	21	U	11	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Pyrene	21	U	13	21	200	µg/Kg-dry	1	11/12/2014 1:27 PM
Surr: 2-Fluorobiphenyl	92.1			44-115		%Rec	1	11/12/2014 1:27 PM
Surr: Nitrobenzene-d5	90.4			37-122		%Rec	1	11/12/2014 1:27 PM
Surr: Terphenyl-d14	94.5			54-127		%Rec	1	11/12/2014 1:27 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 12:34:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-003	**Matrix:**	Soil
Client Sample ID:	SM-14-10		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	99		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	95		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	9.5		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	0.50		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	0.30		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	0.30		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	0.70		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	3.9		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	95		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	0.50		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	24.9					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	3.00						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	11		5.1	5.1	5.1	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	32		25	25	25	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,600		200	280	570	mg/Kg-dry	21.929 82456	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	23		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	77		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.27		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,700	U	780	1,700	2,100	mg/Kg-dry	1	11/6/2014 10:43 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 12:10:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-004	**Matrix:**	Soil
Client Sample ID:	SM-14-11		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 20.155					deg min		
Longitude	-084 12.848					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	120	U	120	120	120	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.81	U	0.65	0.81	2.0	µg/Kg-dry	1	11/13/2014 5:27 AM
4,4'-DDE	0.81	U	0.38	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
4,4'-DDT	0.81	U	0.42	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Aldrin	0.81	U	0.41	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
alpha-BHC	0.81	U	0.35	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
alpha-Chlordane	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
beta-BHC	0.81	U	0.43	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Chlordane (Technical)	16	U	4.2	16	20	µg/Kg-dry	1	11/13/2014 5:27 AM
delta-BHC	0.81	U	0.35	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Dieldrin	0.81	U	0.43	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Endosulfan I	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Endosulfan II	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Endosulfan sulfate	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Endrin	0.81	U	0.46	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Endrin aldehyde	0.81	U	0.47	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Endrin ketone	0.81	U	0.44	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
gamma-BHC	0.81	U	0.37	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
gamma-Chlordane	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Heptachlor	0.81	U	0.44	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Heptachlor epoxide	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Methoxychlor	0.81	U	0.46	0.81	1.0	µg/Kg-dry	1	11/13/2014 5:27 AM
Toxaphene	16	U	6.0	16	20	µg/Kg-dry	1	11/13/2014 5:27 AM
Surr: Decachlorobiphenyl	92.5			55-130		%Rec	1	11/13/2014 5:27 AM
Surr: Tetrachloro-m-xylene	79.4			42-129		%Rec	1	11/13/2014 5:27 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.0	U	3.6	8.0	40	µg/Kg-dry	1	11/7/2014 7:11 AM
Aroclor 1221		U	3.6		40	µg/Kg-dry	1	11/7/2014 7:11 AM
Aroclor 1232		U	5.4		40	µg/Kg-dry	1	11/7/2014 7:11 AM
Aroclor 1242		U	4.5		40	µg/Kg-dry	1	11/7/2014 7:11 AM
Aroclor 1248		U	4.2		40	µg/Kg-dry	1	11/7/2014 7:11 AM
Aroclor 1254		U	5.1		40	µg/Kg-dry	1	11/7/2014 7:11 AM
Aroclor 1260	8.0	U	3.5	8.0	40	µg/Kg-dry	1	11/7/2014 7:11 AM
Aroclor 1262		U	4.8		40	µg/Kg-dry	1	11/7/2014 7:11 AM
Total PCBs		U	3.5		40	µg/Kg-dry	1	11/7/2014 7:11 AM
Surr: Tetrachloro-m-xylene	63.2			44-130		%Rec	1	11/7/2014 7:11 AM
Surr: Decachlorobiphenyl	80.4			60-125		%Rec	1	11/7/2014 7:11 AM

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 12:10:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-004	**Matrix:**	Soil
Client Sample ID:	SM-14-11		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	38		1.7	2.4	12	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.62	U	0.41	0.62	1.2	mg/Kg-dry	1	11/4/2014 2:53 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	2,000		620	860	1,700	µg/Kg-dry	1	11/4/2014 11:27 AM
Barium	6,200	J	260	4,300	8,600	µg/Kg-dry	1	11/4/2014 11:27 AM
Cadmium	60	J	28	43	210	µg/Kg-dry	1	11/4/2014 11:27 AM
Chromium	3,500		71	340	430	µg/Kg-dry	1	11/4/2014 11:27 AM
Copper	4,900		360	860	4,300	µg/Kg-dry	1	11/4/2014 11:27 AM
Iron	3,200,000		27,000	43,000	130,000	µg/Kg-dry	10	11/4/2014 12:23 PM
Lead	1,300	J	530	860	4,300	µg/Kg-dry	1	11/4/2014 11:27 AM
Manganese	54,000		160	210	860	µg/Kg-dry	1	11/4/2014 11:27 AM
Nickel	2,600	J	240	860	4,300	µg/Kg-dry	1	11/4/2014 11:27 AM
Selenium	1,300	U	1,000	1,300	1,700	µg/Kg-dry	1	11/4/2014 11:27 AM
Silver	210	U	70	210	860	µg/Kg-dry	1	11/4/2014 11:27 AM
Zinc	4,200		280	370	3,700	µg/Kg-dry	1	12/23/2014 2:23 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	1.2	J	0.77	5.5	11	µg/Kg-dry	1	11/4/2014 7:27 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	20	U	9.9	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Acenaphthene	20	U	9.0	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Acenaphthylene	20	U	8.6	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Anthracene	20	U	9.9	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Benzo(a)anthracene	20	U	13	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Benzo(a)pyrene	20	U	12	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Benzo(b)fluoranthene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Benzo(g,h,i)perylene	20	U	14	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Benzo(k)fluoranthene	40	U	21	40	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Chrysene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Dibenzo (a,h) anthracene	40	U	32	40	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Fluoranthene	20	U	19	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Fluorene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Indeno(1,2,3-cd)pyrene	40	U	10	40	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Naphthalene	20	U	7.9	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Phenanthrene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Pyrene	20	U	12	20	190	µg/Kg-dry	1	11/12/2014 1:51 PM
Surr: 2-Fluorobiphenyl	95.3			44-115		%Rec	1	11/12/2014 1:51 PM
Surr: Nitrobenzene-d5	89.9			37-122		%Rec	1	11/12/2014 1:51 PM
Surr: Terphenyl-d14	98.6			54-127		%Rec	1	11/12/2014 1:51 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 12:10:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-004	**Matrix:**	Soil
Client Sample ID:	SM-14-11		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	5.6		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	0.20		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	0.10		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	0.10		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	2.3		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	98		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	0.20		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	26.3					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	3.16						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	12		4.8	4.8	4.8	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	31		24	24	24	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	520		180	250	490	mg/Kg-dry	20	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	19		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	81		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.24		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,500	U	700	1,500	1,900	mg/Kg-dry	1	11/6/2014 10:53 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 11:40:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-005	**Matrix:**	Soil
Client Sample ID:	SM-14-12		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 19.825					deg min		
Longitude	-084 12.808					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	140	U	140	140	140	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.91	U	0.73	0.91	2.3	µg/Kg-dry	1	11/13/2014 5:52 AM
4,4'-DDE	0.91	U	0.43	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
4,4'-DDT	0.91	U	0.48	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Aldrin	0.91	U	0.46	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
alpha-BHC	0.91	U	0.40	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
alpha-Chlordane	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
beta-BHC	0.91	U	0.48	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Chlordane (Technical)	18	U	4.7	18	23	µg/Kg-dry	1	11/13/2014 5:52 AM
delta-BHC	0.91	U	0.40	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Dieldrin	0.91	U	0.49	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Endosulfan I	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Endosulfan II	0.91	U	0.50	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Endosulfan sulfate	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Endrin	0.91	U	0.52	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Endrin aldehyde	0.91	U	0.53	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Endrin ketone	0.91	U	0.49	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
gamma-BHC	0.91	U	0.41	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
gamma-Chlordane	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Heptachlor	0.91	U	0.50	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Heptachlor epoxide	0.91	U	0.50	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Methoxychlor	0.91	U	0.52	0.91	1.1	µg/Kg-dry	1	11/13/2014 5:52 AM
Toxaphene	18	U	6.8	18	23	µg/Kg-dry	1	11/13/2014 5:52 AM
Surr: Decachlorobiphenyl	96.1			55-130		%Rec	1	11/13/2014 5:52 AM
Surr: Tetrachloro-m-xylene	81.8			42-129		%Rec	1	11/13/2014 5:52 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	9.0	U	4.1	9.0	45	µg/Kg-dry	1	11/7/2014 7:35 AM
Aroclor 1221		U	4.0		45	µg/Kg-dry	1	11/7/2014 7:35 AM
Aroclor 1232		U	6.1		45	µg/Kg-dry	1	11/7/2014 7:35 AM
Aroclor 1242		U	5.0		45	µg/Kg-dry	1	11/7/2014 7:35 AM
Aroclor 1248		U	4.8		45	µg/Kg-dry	1	11/7/2014 7:35 AM
Aroclor 1254		U	5.7		45	µg/Kg-dry	1	11/7/2014 7:35 AM
Aroclor 1260	9.0	U	4.0	9.0	45	µg/Kg-dry	1	11/7/2014 7:35 AM
Aroclor 1262		U	5.4		45	µg/Kg-dry	1	11/7/2014 7:35 AM
Total PCBs		U	4.0		45	µg/Kg-dry	1	11/7/2014 7:35 AM
Surr: Tetrachloro-m-xylene	69.8			44-130		%Rec	1	11/7/2014 7:35 AM
Surr: Decachlorobiphenyl	88.0			60-125		%Rec	1	11/7/2014 7:35 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 11:40:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-005	**Matrix:**	Soil
Client Sample ID:	SM-14-12		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	46		1.9	2.7	14	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	1.1	J	0.45	0.68	1.4	mg/Kg-dry	1	11/4/2014 2:53 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,700		510	710	1,400	µg/Kg-dry	1	11/4/2014 11:28 AM
Barium	54,000		210	3,500	7,100	µg/Kg-dry	1	11/4/2014 11:28 AM
Cadmium	150	J	23	35	180	µg/Kg-dry	1	11/4/2014 11:28 AM
Chromium	18,000		58	280	350	µg/Kg-dry	1	11/4/2014 11:28 AM
Copper	10,000		290	710	3,500	µg/Kg-dry	1	11/4/2014 11:28 AM
Iron	15,000,000		22,000	35,000	110,000	µg/Kg-dry	10	11/4/2014 12:25 PM
Lead	3,500	J	440	710	3,500	µg/Kg-dry	1	11/4/2014 11:28 AM
Manganese	210,000		1,300	1,800	7,100	µg/Kg-dry	10	11/4/2014 12:25 PM
Nickel	12,000		200	710	3,500	µg/Kg-dry	1	11/4/2014 11:28 AM
Selenium	1,100	U	820	1,100	1,400	µg/Kg-dry	1	11/4/2014 11:28 AM
Silver	180	U	58	180	710	µg/Kg-dry	1	11/4/2014 11:28 AM
Zinc	24,000		470	600	6,000	µg/Kg-dry	1	12/23/2014 2:24 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	4.4	J	1.0	7.2	14	µg/Kg-dry	1	11/4/2014 10:07 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	23	U	11	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Acenaphthene	23	U	10	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Acenaphthylene	23	U	9.7	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Anthracene	23	U	11	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Benzo(a)anthracene	23	U	15	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Benzo(a)pyrene	23	U	14	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Benzo(b)fluoranthene	23	U	12	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Benzo(g,h,i)perylene	23	U	16	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Benzo(k)fluoranthene	45	U	24	45	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Chrysene	23	U	13	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Dibenzo (a,h) anthracene	45	U	36	45	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Fluoranthene	23	U	22	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Fluorene	23	U	13	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Indeno(1,2,3-cd)pyrene	45	U	12	45	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Naphthalene	23	U	8.8	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Phenanthrene	23	U	12	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Pyrene	23	U	14	23	220	µg/Kg-dry	1	11/12/2014 2:15 PM
Surr: 2-Fluorobiphenyl	80.9			44-115		%Rec	1	11/12/2014 2:15 PM
Surr: Nitrobenzene-d5	76.6			37-122		%Rec	1	11/12/2014 2:15 PM
Surr: Terphenyl-d14	91.6			54-127		%Rec	1	11/12/2014 2:15 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 11:40:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-005	**Matrix:**	Soil
Client Sample ID:	SM-14-12		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	97		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	86		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	73		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	60		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	7.9		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	2.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	1.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	1.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	2.9		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	11		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	26		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	57		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	2.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	22.3					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.67						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	16		5.4	5.4	5.4	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	80		25	25	25	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	4,200		210	290	580	mg/Kg-dry	21.097 04641	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	27		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	73		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.95		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,500	U	1,100	2,500	3,100	mg/Kg-dry	1	11/6/2014 11:02 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District
Project: St Marys Sampling
Lab ID: 1410A92-006
Client Sample ID: SM-14-13

Collection Date: 10/21/2014 4:27:00 PM
Matrix: Soil

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 19.124					deg min		
Longitude	-084 12.931					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	150	U	150	150	150	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.99	U	0.80	0.99	2.5	µg/Kg-dry	1	11/13/2014 6:17 AM
4,4'-DDE	0.99	U	0.47	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
4,4'-DDT	0.99	U	0.52	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Aldrin	0.99	U	0.50	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
alpha-BHC	0.99	U	0.43	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
alpha-Chlordane	0.99	U	0.55	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
beta-BHC	0.99	U	0.53	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Chlordane (Technical)	20	U	5.2	20	25	µg/Kg-dry	1	11/13/2014 6:17 AM
delta-BHC	0.99	U	0.43	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Dieldrin	0.99	U	0.53	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Endosulfan I	0.99	U	0.56	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Endosulfan II	0.99	U	0.55	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Endosulfan sulfate	0.99	U	0.56	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Endrin	0.99	U	0.57	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Endrin aldehyde	0.99	U	0.58	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Endrin ketone	0.99	U	0.54	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
gamma-BHC	0.99	U	0.45	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
gamma-Chlordane	0.99	U	0.55	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Heptachlor	0.99	U	0.54	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Heptachlor epoxide	0.99	U	0.55	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Methoxychlor	0.99	U	0.57	0.99	1.2	µg/Kg-dry	1	11/13/2014 6:17 AM
Toxaphene	20	U	7.4	20	25	µg/Kg-dry	1	11/13/2014 6:17 AM
Surr: Decachlorobiphenyl	82.2			55-130		%Rec	1	11/13/2014 6:17 AM
Surr: Tetrachloro-m-xylene	75.4			42-129		%Rec	1	11/13/2014 6:17 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	9.9	U	4.4	9.9	49	µg/Kg-dry	1	11/7/2014 7:59 AM
Aroclor 1221		U	4.4		49	µg/Kg-dry	1	11/7/2014 7:59 AM
Aroclor 1232		U	6.6		49	µg/Kg-dry	1	11/7/2014 7:59 AM
Aroclor 1242		U	5.5		49	µg/Kg-dry	1	11/7/2014 7:59 AM
Aroclor 1248		U	5.2		49	µg/Kg-dry	1	11/7/2014 7:59 AM
Aroclor 1254		U	6.3		49	µg/Kg-dry	1	11/7/2014 7:59 AM
Aroclor 1260	9.9	U	4.3	9.9	49	µg/Kg-dry	1	11/7/2014 7:59 AM
Aroclor 1262		U	5.9		49	µg/Kg-dry	1	11/7/2014 7:59 AM
Total PCBs		U	4.3		49	µg/Kg-dry	1	11/7/2014 7:59 AM
Surr: Tetrachloro-m-xylene	60.2			44-130		%Rec	1	11/7/2014 7:59 AM
Surr: Decachlorobiphenyl	72.2			60-125		%Rec	1	11/7/2014 7:59 AM

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 4:27:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-006	**Matrix:**	Soil
Client Sample ID:	SM-14-13		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	110		2.1	3.0	15	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.66	J	0.49	0.74	1.5	mg/Kg-dry	1	11/4/2014 2:53 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	3,800		820	1,100	2,200	µg/Kg-dry	1	11/4/2014 11:30 AM
Barium	100,000		330	5,600	11,000	µg/Kg-dry	1	11/4/2014 11:30 AM
Cadmium	280	J	37	56	280	µg/Kg-dry	1	11/4/2014 11:30 AM
Chromium	36,000		93	450	560	µg/Kg-dry	1	11/4/2014 11:30 AM
Copper	21,000		470	1,100	5,600	µg/Kg-dry	1	11/4/2014 11:30 AM
Iron	23,000,000		35,000	56,000	170,000	µg/Kg-dry	10	11/4/2014 12:26 PM
Lead	4,800	J	700	1,100	5,600	µg/Kg-dry	1	11/4/2014 11:30 AM
Manganese	420,000		2,100	2,800	11,000	µg/Kg-dry	10	11/4/2014 12:26 PM
Nickel	27,000		320	1,100	5,600	µg/Kg-dry	1	11/4/2014 11:30 AM
Selenium	1,700	U	1,300	1,700	2,200	µg/Kg-dry	1	11/4/2014 11:30 AM
Silver	280	U	92	280	1,100	µg/Kg-dry	1	11/4/2014 11:30 AM
Zinc	32,000		340	440	4,400	µg/Kg-dry	1	12/23/2014 2:25 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	11	J	0.98	7.0	14	µg/Kg-dry	1	11/4/2014 10:09 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	25	U	12	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Acenaphthene	25	U	11	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Acenaphthylene	25	U	10	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Anthracene	25	U	12	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Benzo(a)anthracene	25	U	16	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Benzo(a)pyrene	23	J	15	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Benzo(b)fluoranthene	25	U	13	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Benzo(g,h,i)perylene	25	U	17	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Benzo(k)fluoranthene	49	U	26	49	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Chrysene	25	U	14	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Dibenzo (a,h) anthracene	49	U	39	49	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Fluoranthene	25	U	24	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Fluorene	25	U	14	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Indeno(1,2,3-cd)pyrene	49	U	13	49	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Naphthalene	25	U	9.5	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Phenanthrene	25	U	13	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Pyrene	25	U	15	25	240	µg/Kg-dry	1	11/12/2014 2:39 PM
Surr: 2-Fluorobiphenyl	86.6			44-115		%Rec	1	11/12/2014 2:39 PM
Surr: Nitrobenzene-d5	81.8			37-122		%Rec	1	11/12/2014 2:39 PM
Surr: Terphenyl-d14	92.9			54-127		%Rec	1	11/12/2014 2:39 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 4:27:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-006	**Matrix:**	Soil
Client Sample ID:	SM-14-13		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	70		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	47		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	30		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	8.5		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	3.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	0.80		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	0.80		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	2.3		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	28		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	40		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	26		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	3.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	19.2					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.31						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	26		5.9	5.9	5.9	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	160		30	30	30	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	3,800		260	370	730	mg/Kg-dry	24.390 2439	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	34		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	66		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	1.7		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,400	U	1,100	2,400	3,000	mg/Kg-dry	1	11/6/2014 11:12 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 10:55:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-007	**Matrix:**	Soil
Client Sample ID:	SM-14-14		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 18.712					deg min		
Longitude	-084 12.858					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.86	U	0.70	0.86	2.2	µg/Kg-dry	1	11/13/2014 6:42 AM
4,4'-DDE	0.86	U	0.40	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
4,4'-DDT	0.86	U	0.45	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Aldrin	0.86	U	0.43	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
alpha-BHC	0.86	U	0.38	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
alpha-Chlordane	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
beta-BHC	0.86	U	0.46	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Chlordane (Technical)	17	U	4.5	17	21	µg/Kg-dry	1	11/13/2014 6:42 AM
delta-BHC	0.86	U	0.38	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Dieldrin	0.86	U	0.46	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Endosulfan I	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Endosulfan II	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Endosulfan sulfate	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Endrin	0.86	U	0.49	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Endrin aldehyde	0.86	U	0.50	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Endrin ketone	0.86	U	0.47	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
gamma-BHC	0.86	U	0.39	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
gamma-Chlordane	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Heptachlor	0.86	U	0.47	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Heptachlor epoxide	0.86	U	0.47	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Methoxychlor	0.86	U	0.49	0.86	1.1	µg/Kg-dry	1	11/13/2014 6:42 AM
Toxaphene	17	U	6.4	17	21	µg/Kg-dry	1	11/13/2014 6:42 AM
Surr: Decachlorobiphenyl	97.6			55-130		%Rec	1	11/13/2014 6:42 AM
Surr: Tetrachloro-m-xylene	87.4			42-129		%Rec	1	11/13/2014 6:42 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.5	U	3.9	8.5	42	µg/Kg-dry	1	11/7/2014 8:23 AM
Aroclor 1221		U	3.8		42	µg/Kg-dry	1	11/7/2014 8:23 AM
Aroclor 1232		U	5.8		42	µg/Kg-dry	1	11/7/2014 8:23 AM
Aroclor 1242		U	4.8		42	µg/Kg-dry	1	11/7/2014 8:23 AM
Aroclor 1248		U	4.5		42	µg/Kg-dry	1	11/7/2014 8:23 AM
Aroclor 1254		U	5.4		42	µg/Kg-dry	1	11/7/2014 8:23 AM
Aroclor 1260	8.5	U	3.7	8.5	42	µg/Kg-dry	1	11/7/2014 8:23 AM
Aroclor 1262		U	5.1		42	µg/Kg-dry	1	11/7/2014 8:23 AM
Total PCBs		U	3.7		42	µg/Kg-dry	1	11/7/2014 8:23 AM
Surr: Tetrachloro-m-xylene	77.7			44-130		%Rec	1	11/7/2014 8:23 AM
Surr: Decachlorobiphenyl	97.0			60-125		%Rec	1	11/7/2014 8:23 AM

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 10:55:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-007	**Matrix:**	Soil
Client Sample ID:	SM-14-14		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	22		1.8	2.6	13	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.82	J	0.42	0.65	1.3	mg/Kg-dry	1	11/4/2014 2:53 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,400	J	620	850	1,700	µg/Kg-dry	1	11/4/2014 11:31 AM
Barium	4,300	J	250	4,300	8,500	µg/Kg-dry	1	11/4/2014 11:31 AM
Cadmium	68	J	28	43	210	µg/Kg-dry	1	11/4/2014 11:31 AM
Chromium	2,000		70	340	430	µg/Kg-dry	1	11/4/2014 11:31 AM
Copper	5,100		350	850	4,300	µg/Kg-dry	1	11/4/2014 11:31 AM
Iron	1,800,000		2,700	4,300	13,000	µg/Kg-dry	1	11/4/2014 11:31 AM
Lead	910	J	530	850	4,300	µg/Kg-dry	1	11/4/2014 11:31 AM
Manganese	32,000		160	210	850	µg/Kg-dry	1	11/4/2014 11:31 AM
Nickel	1,400	J	240	850	4,300	µg/Kg-dry	1	11/4/2014 11:31 AM
Selenium	1,300	U	990	1,300	1,700	µg/Kg-dry	1	11/4/2014 11:31 AM
Silver	210	U	70	210	850	µg/Kg-dry	1	11/4/2014 11:31 AM
Zinc	3,200	J	310	400	4,000	µg/Kg-dry	1	12/23/2014 2:27 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	1.9	J	0.81	5.7	11	µg/Kg-dry	1	11/4/2014 10:10 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	21	U	10	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Acenaphthene	21	U	9.5	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Acenaphthylene	21	U	9.1	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Anthracene	21	U	10	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Benzo(a)anthracene	21	U	14	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Benzo(a)pyrene	21	U	13	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Benzo(b)fluoranthene	21	U	12	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Benzo(g,h,i)perylene	21	U	15	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Benzo(k)fluoranthene	43	U	22	43	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Chrysene	21	U	12	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Dibenzo (a,h) anthracene	43	U	34	43	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Fluoranthene	21	U	21	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Fluorene	21	U	12	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Indeno(1,2,3-cd)pyrene	43	U	11	43	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Naphthalene	21	U	8.3	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Phenanthrene	21	U	11	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Pyrene	21	U	13	21	210	µg/Kg-dry	1	11/12/2014 3:03 PM
Surr: 2-Fluorobiphenyl	91.1			44-115		%Rec	1	11/12/2014 3:03 PM
Surr: Nitrobenzene-d5	88.0			37-122		%Rec	1	11/12/2014 3:03 PM
Surr: Terphenyl-d14	97.8			54-127		%Rec	1	11/12/2014 3:03 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/22/2014 10:55:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-007	**Matrix:**	Soil
Client Sample ID:	SM-14-14		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	82		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	0.80		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	0.10		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	0.10		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	0.10		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	18		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	82		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	0.10		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	24.6					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.96						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	11		5.1	5.1	5.1	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	36		25	25	25	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	360	J	200	270	550	mg/Kg-dry	21.186 44068	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	23		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	77		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.10	U	0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,300	U	610	1,300	1,700	mg/Kg-dry	1	11/6/2014 11:20 AM

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 6:35:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-008	**Matrix:**	Soil
Client Sample ID:	SM-14-15		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 19.346					deg min		
Longitude	-084 12.880					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	180	U	180	180	180	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	1.2	U	0.97	1.2	3.1	µg/Kg-dry	1	11/13/2014 7:07 AM
4,4'-DDE	1.2	U	0.57	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
4,4'-DDT	1.2	U	0.63	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Aldrin	1.2	U	0.61	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
alpha-BHC	1.2	U	0.53	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
alpha-Chlordane	1.2	U	0.67	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
beta-BHC	1.2	U	0.64	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Chlordane (Technical)	24	U	6.3	24	30	µg/Kg-dry	1	11/13/2014 7:07 AM
delta-BHC	1.2	U	0.53	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Dieldrin	1.2	U	0.65	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Endosulfan I	1.2	U	0.67	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Endosulfan II	1.2	U	0.67	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Endosulfan sulfate	1.2	U	0.67	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Endrin	1.2	U	0.69	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Endrin aldehyde	1.2	U	0.70	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Endrin ketone	1.2	U	0.66	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
gamma-BHC	1.2	U	0.55	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
gamma-Chlordane	1.2	U	0.67	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Heptachlor	1.2	U	0.66	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Heptachlor epoxide	1.2	U	0.66	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Methoxychlor	1.2	U	0.69	1.2	1.5	µg/Kg-dry	1	11/13/2014 7:07 AM
Toxaphene	24	U	9.0	24	30	µg/Kg-dry	1	11/13/2014 7:07 AM
Surr: Decachlorobiphenyl	91.1			55-130		%Rec	1	11/13/2014 7:07 AM
Surr: Tetrachloro-m-xylene	82.9			42-129		%Rec	1	11/13/2014 7:07 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	12	U	5.4	12	59	µg/Kg-dry	1	11/7/2014 8:47 AM
Aroclor 1221		U	5.4		59	µg/Kg-dry	1	11/7/2014 8:47 AM
Aroclor 1232		U	8.1		59	µg/Kg-dry	1	11/7/2014 8:47 AM
Aroclor 1242		U	6.7		59	µg/Kg-dry	1	11/7/2014 8:47 AM
Aroclor 1248		U	6.3		59	µg/Kg-dry	1	11/7/2014 8:47 AM
Aroclor 1254		U	7.6		59	µg/Kg-dry	1	11/7/2014 8:47 AM
Aroclor 1260	12	U	5.3	12	59	µg/Kg-dry	1	11/7/2014 8:47 AM
Aroclor 1262		U	7.1		59	µg/Kg-dry	1	11/7/2014 8:47 AM
Total PCBs		U	5.3		59	µg/Kg-dry	1	11/7/2014 8:47 AM
Surr: Tetrachloro-m-xylene	60.7			44-130		%Rec	1	11/7/2014 8:47 AM
Surr: Decachlorobiphenyl	72.4			60-125		%Rec	1	11/7/2014 8:47 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 6:35:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-008	**Matrix:**	Soil
Client Sample ID:	SM-14-15		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	200		2.4	3.5	17	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.89	U	0.58	0.89	1.8	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	5,500		1,000	1,400	2,900	µg/Kg-dry	1	11/4/2014 11:13 AM
Barium	150,000		420	7,100	14,000	µg/Kg-dry	1	11/4/2014 11:13 AM
Cadmium	190	J	47	71	360	µg/Kg-dry	1	11/4/2014 11:13 AM
Chromium	36,000		120	570	710	µg/Kg-dry	1	11/4/2014 11:13 AM
Copper	28,000		590	1,400	7,100	µg/Kg-dry	1	11/4/2014 11:13 AM
Iron	23,000,000		45,000	71,000	210,000	µg/Kg-dry	10	11/4/2014 12:18 PM
Lead	5,900	J	890	1,400	7,100	µg/Kg-dry	1	11/4/2014 11:13 AM
Manganese	440,000		2,600	3,600	14,000	µg/Kg-dry	10	11/4/2014 12:18 PM
Nickel	28,000		400	1,400	7,100	µg/Kg-dry	1	11/4/2014 11:13 AM
Selenium	2,100	U	1,700	2,100	2,900	µg/Kg-dry	1	11/4/2014 11:13 AM
Silver	360	U	120	360	1,400	µg/Kg-dry	1	11/4/2014 11:13 AM
Zinc	41,000		480	630	6,300	µg/Kg-dry	1	12/23/2014 2:10 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	10	J	1.4	9.9	20	µg/Kg-dry	1	11/4/2014 10:17 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	30	U	15	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Acenaphthene	30	U	13	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Acenaphthylene	30	U	13	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Anthracene	30	U	15	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Benzo(a)anthracene	30	U	20	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Benzo(a)pyrene	30	U	18	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Benzo(b)fluoranthene	30	U	16	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Benzo(g,h,i)perylene	30	U	21	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Benzo(k)fluoranthene	60	U	31	60	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Chrysene	30	U	17	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Dibenzo (a,h) anthracene	60	U	48	60	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Fluoranthene	30	U	29	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Fluorene	30	U	17	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Indeno(1,2,3-cd)pyrene	60	U	16	60	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Naphthalene	30	U	12	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Phenanthrene	30	U	16	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Pyrene	30	U	18	30	290	µg/Kg-dry	1	11/12/2014 3:27 PM
Surr: 2-Fluorobiphenyl	80.4			44-115		%Rec	1	11/12/2014 3:27 PM
Surr: Nitrobenzene-d5	76.8			37-122		%Rec	1	11/12/2014 3:27 PM
Surr: Terphenyl-d14	85.4			54-127		%Rec	1	11/12/2014 3:27 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 6:35:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-008	**Matrix:**	Soil
Client Sample ID:	SM-14-15		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	80		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	59		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	43		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	10		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	3.6		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	1.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	1.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	20		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	37		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	40		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	3.6		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	16.9					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.03						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	23		7.1	7.1	7.1	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	130		34	34	34	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	3,900		310	430	870	mg/Kg-dry	23.923 44498	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	45		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	55		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	1.7		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,500	U	1,100	2,500	3,100	mg/Kg-dry	1	11/6/2014 11:31 AM

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 6:07:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-009	**Matrix:**	Soil
Client Sample ID:	SM-14-16		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 17.999					deg min		
Longitude	-084 12.945					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.85	U	0.68	0.85	2.1	µg/Kg-dry	1	11/13/2014 7:32 AM
4,4'-DDE	0.85	U	0.40	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
4,4'-DDT	0.85	U	0.44	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Aldrin	0.85	U	0.43	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
alpha-BHC	0.85	U	0.37	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
alpha-Chlordane	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
beta-BHC	0.85	U	0.45	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Chlordane (Technical)	17	U	4.4	17	21	µg/Kg-dry	1	11/13/2014 7:32 AM
delta-BHC	0.85	U	0.37	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Dieldrin	0.85	U	0.46	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Endosulfan I	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Endosulfan II	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Endosulfan sulfate	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Endrin	0.85	U	0.48	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Endrin aldehyde	0.85	U	0.49	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Endrin ketone	0.85	U	0.46	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
gamma-BHC	0.85	U	0.38	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
gamma-Chlordane	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Heptachlor	0.85	U	0.46	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Heptachlor epoxide	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Methoxychlor	0.85	U	0.48	0.85	1.0	µg/Kg-dry	1	11/13/2014 7:32 AM
Toxaphene	17	U	6.3	17	21	µg/Kg-dry	1	11/13/2014 7:32 AM
Surr: Decachlorobiphenyl	91.5			55-130		%Rec	1	11/13/2014 7:32 AM
Surr: Tetrachloro-m-xylene	83.0			42-129		%Rec	1	11/13/2014 7:32 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.4	U	3.8	8.4	42	µg/Kg-dry	1	11/7/2014 9:12 AM
Aroclor 1221		U	3.8		42	µg/Kg-dry	1	11/7/2014 9:12 AM
Aroclor 1232		U	5.7		42	µg/Kg-dry	1	11/7/2014 9:12 AM
Aroclor 1242		U	4.7		42	µg/Kg-dry	1	11/7/2014 9:12 AM
Aroclor 1248		U	4.4		42	µg/Kg-dry	1	11/7/2014 9:12 AM
Aroclor 1254		U	5.3		42	µg/Kg-dry	1	11/7/2014 9:12 AM
Aroclor 1260	8.4	U	3.7	8.4	42	µg/Kg-dry	1	11/7/2014 9:12 AM
Aroclor 1262		U	5.0		42	µg/Kg-dry	1	11/7/2014 9:12 AM
Total PCBs		U	3.7		42	µg/Kg-dry	1	11/7/2014 9:12 AM
Surr: Tetrachloro-m-xylene	73.0			44-130		%Rec	1	11/7/2014 9:12 AM
Surr: Decachlorobiphenyl	93.0			60-125		%Rec	1	11/7/2014 9:12 AM

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 6:07:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-009	**Matrix:**	Soil
Client Sample ID:	SM-14-16		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	36		1.7	2.5	12	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.63	U	0.41	0.63	1.3	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,800		630	860	1,700	µg/Kg-dry	1	11/4/2014 11:32 AM
Barium	7,600	J	260	4,300	8,600	µg/Kg-dry	1	11/4/2014 11:32 AM
Cadmium	100	J	28	43	220	µg/Kg-dry	1	11/4/2014 11:32 AM
Chromium	3,800		71	340	430	µg/Kg-dry	1	11/4/2014 11:32 AM
Copper	3,700	J	360	860	4,300	µg/Kg-dry	1	11/4/2014 11:32 AM
Iron	3,400,000		27,000	43,000	130,000	µg/Kg-dry	10	11/4/2014 12:29 PM
Lead	1,400	J	540	860	4,300	µg/Kg-dry	1	11/4/2014 11:32 AM
Manganese	51,000		160	220	860	µg/Kg-dry	1	11/4/2014 11:32 AM
Nickel	2,800	J	240	860	4,300	µg/Kg-dry	1	11/4/2014 11:32 AM
Selenium	1,300	U	1,000	1,300	1,700	µg/Kg-dry	1	11/4/2014 11:32 AM
Silver	220	U	70	220	860	µg/Kg-dry	1	11/4/2014 11:32 AM
Zinc	5,000		280	360	3,600	µg/Kg-dry	1	12/23/2014 2:28 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	1.3	J	1.1	7.5	15	µg/Kg-dry	1	11/4/2014 10:12 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	21	U	10	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Acenaphthene	21	U	9.4	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Acenaphthylene	21	U	9.0	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Anthracene	21	U	10	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Benzo(a)anthracene	21	U	14	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Benzo(a)pyrene	21	U	13	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Benzo(b)fluoranthene	21	U	11	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Benzo(g,h,i)perylene	21	U	15	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Benzo(k)fluoranthene	42	U	22	42	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Chrysene	21	U	12	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Dibenzo (a,h) anthracene	42	U	33	42	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Fluoranthene	21	U	20	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Fluorene	21	U	12	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Indeno(1,2,3-cd)pyrene	42	U	11	42	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Naphthalene	21	U	8.2	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Phenanthrene	21	U	11	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Pyrene	21	U	13	21	200	µg/Kg-dry	1	11/12/2014 3:51 PM
Surr: 2-Fluorobiphenyl	81.2			44-115		%Rec	1	11/12/2014 3:51 PM
Surr: Nitrobenzene-d5	79.2			37-122		%Rec	1	11/12/2014 3:51 PM
Surr: Terphenyl-d14	92.5			54-127		%Rec	1	11/12/2014 3:51 PM

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 6:07:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-009	**Matrix:**	Soil
Client Sample ID:	SM-14-16		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	97		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	7.5		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	0.20		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	0.10		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	0.10		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	0.20		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	3.1		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	96		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	0.20		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	25.1					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	3.01						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	11		5.0	5.0	5.0	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	52		25	25	25	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	730		190	260	520	mg/Kg-dry	20.408 16327	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	22		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	78		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.20		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,600	U	710	1,600	1,900	mg/Kg-dry	1	11/6/2014 11:43 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 5:33:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-010	**Matrix:**	Soil
Client Sample ID:	SM-14-17		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 17.673					deg min		
Longitude	-084 12.963					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.89	U	0.72	0.89	2.2	µg/Kg-dry	1	11/13/2014 7:57 AM
4,4'-DDE	0.89	U	0.42	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
4,4'-DDT	0.89	U	0.46	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Aldrin	0.89	U	0.45	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
alpha-BHC	0.89	U	0.39	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
alpha-Chlordane	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
beta-BHC	0.89	U	0.47	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Chlordane (Technical)	18	U	4.6	18	22	µg/Kg-dry	1	11/13/2014 7:57 AM
delta-BHC	0.89	U	0.39	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Dieldrin	0.89	U	0.48	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Endosulfan I	0.89	U	0.50	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Endosulfan II	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Endosulfan sulfate	0.89	U	0.50	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Endrin	0.89	U	0.51	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Endrin aldehyde	0.89	U	0.52	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Endrin ketone	0.89	U	0.48	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
gamma-BHC	0.89	U	0.40	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
gamma-Chlordane	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Heptachlor	0.89	U	0.48	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Heptachlor epoxide	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Methoxychlor	0.89	U	0.51	0.89	1.1	µg/Kg-dry	1	11/13/2014 7:57 AM
Toxaphene	18	U	6.6	18	22	µg/Kg-dry	1	11/13/2014 7:57 AM
Surr: Decachlorobiphenyl	92.9			55-130		%Rec	1	11/13/2014 7:57 AM
Surr: Tetrachloro-m-xylene	85.7			42-129		%Rec	1	11/13/2014 7:57 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.8	U	4.0	8.8	44	µg/Kg-dry	1	11/7/2014 9:36 AM
Aroclor 1221		U	4.0		44	µg/Kg-dry	1	11/7/2014 9:36 AM
Aroclor 1232		U	5.9		44	µg/Kg-dry	1	11/7/2014 9:36 AM
Aroclor 1242		U	4.9		44	µg/Kg-dry	1	11/7/2014 9:36 AM
Aroclor 1248		U	4.6		44	µg/Kg-dry	1	11/7/2014 9:36 AM
Aroclor 1254		U	5.6		44	µg/Kg-dry	1	11/7/2014 9:36 AM
Aroclor 1260	8.8	U	3.9	8.8	44	µg/Kg-dry	1	11/7/2014 9:36 AM
Aroclor 1262		U	5.2		44	µg/Kg-dry	1	11/7/2014 9:36 AM
Total PCBs		U	3.9		44	µg/Kg-dry	1	11/7/2014 9:36 AM
Surr: Tetrachloro-m-xylene	79.6			44-130		%Rec	1	11/7/2014 9:36 AM
Surr: Decachlorobiphenyl	98.5			60-125		%Rec	1	11/7/2014 9:36 AM

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 5:33:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-010	**Matrix:**	Soil
Client Sample ID:	SM-14-17		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	40		1.8	2.6	13	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.67	U	0.44	0.67	1.3	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,600		450	620	1,200	µg/Kg-dry	1	11/4/2014 11:34 AM
Barium	24,000		180	3,100	6,200	µg/Kg-dry	1	11/4/2014 11:34 AM
Cadmium	140	J	21	31	160	µg/Kg-dry	1	11/4/2014 11:34 AM
Chromium	11,000		51	250	310	µg/Kg-dry	1	11/4/2014 11:34 AM
Copper	6,700		260	620	3,100	µg/Kg-dry	1	11/4/2014 11:34 AM
Iron	7,500,000		19,000	31,000	93,000	µg/Kg-dry	10	11/4/2014 12:30 PM
Lead	3,300		390	620	3,100	µg/Kg-dry	1	11/4/2014 11:34 AM
Manganese	100,000		110	160	620	µg/Kg-dry	1	11/4/2014 11:34 AM
Nickel	7,200		180	620	3,100	µg/Kg-dry	1	11/4/2014 11:34 AM
Selenium	930	U	720	930	1,200	µg/Kg-dry	1	11/4/2014 11:34 AM
Silver	160	U	51	160	620	µg/Kg-dry	1	11/4/2014 11:34 AM
Zinc	12,000		310	400	4,000	µg/Kg-dry	1	12/23/2014 2:30 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	4.0	J	0.88	6.2	12	µg/Kg-dry	1	11/4/2014 10:22 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Acenaphthene	22	U	9.7	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Acenaphthylene	22	U	9.3	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Benzo(a)anthracene	22	U	14	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Benzo(a)pyrene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Benzo(g,h,i)perylene	22	U	15	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Benzo(k)fluoranthene	44	U	23	44	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Chrysene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Dibenzo (a,h) anthracene	44	U	35	44	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Fluoranthene	22	U	21	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Fluorene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Indeno(1,2,3-cd)pyrene	44	U	11	44	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Naphthalene	22	U	8.5	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Phenanthrene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Pyrene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 4:15 PM
Surr: 2-Fluorobiphenyl	84.3			44-115		%Rec	1	11/12/2014 4:15 PM
Surr: Nitrobenzene-d5	78.7			37-122		%Rec	1	11/12/2014 4:15 PM
Surr: Terphenyl-d14	96.3			54-127		%Rec	1	11/12/2014 4:15 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 5:33:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-010	**Matrix:**	Soil
Client Sample ID:	SM-14-17		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	94		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	90		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	41		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	8.3		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	4.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	4.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	1.6		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	8.5		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	82		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	8.3		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	20.5					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.47						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	18		5.2	5.2	5.2	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	76		26	26	26	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,600		200	280	560	mg/Kg-dry	21.008 40336	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	25		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	75		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.50		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,600	U	710	1,600	1,900	mg/Kg-dry	1	11/6/2014 11:53 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 5:05:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-011	**Matrix:**	Soil
Client Sample ID:	SM-14-18		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 17.329					deg min		
Longitude	-084 12.799					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.90	U	0.73	0.90	2.3	µg/Kg-dry	1	11/13/2014 9:12 AM
4,4'-DDE	0.90	U	0.43	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
4,4'-DDT	0.90	U	0.47	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Aldrin	0.90	U	0.45	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
alpha-BHC	0.90	U	0.39	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
alpha-Chlordane	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
beta-BHC	0.90	U	0.48	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Chlordane (Technical)	18	U	4.7	18	22	µg/Kg-dry	1	11/13/2014 9:12 AM
delta-BHC	0.90	U	0.39	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Dieldrin	0.90	U	0.49	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Endosulfan I	0.90	U	0.51	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Endosulfan II	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Endosulfan sulfate	0.90	U	0.51	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Endrin	0.90	U	0.52	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Endrin aldehyde	0.90	U	0.53	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Endrin ketone	0.90	U	0.49	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
gamma-BHC	0.90	U	0.41	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
gamma-Chlordane	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Heptachlor	0.90	U	0.49	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Heptachlor epoxide	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Methoxychlor	0.90	U	0.52	0.90	1.1	µg/Kg-dry	1	11/13/2014 9:12 AM
Toxaphene	18	U	6.7	18	22	µg/Kg-dry	1	11/13/2014 9:12 AM
Surr: Decachlorobiphenyl	88.7			55-130		%Rec	1	11/13/2014 9:12 AM
Surr: Tetrachloro-m-xylene	76.3			42-129		%Rec	1	11/13/2014 9:12 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	9.0	U	4.0	9.0	44	µg/Kg-dry	1	11/7/2014 11:44 AM
Aroclor 1221		U	4.0		44	µg/Kg-dry	1	11/7/2014 11:44 AM
Aroclor 1232		U	6.0		44	µg/Kg-dry	1	11/7/2014 11:44 AM
Aroclor 1242		U	5.0		44	µg/Kg-dry	1	11/7/2014 11:44 AM
Aroclor 1248		U	4.7		44	µg/Kg-dry	1	11/7/2014 11:44 AM
Aroclor 1254		U	5.7		44	µg/Kg-dry	1	11/7/2014 11:44 AM
Aroclor 1260	9.0	U	3.9	9.0	44	µg/Kg-dry	1	11/7/2014 11:44 AM
Aroclor 1262		U	5.3		44	µg/Kg-dry	1	11/7/2014 11:44 AM
Total PCBs		U	3.9		44	µg/Kg-dry	1	11/7/2014 11:44 AM
Surr: Tetrachloro-m-xylene	71.6			44-130		%Rec	1	11/7/2014 11:44 AM
Surr: Decachlorobiphenyl	92.3			60-125		%Rec	1	11/7/2014 11:44 AM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 5:05:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-011	**Matrix:**	Soil
Client Sample ID:	SM-14-18		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	64		1.9	2.7	13	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.68	U	0.44	0.68	1.4	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,600		520	710	1,400	µg/Kg-dry	1	11/4/2014 11:41 AM
Barium	17,000		210	3,600	7,100	µg/Kg-dry	1	11/4/2014 11:41 AM
Cadmium	150	J	23	36	180	µg/Kg-dry	1	11/4/2014 11:41 AM
Chromium	9,200		59	280	360	µg/Kg-dry	1	11/4/2014 11:41 AM
Copper	7,100		300	710	3,600	µg/Kg-dry	1	11/4/2014 11:41 AM
Iron	6,600,000		22,000	36,000	110,000	µg/Kg-dry	10	11/4/2014 12:37 PM
Lead	2,400	J	440	710	3,600	µg/Kg-dry	1	11/4/2014 11:41 AM
Manganese	93,000		130	180	710	µg/Kg-dry	1	11/4/2014 11:41 AM
Nickel	5,900		200	710	3,600	µg/Kg-dry	1	11/4/2014 11:41 AM
Selenium	1,100	U	830	1,100	1,400	µg/Kg-dry	1	11/4/2014 11:41 AM
Silver	180	U	58	180	710	µg/Kg-dry	1	11/4/2014 11:41 AM
Zinc	10,000		330	430	4,300	µg/Kg-dry	1	12/23/2014 2:36 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	5.4	J	1.1	7.6	15	µg/Kg-dry	1	11/4/2014 10:24 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Acenaphthene	22	U	9.9	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Acenaphthylene	22	U	9.5	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Benzo(a)anthracene	22	U	15	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Benzo(a)pyrene	22	U	14	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Benzo(g,h,i)perylene	22	U	16	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Benzo(k)fluoranthene	45	U	23	45	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Chrysene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Dibenzo (a,h) anthracene	45	U	35	45	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Fluoranthene	22	U	21	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Fluorene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Indeno(1,2,3-cd)pyrene	45	U	12	45	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Naphthalene	22	U	8.7	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Phenanthrene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Pyrene	22	U	14	22	210	µg/Kg-dry	1	11/12/2014 4:40 PM
Surr: 2-Fluorobiphenyl	81.3			44-115		%Rec	1	11/12/2014 4:40 PM
Surr: Nitrobenzene-d5	77.2			37-122		%Rec	1	11/12/2014 4:40 PM
Surr: Terphenyl-d14	96.4			54-127		%Rec	1	11/12/2014 4:40 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 5:05:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-011	**Matrix:**	Soil
Client Sample ID:	SM-14-18		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	99		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	95		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	92		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	50		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	12		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	6.1		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	6.1		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	1.3		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	7.0		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	80		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	12		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	21.3					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.56						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	25		5.2	5.2	5.2	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	180		26	26	26	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	2,300		220	310	620	mg/Kg-dry	22.831 05023	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	26		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	74		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.82		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,600		900	2,000	2,500	mg/Kg-dry	1	11/6/2014 12:11 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 12:58:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-012	**Matrix:**	Soil
Client Sample ID:	SM-14-19		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 26.918					deg min		
Longitude	-084 16.366					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	160	U	160	160	160	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	1.1	U	0.86	1.1	2.7	µg/Kg-dry	1	11/13/2014 10:59 AM
4,4'-DDE	1.1	U	0.50	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
4,4'-DDT	1.1	U	0.56	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Aldrin	1.1	U	0.54	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
alpha-BHC	1.1	U	0.47	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
alpha-Chlordane	1.1	U	0.59	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
beta-BHC	1.1	U	0.57	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Chlordane (Technical)	21	U	5.5	21	27	µg/Kg-dry	1	11/13/2014 10:59 AM
delta-BHC	1.1	U	0.47	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Dieldrin	1.1	U	0.57	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Endosulfan I	1.1	U	0.60	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Endosulfan II	1.1	U	0.59	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Endosulfan sulfate	1.1	U	0.60	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Endrin	1.1	U	0.61	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Endrin aldehyde	1.1	U	0.62	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Endrin ketone	1.1	U	0.58	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
gamma-BHC	1.1	U	0.48	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
gamma-Chlordane	1.1	U	0.59	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Heptachlor	1.1	U	0.58	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Heptachlor epoxide	1.1	U	0.59	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Methoxychlor	1.1	U	0.61	1.1	1.3	µg/Kg-dry	1	11/13/2014 10:59 AM
Toxaphene	21	U	8.0	21	27	µg/Kg-dry	1	11/13/2014 10:59 AM
Surr: Decachlorobiphenyl	90.7			55-130		%Rec	1	11/13/2014 10:59 AM
Surr: Tetrachloro-m-xylene	84.4			42-129		%Rec	1	11/13/2014 10:59 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	11	U	4.8	11	52	µg/Kg-dry	1	11/7/2014 12:08 PM
Aroclor 1221		U	4.8		52	µg/Kg-dry	1	11/7/2014 12:08 PM
Aroclor 1232		U	7.1		52	µg/Kg-dry	1	11/7/2014 12:08 PM
Aroclor 1242		U	5.9		52	µg/Kg-dry	1	11/7/2014 12:08 PM
Aroclor 1248		U	5.6		52	µg/Kg-dry	1	11/7/2014 12:08 PM
Aroclor 1254		U	6.7		52	µg/Kg-dry	1	11/7/2014 12:08 PM
Aroclor 1260	11	U	4.6	11	52	µg/Kg-dry	1	11/7/2014 12:08 PM
Aroclor 1262		U	6.3		52	µg/Kg-dry	1	11/7/2014 12:08 PM
Total PCBs		U	4.6		52	µg/Kg-dry	1	11/7/2014 12:08 PM
Surr: Tetrachloro-m-xylene	82.1			44-130		%Rec	1	11/7/2014 12:08 PM
Surr: Decachlorobiphenyl	114			60-125		%Rec	1	11/7/2014 12:08 PM

Client: USACE- Detroit District
Project: St Marys Sampling
Lab ID: 1410A92-012
Client Sample ID: SM-14-19

Collection Date: 10/21/2014 12:58:00 PM
Matrix: Soil

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	140		2.1	3.1	15	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.79	U	0.52	0.79	1.6	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	5,400		780	1,100	2,100	µg/Kg-dry	1	11/4/2014 11:42 AM
Barium	220,000		320	5,300	11,000	µg/Kg-dry	1	11/4/2014 11:42 AM
Cadmium	330		35	53	270	µg/Kg-dry	1	11/4/2014 11:42 AM
Chromium	73,000		88	430	530	µg/Kg-dry	1	11/4/2014 11:42 AM
Copper	46,000		440	1,100	5,300	µg/Kg-dry	1	11/4/2014 11:42 AM
Iron	41,000,000		330,000	530,000	1,600,000	µg/Kg-dry	100	11/4/2014 12:57 PM
Lead	9,500		670	1,100	5,300	µg/Kg-dry	1	11/4/2014 11:42 AM
Manganese	740,000		2,000	2,700	11,000	µg/Kg-dry	10	11/4/2014 12:39 PM
Nickel	57,000		300	1,100	5,300	µg/Kg-dry	1	11/4/2014 11:42 AM
Selenium	1,600	U	1,200	1,600	2,100	µg/Kg-dry	1	11/4/2014 11:42 AM
Silver	270	U	87	270	1,100	µg/Kg-dry	1	11/4/2014 11:42 AM
Zinc	82,000		420	540	5,400	µg/Kg-dry	1	12/23/2014 2:37 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	26		1.3	9.4	19	µg/Kg-dry	1	11/4/2014 10:25 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	27	U	13	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Acenaphthene	27	U	12	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Acenaphthylene	27	U	11	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Anthracene	27	U	13	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Benzo(a)anthracene	27	U	17	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Benzo(a)pyrene	27	U	16	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Benzo(b)fluoranthene	27	U	14	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Benzo(g,h,i)perylene	27	U	19	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Benzo(k)fluoranthene	53	U	28	53	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Chrysene	27	U	15	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Dibenzo (a,h) anthracene	53	U	42	53	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Fluoranthene	27	U	25	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Fluorene	27	U	15	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Indeno(1,2,3-cd)pyrene	53	U	14	53	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Naphthalene	27	U	10	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Phenanthrene	27	U	14	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Pyrene	27	U	16	27	250	µg/Kg-dry	1	11/12/2014 5:04 PM
Surr: 2-Fluorobiphenyl	80.6			44-115		%Rec	1	11/12/2014 5:04 PM
Surr: Nitrobenzene-d5	76.0			37-122		%Rec	1	11/12/2014 5:04 PM
Surr: Terphenyl-d14	95.5			54-127		%Rec	1	11/12/2014 5:04 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 12:58:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-012	**Matrix:**	Soil
Client Sample ID:	SM-14-19		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	94		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	54		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	29		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	17		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	7.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	3.0		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	1.7		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	1.7		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	6.5		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	39		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	37		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	14		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	3.0		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	17.9					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.15						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	31		6.4	6.4	6.4	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	290		29	29	29	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	6,200		260	360	710	mg/Kg-dry	22.222 22222	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	38		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	62		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	2.0		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,800	J	1,200	2,600	3,200	mg/Kg-dry	1	11/6/2014 12:41 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District
Project: St Marys Sampling
Lab ID: 1410A92-013
Client Sample ID: SM-14-20

Collection Date: 10/21/2014 12:27:00 PM
Matrix: Soil

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 20.805					deg min		
Longitude	-084 16.271					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.90	U	0.73	0.90	2.3	µg/Kg-dry	1	11/13/2014 11:24 AM
4,4'-DDE	0.90	U	0.42	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
4,4'-DDT	0.90	U	0.47	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Aldrin	0.90	U	0.45	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
alpha-BHC	0.90	U	0.39	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
alpha-Chlordane	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
beta-BHC	0.90	U	0.48	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Chlordane (Technical)	18	U	4.7	18	22	µg/Kg-dry	1	11/13/2014 11:24 AM
delta-BHC	0.90	U	0.39	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Dieldrin	0.90	U	0.48	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Endosulfan I	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Endosulfan II	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Endosulfan sulfate	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Endrin	0.90	U	0.51	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Endrin aldehyde	0.90	U	0.52	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Endrin ketone	0.90	U	0.49	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
gamma-BHC	0.90	U	0.41	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
gamma-Chlordane	0.90	U	0.50	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Heptachlor	0.90	U	0.49	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Heptachlor epoxide	0.90	U	0.49	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Methoxychlor	0.90	U	0.51	0.90	1.1	µg/Kg-dry	1	11/13/2014 11:24 AM
Toxaphene	18	U	6.7	18	22	µg/Kg-dry	1	11/13/2014 11:24 AM
Surr: Decachlorobiphenyl	87.9			55-130		%Rec	1	11/13/2014 11:24 AM
Surr: Tetrachloro-m-xylene	78.5			42-129		%Rec	1	11/13/2014 11:24 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.9	U	4.0	8.9	44	µg/Kg-dry	1	11/7/2014 12:32 PM
Aroclor 1221		U	4.0		44	µg/Kg-dry	1	11/7/2014 12:32 PM
Aroclor 1232		U	6.0		44	µg/Kg-dry	1	11/7/2014 12:32 PM
Aroclor 1242		U	5.0		44	µg/Kg-dry	1	11/7/2014 12:32 PM
Aroclor 1248		U	4.7		44	µg/Kg-dry	1	11/7/2014 12:32 PM
Aroclor 1254		U	5.7		44	µg/Kg-dry	1	11/7/2014 12:32 PM
Aroclor 1260	8.9	U	3.9	8.9	44	µg/Kg-dry	1	11/7/2014 12:32 PM
Aroclor 1262		U	5.3		44	µg/Kg-dry	1	11/7/2014 12:32 PM
Total PCBs		U	3.9		44	µg/Kg-dry	1	11/7/2014 12:32 PM
Surr: Tetrachloro-m-xylene	78.3			44-130		%Rec	1	11/7/2014 12:32 PM
Surr: Decachlorobiphenyl	102			60-125		%Rec	1	11/7/2014 12:32 PM

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 12:27:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-013	**Matrix:**	Soil
Client Sample ID:	SM-14-20		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	120		1.9	2.7	13	mg/Kg-dry	20	11/18/2014 9:02 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.67	U	0.44	0.67	1.3	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	2,800		650	900	1,800	µg/Kg-dry	1	11/4/2014 11:44 AM
Barium	86,000		270	4,500	9,000	µg/Kg-dry	1	11/4/2014 11:44 AM
Cadmium	220	J	30	45	220	µg/Kg-dry	1	11/4/2014 11:44 AM
Chromium	32,000		74	360	450	µg/Kg-dry	1	11/4/2014 11:44 AM
Copper	19,000		370	900	4,500	µg/Kg-dry	1	11/4/2014 11:44 AM
Iron	20,000,000		28,000	45,000	130,000	µg/Kg-dry	10	11/4/2014 12:40 PM
Lead	4,200	J	560	900	4,500	µg/Kg-dry	1	11/4/2014 11:44 AM
Manganese	440,000		1,700	2,200	9,000	µg/Kg-dry	10	11/4/2014 12:40 PM
Nickel	25,000		250	900	4,500	µg/Kg-dry	1	11/4/2014 11:44 AM
Selenium	1,300	U	1,000	1,300	1,800	µg/Kg-dry	1	11/4/2014 11:44 AM
Silver	220	U	73	220	900	µg/Kg-dry	1	11/4/2014 11:44 AM
Zinc	30,000		300	390	3,900	µg/Kg-dry	1	12/23/2014 2:38 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	12	J	1.0	7.1	14	µg/Kg-dry	1	11/4/2014 10:27 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Acenaphthene	22	U	9.9	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Acenaphthylene	22	U	9.5	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Benzo(a)anthracene	22	U	15	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Benzo(a)pyrene	22	U	14	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Benzo(g,h,i)perylene	22	U	16	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Benzo(k)fluoranthene	45	U	23	45	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Chrysene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Dibenzo (a,h) anthracene	45	U	35	45	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Fluoranthene	22	U	22	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Fluorene	22	U	13	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Indeno(1,2,3-cd)pyrene	45	U	12	45	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Naphthalene	22	U	8.7	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Phenanthrene	22	U	12	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Pyrene	22	U	14	22	210	µg/Kg-dry	1	11/12/2014 5:28 PM
Surr: 2-Fluorobiphenyl	77.7			44-115		%Rec	1	11/12/2014 5:28 PM
Surr: Nitrobenzene-d5	72.6			37-122		%Rec	1	11/12/2014 5:28 PM
Surr: Terphenyl-d14	86.4			54-127		%Rec	1	11/12/2014 5:28 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 12:27:00 PM
Project:	St Marys Sampling		
Lab ID:	1410A92-013	**Matrix:**	Soil
Client Sample ID:	SM-14-20		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	74		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	45		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	29		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	14		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	7.5		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	1.6		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	1.6		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	1.8		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	24		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	45		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	21		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	7.5		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	18.4					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.21						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	20		5.3	5.3	5.3	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	180		27	27	27	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	3,400		200	280	550	mg/Kg-dry	20.080 32129	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	27		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	73		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	1.5		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,600	U	1,200	2,600	3,300	mg/Kg-dry	1	11/6/2014 12:53 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 11:58:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-014	**Matrix:**	Soil
Client Sample ID:	SM-14-21		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 26.520					deg min		
Longitude	-084 15.976					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	150	U	150	150	150	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.98	U	0.79	0.98	2.5	µg/Kg-dry	1	11/13/2014 11:49 AM
4,4'-DDE	0.98	U	0.46	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
4,4'-DDT	0.98	U	0.51	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Aldrin	0.98	U	0.49	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
alpha-BHC	0.98	U	0.43	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
alpha-Chlordane	0.98	U	0.54	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
beta-BHC	0.98	U	0.52	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Chlordane (Technical)	19	U	5.1	19	24	µg/Kg-dry	1	11/13/2014 11:49 AM
delta-BHC	0.98	U	0.43	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Dieldrin	0.98	U	0.53	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Endosulfan I	0.98	U	0.55	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Endosulfan II	0.98	U	0.54	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Endosulfan sulfate	0.98	U	0.55	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Endrin	0.98	U	0.56	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Endrin aldehyde	0.98	U	0.57	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Endrin ketone	0.98	U	0.53	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
gamma-BHC	0.98	U	0.44	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
gamma-Chlordane	0.98	U	0.54	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Heptachlor	0.98	U	0.53	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Heptachlor epoxide	0.98	U	0.54	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Methoxychlor	0.98	U	0.56	0.98	1.2	µg/Kg-dry	1	11/13/2014 11:49 AM
Toxaphene	19	U	7.3	19	24	µg/Kg-dry	1	11/13/2014 11:49 AM
Surr: Decachlorobiphenyl	94.5			55-130		%Rec	1	11/13/2014 11:49 AM
Surr: Tetrachloro-m-xylene	87.7			42-129		%Rec	1	11/13/2014 11:49 AM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	9.7	U	4.4	9.7	48	µg/Kg-dry	1	11/7/2014 12:57 PM
Aroclor 1221		U	4.4		48	µg/Kg-dry	1	11/7/2014 12:57 PM
Aroclor 1232		U	6.5		48	µg/Kg-dry	1	11/7/2014 12:57 PM
Aroclor 1242		U	5.4		48	µg/Kg-dry	1	11/7/2014 12:57 PM
Aroclor 1248		U	5.1		48	µg/Kg-dry	1	11/7/2014 12:57 PM
Aroclor 1254		U	6.2		48	µg/Kg-dry	1	11/7/2014 12:57 PM
Aroclor 1260	9.7	U	4.3	9.7	48	µg/Kg-dry	1	11/7/2014 12:57 PM
Aroclor 1262		U	5.8		48	µg/Kg-dry	1	11/7/2014 12:57 PM
Total PCBs		U	4.3		48	µg/Kg-dry	1	11/7/2014 12:57 PM
Surr: Tetrachloro-m-xylene	87.5			44-130		%Rec	1	11/7/2014 12:57 PM
Surr: Decachlorobiphenyl	113			60-125		%Rec	1	11/7/2014 12:57 PM

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 11:58:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-014	**Matrix:**	Soil
Client Sample ID:	SM-14-21		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	110		2.0	2.9	15	mg/Kg-dry	20	11/18/2014 9:03 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.75	U	0.49	0.75	1.5	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	4,300		790	1,100	2,200	µg/Kg-dry	1	11/4/2014 11:45 AM
Barium	170,000		320	5,500	11,000	µg/Kg-dry	1	11/4/2014 11:45 AM
Cadmium	290		36	55	270	µg/Kg-dry	1	11/4/2014 11:45 AM
Chromium	54,000		90	440	550	µg/Kg-dry	1	11/4/2014 11:45 AM
Copper	34,000		450	1,100	5,500	µg/Kg-dry	1	11/4/2014 11:45 AM
Iron	30,000,000		340,000	550,000	1,600,000	µg/Kg-dry	100	11/4/2014 12:58 PM
Lead	7,500		680	1,100	5,500	µg/Kg-dry	1	11/4/2014 11:45 AM
Manganese	560,000		2,000	2,700	11,000	µg/Kg-dry	10	11/4/2014 12:41 PM
Nickel	40,000		310	1,100	5,500	µg/Kg-dry	1	11/4/2014 11:45 AM
Selenium	1,600	U	1,300	1,600	2,200	µg/Kg-dry	1	11/4/2014 11:45 AM
Silver	270	U	89	270	1,100	µg/Kg-dry	1	11/4/2014 11:45 AM
Zinc	68,000		550	710	7,100	µg/Kg-dry	1	12/23/2014 2:40 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	16	J	1.3	9.6	19	µg/Kg-dry	1	11/4/2014 10:29 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	25	U	12	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Acenaphthene	25	U	11	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Acenaphthylene	25	U	11	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Anthracene	25	U	12	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Benzo(a)anthracene	25	U	16	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Benzo(a)pyrene	25	U	15	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Benzo(b)fluoranthene	25	U	14	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Benzo(g,h,i)perylene	25	U	18	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Benzo(k)fluoranthene	50	U	26	50	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Chrysene	25	U	14	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Dibenzo (a,h) anthracene	50	U	39	50	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Fluoranthene	25	U	24	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Fluorene	25	U	14	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Indeno(1,2,3-cd)pyrene	50	U	13	50	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Naphthalene	25	U	9.7	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Phenanthrene	25	U	13	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Pyrene	25	U	15	25	240	µg/Kg-dry	1	11/12/2014 5:52 PM
Surr: 2-Fluorobiphenyl	72.6			44-115		%Rec	1	11/12/2014 5:52 PM
Surr: Nitrobenzene-d5	69.4			37-122		%Rec	1	11/12/2014 5:52 PM
Surr: Terphenyl-d14	81.4			54-127		%Rec	1	11/12/2014 5:52 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 11:58:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-014	**Matrix:**	Soil
Client Sample ID:	SM-14-21		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	76		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	54		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	36		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	11		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	4.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	2.0		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	2.0		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	2.0		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	22		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	40		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	32		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	4.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	17.1					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.05						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	19		5.8	5.8	5.8	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	150		29	29	29	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	4,300		240	330	660	mg/Kg-dry	21.929 82456	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	33		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	67		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	1.1		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,300	U	1,100	2,300	2,900	mg/Kg-dry	1	11/6/2014 1:03 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 11:12:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-015	**Matrix:**	Soil
Client Sample ID:	SM-14-22		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 26.786					deg min		
Longitude	-084 15.914					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	170	U	170	170	170	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	1.2	U	0.93	1.2	2.9	µg/Kg-dry	1	11/13/2014 12:16 PM
4,4'-DDE	1.2	U	0.54	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
4,4'-DDT	1.2	U	0.60	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Aldrin	1.2	U	0.58	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
alpha-BHC	1.2	U	0.50	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
alpha-Chlordane	1.2	U	0.64	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
beta-BHC	1.2	U	0.61	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Chlordane (Technical)	23	U	6.0	23	29	µg/Kg-dry	1	11/13/2014 12:16 PM
delta-BHC	1.2	U	0.50	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Dieldrin	1.2	U	0.62	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Endosulfan I	1.2	U	0.65	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Endosulfan II	1.2	U	0.64	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Endosulfan sulfate	1.2	U	0.65	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Endrin	1.2	U	0.66	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Endrin aldehyde	1.2	U	0.67	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Endrin ketone	1.2	U	0.63	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
gamma-BHC	1.2	U	0.52	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
gamma-Chlordane	1.2	U	0.64	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Heptachlor	1.2	U	0.63	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Heptachlor epoxide	1.2	U	0.64	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Methoxychlor	1.2	U	0.66	1.2	1.4	µg/Kg-dry	1	11/13/2014 12:16 PM
Toxaphene	23	U	8.6	23	29	µg/Kg-dry	1	11/13/2014 12:16 PM
Surr: Decachlorobiphenyl	90.5			55-130		%Rec	1	11/13/2014 12:16 PM
Surr: Tetrachloro-m-xylene	84.4			42-129		%Rec	1	11/13/2014 12:16 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	11	U	5.2	11	57	µg/Kg-dry	1	11/7/2014 1:21 PM
Aroclor 1221		U	5.1		57	µg/Kg-dry	1	11/7/2014 1:21 PM
Aroclor 1232		U	7.7		57	µg/Kg-dry	1	11/7/2014 1:21 PM
Aroclor 1242		U	6.4		57	µg/Kg-dry	1	11/7/2014 1:21 PM
Aroclor 1248		U	6.0		57	µg/Kg-dry	1	11/7/2014 1:21 PM
Aroclor 1254		U	7.3		57	µg/Kg-dry	1	11/7/2014 1:21 PM
Aroclor 1260	11	U	5.0	11	57	µg/Kg-dry	1	11/7/2014 1:21 PM
Aroclor 1262		U	6.8		57	µg/Kg-dry	1	11/7/2014 1:21 PM
Total PCBs		U	5.0		57	µg/Kg-dry	1	11/7/2014 1:21 PM
Surr: Tetrachloro-m-xylene	80.6			44-130		%Rec	1	11/7/2014 1:21 PM
Surr: Decachlorobiphenyl	106			60-125		%Rec	1	11/7/2014 1:21 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 11:12:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-015	**Matrix:**	Soil
Client Sample ID:	SM-14-22		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	170		2.4	3.5	17	mg/Kg-dry	20	11/18/2014 9:03 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	1.0	J	0.56	0.86	1.7	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	6,500		860	1,200	2,400	µg/Kg-dry	1	11/4/2014 11:46 AM
Barium	270,000		350	5,900	12,000	µg/Kg-dry	1	11/4/2014 11:46 AM
Cadmium	410		39	59	300	µg/Kg-dry	1	11/4/2014 11:46 AM
Chromium	78,000		98	480	590	µg/Kg-dry	1	11/4/2014 11:46 AM
Copper	49,000		490	1,200	5,900	µg/Kg-dry	1	11/4/2014 11:46 AM
Iron	41,000,000		370,000	590,000	1,800,000	µg/Kg-dry	100	11/4/2014 1:00 PM
Lead	10,000		740	1,200	5,900	µg/Kg-dry	1	11/4/2014 11:46 AM
Manganese	740,000		2,200	3,000	12,000	µg/Kg-dry	10	11/4/2014 12:43 PM
Nickel	60,000		340	1,200	5,900	µg/Kg-dry	1	11/4/2014 11:46 AM
Selenium	1,800	U	1,400	1,800	2,400	µg/Kg-dry	1	11/4/2014 11:46 AM
Silver	300	U	97	300	1,200	µg/Kg-dry	1	11/4/2014 11:46 AM
Zinc	81,000		430	560	5,600	µg/Kg-dry	1	12/23/2014 2:41 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	22		1.4	9.9	20	µg/Kg-dry	1	11/4/2014 10:30 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	29	U	14	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Acenaphthene	29	U	13	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Acenaphthylene	29	U	12	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Anthracene	29	U	14	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Benzo(a)anthracene	29	U	19	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Benzo(a)pyrene	29	U	18	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Benzo(b)fluoranthene	29	U	16	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Benzo(g,h,i)perylene	29	U	21	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Benzo(k)fluoranthene	58	U	30	58	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Chrysene	29	U	16	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Dibenzo (a,h) anthracene	58	U	46	58	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Fluoranthene	29	U	28	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Fluorene	29	U	16	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Indeno(1,2,3-cd)pyrene	58	U	15	58	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Naphthalene	29	U	11	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Phenanthrene	29	U	15	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Pyrene	29	U	18	29	280	µg/Kg-dry	1	11/12/2014 6:16 PM
Surr: 2-Fluorobiphenyl	85.2			44-115		%Rec	1	11/12/2014 6:16 PM
Surr: Nitrobenzene-d5	82.8			37-122		%Rec	1	11/12/2014 6:16 PM
Surr: Terphenyl-d14	94.1			54-127		%Rec	1	11/12/2014 6:16 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 11:12:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-015	**Matrix:**	Soil
Client Sample ID:	SM-14-22		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	95		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	59		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	31		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	18		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	6.9		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	2.8		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	1.4		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	1.4		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	4.7		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	37		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	40		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	15		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	2.8		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	16.6					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	2.00						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	31		6.8	6.8	6.8	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	180		33	33	33	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	5,000		310	430	870	mg/Kg-dry	24.875 62189	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	43		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	57		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	2.1		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,400	U	1,100	2,400	3,000	mg/Kg-dry	1	11/6/2014 1:13 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 10:40:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-016	**Matrix:**	Soil
Client Sample ID:	SM-14-23		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 25.151					deg min		
Longitude	-084 15.385					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.86	U	0.70	0.86	2.2	µg/Kg-dry	1	11/13/2014 12:42 PM
4,4'-DDE	0.86	U	0.41	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
4,4'-DDT	0.86	U	0.45	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Aldrin	0.86	U	0.43	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
alpha-BHC	0.86	U	0.38	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
alpha-Chlordane	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
beta-BHC	0.86	U	0.46	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Chlordane (Technical)	17	U	4.5	17	22	µg/Kg-dry	1	11/13/2014 12:42 PM
delta-BHC	0.86	U	0.38	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Dieldrin	0.86	U	0.46	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Endosulfan I	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Endosulfan II	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Endosulfan sulfate	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Endrin	0.86	U	0.49	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Endrin aldehyde	0.86	U	0.50	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Endrin ketone	0.86	U	0.47	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
gamma-BHC	0.86	U	0.39	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
gamma-Chlordane	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Heptachlor	0.86	U	0.47	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Heptachlor epoxide	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Methoxychlor	0.86	U	0.49	0.86	1.1	µg/Kg-dry	1	11/13/2014 12:42 PM
Toxaphene	17	U	6.5	17	22	µg/Kg-dry	1	11/13/2014 12:42 PM
Surr: Decachlorobiphenyl	82.2			55-130		%Rec	1	11/13/2014 12:42 PM
Surr: Tetrachloro-m-xylene	74.8			42-129		%Rec	1	11/13/2014 12:42 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.6	U	3.9	8.6	43	µg/Kg-dry	1	11/7/2014 1:45 PM
Aroclor 1221		U	3.9		43	µg/Kg-dry	1	11/7/2014 1:45 PM
Aroclor 1232		U	5.8		43	µg/Kg-dry	1	11/7/2014 1:45 PM
Aroclor 1242		U	4.8		43	µg/Kg-dry	1	11/7/2014 1:45 PM
Aroclor 1248		U	4.5		43	µg/Kg-dry	1	11/7/2014 1:45 PM
Aroclor 1254		U	5.4		43	µg/Kg-dry	1	11/7/2014 1:45 PM
Aroclor 1260	8.6	U	3.8	8.6	43	µg/Kg-dry	1	11/7/2014 1:45 PM
Aroclor 1262		U	5.1		43	µg/Kg-dry	1	11/7/2014 1:45 PM
Total PCBs		U	3.8		43	µg/Kg-dry	1	11/7/2014 1:45 PM
Surr: Tetrachloro-m-xylene	75.7			44-130		%Rec	1	11/7/2014 1:45 PM
Surr: Decachlorobiphenyl	94.3			60-125		%Rec	1	11/7/2014 1:45 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 10:40:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-016	**Matrix:**	Soil
Client Sample ID:	SM-14-23		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	20		1.9	2.7	13	mg/Kg-dry	20	11/18/2014 9:03 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.65	U	0.43	0.65	1.3	mg/Kg-dry	1	11/4/2014 2:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,400	J	590	810	1,600	µg/Kg-dry	1	11/4/2014 11:48 AM
Barium	21,000		240	4,000	8,100	µg/Kg-dry	1	11/4/2014 11:48 AM
Cadmium	160	J	27	40	200	µg/Kg-dry	1	11/4/2014 11:48 AM
Chromium	12,000		67	320	400	µg/Kg-dry	1	11/4/2014 11:48 AM
Copper	8,700		340	810	4,000	µg/Kg-dry	1	11/4/2014 11:48 AM
Iron	9,200,000		25,000	40,000	120,000	µg/Kg-dry	10	11/4/2014 12:44 PM
Lead	5,400		500	810	4,000	µg/Kg-dry	1	11/4/2014 11:48 AM
Manganese	110,000		150	200	810	µg/Kg-dry	1	11/4/2014 11:48 AM
Nickel	6,700		230	810	4,000	µg/Kg-dry	1	11/4/2014 11:48 AM
Selenium	1,200	U	940	1,200	1,600	µg/Kg-dry	1	11/4/2014 11:48 AM
Silver	200	U	66	200	810	µg/Kg-dry	1	11/4/2014 11:48 AM
Zinc	20,000		300	390	3,900	µg/Kg-dry	1	12/23/2014 2:43 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	21		1.2	8.6	17	µg/Kg-dry	1	11/4/2014 10:32 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	13	J	11	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Acenaphthene	21	U	9.5	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Acenaphthylene	21	U	9.2	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Anthracene	16	J	10	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Benzo(a)anthracene	52	J	14	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Benzo(a)pyrene	46	J	13	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Benzo(b)fluoranthene	57	Jm	12	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Benzo(g,h,i)perylene	35	J	15	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Benzo(k)fluoranthene	28	Jm	22	43	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Chrysene	55	J	12	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Dibenzo (a,h) anthracene	43	U	34	43	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Fluoranthene	96	J	21	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Fluorene	21	U	12	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Indeno(1,2,3-cd)pyrene	28	J	11	43	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Naphthalene	65	J	8.3	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Phenanthrene	61	J	11	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Pyrene	78	J	13	21	210	µg/Kg-dry	1	11/12/2014 6:41 PM
Surr: 2-Fluorobiphenyl	96.2			44-115		%Rec	1	11/12/2014 6:41 PM
Surr: Nitrobenzene-d5	93.0			37-122		%Rec	1	11/12/2014 6:41 PM
Surr: Terphenyl-d14	97.8			54-127		%Rec	1	11/12/2014 6:41 PM

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 10:40:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-016	**Matrix:**	Soil
Client Sample ID:	SM-14-23		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	90		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	84		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	29		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	6.5		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	3.6		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	3.6		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	2.1		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	14		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	78		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	6.5		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	34.1					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	4.09						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	15		5.1	5.1	5.1	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	140		25	25	25	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	2,500		200	270	550	mg/Kg-dry	20.920 50209	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	24		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	76		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	1.1		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	5,400		750	1,600	2,000	mg/Kg-dry	1	11/6/2014 1:37 PM

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 10:13:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-017	**Matrix:**	Soil
Client Sample ID:	SM-14-24		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 25.905					deg min		
Longitude	-084 15.437					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	120	U	120	120	120	mg/Kg-dry	1	11/3/2014 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.81	U	0.66	0.81	2.1	µg/Kg-dry	1	11/13/2014 1:07 PM
4,4'-DDE	0.81	U	0.38	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
4,4'-DDT	0.81	U	0.43	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Aldrin	0.81	U	0.41	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
alpha-BHC	0.81	U	0.35	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
alpha-Chlordane	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
beta-BHC	0.81	U	0.43	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Chlordane (Technical)	16	U	4.2	16	20	µg/Kg-dry	1	11/13/2014 1:07 PM
delta-BHC	0.81	U	0.35	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Dieldrin	0.81	U	0.44	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Endosulfan I	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Endosulfan II	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Endosulfan sulfate	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Endrin	0.81	U	0.46	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Endrin aldehyde	0.81	U	0.47	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Endrin ketone	0.81	U	0.44	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
gamma-BHC	0.81	U	0.37	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
gamma-Chlordane	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Heptachlor	0.81	U	0.44	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Heptachlor epoxide	0.81	U	0.45	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Methoxychlor	0.81	U	0.46	0.81	1.0	µg/Kg-dry	1	11/13/2014 1:07 PM
Toxaphene	16	U	6.1	16	20	µg/Kg-dry	1	11/13/2014 1:07 PM
Surr: Decachlorobiphenyl	83.7			55-130		%Rec	1	11/13/2014 1:07 PM
Surr: Tetrachloro-m-xylene	77.5			42-129		%Rec	1	11/13/2014 1:07 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: JD1**
Aroclor 1016	8.1	U	3.6	8.1	40	µg/Kg-dry	1	11/7/2014 2:09 PM
Aroclor 1221		U	3.6		40	µg/Kg-dry	1	11/7/2014 2:09 PM
Aroclor 1232		U	5.4		40	µg/Kg-dry	1	11/7/2014 2:09 PM
Aroclor 1242		U	4.5		40	µg/Kg-dry	1	11/7/2014 2:09 PM
Aroclor 1248		U	4.3		40	µg/Kg-dry	1	11/7/2014 2:09 PM
Aroclor 1254		U	5.1		40	µg/Kg-dry	1	11/7/2014 2:09 PM
Aroclor 1260	8.1	U	3.5	8.1	40	µg/Kg-dry	1	11/7/2014 2:09 PM
Aroclor 1262		U	4.8		40	µg/Kg-dry	1	11/7/2014 2:09 PM
Total PCBs		U	3.5		40	µg/Kg-dry	1	11/7/2014 2:09 PM
Surr: Tetrachloro-m-xylene	81.6			44-130		%Rec	1	11/7/2014 2:09 PM
Surr: Decachlorobiphenyl	102			60-125		%Rec	1	11/7/2014 2:09 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 10:13:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-017	**Matrix:**	Soil
Client Sample ID:	SM-14-24		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	24		1.6	2.3	12	mg/Kg-dry	20	11/18/2014 9:03 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.61	U	0.40	0.61	1.2	mg/Kg-dry	1	11/4/2014 3:04 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,400	J	530	730	1,500	µg/Kg-dry	1	11/4/2014 11:49 AM
Barium	11,000		220	3,700	7,300	µg/Kg-dry	1	11/4/2014 11:49 AM
Cadmium	110	J	24	37	180	µg/Kg-dry	1	11/4/2014 11:49 AM
Chromium	5,700		60	290	370	µg/Kg-dry	1	11/4/2014 11:49 AM
Copper	4,200		300	730	3,700	µg/Kg-dry	1	11/4/2014 11:49 AM
Iron	4,400,000		23,000	37,000	110,000	µg/Kg-dry	10	11/4/2014 12:45 PM
Lead	2,500	J	460	730	3,700	µg/Kg-dry	1	11/4/2014 11:49 AM
Manganese	110,000		140	180	730	µg/Kg-dry	1	11/4/2014 11:49 AM
Nickel	3,700		210	730	3,700	µg/Kg-dry	1	11/4/2014 11:49 AM
Selenium	1,100	U	850	1,100	1,500	µg/Kg-dry	1	11/4/2014 11:49 AM
Silver	180	U	60	180	730	µg/Kg-dry	1	11/4/2014 11:49 AM
Zinc	7,400		370	480	4,800	µg/Kg-dry	1	12/23/2014 2:44 PM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	4.0	J	0.99	7.0	14	µg/Kg-dry	1	11/4/2014 10:33 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: JH1**
2-Methylnaphthalene	20	U	9.8	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Acenaphthene	20	U	8.9	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Acenaphthylene	20	U	8.5	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Anthracene	20	U	9.8	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Benzo(a)anthracene	20	U	13	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Benzo(a)pyrene	20	U	12	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Benzo(b)fluoranthene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Benzo(g,h,i)perylene	20	U	14	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Benzo(k)fluoranthene	40	U	21	40	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Chrysene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Dibenzo (a,h) anthracene	40	U	32	40	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Fluoranthene	20	U	19	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Fluorene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Indeno(1,2,3-cd)pyrene	40	U	10	40	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Naphthalene	20	U	7.8	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Phenanthrene	20	U	11	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Pyrene	20	U	12	20	190	µg/Kg-dry	1	11/12/2014 7:05 PM
Surr: 2-Fluorobiphenyl	80.8			44-115		%Rec	1	11/12/2014 7:05 PM
Surr: Nitrobenzene-d5	75.3			37-122		%Rec	1	11/12/2014 7:05 PM
Surr: Terphenyl-d14	93.8			54-127		%Rec	1	11/12/2014 7:05 PM

RTI Laboratories - Analytical Report

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client:	USACE- Detroit District	**Collection Date:**	10/21/2014 10:13:00 AM
Project:	St Marys Sampling		
Lab ID:	1410A92-017	**Matrix:**	Soil
Client Sample ID:	SM-14-24		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.20 (850-um)	98		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.40 (425-um)	89		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.100 (150-um)	28		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No.200 (75-um)	3.9		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
No. 270 (53-um)	1.9		0.10	0.10	0.10	% Finer	1	11/5/2014 9:50 AM
Non-retained material	1.9		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Coarse Sand	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Medium Sand	11		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Fine Sand	85		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Silt	3.9		0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/5/2014 9:50 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	25.0					lbs/gal	1	11/6/2014 2:30 PM
Density Temperature	22.0					°C	1	11/6/2014 2:30 PM
Specific Gravity at 20 deg. C	3.01						1	11/6/2014 2:30 PM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	13		4.7	4.7	4.7	mg/Kg-dry	1	11/3/2014 2:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	76		23	23	23	mg/Kg-dry	1	11/5/2014 4:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,400		150	210	410	mg/Kg-dry	16.835 01684	11/6/2014 10:30 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	18		1.0	1.0	1.0	wt%	1	10/27/2014 3:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	82		0.10	0.20	0.50	%	1	10/27/2014 3:00 PM
Total Volatile Solids	0.23		0.10	0.10	0.10	%	1	10/27/2014 3:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,600	U	740	1,600	2,000	mg/Kg-dry	1	11/6/2014 1:48 PM

RTI Laboratories - DATES REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-001A	SM-14-07	10/22/2014 1:41 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-001B	SM-14-07	10/22/2014 1:41 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 3:23 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/19/2014 3:17 PM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/19/2014 3:17 PM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 5:10 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 11:50 AM
1410A92-001C	SM-14-07	10/22/2014 1:41 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:53 PM
				SW_7471S-Mercury		11/3/2014 7:22 AM	11/4/2014 7:22 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:23 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:19 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:19 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 10:06 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 8:57 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-002A	SM-14-08	10/22/2014 1:15 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-002B	SM-14-08	10/22/2014 1:15 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 3:47 AM

RTI Laboratories - DATES REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-002B	SM-14-08	10/22/2014 1:15 PM	Soil				
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 5:34 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 1:02 PM
1410A92-002C	SM-14-08	10/22/2014 1:15 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:53 PM
				SW_7471S-Mercury		11/3/2014 7:22 AM	11/4/2014 7:23 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:24 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:21 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:20 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 10:34 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 8:57 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-003A	SM-14-10	10/22/2014 12:34 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-003B	SM-14-10	10/22/2014 12:34 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 5:02 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 5:58 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 1:27 PM
1410A92-003C	SM-14-10	10/22/2014 12:34 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:53 PM
				SW_7471S-Mercury		11/3/2014 7:22 AM	11/4/2014 7:25 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:26 AM

RTI Laboratories - DATES REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-003C	SM-14-10	10/22/2014 12:34 PM	Soil				
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:22 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:21 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 10:43 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 8:57 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-004A	SM-14-11	10/22/2014 12:10 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-004B	SM-14-11	10/22/2014 12:10 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 5:27 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 7:11 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 1:51 PM
1410A92-004C	SM-14-11	10/22/2014 12:10 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:53 PM
				SW_7471S-Mercury		11/3/2014 7:22 AM	11/4/2014 7:27 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:27 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:23 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:23 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 10:53 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM

RTI Laboratories - DATES REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-005A	SM-14-12	10/22/2014 11:40 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-005B	SM-14-12	10/22/2014 11:40 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 5:52 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 7:35 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 2:15 PM
1410A92-005C	SM-14-12	10/22/2014 11:40 AM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:53 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:07 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:28 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:25 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:24 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 11:02 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-006A	SM-14-13	10/21/2014 4:27 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-006B	SM-14-13	10/21/2014 4:27 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 6:17 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 7:59 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 2:39 PM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-006C	SM-14-13	10/21/2014 4:27 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:53 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:09 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:30 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:26 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:25 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 11:12 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-007A	SM-14-14	10/22/2014 10:55 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-007B	SM-14-14	10/22/2014 10:55 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 6:42 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 8:23 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 3:03 PM
1410A92-007C	SM-14-14	10/22/2014 10:55 AM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:53 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:10 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:31 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:27 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:27 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 11:20 AM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-007C	SM-14-14	10/22/2014 10:55 AM	Soil				
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-008A	SM-14-15	10/21/2014 6:35 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-008B	SM-14-15	10/21/2014 6:35 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 7:07 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 8:47 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 3:27 PM
1410A92-008C	SM-14-15	10/21/2014 6:35 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:17 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:13 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:18 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:10 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 11:31 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-009A	SM-14-16	10/21/2014 6:07 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM

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Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-009B	SM-14-16	10/21/2014 6:07 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 7:32 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 9:12 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 3:51 PM
1410A92-009C	SM-14-16	10/21/2014 6:07 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:12 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:32 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:29 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:28 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 11:43 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-010A	SM-14-17	10/21/2014 5:33 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-010B	SM-14-17	10/21/2014 5:33 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 7:57 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 9:36 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 4:15 PM
1410A92-010C	SM-14-17	10/21/2014 5:33 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM

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Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-010C	SM-14-17	10/21/2014 5:33 PM	Soil				
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:22 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:34 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:30 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:30 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 11:53 AM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-011A	SM-14-18	10/21/2014 5:05 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-011B	SM-14-18	10/21/2014 5:05 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 9:12 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 11:44 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 4:40 PM
1410A92-011C	SM-14-18	10/21/2014 5:05 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:24 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:41 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:37 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:36 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 12:11 PM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-011C	SM-14-18	10/21/2014 5:05 PM	Soil				
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-012A	SM-14-19	10/21/2014 12:58 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-012B	SM-14-19	10/21/2014 12:58 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 10:59 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 12:08 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 5:04 PM
1410A92-012C	SM-14-19	10/21/2014 12:58 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:25 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:42 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:39 PM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:57 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:37 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 12:41 PM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-013A	SM-14-20	10/21/2014 12:27 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-013B	SM-14-20	10/21/2014 12:27 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-013B	SM-14-20	10/21/2014 12:27 PM	Soil				
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 11:24 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 12:32 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 5:28 PM
1410A92-013C	SM-14-20	10/21/2014 12:27 PM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:27 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:44 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:40 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:38 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 12:53 PM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:02 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-014A	SM-14-21	10/21/2014 11:58 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-014B	SM-14-21	10/21/2014 11:58 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 11:49 AM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 12:57 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 5:52 PM
1410A92-014C	SM-14-21	10/21/2014 11:58 AM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:29 AM

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Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-014C	SM-14-21	10/21/2014 11:58 AM	Soil				
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:45 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:41 PM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:58 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:40 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 1:03 PM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:03 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-015A	SM-14-22	10/21/2014 11:12 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-015B	SM-14-22	10/21/2014 11:12 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 12:16 PM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 1:21 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 6:16 PM
1410A92-015C	SM-14-22	10/21/2014 11:12 AM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:30 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:46 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:43 PM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 1:00 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:41 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 1:13 PM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM

RTI Laboratories - DATES REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-015C	SM-14-22	10/21/2014 11:12 AM	Soil				
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:03 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-016A	SM-14-23	10/21/2014 10:40 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-016B	SM-14-23	10/21/2014 10:40 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 12:42 PM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 1:45 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 6:41 PM
1410A92-016C	SM-14-23	10/21/2014 10:40 AM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 2:59 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:32 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:48 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:44 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:43 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 1:37 PM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:03 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM
1410A92-017A	SM-14-24	10/21/2014 10:13 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/5/2014 9:50 AM	11/5/2014 9:50 AM
				ASTM-D854-Soil Density/Specific Gravity		11/6/2014 2:30 PM	11/6/2014 2:30 PM
1410A92-017B	SM-14-24	10/21/2014 10:13 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		10/29/2014 11:32 AM	11/3/2014 10:00 AM

RTI Laboratories - DATES REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1410A92-017B	SM-14-24	10/21/2014 10:13 AM	Soil				
				SW_8081S-Organochlorine Pesticides		11/4/2014 7:43 AM	11/13/2014 1:07 PM
				SW_8082S-Polychlorinated Biphenyls		11/4/2014 7:44 AM	11/7/2014 2:09 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/4/2014 7:41 AM	11/12/2014 7:05 PM
1410A92-017C	SM-14-24	10/21/2014 10:13 AM	Soil				
				EPA_350.1-S-Ammonia		10/31/2014 10:20 AM	11/3/2014 2:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/6/2014 10:30 AM	11/6/2014 10:30 AM
				SW_9012S-Cyanide		11/4/2014 8:27 AM	11/4/2014 3:04 PM
				SW_7471S-Mercury		11/3/2014 10:01 AM	11/4/2014 10:33 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 11:49 AM
				SW_6010S-Metals, ICP/OES		10/29/2014 11:45 AM	11/4/2014 12:45 PM
				SW_6010S-Metals, ICP/OES		12/23/2014 11:27 AM	12/23/2014 2:44 PM
				SW_9060S-Organic Carbon		11/5/2014 1:49 PM	11/6/2014 1:48 PM
				PMOIST-Percent Moisture		10/27/2014 3:00 PM	10/27/2014 3:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		10/31/2014 10:22 AM	11/5/2014 4:00 PM
				SM_4500-P-FS-Total Phosphorus		11/7/2014 9:33 AM	11/18/2014 9:03 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		10/27/2014 3:00 PM	10/27/2014 3:00 PM

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 34935**

Sample ID:	LCS-34935	Samp Type:	LCS	Test Code:	SW_9071	Units:	mg/Kg	Prep Date:	10/29/2014	RunNo:	72995	
Client ID:	LCSS	Batch ID:	34935	TestNo:	SW9071	SW3540C		Analysis Date:	11/3/2014	SeqNo:	1419333	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	1,100	97	1,298	0	83.8	70	120					

Sample ID:	MB-34935	Samp Type:	MBLK	Test Code:	SW_9071	Units:	mg/Kg	Prep Date:	10/29/2014	RunNo:	72995	
Client ID:	PBS	Batch ID:	34935	TestNo:	SW9071	SW3540C		Analysis Date:	11/3/2014	SeqNo:	1419334	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	99	99									U	

Sample ID:	1410A40-015BMS	Samp Type:	MS	Test Code:	SW_9071	Units:	mg/Kg-dry	Prep Date:	10/29/2014	RunNo:	72995	
Client ID:	ZZZZZZ	Batch ID:	34935	TestNo:	SW9071	SW3540C		Analysis Date:	11/3/2014	SeqNo:	1419336	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	3,000	240	3,182	342.6	83.7	70	120					

Sample ID:	1410A40-015BMSD	Samp Type:	MSD	Test Code:	SW_9071	Units:	mg/Kg-dry	Prep Date:	10/29/2014	RunNo:	72995	
Client ID:	ZZZZZZ	Batch ID:	34935	TestNo:	SW9071	SW3540C		Analysis Date:	11/3/2014	SeqNo:	1419337	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	3,100	240	3,181	342.6	87.7	70	120	3,007	4.11	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34936

Sample ID:	MB-34936	Samp Type:	MBLK	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	10/29/2014	RunNo:	72985
Client ID:	PBS	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1419071

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	2,000	2,000									U
Barium	340	10,000									J
Chromium	130	500									J
Copper	5,000	5,000									U
Iron	4,500	15,000									J
Lead	5,000	5,000									U
Manganese	1,000	1,000									U
Nickel	5,000	5,000									U
Selenium	2,000	2,000									U
Silver	180	1,000									J

Sample ID:	1410A92-008CMS	Samp Type:	MS	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	10/29/2014	RunNo:	72985
Client ID:	SM-14-15MS1	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1419074

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	34,000	2,700	33,340	5,500	86.3	82	111				
Barium	210,000	13,000	33,340	146,400	203	83	113				S
Chromium	74,000	670	33,340	35,590	115	85	113				S
Copper	68,000	6,700	33,340	27,950	120	81	117				S
Iron	23,000,000	20,000	333,400	20,840,000	682	81	118				ES
Lead	36,000	6,700	33,340	5,877	90.4	81	112				
Manganese	460,000	1,300	33,340	392,300	190	84	114				ES
Nickel	70,000	6,700	33,340	28,480	123	83	113				S
Selenium	19,000	2,700	33,340	0	55.5	78	111				S
Silver	32,000	1,300	33,340	0	95.4	82	112				

Sample ID:	1410A92-008CMSD	Samp Type:	MSD	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	10/29/2014	RunNo:	72985
Client ID:	SM-14-15SD1	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1419075

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	37,000	2,800	34,880	5,500	89.3	82	111	34,270	6.68	20	
Barium	200,000	14,000	34,880	146,400	145	83	113	214,100	8.37	20	S

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34936

Sample ID:	1410A92-008CMSD	Samp Type:	MSD	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	10/29/2014	RunNo:	72985
Client ID:	SM-14-15SD1	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1419075

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Chromium	73,000	700	34,880	35,590	108	85	113	73,830	0.828	20	
Copper	66,000	7,000	34,880	27,950	109	81	117	68,000	3.02	20	
Iron	22,000,000	21,000	348,800	20,840,000	291	81	118	23,120,000	5.59	20	ES
Lead	37,000	7,000	34,880	5,877	89.7	81	112	36,030	3.07	20	
Manganese	440,000	1,400	34,880	392,300	145	84	114	455,700	2.85	20	ES
Nickel	67,000	7,000	34,880	28,480	110	83	113	69,540	4.10	20	
Selenium	21,000	2,800	34,880	0	61.5	78	111	18,510	14.7	20	S
Silver	33,000	1,400	34,880	0	93.5	82	112	31,800	2.52	20	

Sample ID:	LCS-34936	Samp Type:	LCS	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	10/29/2014	RunNo:	72985
Client ID:	LCSS	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1419897

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	27,000	2,000	25,000	0	107	82	111				
Barium	26,000	10,000	25,000	0	105	83	113				
Chromium	27,000	500	25,000	0	109	85	113				
Copper	29,000	5,000	25,000	0	117	81	117				
Iron	260,000	15,000	250,000	0	105	81	118				
Lead	27,000	5,000	25,000	0	108	81	112				
Manganese	28,000	1,000	25,000	0	113	84	114				
Nickel	26,000	5,000	25,000	0	102	83	113				
Selenium	27,000	2,000	25,000	0	106	78	111				
Silver	24,000	1,000	25,000	0	98.0	82	112				

Sample ID:	MB-34936	Samp Type:	MBLK	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	10/29/2014	RunNo:	78540
Client ID:	PBS	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1522268

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	250	250									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 34936**

Sample ID:	LCS-34936	Samp Type:	LCS	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	10/29/2014	RunNo:	78540
Client ID:	LCSS	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1522269

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	27,000	250	25,000	0	109	82	113				

Sample ID:	1410A92-008CMS	Samp Type:	MS	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	10/29/2014	RunNo:	78540
Client ID:	SM-14-15MS1	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1522271

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	33,000	330	33,340	185.3	99.7	82	113				

Sample ID:	1410A92-008CMSD	Samp Type:	MSD	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	10/29/2014	RunNo:	78540
Client ID:	SM-14-15SD1	Batch ID:	34936	TestNo:	SW6010B	SW3050B		Analysis Date:	11/4/2014	SeqNo:	1522272

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	34,000	350	34,880	185.3	96.4	82	113	33,430	1.13	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 34968**

Sample ID:	LCS-34968	Samp Type:	LCS	Test Code:	EPA_350.1-S	Units:	mg/Kg	Prep Date:	10/31/2014	RunNo:	73027
Client ID:	LCSS	Batch ID:	34968	TestNo:	E350.1			Analysis Date:	11/3/2014	SeqNo:	1420015

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	98	4.0	100.0	0	98.2	80	120				

Sample ID:	MB-34968	Samp Type:	MBLK	Test Code:	EPA_350.1-S	Units:	mg/Kg	Prep Date:	10/31/2014	RunNo:	73027
Client ID:	PBS	Batch ID:	34968	TestNo:	E350.1			Analysis Date:	11/3/2014	SeqNo:	1420016

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	4.0	4.0									U

Sample ID:	1410A92-002CDUP	Samp Type:	DUP	Test Code:	EPA_350.1-S	Units:	mg/Kg-dry	Prep Date:	10/31/2014	RunNo:	73027
Client ID:	SM-14-08LR1	Batch ID:	34968	TestNo:	E350.1			Analysis Date:	11/3/2014	SeqNo:	1420019

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	15	4.8						14.60	3.19	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 34969**

Sample ID:	LCS-34969	Samp Type:	LCS	Test Code:	EPA_351.2-S	Units:	mg/Kg	Prep Date:	10/31/2014	RunNo:	73028
Client ID:	LCSS	Batch ID:	34969	TestNo:	E351.2			Analysis Date:	11/5/2014	SeqNo:	1420040

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	200	20	200.0	0	98.0	80	120				

Sample ID:	MB-34969	Samp Type:	MBLK	Test Code:	EPA_351.2-S	Units:	mg/Kg	Prep Date:	10/31/2014	RunNo:	73028
Client ID:	PBS	Batch ID:	34969	TestNo:	E351.2			Analysis Date:	11/5/2014	SeqNo:	1420041

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	20	20									U

Sample ID:	1410A92-002CDUP	Samp Type:	DUP	Test Code:	EPA_351.2-S	Units:	mg/Kg-dry	Prep Date:	10/31/2014	RunNo:	73028
Client ID:	SM-14-08LR1	Batch ID:	34969	TestNo:	E351.2			Analysis Date:	11/5/2014	SeqNo:	1420044

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	62	23						62.93	0.998	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34982

Sample ID:	MB-34982	Samp Type:	MBLK	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	11/3/2014	RunNo:	72949
Client ID:	PBS	Batch ID:	34982	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418516

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Mercury	1.1	12									J

Sample ID:	LCS-34982	Samp Type:	LCS	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	11/3/2014	RunNo:	72949
Client ID:	LCSS	Batch ID:	34982	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418517

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Mercury	61	12	60.00	0	101	80	124				

Sample ID:	1410A40-001CMS	Samp Type:	MS	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72949
Client ID:	ZZZZZZ	Batch ID:	34982	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418520

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Mercury	310	27	135.9	170.6	99.4	80	124				

Sample ID:	1410A40-001CMSD	Samp Type:	MSD	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72949
Client ID:	ZZZZZZ	Batch ID:	34982	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418521

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Mercury	300	28	141.1	170.6	94.8	80	124	305.7	0.426	20	

Sample ID:	1410A40-015CMS	Samp Type:	MS	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72949
Client ID:	ZZZZZZ	Batch ID:	34982	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418534

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Mercury	250	21	102.9	174.3	76.9	80	124				S

Sample ID:	1410A40-015CMSD	Samp Type:	MSD	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72949
Client ID:	ZZZZZZ	Batch ID:	34982	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418535

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Mercury	380	21	105.9	174.3	192	80	124	253.4	39.4	20	RS

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WO#: 1410A92

Date Reported: 2/22/2016
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34988

Sample ID:	1410A92-008CMS	Samp Type:	MS	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72950	
Client ID:	SM-14-15MS1	Batch ID:	34988	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418819	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	110	21	102.7	10.29	99.5	80	124					

Sample ID:	1410A92-008CMSD	Samp Type:	MSD	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72950	
Client ID:	SM-14-15SD1	Batch ID:	34988	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418820	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	120	20	100.8	10.29	108	80	124	112.4	5.86	20		

Sample ID:	MB-34988	Samp Type:	MBLK	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	11/3/2014	RunNo:	72950	
Client ID:	PBS	Batch ID:	34988	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418843	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	1.9	12									J	

Sample ID:	LCS-34988	Samp Type:	LCS	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	11/3/2014	RunNo:	72950	
Client ID:	LCSS	Batch ID:	34988	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418844	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	61	12	60.00	0	101	80	124					

Sample ID:	1410A61-004AMS	Samp Type:	MS	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72950	
Client ID:	ZZZZZZ	Batch ID:	34988	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418846	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	320	17	84.33	224.3	118	80	124					

Sample ID:	1410A61-004AMSD	Samp Type:	MSD	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/3/2014	RunNo:	72950	
Client ID:	ZZZZZZ	Batch ID:	34988	TestNo:	SW7471A	SW7471B		Analysis Date:	11/4/2014	SeqNo:	1418847	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	280	16	79.14	224.3	65.8	80	124	323.9	15.8	20	S	

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WO#: 1410A92

Date Reported: 2/22/2016
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 34995**

Sample ID:	MB-34995	Samp Type:	MBLK	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73294
Client ID:	PBS	Batch ID:	34995	TestNo:	SW8270C	SW3550C		Analysis Date:	11/12/2014	SeqNo:	1425721

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	160	160									U
Acenaphthene	160	160									U
Acenaphthylene	160	160									U
Anthracene	160	160									U
Benzo(a)anthracene	160	160									U
Benzo(a)pyrene	160	160									U
Benzo(b)fluoranthene	160	160									U
Benzo(g,h,i)perylene	160	160									U
Benzo(k)fluoranthene	160	160									U
Chrysene	160	160									U
Dibenzo (a,h) anthracene	160	160									U
Fluoranthene	160	160									U
Fluorene	160	160									U
Indeno(1,2,3-cd)pyrene	160	160									U
Naphthalene	160	160									U
Phenanthrene	160	160									U
Pyrene	160	160									U
Surr: 2-Fluorobiphenyl	710		821.0		87.1	44	115				
Surr: Nitrobenzene-d5	670		821.0		81.8	37	122				
Surr: Terphenyl-d14	770		821.0		93.3	54	127				

Sample ID:	LCS-34995	Samp Type:	LCS	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73294
Client ID:	LCSS	Batch ID:	34995	TestNo:	SW8270C	SW3550C		Analysis Date:	11/12/2014	SeqNo:	1425722

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	610	160	663.4	0	91.2	38	122				
Acenaphthene	610	160	663.4	0	92.5	40	123				
Acenaphthylene	630	160	663.4	0	94.2	32	132				
Anthracene	620	160	663.4	0	93.4	47	123				
Benzo(a)anthracene	630	160	663.4	0	95.7	49	126				
Benzo(a)pyrene	670	160	663.4	0	100	45	129				

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34995

Sample ID:	LCS-34995	Samp Type:	LCS	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73294
Client ID:	LCSS	Batch ID:	34995	TestNo:	SW8270C	SW3550C		Analysis Date:	11/12/2014	SeqNo:	1425722

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Benzo(b)fluoranthene	650	160	663.4	0	97.6	45	132				m
Benzo(g,h,i)perylene	710	160	663.4	0	107	43	134				
Benzo(k)fluoranthene	740	160	663.4	0	111	47	132				
Chrysene	650	160	663.4	0	97.8	50	124				
Dibenzo (a,h) anthracene	710	160	663.4	0	107	45	134				
Fluoranthene	640	160	663.4	0	95.9	50	127				
Fluorene	630	160	663.4	0	94.4	43	125				
Indeno(1,2,3-cd)pyrene	710	160	663.4	0	106	45	133				
Naphthalene	600	160	663.4	0	90.6	35	123				
Phenanthrene	630	160	663.4	0	95.0	50	121				
Pyrene	680	160	663.4	0	102	47	127				
Surr: 2-Fluorobiphenyl	790		829.2		95.0	44	115				
Surr: Nitrobenzene-d5	750		829.2		91.0	37	122				
Surr: Terphenyl-d14	850		829.2		102	54	127				

Sample ID:	1410A92-001BMS	Samp Type:	MS	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73294
Client ID:	SM-14-07MS1	Batch ID:	34995	TestNo:	SW8270C	SW3550C		Analysis Date:	11/12/2014	SeqNo:	1425724

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	730	210	875.3	0	83.3	38	122				
Acenaphthene	770	210	875.3	0	87.5	40	123				
Acenaphthylene	770	210	875.3	0	88.0	32	132				
Anthracene	820	210	875.3	0	93.6	47	123				
Benzo(a)anthracene	840	210	875.3	0	95.7	49	126				
Benzo(a)pyrene	870	210	875.3	0	99.6	45	129				
Benzo(b)fluoranthene	830	210	875.3	0	94.7	45	132				
Benzo(g,h,i)perylene	850	210	875.3	0	96.5	43	134				
Benzo(k)fluoranthene	930	210	875.3	0	107	47	132				m
Chrysene	790	210	875.3	0	90.1	50	124				
Dibenzo (a,h) anthracene	860	210	875.3	0	98.1	45	134				
Fluoranthene	830	210	875.3	0	95.3	50	127				

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34995

Sample ID:	1410A92-001BMS	Samp Type:	MS	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73294
Client ID:	SM-14-07MS1	Batch ID:	34995	TestNo:	SW8270C	SW3550C		Analysis Date:	11/12/2014	SeqNo:	1425724

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Fluorene	790	210	875.3	0	90.3	43	125				
Indeno(1,2,3-cd)pyrene	860	210	875.3	0	98.3	45	133				
Naphthalene	710	210	875.3	0	80.8	35	123				
Phenanthrene	810	210	875.3	0	92.1	50	121				
Pyrene	850	210	875.3	0	96.7	47	127				
Surr: 2-Fluorobiphenyl	950		1,094		86.6	44	115				
Surr: Nitrobenzene-d5	900		1,094		82.4	37	122				
Surr: Terphenyl-d14	1,100		1,094		99.8	54	127				

Sample ID:	1410A92-001BMSD	Samp Type:	MSD	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73294
Client ID:	SM-14-07SD1	Batch ID:	34995	TestNo:	SW8270C	SW3550C		Analysis Date:	11/12/2014	SeqNo:	1425725

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	660	210	888.9	0	74.6	38	122	729.6	9.54	25	
Acenaphthene	690	210	888.9	0	77.5	40	123	766.3	10.6	25	
Acenaphthylene	710	210	888.9	0	80.1	32	132	770.3	7.80	25	
Anthracene	760	210	888.9	0	85.3	47	123	819.7	7.79	25	
Benzo(a)anthracene	780	210	888.9	0	87.2	49	126	837.7	7.70	25	
Benzo(a)pyrene	830	210	888.9	0	93.3	45	129	872.2	5.04	25	
Benzo(b)fluoranthene	800	210	888.9	0	89.7	45	132	828.9	3.83	25	
Benzo(g,h,i)perylene	850	210	888.9	0	95.6	43	134	845.1	0.606	25	
Benzo(k)fluoranthene	910	210	888.9	0	102	47	132	933.5	3.06	25	m
Chrysene	770	210	888.9	0	87.0	50	124	789.1	1.96	25	
Dibenzo (a,h) anthracene	860	210	888.9	0	96.3	45	134	858.7	0.310	25	
Fluoranthene	770	210	888.9	0	86.8	50	127	834.2	7.74	25	
Fluorene	720	210	888.9	0	81.0	43	125	790.8	9.31	25	
Indeno(1,2,3-cd)pyrene	850	210	888.9	0	95.2	45	133	860.4	1.61	25	
Naphthalene	650	210	888.9	0	73.4	35	123	707.7	8.05	25	
Phenanthrene	750	210	888.9	0	84.6	50	121	806.1	6.95	25	
Pyrene	810	210	888.9	0	91.4	47	127	846.8	4.15	25	
Surr: 2-Fluorobiphenyl	880		1,111		78.8	44	115		0	25	

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 34995**

Sample ID:	**1410A92-001BMSD**	Samp Type:	**MSD**	Test Code:	**SW_8270S**	Units:	**µg/Kg-dry**	Prep Date:	**11/4/2014**	RunNo:	**73294**		
Client ID:	**SM-14-07SD1**	Batch ID:	**34995**	TestNo:	**SW8270C**	**SW3550C**		Analysis Date:	**11/12/2014**	SeqNo:	**1425725**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	840		1,111		75.3	37	122		0	25	
Surr: Terphenyl-d14	1,100		1,111		95.0	54	127		0	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34997

Sample ID:	MB-34997	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73329
Client ID:	PBS	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427068

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	1.7	1.7									U
4,4'-DDE	0.81	0.81									U
4,4'-DDT	0.81	0.81									U
Aldrin	0.81	0.81									U
alpha-BHC	0.81	0.81									U
alpha-Chlordane	0.81	0.81									U
beta-BHC	0.81	0.81									U
Chlordane (Technical)	16	16									U
delta-BHC	0.81	0.81									U
Dieldrin	0.81	0.81									U
Endosulfan I	0.81	0.81									U
Endosulfan II	0.81	0.81									U
Endosulfan sulfate	0.81	0.81									U
Endrin	0.81	0.81									U
Endrin aldehyde	0.81	0.81									U
Endrin ketone	0.81	0.81									U
gamma-BHC	0.81	0.81									U
gamma-Chlordane	0.81	0.81									U
Heptachlor	0.81	0.81									U
Heptachlor epoxide	0.81	0.81									U
Methoxychlor	0.81	0.81									U
Toxaphene	16	16									U
Surr: Decachlorobiphenyl	7.9		8.063		97.7	55	130				
Surr: Tetrachloro-m-xylene	7.2		8.063		89.5	42	129				

Sample ID:	1410A92-002BMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73329
Client ID:	SM-14-08MS1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427071

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	9.9	2.0	9.838	0	100	56	139				
4,4'-DDE	9.6	0.98	9.838	0	98.0	56	134				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34997

Sample ID:	1410A92-002BMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73329
Client ID:	SM-14-08MS1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427071

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDT	10	0.98	9.838	0	102	50	141				
Aldrin	9.2	0.98	9.838	0	93.1	45	136				
alpha-BHC	8.8	0.98	9.838	0	89.0	45	137				
alpha-Chlordane	9.3	0.98	9.838	0	94.9	54	133				
beta-BHC	9.3	0.98	9.838	0	94.1	50	136				
Chlordane (Technical)	20	20		0	0	43	149				U
delta-BHC	9.2	0.98	9.838	0	93.8	47	139				
Dieldrin	9.5	0.98	9.838	0	96.4	56	136				
Endosulfan I	9.5	0.98	9.838	0	96.2	53	132				
Endosulfan II	9.7	0.98	9.838	0	99.0	53	134				
Endosulfan sulfate	10	0.98	9.838	0	102	55	136				
Endrin	11	0.98	9.838	0	107	57	140				
Endrin aldehyde	10	0.98	9.838	0	102	35	137				
Endrin ketone	9.8	0.98	9.838	0	100	55	136				
gamma-BHC	9.3	0.98	9.838	0	94.6	49	135				
gamma-Chlordane	8.8	0.98	9.838	0	89.6	53	135				m
Heptachlor	9.4	0.98	9.838	0	95.2	47	136				
Heptachlor epoxide	9.3	0.98	9.838	0	94.7	52	136				
Methoxychlor	10	0.98	9.838	0	106	52	143				
Toxaphene	20	20		0	0	33	141				U
Surr: Decachlorobiphenyl	10		9.838		101	55	130				
Surr: Tetrachloro-m-xylene	8.4		9.838		85.4	42	129				

Sample ID:	1410A92-002BMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73329
Client ID:	SM-14-08SD1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427072

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	11	2.0	9.880	0	107	56	139	9.857	6.85	25	
4,4'-DDE	10	0.99	9.880	0	102	56	134	9.638	4.63	25	
4,4'-DDT	11	0.99	9.880	0	110	50	141	10.06	7.32	25	
Aldrin	9.7	0.99	9.880	0	98.2	45	136	9.162	5.68	25	

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WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34997

Sample ID:	1410A92-002BMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73329
Client ID:	SM-14-08SD1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427072

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
alpha-BHC	9.5	0.99	9.880	0	96.5	45	137	8.758	8.45	25	
alpha-Chlordane	9.8	0.99	9.880	0	99.2	54	133	9.334	4.87	25	
beta-BHC	9.7	0.99	9.880	0	97.7	50	136	9.260	4.17	25	
Chlordane (Technical)	20	20		0	0	43	149	0	0	25	U
delta-BHC	9.8	0.99	9.880	0	99.5	47	139	9.227	6.36	25	
Dieldrin	10	0.99	9.880	0	101	56	136	9.485	4.79	25	m
Endosulfan I	9.9	0.99	9.880	0	99.8	53	132	9.465	4.10	25	
Endosulfan II	10	0.99	9.880	0	105	53	134	9.743	6.45	25	
Endosulfan sulfate	11	0.99	9.880	0	110	55	136	9.989	7.97	25	
Endrin	11	0.99	9.880	0	111	57	140	10.55	3.70	25	
Endrin aldehyde	11	0.99	9.880	0	113	35	137	10.00	11.3	25	
Endrin ketone	11	0.99	9.880	0	108	55	136	9.838	7.97	25	
gamma-BHC	9.6	0.99	9.880	0	97.4	49	135	9.303	3.42	25	
gamma-Chlordane	9.8	0.99	9.880	0	99.4	53	135	8.813	10.8	25	m
Heptachlor	9.8	0.99	9.880	0	99.3	47	136	9.369	4.57	25	
Heptachlor epoxide	9.7	0.99	9.880	0	97.8	52	136	9.313	3.69	25	
Methoxychlor	11	0.99	9.880	0	116	52	143	10.39	9.45	25	
Toxaphene	20	20		0	0	33	141	0	0	25	U
Surr: Decachlorobiphenyl	11		9.880		108	55	130		0	25	
Surr: Tetrachloro-m-xylene	8.7		9.880		88.4	42	129		0	25	

Sample ID:	MB-34997	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73330
Client ID:	PBS	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427124

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	1.7	1.7									U
4,4'-DDE	0.81	0.81									U
4,4'-DDT	0.81	0.81									U
Aldrin	0.81	0.81									U
alpha-BHC	0.81	0.81									U
alpha-Chlordane	0.81	0.81									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34997

Sample ID:	MB-34997	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73330
Client ID:	PBS	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427124

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
beta-BHC	0.81	0.81									U
Chlordane (Technical)	16	16									U
delta-BHC	0.81	0.81									U
Dieldrin	0.81	0.81									U
Endosulfan I	0.81	0.81									U
Endosulfan II	0.81	0.81									U
Endosulfan sulfate	0.81	0.81									U
Endrin	0.81	0.81									U
Endrin aldehyde	0.81	0.81									U
Endrin ketone	0.81	0.81									U
gamma-BHC	0.81	0.81									U
gamma-Chlordane	0.81	0.81									U
Heptachlor	0.81	0.81									U
Heptachlor epoxide	0.81	0.81									U
Methoxychlor	0.81	0.81									U
Toxaphene	16	16									U
Surr: Decachlorobiphenyl	7.8		8.063		96.8	55	130				
Surr: Tetrachloro-m-xylene	6.8		8.063		84.5	42	129				

Sample ID:	1410A92-002BMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73330
Client ID:	SM-14-08MS1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427127

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	9.7	2.0	9.838	0	98.2	56	139				
4,4'-DDE	9.4	0.98	9.838	0	95.5	56	134				
4,4'-DDT	9.8	0.98	9.838	0	99.9	50	141				
Aldrin	9.0	0.98	9.838	0	91.2	45	136				
alpha-BHC	8.7	0.98	9.838	0	88.7	45	137				
alpha-Chlordane	9.3	0.98	9.838	0	94.2	54	133				
beta-BHC	9.3	0.98	9.838	0	94.7	50	136				
Chlordane (Technical)	20	20		0	0	43	149				U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34997

Sample ID:	1410A92-002BMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73330
Client ID:	SM-14-08MS1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427127

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
delta-BHC	9.1	0.98	9.838	0	92.7	47	139				
Dieldrin	9.3	0.98	9.838	0	95.0	56	136				
Endosulfan I	9.2	0.98	9.838	0	93.7	53	132				
Endosulfan II	9.6	0.98	9.838	0	97.6	53	134				
Endosulfan sulfate	9.5	0.98	9.838	0	97.0	55	136				
Endrin	10	0.98	9.838	0	105	57	140				
Endrin aldehyde	9.9	0.98	9.838	0	101	35	137				
Endrin ketone	9.7	0.98	9.838	0	98.6	55	136				
gamma-BHC	9.0	0.98	9.838	0	91.7	49	135				
gamma-Chlordane	9.2	0.98	9.838	0	93.9	53	135				
Heptachlor	9.1	0.98	9.838	0	92.4	47	136				
Heptachlor epoxide	9.2	0.98	9.838	0	93.9	52	136				
Methoxychlor	10	0.98	9.838	0	104	52	143				
Toxaphene	20	20		0	0	33	141				U
Surr: Decachlorobiphenyl	9.8		9.838		99.9	55	130				
Surr: Tetrachloro-m-xylene	8.0		9.838		81.2	42	129				

Sample ID:	1410A92-002BMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73330
Client ID:	SM-14-08SD1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427128

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	10	2.0	9.880	0	104	56	139	9.660	6.44	25	
4,4'-DDE	9.9	0.99	9.880	0	100	56	134	9.400	4.96	25	
4,4'-DDT	11	0.99	9.880	0	107	50	141	9.825	7.05	25	
Aldrin	9.3	0.99	9.880	0	94.6	45	136	8.975	4.06	25	
alpha-BHC	9.2	0.99	9.880	0	92.9	45	137	8.724	5.04	25	
alpha-Chlordane	9.6	0.99	9.880	0	97.6	54	133	9.269	3.98	25	
beta-BHC	9.4	0.99	9.880	0	95.1	50	136	9.317	0.832	25	
Chlordane (Technical)	20	20		0	0	43	149	0	0	25	U
delta-BHC	9.7	0.99	9.880	0	97.9	47	139	9.122	5.81	25	
Dieldrin	9.8	0.99	9.880	0	98.8	56	136	9.343	4.41	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34997

Sample ID:	1410A92-002BMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73330
Client ID:	SM-14-08SD1	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/13/2014	SeqNo:	1427128

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Endosulfan I	9.6	0.99	9.880	0	97.5	53	132	9.223	4.30	25	
Endosulfan II	10	0.99	9.880	0	103	53	134	9.606	6.17	25	
Endosulfan sulfate	10	0.99	9.880	0	106	55	136	9.539	9.12	25	
Endrin	11	0.99	9.880	0	108	57	140	10.29	3.78	25	
Endrin aldehyde	11	0.99	9.880	0	113	35	137	9.943	11.7	25	
Endrin ketone	11	0.99	9.880	0	106	55	136	9.704	7.94	25	
gamma-BHC	9.4	0.99	9.880	0	95.0	49	135	9.022	3.90	25	
gamma-Chlordane	9.7	0.99	9.880	0	97.8	53	135	9.236	4.50	25	
Heptachlor	9.5	0.99	9.880	0	95.8	47	136	9.095	4.03	25	
Heptachlor epoxide	9.6	0.99	9.880	0	97.1	52	136	9.243	3.75	25	
Methoxychlor	11	0.99	9.880	0	114	52	143	10.20	9.97	25	
Toxaphene	20	20		0	0	33	141	0	0	25	U
Surr: Decachlorobiphenyl	10		9.880		105	55	130		0	25	
Surr: Tetrachloro-m-xylene	8.4		9.880		84.7	42	129		0	25	

Sample ID:	LCS-34997	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73498
Client ID:	LCSS	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/19/2014	SeqNo:	1430748

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	8.6	1.7	8.221	0	104	56	139				
4,4'-DDE	8.3	0.82	8.221	0	100	56	134				
4,4'-DDT	8.7	0.82	8.221	0	106	50	141				
Aldrin	8.1	0.82	8.221	0	98.6	45	136				
alpha-BHC	8.1	0.82	8.221	0	99.0	45	137				
alpha-Chlordane	8.1	0.82	8.221	0	98.3	54	133				
beta-BHC	8.2	0.82	8.221	0	99.5	50	136				
Chlordane (Technical)	17	17		0	0	43	149				U
delta-BHC	7.9	0.82	8.221	0	96.1	47	139				
Dieldrin	8.2	0.82	8.221	0	99.3	56	136				
Endosulfan I	8.1	0.82	8.221	0	98.6	53	132				
Endosulfan II	4.7	0.82	8.221	0	57.3	53	134				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34997

Sample ID:	LCS-34997	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73498
Client ID:	LCSS	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/19/2014	SeqNo:	1430748

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Endosulfan sulfate	4.5	0.82	8.221	0	54.2	55	136				S
Endrin	9.4	0.82	8.221	0	114	57	140				
Endrin aldehyde	3.5	0.82	8.221	0	42.0	35	137				
Endrin ketone	7.4	0.82	8.221	0	89.6	55	136				
gamma-BHC	8.3	0.82	8.221	0	101	49	135				
gamma-Chlordane	8.3	0.82	8.221	0	101	53	135				
Heptachlor	8.3	0.82	8.221	0	101	47	136				
Heptachlor epoxide	8.0	0.82	8.221	0	97.8	52	136				
Methoxychlor	6.5	0.82	8.221	0	78.9	52	143				
Toxaphene	17	17		0	0	33	141				U
Surr: Decachlorobiphenyl	8.9		8.221		108	55	130				
Surr: Tetrachloro-m-xylene	7.6		8.221		92.1	42	129				

Sample ID:	LCS-34997	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73499
Client ID:	LCSS	Batch ID:	34997	TestNo:	SW8081A	SW3550C		Analysis Date:	11/19/2014	SeqNo:	1430793

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	8.6	1.7	8.221	0	105	56	139				
4,4'-DDE	8.4	0.82	8.221	0	102	56	134				
4,4'-DDT	8.8	0.82	8.221	0	107	50	141				
Aldrin	8.1	0.82	8.221	0	98.4	45	136				
alpha-BHC	8.1	0.82	8.221	0	99.1	45	137				
alpha-Chlordane	8.3	0.82	8.221	0	101	54	133				
beta-BHC	8.6	0.82	8.221	0	104	50	136				
Chlordane (Technical)	17	17		0	0	43	149				U
delta-BHC	8.0	0.82	8.221	0	96.9	47	139				
Dieldrin	8.4	0.82	8.221	0	102	56	136				
Endosulfan I	8.3	0.82	8.221	0	101	53	132				
Endosulfan II	4.6	0.82	8.221	0	56.4	53	134				
Endosulfan sulfate	4.5	0.82	8.221	0	55.3	55	136				
Endrin	9.5	0.82	8.221	0	115	57	140				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 34997**

Sample ID:	**LCS-34997**	Samp Type:	**LCS**	Test Code:	**SW_8081S**	Units:	**µg/Kg**	Prep Date:	**11/4/2014**	RunNo:	**73499**
Client ID:	**LCSS**	Batch ID:	**34997**	TestNo:	**SW8081A**	**SW3550C**		Analysis Date:	**11/19/2014**	SeqNo:	**1430793**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Endrin aldehyde	3.2	0.82	8.221	0	38.9	35	137				
Endrin ketone	7.6	0.82	8.221	0	92.4	55	136				
gamma-BHC	8.2	0.82	8.221	0	99.6	49	135				
gamma-Chlordane	8.3	0.82	8.221	0	101	53	135				
Heptachlor	8.4	0.82	8.221	0	102	47	136				
Heptachlor epoxide	8.2	0.82	8.221	0	99.9	52	136				
Methoxychlor	6.6	0.82	8.221	0	80.6	52	143				
Toxaphene	17	17		0	0	33	141				U
Surr: Decachlorobiphenyl	8.7		8.221		106	55	130				
Surr: Tetrachloro-m-xylene	7.3		8.221		89.4	42	129				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34998

Sample ID:	1410A92-003BMS	Samp Type:	MS	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73304
Client ID:	SM-14-10MS1	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425914

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	190	42	212.3	0	88.2	46	129				
Aroclor 1260	190	42	212.3	0	91.6	45	134				
Surr: Tetrachloro-m-xylene	7.9		10.62		74.5	44	130				
Surr: Decachlorobiphenyl	9.8		10.62		92.0	40	135				

Sample ID:	1410A92-003BMSD	Samp Type:	MSD	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73304
Client ID:	SM-14-10SD1	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425915

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	180	42	212.4	0	86.9	46	129	187.2	1.39	25	
Aroclor 1260	190	42	212.4	0	89.4	45	134	194.5	2.37	25	
Surr: Tetrachloro-m-xylene	7.7		10.62		72.7	44	130		0	25	
Surr: Decachlorobiphenyl	9.7		10.62		91.7	40	135		0	25	

Sample ID:	LCS-34998	Samp Type:	LCS	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73304
Client ID:	LCSS	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425942

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	160	32	162.7	0	95.5	46	129				
Aroclor 1260	150	32	162.7	0	93.3	45	134				
Surr: Tetrachloro-m-xylene	6.6		8.133		81.2	44	130				
Surr: Decachlorobiphenyl	8.0		8.133		98.6	40	135				

Sample ID:	MB-34998	Samp Type:	MBLK	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73304
Client ID:	PBS	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425944

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	32	32									U
Aroclor 1221	32	32									U
Aroclor 1232	32	32									U
Aroclor 1242	32	32									U
Aroclor 1248	32	32									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34998

Sample ID:	MB-34998	Samp Type:	MBLK	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73304
Client ID:	PBS	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425944

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1254	32	32									U
Aroclor 1260	32	32									U
Aroclor 1262	32	32									U
Total PCBs	32	32									U
Surr: Tetrachloro-m-xylene	6.9		8.096		84.8	44	130				
Surr: Decachlorobiphenyl	8.0		8.096		98.9	60	125				

Sample ID:	1410A92-003BMS	Samp Type:	MS	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73305
Client ID:	SM-14-10MS1	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425965

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	190	42	212.3	0	89.7	46	129				
Aroclor 1260	200	42	212.3	0	95.0	45	134				
Surr: Tetrachloro-m-xylene	9.2		10.62		86.6	44	130				
Surr: Decachlorobiphenyl	10		10.62		94.7	40	135				

Sample ID:	1410A92-003BMSD	Samp Type:	MSD	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	11/4/2014	RunNo:	73305
Client ID:	SM-14-10SD1	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425966

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	190	42	212.4	0	88.2	46	129	187.2	0.118	25	
Aroclor 1260	200	42	212.4	0	92.7	45	134	194.5	1.17	25	
Surr: Tetrachloro-m-xylene	8.5		10.62		80.3	44	130		0	25	
Surr: Decachlorobiphenyl	10		10.62		94.1	40	135		0	25	

Sample ID:	LCS-34998	Samp Type:	LCS	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73305
Client ID:	LCSS	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425994

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	160	32	162.7	0	96.4	46	129				
Aroclor 1260	160	32	162.7	0	96.5	45	134				
Surr: Tetrachloro-m-xylene	7.2		8.133		88.4	44	130				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 34998

Sample ID:	LCS-34998	Samp Type:	LCS	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73305
Client ID:	LCSS	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425994

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	8.2		8.133		100	40	135				

Sample ID:	MB-34998	Samp Type:	MBLK	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/4/2014	RunNo:	73305
Client ID:	PBS	Batch ID:	34998	TestNo:	SW8082	SW3550C		Analysis Date:	11/7/2014	SeqNo:	1425996

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	32	32									U
Aroclor 1221	32	32									U
Aroclor 1232	32	32									U
Aroclor 1242	32	32									U
Aroclor 1248	32	32									U
Aroclor 1254	32	32									U
Aroclor 1260	32	32									U
Aroclor 1262	32	32									U
Total PCBs	32	32									U
Surr: Tetrachloro-m-xylene	7.3		8.096		89.7	44	130				
Surr: Decachlorobiphenyl	8.0		8.096		99.3	60	125				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35002

Sample ID:	MB-35002	Samp Type:	MBLK	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	11/4/2014	RunNo:	72979	
Client ID:	PBS	Batch ID:	35002	TestNo:	SW9012A			Analysis Date:	11/4/2014	SeqNo:	1419240	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	1.0	1.0									U	

Sample ID:	LCS-35002	Samp Type:	LCS	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	11/4/2014	RunNo:	72979	
Client ID:	LCSS	Batch ID:	35002	TestNo:	SW9012A			Analysis Date:	11/4/2014	SeqNo:	1419241	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	1.6	1.0	2.000	0	78.6	76	120					

Sample ID:	1410A92-001CMS	Samp Type:	MS	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	11/4/2014	RunNo:	72979	
Client ID:	SM-14-07MS1	Batch ID:	35002	TestNo:	SW9012A			Analysis Date:	11/4/2014	SeqNo:	1419261	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	6.4	1.3	6.720	0	95.2	76	120					

Sample ID:	1410A92-001CMSD	Samp Type:	MSD	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	11/4/2014	RunNo:	72979	
Client ID:	SM-14-07SD1	Batch ID:	35002	TestNo:	SW9012A			Analysis Date:	11/4/2014	SeqNo:	1419264	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	7.2	1.3	6.720	0	107	76	120	6.398	12.0	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35024

Sample ID:	MB-35024	Samp Type:	MBLK	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/5/2014	RunNo:	73065	
Client ID:	PBS	Batch ID:	35024	TestNo:	SW9060			Analysis Date:	11/6/2014	SeqNo:	1420667	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	2,000	2,000									U	

Sample ID:	LCS-35024	Samp Type:	LCS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/5/2014	RunNo:	73065	
Client ID:	LCSS	Batch ID:	35024	TestNo:	SW9060			Analysis Date:	11/6/2014	SeqNo:	1420668	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	21,000	2,000	20,000	0	103	80	120					

Sample ID:	1410A92-001CMS	Samp Type:	MS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/5/2014	RunNo:	73065	
Client ID:	SM-14-07MS1	Batch ID:	35024	TestNo:	SW9060			Analysis Date:	11/6/2014	SeqNo:	1420672	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	22,000	1,900	19,370	0	112	70	130					

Sample ID:	1410A92-001CMSD	Samp Type:	MSD	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/5/2014	RunNo:	73065	
Client ID:	SM-14-07SD1	Batch ID:	35024	TestNo:	SW9060			Analysis Date:	11/6/2014	SeqNo:	1420673	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	22,000	2,000	19,570	0	113	70	130	21,660	2.38	25		

Sample ID:	1410A92-011CMS	Samp Type:	MS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/5/2014	RunNo:	73065	
Client ID:	SM-14-18MS1	Batch ID:	35024	TestNo:	SW9060			Analysis Date:	11/6/2014	SeqNo:	1420685	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	30,000	2,500	24,690	2,605	112	70	130					

Sample ID:	1410A92-011CMSD	Samp Type:	MSD	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/5/2014	RunNo:	73065	
Client ID:	SM-14-18SD1	Batch ID:	35024	TestNo:	SW9060			Analysis Date:	11/6/2014	SeqNo:	1420686	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	35,000	2,500	24,670	2,605	130	70	130	30,160	13.7	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35061**

Sample ID:	MB-35061	Samp Type:	MBLK	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	11/7/2014	RunNo:	73558	
Client ID:	PBS	Batch ID:	35061	TestNo:	A4500-P-F			Analysis Date:	11/18/2014	SeqNo:	1431971	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	0.50	0.50									U	

Sample ID:	LCS-35061	Samp Type:	LCS	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	11/7/2014	RunNo:	73558	
Client ID:	LCSS	Batch ID:	35061	TestNo:	A4500-P-F			Analysis Date:	11/18/2014	SeqNo:	1431972	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	8.9	0.49	9.709	0	91.8	80	120					

Sample ID:	1410A40-015CMS	Samp Type:	MS	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	11/7/2014	RunNo:	73558	
Client ID:	ZZZZZZ	Batch ID:	35061	TestNo:	A4500-P-F			Analysis Date:	11/18/2014	SeqNo:	1431974	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	550	24	235.4	225.6	136	75	125				S	

Sample ID:	1410A40-015CMSD	Samp Type:	MSD	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	11/7/2014	RunNo:	73558	
Client ID:	ZZZZZZ	Batch ID:	35061	TestNo:	A4500-P-F			Analysis Date:	11/18/2014	SeqNo:	1431975	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	540	24	235.4	225.6	132	75	125	545.7	1.90	25	S	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35459

Sample ID:	MB-35459	Samp Type:	MBLK	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	12/23/2014	RunNo:	74265	
Client ID:	PBS	Batch ID:	35459	TestNo:	SW6010B	SW3050B		Analysis Date:	12/23/2014	SeqNo:	1444800	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Zinc	5,000	5,000									U	

Sample ID:	LCS-35459	Samp Type:	LCS	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	12/23/2014	RunNo:	74265	
Client ID:	LCSS	Batch ID:	35459	TestNo:	SW6010B	SW3050B		Analysis Date:	12/23/2014	SeqNo:	1444801	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Zinc	28,000	5,000	25,000	0	112	82	113					

Sample ID:	1410A92-008CMS	Samp Type:	MS	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	12/23/2014	RunNo:	74265	
Client ID:	SM-14-15MS1	Batch ID:	35459	TestNo:	SW6010B	SW3050B		Analysis Date:	12/23/2014	SeqNo:	1444803	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Zinc	74,000	6,500	32,390	41,490	101	82	113					

Sample ID:	1410A92-008CMSD	Samp Type:	MSD	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	12/23/2014	RunNo:	74265	
Client ID:	SM-14-15SD1	Batch ID:	35459	TestNo:	SW6010B	SW3050B		Analysis Date:	12/23/2014	SeqNo:	1444804	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Zinc	72,000	6,000	30,030	41,490	102	82	113	74,270	3.13	20		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R72725

Sample ID:	1410A92-001CDUP	Samp Type:	DUP	Test Code:	PMOIST	Units:	wt%	Prep Date:	10/27/2014	RunNo:	72725
Client ID:	SM-14-07LR1	Batch ID:	R72725	TestNo:	D2216			Analysis Date:	10/27/2014	SeqNo:	1414570

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	26	1.0						25.60	0.606	20	

Sample ID:	1410A92-011CDUP	Samp Type:	DUP	Test Code:	PMOIST	Units:	wt%	Prep Date:	10/27/2014	RunNo:	72725
Client ID:	SM-14-18LR1	Batch ID:	R72725	TestNo:	D2216			Analysis Date:	10/27/2014	SeqNo:	1414581

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	27	1.0						26.48	1.98	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R72727

Sample ID:	1410A92-001CDUP	Samp Type:	DUP	Test Code:	SM_2540G	Units:	%	Prep Date:	10/27/2014	RunNo:	72727
Client ID:	SM-14-07LR1	Batch ID:	R72727	TestNo:	A2540G			Analysis Date:	10/27/2014	SeqNo:	1414606

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Solids	74	0.50						74.40	0.209	20	

Sample ID:	1410A92-011CDUP	Samp Type:	DUP	Test Code:	SM_2540G	Units:	%	Prep Date:	10/27/2014	RunNo:	72727
Client ID:	SM-14-18LR1	Batch ID:	R72727	TestNo:	A2540G			Analysis Date:	10/27/2014	SeqNo:	1414617

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Solids	73	0.50						73.53	0.724	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: R72812**

Sample ID:	1410A92-001CDUP	Samp Type:	DUP	Test Code:	SM_2540G	Units:	%	Prep Date:	10/27/2014	RunNo:	72812
Client ID:	SM-14-07LR1	Batch ID:	R72812	TestNo:	A2540G			Analysis Date:	10/27/2014	SeqNo:	1416101

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Volatile Solids	0.27	0.10						0.2562	5.19	20	

Sample ID:	1410A92-011CDUP	Samp Type:	DUP	Test Code:	SM_2540G	Units:	%	Prep Date:	10/27/2014	RunNo:	72812
Client ID:	SM-14-18LR1	Batch ID:	R72812	TestNo:	A2540G			Analysis Date:	10/27/2014	SeqNo:	1416125

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Volatile Solids	0.97	0.10						0.8230	16.8	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R73072

Sample ID:	MB-110614	Samp Type:	MBLK	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	11/6/2014	RunNo:	73072	
Client ID:	PBS	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421037	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	20	20									U	

Sample ID:	LCS-110614	Samp Type:	LCS	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	11/6/2014	RunNo:	73072	
Client ID:	LCSS	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421038	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	100	20	100.0	0	103	80	120					

Sample ID:	1410A92-001CMS	Samp Type:	MS	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	11/6/2014	RunNo:	73072	
Client ID:	SM-14-07MS1	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421041	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	17,000	650	16,150	646.2	101	70	130					

Sample ID:	1410A92-001CMSD	Samp Type:	MSD	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	11/6/2014	RunNo:	73072	
Client ID:	SM-14-07SD1	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421042	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	17,000	650	16,150	646.2	100	70	130	16,900	0.191	25		

Sample ID:	MB-2-110614	Samp Type:	MBLK	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	11/6/2014	RunNo:	73072	
Client ID:	PBS	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421053	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	20	20									U	

Sample ID:	1410A92-011CMS	Samp Type:	MS	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	11/6/2014	RunNo:	73072	
Client ID:	SM-14-18MS1	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421056	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	17,000	620	15,530	1,180	104	70	130					

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R73072

Sample ID:	1410A92-011CMSD	Samp Type:	MSD	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	11/6/2014	RunNo:	73072
Client ID:	SM-14-18SD1	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421057

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Chemical Oxygen Demand	17,000	620	15,530	1,180	102	70	130	17,300	1.99	25	

Sample ID:	MB-3-110614	Samp Type:	MBLK	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	11/6/2014	RunNo:	73072
Client ID:	PBS	Batch ID:	R73072	TestNo:	E410.4			Analysis Date:	11/6/2014	SeqNo:	1421065

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Chemical Oxygen Demand	20	20									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R73091**

Sample ID:	**1410A92-017ADUP**	Samp Type:	**DUP**	Test Code:	**ASTM-D854**	Units:	**lbs/gal**	Prep Date:	**11/6/2014**	RunNo:	**73091**		
Client ID:	**SM-14-24LR1**	Batch ID:	**R73091**	TestNo:	**D854**			Analysis Date:	**11/6/2014**	SeqNo:	**1421465**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Density	29.6							25.05	16.7	20	
Density Temperature	22.0							22.00	0	20	
Specific Gravity at 20 deg. C	3.56							3.008	16.7	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

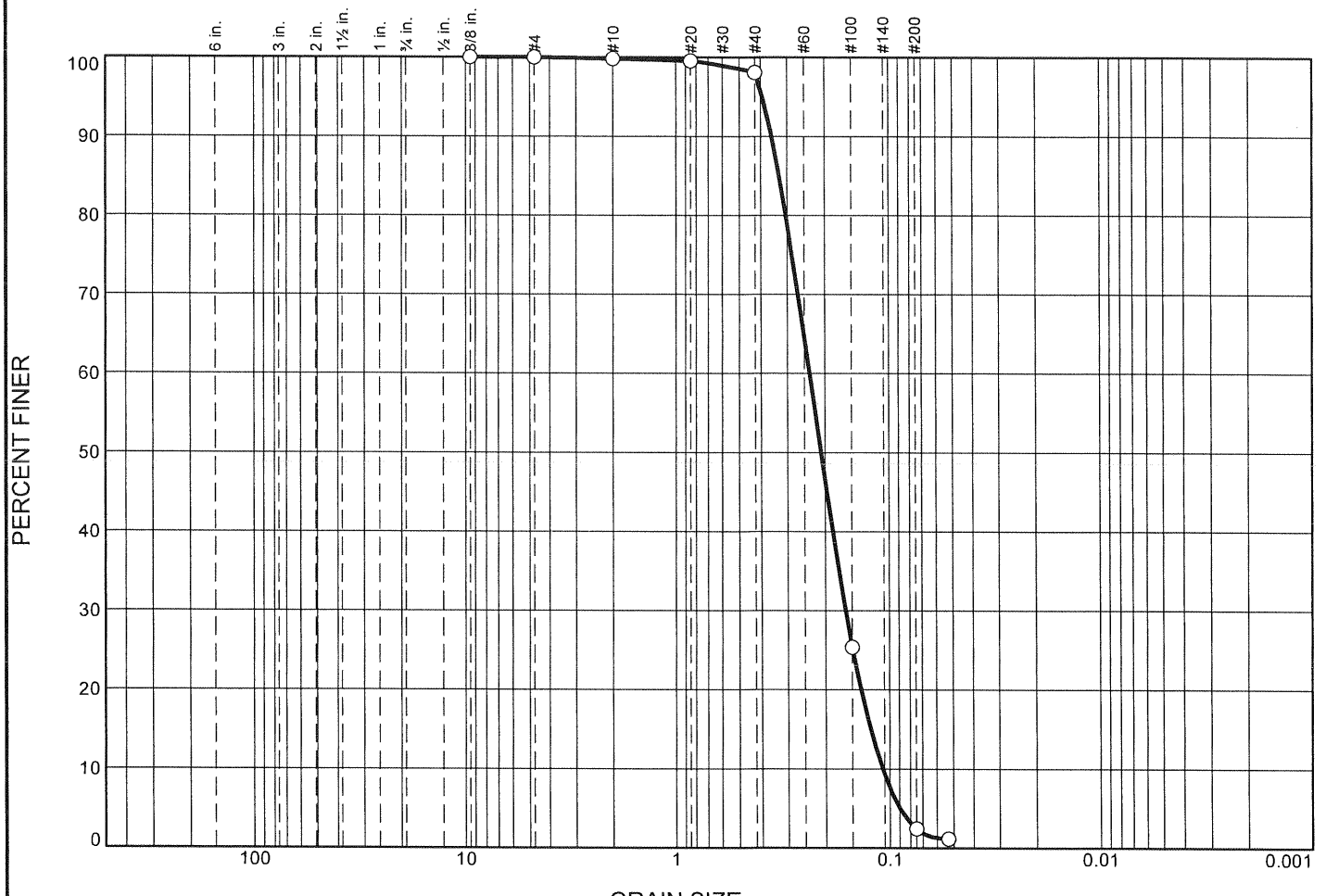
Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R73092

Sample ID:	1410A92-017ADUP	Samp Type:	DUP	Test Code:	ASTM-D422	Units:	% Finer	Prep Date:	11/5/2014	RunNo:	73092
Client ID:	SM-14-24LR1	Batch ID:	R73092	TestNo:	ASTM-D422			Analysis Date:	11/5/2014	SeqNo:	1421485

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
No. 4 (4.75-mm)	100	0.10						100.0	0	25	
No.10 (2-mm)	100	0.10						100.0	0	25	
No.20 (850-um)	99	0.10						98.30	0.305	25	
No.40 (425-um)	89	0.10						88.80	0	25	
No.100 (150-um)	28	0.10						27.90	0.719	25	
No.200 (75-um)	4.2	0.10						3.900	7.41	25	
No. 270 (53-um)	2.1	0.10						1.900	10.0	25	
Non-retained material	2.1	0.10						1.900	10.0	25	
Coarse Gravel	0.10	0.10						0	0	25	U
Fine Gravel	0.10	0.10						0	0	25	U
Coarse Sand	0.10	0.10						0	0	25	U
Medium Sand	11	0.10						11.20	0	25	
Fine Sand	85	0.10						84.90	0.354	25	
Silt	4.2	0.10						3.900	7.41	25	
Clay	0.10	0.10						0	0	25	U

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	1.7	95.7	2.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3283	0.2361	0.2091	0.1609	0.1231	0.1081	1.01	2.18

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-07 **Sample Number:** 1410A92-001A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-07
Sample Number: 1410A92-001A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
111.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.50	455.30	99.8
		#20	474.80	474.50	99.6
		#40	477.90	476.30	98.1
		#100	438.40	357.40	25.4
		#200	340.40	314.80	2.4
		#270	392.30	390.90	1.2

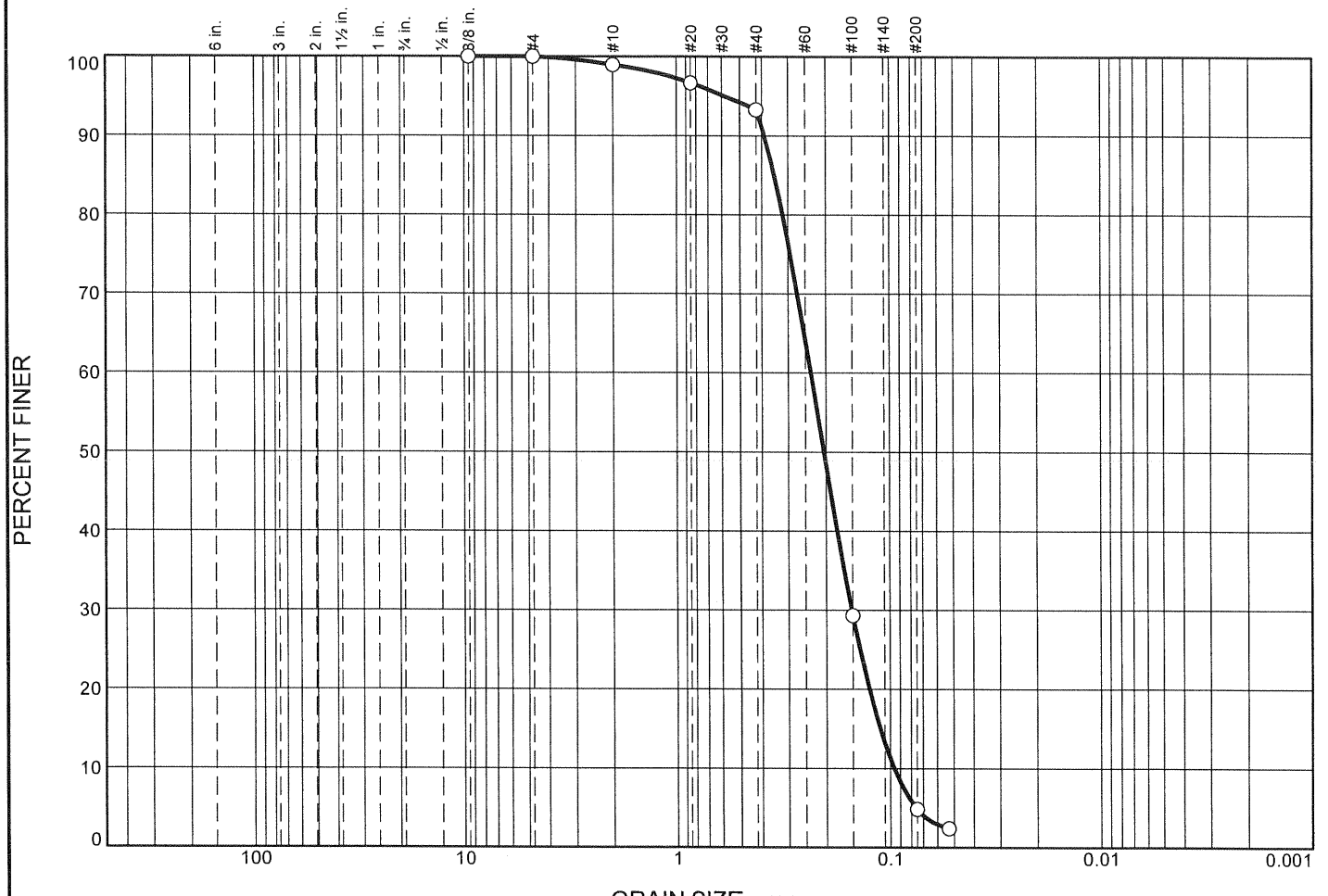
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.2	1.7	95.7	97.6			2.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1081	0.1231	0.1365	0.1609	0.2091	0.2361	0.3052	0.3283	0.3563	0.3928

Fineness Modulus	C_u	C_c
0.97	2.18	1.01

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.0	5.7	88.5	4.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3483	0.2354	0.2048	0.1517	0.1114	0.0959	1.02	2.46

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-08 **Sample Number:** 1410A92-002A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-08
Sample Number: 1410A92-002A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
144.90	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	456.80	455.30	99.0
		#20	477.80	474.50	96.7
		#40	481.20	476.30	93.3
		#100	450.10	357.40	29.3
		#200	350.30	314.80	4.8
		#270	394.40	390.90	2.4

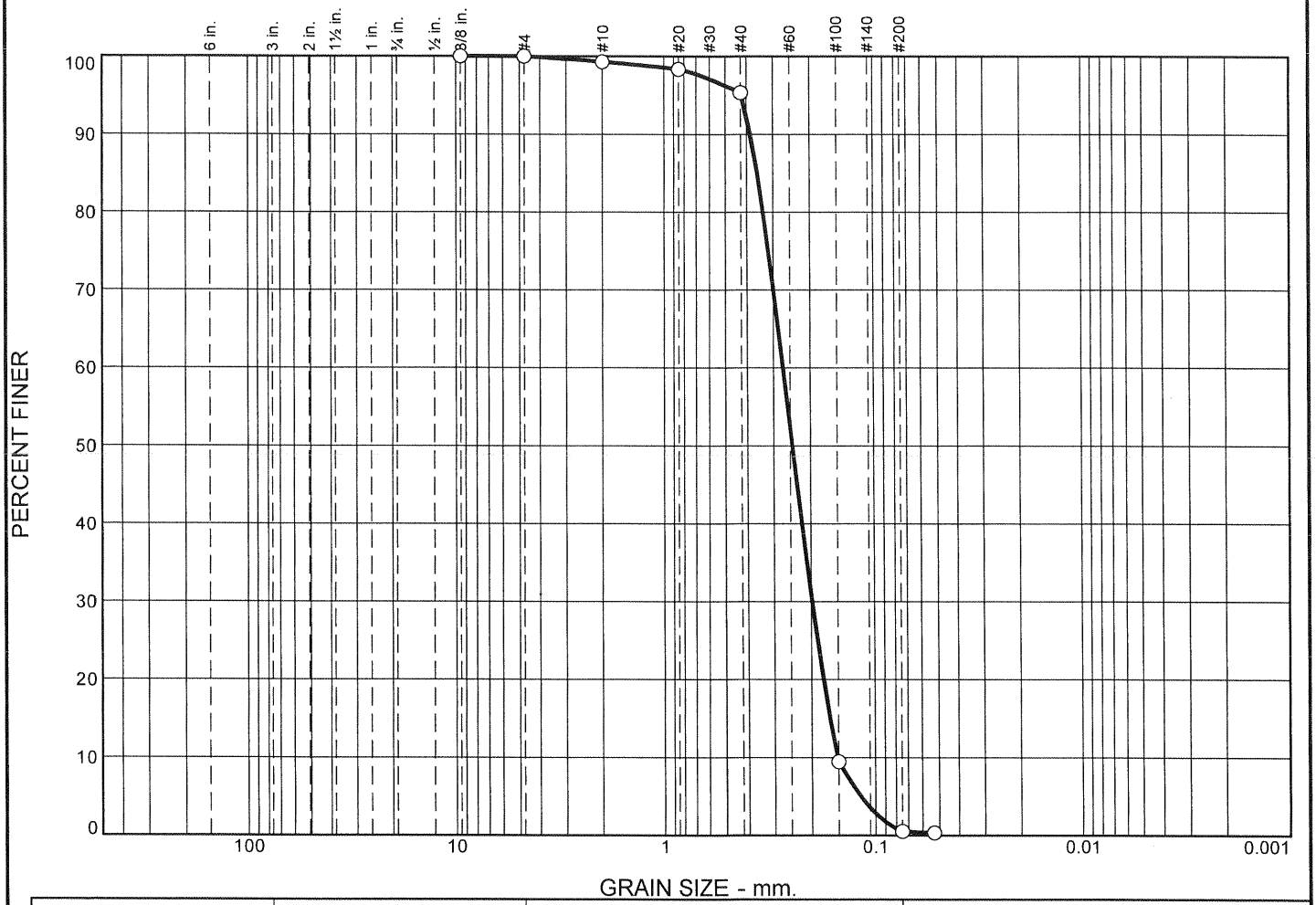
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.0	5.7	88.5	95.2			4.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0959	0.1114	0.1254	0.1517	0.2048	0.2354	0.3182	0.3483	0.3877	0.5808

Fineness Modulus	C_u	C_c
1.02	2.46	1.02

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.7	3.9	94.9	0.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3584	0.2701	0.2441	0.1982	0.1644	0.1515	0.96	1.78

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-10 **Sample Number:** 1410A92-003A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-10
Sample Number: 1410A92-003A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
116.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	456.10	455.30	99.3
		#20	475.60	474.50	98.4
		#40	479.80	476.30	95.4
		#100	457.40	357.40	9.5
		#200	325.20	314.80	0.5
		#270	391.10	390.90	0.3

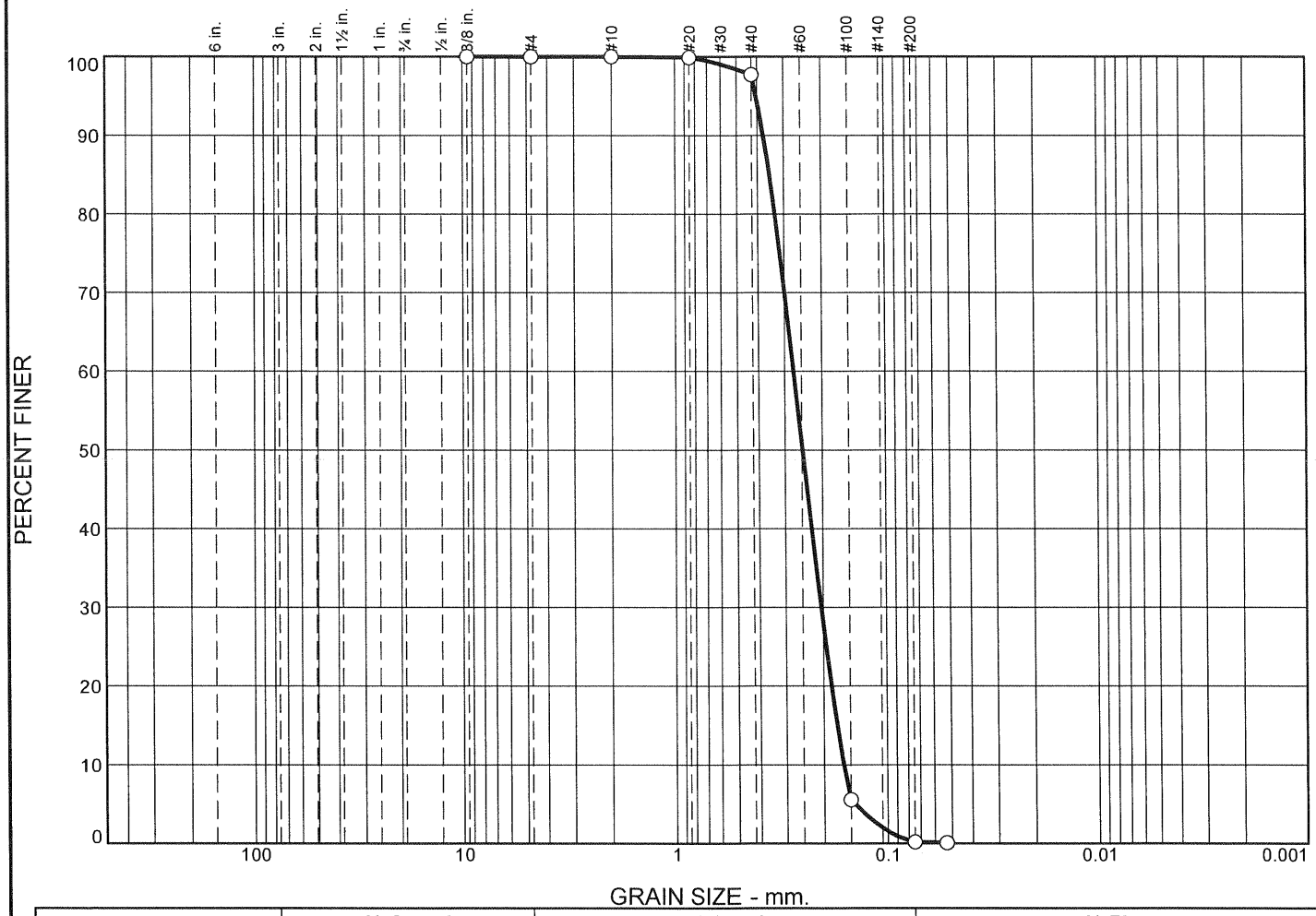
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.7	3.9	94.9	99.5			0.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1515	0.1644	0.1760	0.1982	0.2441	0.2701	0.3362	0.3584	0.3853	0.4217

Fineness Modulus	C_u	C_c
1.25	1.78	0.96

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	2.3	97.5	0.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3518	0.2720	0.2477	0.2046	0.1730	0.1616	0.95	1.68

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-11 **Sample Number:** 1410A92-004A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-11
Sample Number: 1410A92-004A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
114.90	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	474.60	474.50	99.9
		#40	478.80	476.30	97.7
		#100	463.30	357.40	5.6
		#200	321.00	314.80	0.2
		#270	391.00	390.90	0.1

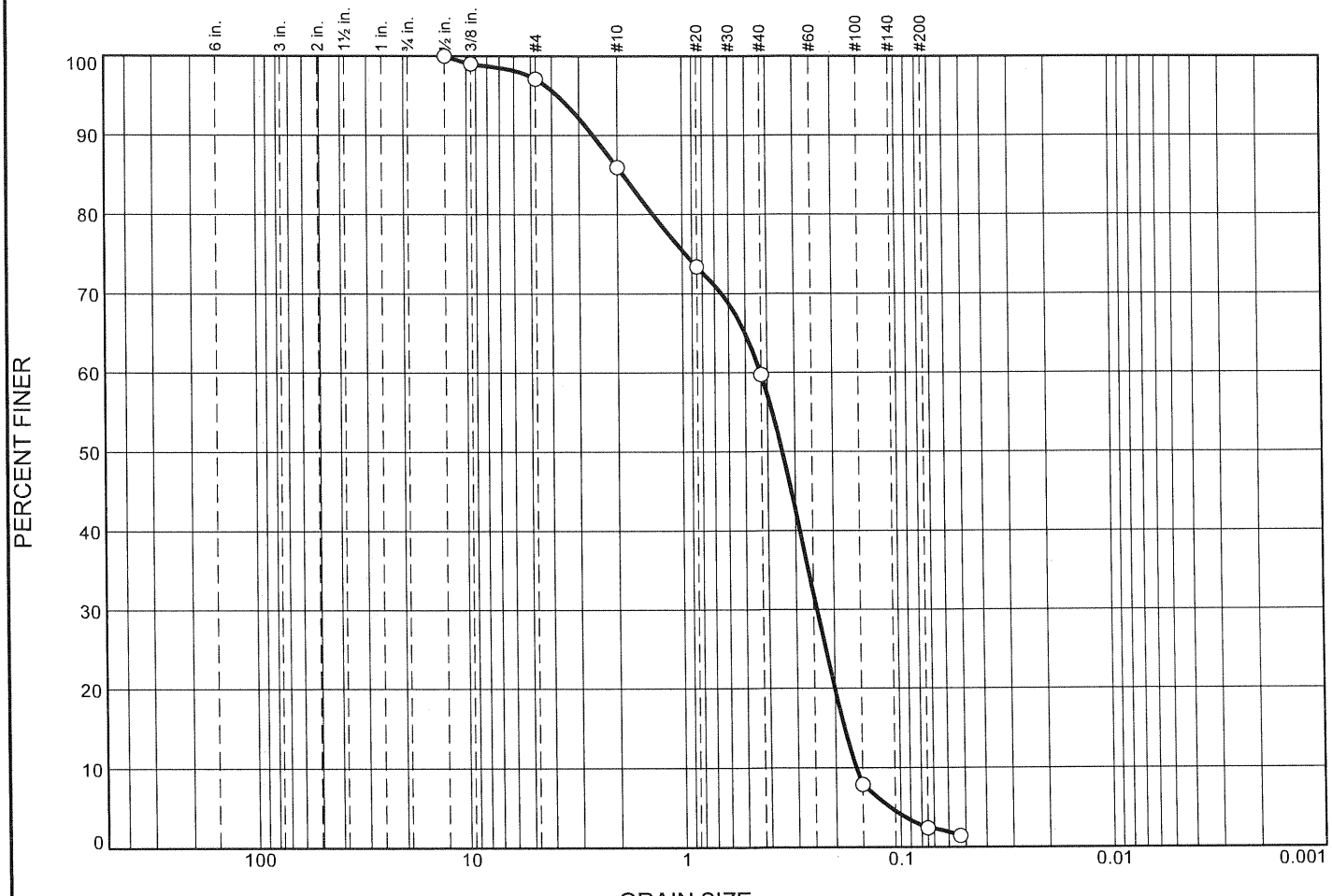
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.3	97.5	99.8			0.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1616	0.1730	0.1838	0.2046	0.2477	0.2720	0.3323	0.3518	0.3750	0.4041

Fineness Modulus	C_u	C_c
1.25	1.68	0.95

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.9	11.2	26.1	57.4	2.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.8846	0.4276	0.3434	0.2411	0.1811	0.1601	0.85	2.67

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-12 **Sample Number:** 1410A92-005A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

2/18/2015

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-12
Sample Number: 1410A92-005A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
103.90	0.00	.5	1.00	1.00	100.0
		.375	543.00	542.00	99.0
		#4	500.20	498.20	97.1
		#10	466.90	455.30	85.9
		#20	487.50	474.50	73.4
		#40	490.50	476.30	59.8
		#100	411.30	357.40	7.9
		#200	320.50	314.80	2.4
		#270	391.90	390.90	1.4

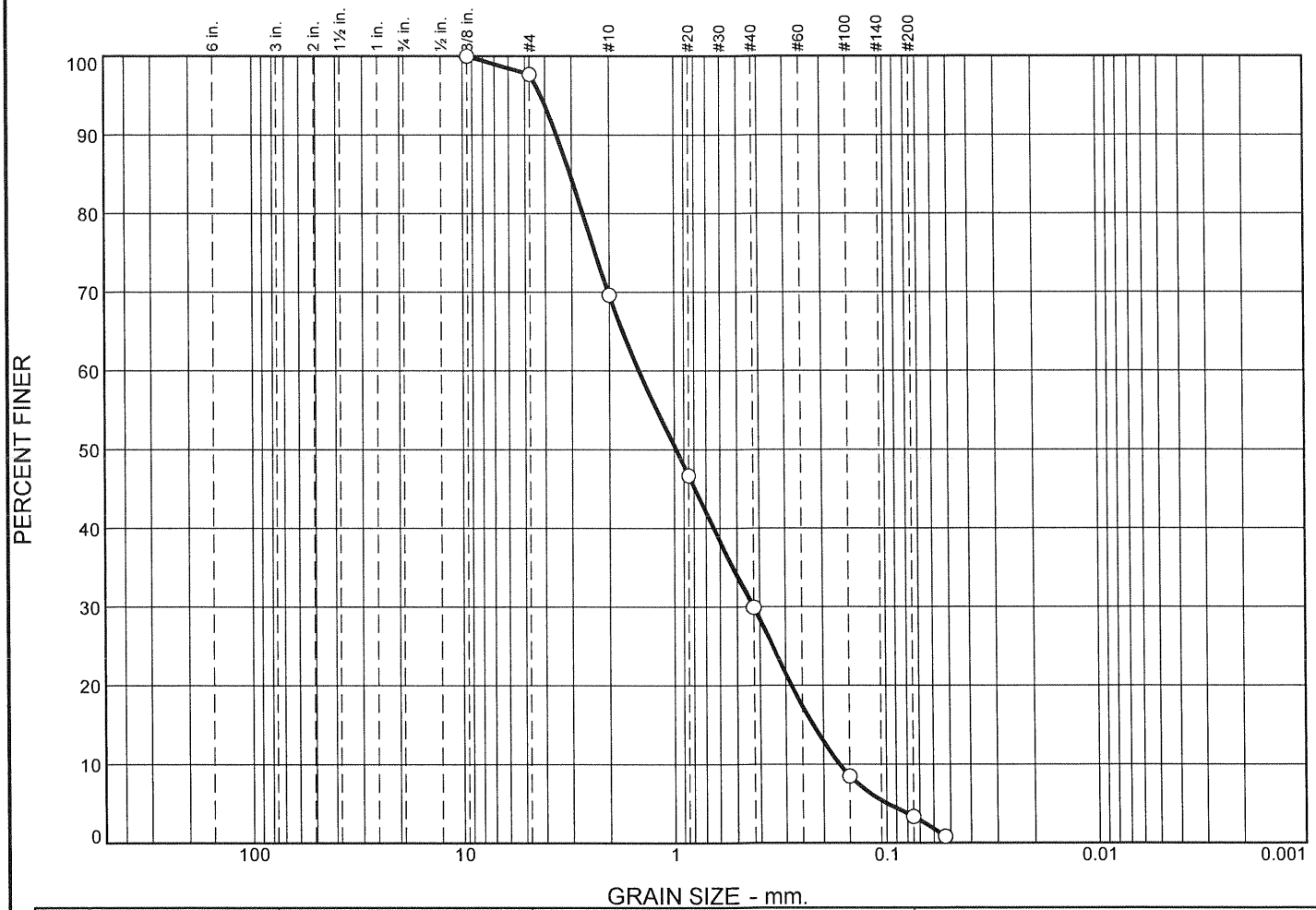
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.9	2.9	11.2	26.1	57.4	94.7			2.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1601	0.1811	0.2008	0.2411	0.3434	0.4276	1.3685	1.8846	2.5884	3.7566

Fineness Modulus	C_u	C_c
2.18	2.67	0.85

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.3	28.1	39.7	26.5	3.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.0482	1.4568	0.9776	0.4259	0.2230	0.1678	0.74	8.68

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-13 **Sample Number:** 1410A92-006A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-13
Sample Number: 1410A92-006A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
95.50	0.00	.375	542.00	542.00	100.0
		#4	500.40	498.20	97.7
		#10	482.10	455.30	69.6
		#20	496.40	474.50	46.7
		#40	492.30	476.30	29.9
		#100	377.90	357.40	8.5
		#200	319.70	314.80	3.4
		#270	393.30	390.90	0.8

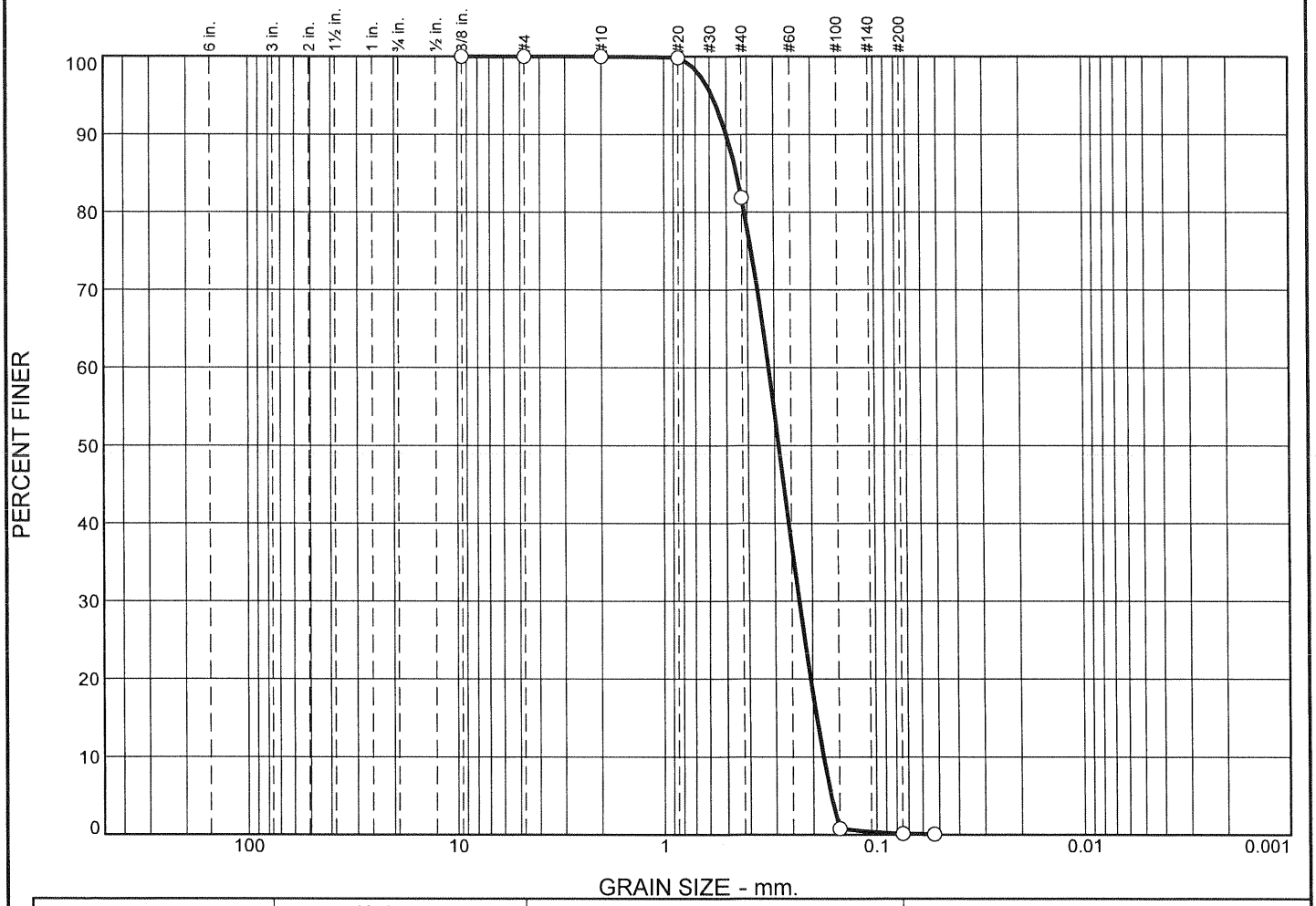
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.3	2.3	28.1	39.7	26.5	94.3			3.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1678	0.2230	0.2811	0.4259	0.9776	1.4568	2.6603	3.0482	3.5276	4.1939

Fineness Modulus	C_u	C_c
3.04	8.68	0.74

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	18.1	81.8	0.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4488	0.3199	0.2866	0.2305	0.1922	0.1789	0.93	1.79

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-14 **Sample Number:** 1410A92-007A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-14
Sample Number: 1410A92-007A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
152.90	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	474.70	474.50	99.9
		#40	503.80	476.30	81.9
		#100	481.40	357.40	0.8
		#200	315.80	314.80	0.1
		#270	391.00	390.90	0.1

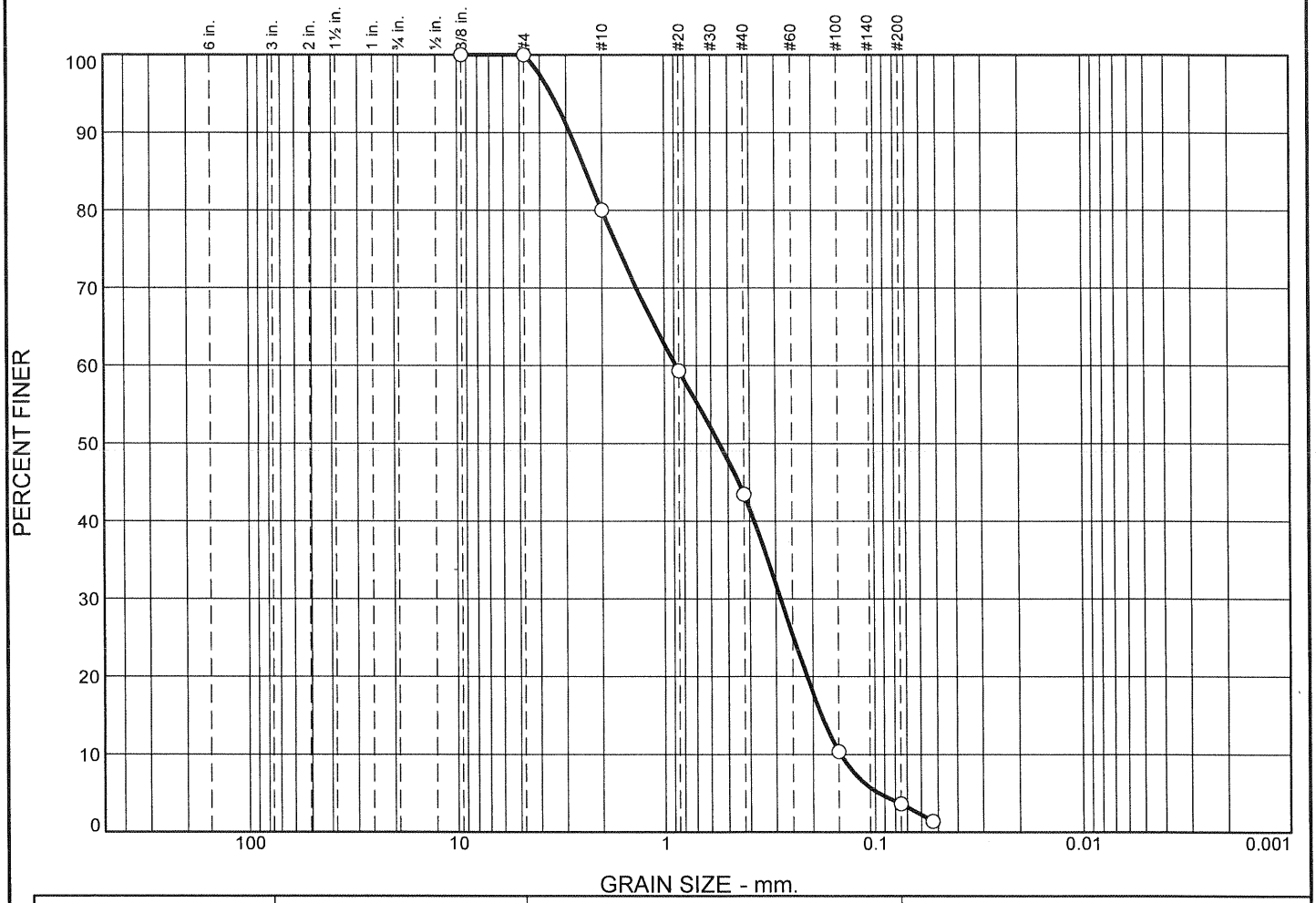
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	18.1	81.8	99.9			0.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1789	0.1922	0.2050	0.2305	0.2866	0.3199	0.4125	0.4488	0.4993	0.5827

Fineness Modulus	C_u	C_c
1.49	1.79	0.93

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	19.9	36.7	39.8	3.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.3885	0.8776	0.5473	0.2848	0.1814	0.1473	0.63	5.96

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-15 **Sample Number:** 1410A92-008A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-15
Sample Number: 1410A92-008A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
115.80	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	478.40	455.30	80.1
		#20	498.50	474.50	59.3
		#40	494.70	476.30	43.4
		#100	395.70	357.40	10.4
		#200	322.60	314.80	3.6
		#270	393.50	390.90	1.4

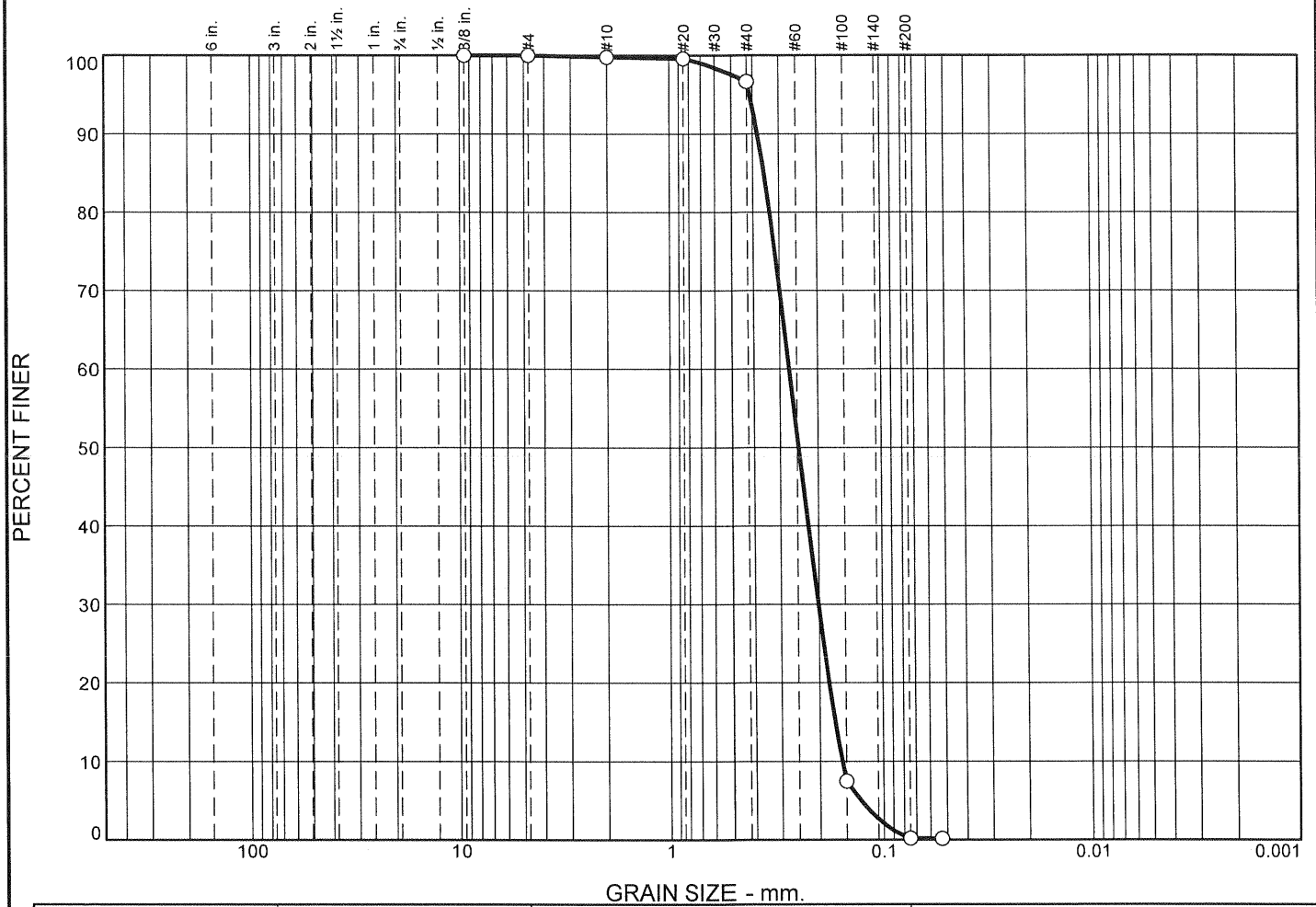
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	19.9	36.7	39.8	96.4			3.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1473	0.1814	0.2136	0.2848	0.5473	0.8776	1.9962	2.3885	2.8696	3.5261

Fineness Modulus	C_u	C_c
2.54	5.96	0.63

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	3.1	96.5	0.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3547	0.2711	0.2460	0.2015	0.1689	0.1568	0.96	1.73

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-16 **Sample Number:** 1410A92-009A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-16
Sample Number: 1410A92-009A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
147.20	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.60	455.30	99.8
		#20	474.80	474.50	99.6
		#40	480.60	476.30	96.7
		#100	488.70	357.40	7.5
		#200	325.50	314.80	0.2
		#270	391.00	390.90	0.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.2	3.1	96.5	99.8			0.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1568	0.1689	0.1801	0.2015	0.2460	0.2711	0.3339	0.3547	0.3794	0.4113

Fineness Modulus	C_u	C_c
1.24	1.73	0.96

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.6	8.5	81.6	8.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3560	0.2074	0.1742	0.1240	0.0919	0.0799	0.93	2.59

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-17 **Sample Number:** 1410A92-010A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-17
Sample Number: 1410A92-010A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
140.70	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	457.50	455.30	98.4
		#20	480.10	474.50	94.5
		#40	482.70	476.30	89.9
		#100	426.00	357.40	41.2
		#200	361.00	314.80	8.3
		#270	396.40	390.90	4.4

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.6	8.5	81.6	91.7			8.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0799	0.0919	0.1027	0.1240	0.1742	0.2074	0.3112	0.3560	0.4268	1.0282

Fineness Modulus	C_u	C_c
0.92	2.59	0.93

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.3	7.0	80.2	11.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3169	0.1770	0.1493	0.1092	0.0825	0.0709	0.95	2.50

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-18 **Sample Number:** 1410A92-011A

Remarks:

○ 11/05/2014

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Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-18
Sample Number: 1410A92-011A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
167.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	457.40	455.30	98.7
		#20	480.20	474.50	95.3
		#40	482.40	476.30	91.7
		#100	426.70	357.40	50.3
		#200	379.70	314.80	11.5
		#270	400.00	390.90	6.1

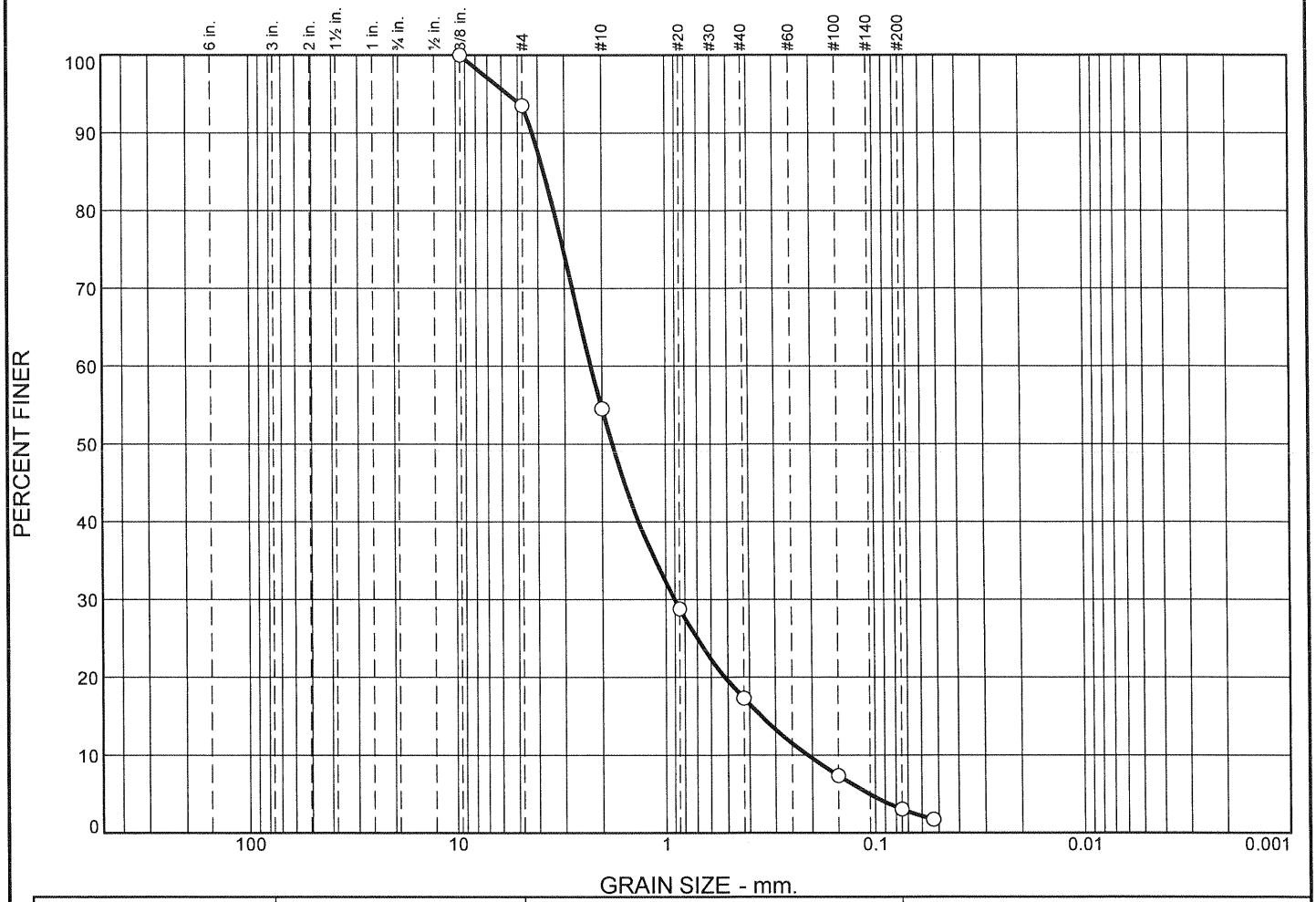
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.3	7.0	80.2	88.5			11.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0709	0.0825	0.0918	0.1092	0.1493	0.1770	0.2728	0.3169	0.3867	0.6745

Fineness Modulus	C_u	C_c
0.76	2.50	0.95

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	6.5	39.0	37.2	14.3	3.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.7550	2.2495	1.7945	0.9010	0.3515	0.2103	1.72	10.70

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-19 **Sample Number:** 1410A92-012A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-19
Sample Number: 1410A92-012A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
46.20	0.00	.375	542.00	542.00	100.0
		#4	501.20	498.20	93.5
		#10	473.30	455.30	54.5
		#20	486.40	474.50	28.8
		#40	481.60	476.30	17.3
		#100	362.00	357.40	7.4
		#200	316.80	314.80	3.0
		#270	391.50	390.90	1.7

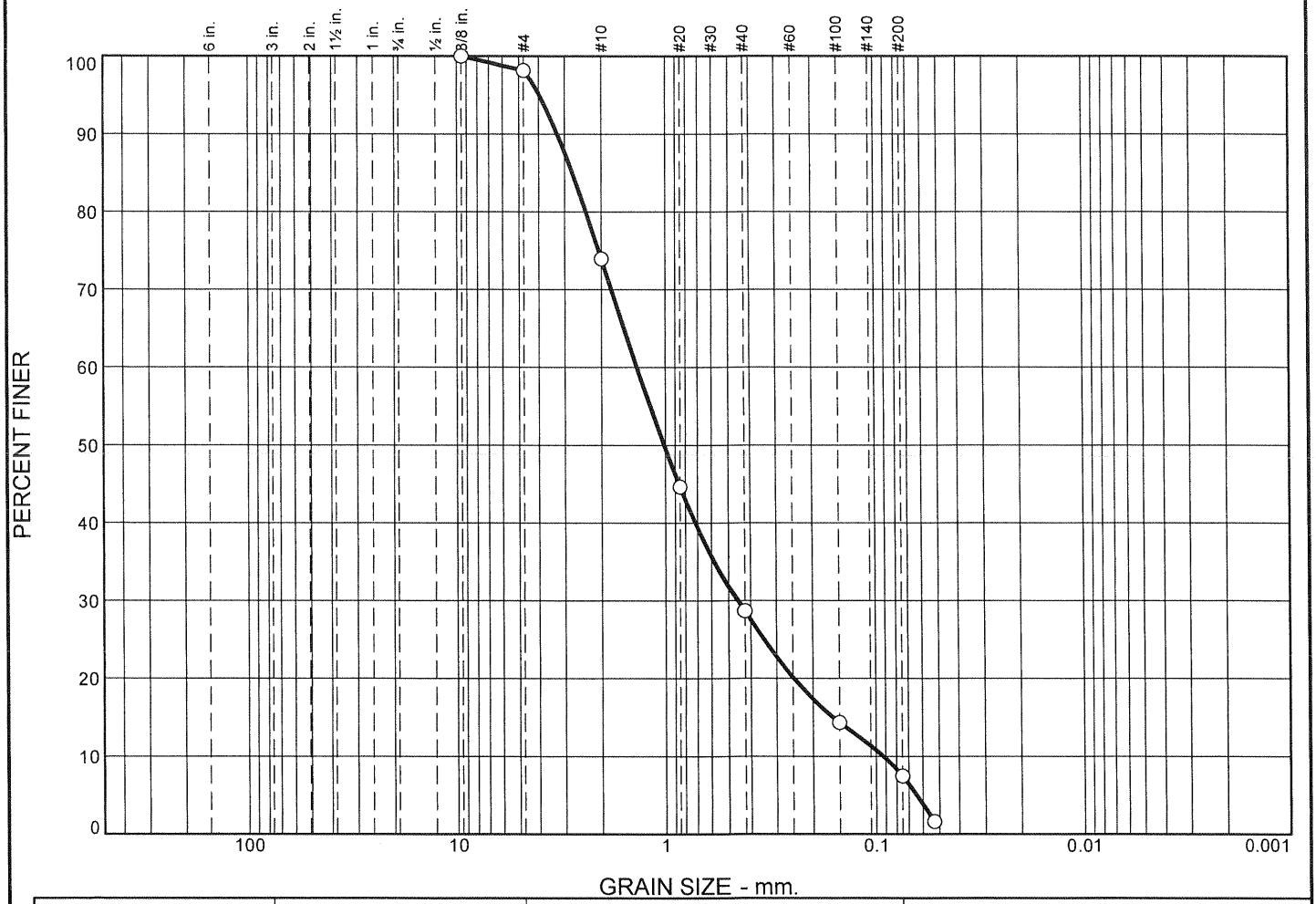
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	6.5	6.5	39.0	37.2	14.3	90.5			3.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2103	0.3515	0.5153	0.9010	1.7945	2.2495	3.3628	3.7550	4.2591	5.5743

Fineness Modulus	C_u	C_c
3.65	10.70	1.72

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.8	24.3	45.2	21.2	7.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.7545	1.3594	1.0128	0.4557	0.1607	0.0923	1.66	14.73

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-20 **Sample Number:** 1410A92-013A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-20
Sample Number: 1410A92-013A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
49.50	0.00	.375	542.00	542.00	100.0
		#4	499.10	498.20	98.2
		#10	467.30	455.30	73.9
		#20	489.00	474.50	44.6
		#40	484.20	476.30	28.7
		#100	364.50	357.40	14.3
		#200	318.20	314.80	7.5
		#270	393.80	390.90	1.6

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.8	1.8	24.3	45.2	21.2	90.7			7.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0923	0.1607	0.2468	0.4557	1.0128	1.3594	2.3727	2.7545	3.2487	3.9686

Fineness Modulus	C_u	C_c
2.94	14.73	1.66

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.0	22.4	39.5	31.7	4.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.7367	1.1083	0.7345	0.3406	0.1887	0.1426	0.73	7.77

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-21 **Sample Number:** 1410A92-014A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-21
Sample Number: 1410A92-014A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
54.90	0.00	.375	542.00	542.00	100.0
		#4	499.30	498.20	98.0
		#10	467.60	455.30	75.6
		#20	486.60	474.50	53.6
		#40	485.90	476.30	36.1
		#100	371.30	357.40	10.7
		#200	318.30	314.80	4.4
		#270	392.20	390.90	2.0

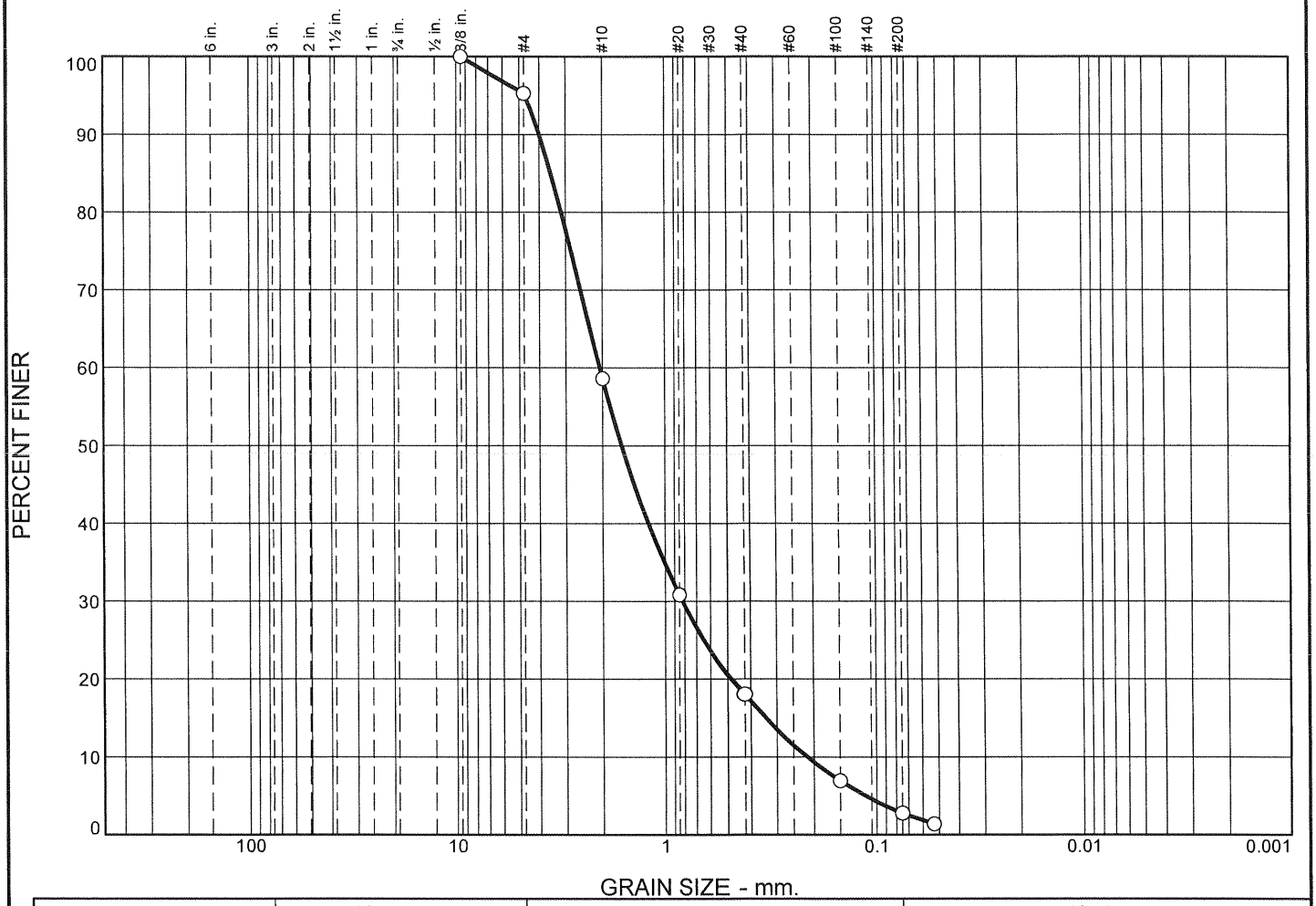
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.0	2.0	22.4	39.5	31.7	93.6			4.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1426	0.1887	0.2341	0.3406	0.7345	1.1083	2.3182	2.7367	3.2616	4.0086

Fineness Modulus	C_u	C_c
2.78	7.77	0.73

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.7	36.7	40.5	15.3	2.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.5244	2.0633	1.6195	0.8196	0.3393	0.2152	1.51	9.59

Material Description	USCS	AASHTO
○		

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-22 **Sample Number:** 1410A92-015A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-22
Sample Number: 1410A92-015A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
36.00	0.00	.375	542.00	542.00	100.0
		#4	499.90	498.20	95.3
		#10	468.50	455.30	58.6
		#20	484.50	474.50	30.8
		#40	480.90	476.30	18.1
		#100	361.40	357.40	6.9
		#200	316.30	314.80	2.8
		#270	391.40	390.90	1.4

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.7	4.7	36.7	40.5	15.3	92.5			2.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2152	0.3393	0.4833	0.8196	1.6195	2.0633	3.1473	3.5244	4.0016	4.6979

Fineness Modulus	C_u	C_c
3.55	9.59	1.51

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	2.1	13.9	77.5	6.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4404	0.2548	0.2159	0.1527	0.1074	0.0902	1.02	2.83

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-23 **Sample Number:** 1410A92-016A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-23
Sample Number: 1410A92-016A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
66.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	456.70	455.30	97.9
		#20	479.40	474.50	90.5
		#40	480.60	476.30	84.0
		#100	393.90	357.40	29.1
		#200	329.80	314.80	6.5
		#270	392.80	390.90	3.6

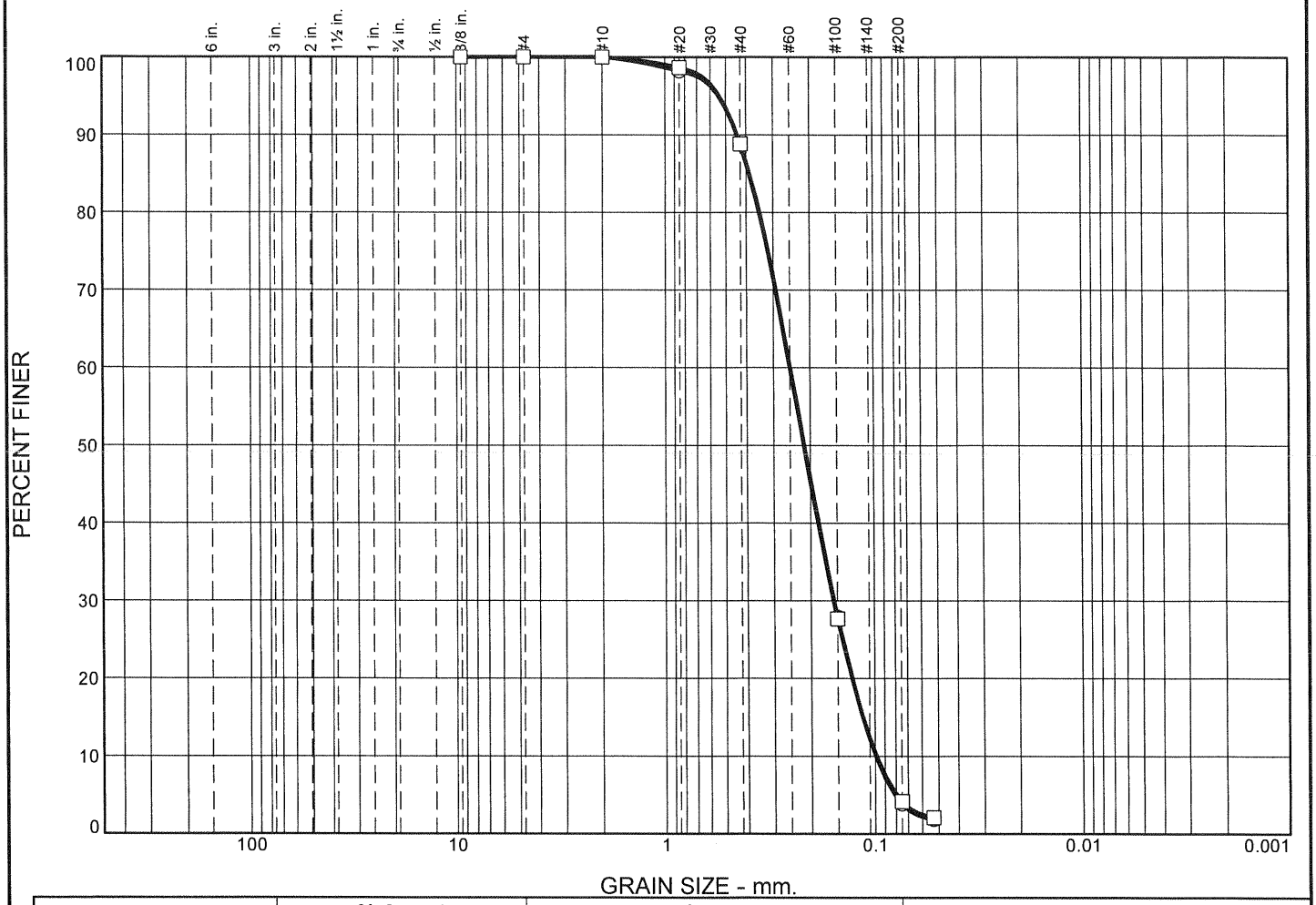
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	2.1	13.9	77.5	93.5			6.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0902	0.1074	0.1230	0.1527	0.2159	0.2548	0.3775	0.4404	0.7013	1.4599

Fineness Modulus	C_u	C_c
1.21	2.83	1.02

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	11.2	84.9	3.9	
□	0.0	0.0	0.0	0.0	11.2	84.6	4.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3864	0.2490	0.2140	0.1557	0.1143	0.0991	0.98	2.51
□			0.3868	0.2501	0.2150	0.1564	0.1142	0.0985	0.99	2.54

	Material Description	USCS	AASHTO
○			
□			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-24 **Sample Number:** 1410A92-017A

□ **Source of Sample:** SM-14-24 **Sample Number:** 1410A92-017A dup

Remarks:

○ 11/05/2014

□ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-24
Sample Number: 1410A92-017A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
80.30	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	475.90	474.50	98.3
		#40	483.90	476.30	88.8
		#100	406.30	357.40	27.9
		#200	334.10	314.80	3.9
		#270	392.50	390.90	1.9

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	11.2	84.9	96.1			3.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0991	0.1143	0.1284	0.1557	0.2140	0.2490	0.3480	0.3864	0.4404	0.5433

Fineness Modulus	C_u	C_c
1.05	2.51	0.98

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-24
Sample Number: 1410A92-017A dup
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
81.30	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	475.60	474.50	98.6
		#40	484.30	476.30	88.8
		#100	407.10	357.40	27.7
		#200	333.90	314.80	4.2
		#270	392.60	390.90	2.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	11.2	84.6	95.8			4.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0985	0.1142	0.1287	0.1564	0.2150	0.2501	0.3488	0.3868	0.4399	0.5371

Fineness Modulus	C_u	C_c
1.05	2.54	0.99

RTI Laboratories - Definitions and Acronyms

WO#: 1410A92

Date Reported: 2/22/2016
Revision v5

DEFINITIONS:

DF: Dilution factor; the dilution factor applied to the prepared sample.

DL: Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.

DUP: Duplicate; aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently, used to calculate Precision (%RPD).

LCS: Laboratory Control Sample; prepared by adding a known amount of target analytes to a specified amount of clean matrix and prepared with the batch of samples, used to calculate Accuracy (%REC).

LCSD: A duplicate LCS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

LOD: Limit of Detection; a laboratory verified concentration that can be detected at three times greater than the noise level. This concentration is equal to or greater than the DL.

LOQ: Limit of Quantitation; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below the LOQ are reported with a "J" qualifier.

MBLK: Method Blank; a sample of similar matrix that does not contain target analytes or interference that may impact the analytical results and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedure, used to assess and verify that the analytical process is free of contamination.

Mg/Kg or mg/L: Units of part per million (PPM) – milligram per Kilogram (W/W) or milligram per Liter (W/V).

MS: Matrix Spike; prepared by adding a known amount of target analytes to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available, used to calculate Accuracy (%REC)

MSD: A duplicate MS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

% REC: Percent Recovery of a known spike (SPK); a measure of accuracy expressed as a percentage of a measured (recovered) concentration compared to the known concentration (SPK) added to the sample. This is compared to the Low Limit and High Limit.

% RPD: Relative Percent Difference; a measure of precision expressed as a percentage of the difference between two duplicates relative to the average concentration. This is compared to the RPD Limit.

Qual: Qualifier that applies to the analyte reported

SPK: Spike; used in the QC section for both SPK Value and SPK Ref Val

Ug/Kg or ug/L: Units of part per billion (PPB) – microgram per Kilogram (W/W) or microgram per Liter (W/V).

QUALIFIERS:

*: Reported value exceeds the maximum allowed concentration by regulation or permit.

B: Analyte detected in the associated Method Blank at a concentration greater than 1/2 the LOQ

G: ICB/CCB result is greater than the MDL

H: Holding time for preparation or analysis has been exceeded

J: Estimated result. Greater uncertainty is associated with this result and data reported is estimated.

M: Manual Integration used to determine area response

P: Second column RPD exceeds 40%

Q: % REC exceeded control limits. When applied to sample analytes - denotes an associated LCS recovery that exceeded control limits.

R: % RPD exceeds control limits

T: MBLK result is greater than 1/2 of the LOQ

U: The analyte concentration is less than the DL. The result is reported as less than the LOD

X: Matrix spike recovery for the noted analyte exceeded control limits. Applied to the MS/MSD parent sample.

Y: Percent Difference/Drift in the associated CCV exceeded acceptance criteria.

Z: Percent Difference/Drift in the associated ICV exceeded acceptance criteria.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 2

RTI LABORATORIES, INC.

1410 A92

NELAC Cert #000975 | MBE Cert #M-4150-2-424 | 8(a) / SDB

ENVIRONMENTAL SCIENCES LAB
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Phone (734) 422-8000
Fax (734) 422-5342
www.rtilab.com

Please include Email Address of Report Recipient !!!

SUBMITTING COMPANY: RTI	REPORT TO: Ms. Pam Horner	BILL TO:	P.O. #
PROJECT NAME: St Mary's River	PROJECT #: DC04	QUOTE #: 13453	COMPANY: USACE - Detroit
SAMPLING LOCATION (STATE or COUNTRY): St Claire MI	ADDRESS: 477 Michigan Ave.	ADDRESS:	
SPECIAL INSTRUCTIONS / COMMENTS:	CITY, STATE, ZIP: Detoit ,MI	CITY, STATE, ZIP:	
	PHONE: 313-226-6748	EMAIL (OR FAX IF NO EMAIL AVAILABLE):	
SAMPLER'S PRINTED NAME: Fred Hotash, Gerard LaLonde, Andrew Mrazik	SAMPLER'S SIGNATURE:		

ANALYTICAL PARAMETERS

ITEM NUMBER	SAMPLE I.D.	DATE SAMPLED	TIME SAMPLED (24-hour format)	MATRIX CODE (see codes below)	NBR OF BOTTLES	NBR OF CONTAINERS AND PRESERVATIVES: NONE	HCl	HNO3	H2SO4	NaOH	Methanol	OTHER	PESTS, PCBs, PAH	TOC, COD, OIL & GREASE	% VOLATILE RESIDUE/BOD/Cyanide	GRAIN SIZE (WET SIEVE)	METALS, %MOISTURE/ NUTS	%RESIDUE/ PLACE DENSITY	SPECIFIC GRAVITY				Comments
1	SM-14-07	10/22/14	1341	S	3	3							X	X	X	X	X	X	X				
2	SM-14-08	10/22/14	1315	S	3	3							X	X	X	X	X	X	X				
3	SM-14-10	10/22/14	1234	S	3	3							X	X	X	X	X	X	X				
4	SM-14-11	10/22/14	1210	S	3	3							X	X	X	X	X	X	X				
5	SM-14-12	10/22/14	1140	S	3	3							X	X	X	X	X	X	X				
6	SM-14-13	10/21/14	1627	S	3	3							X	X	X	X	X	X	X				
7	SM-14-14	10/22/14	1055	S	3	3							X	X	X	X	X	X	X				
8	SM-14-15	10/21/14	1835	S	3	3							X	X	X	X	X	X	X				
9	SM-14-16	10/21/14	1807	S	3	3							X	X	X	X	X	X	X				
10	SM-14-17	10/21/14	1733	S	3	3							X	X	X	X	X	X	X				
11	SM-14-18	10/21/14	1705	S	3	3							X	X	X	X	X	X	X				
12	SM-14-19	10/21/14	1258	S	3	3							X	X	X	X	X	X	X				

Relinquished By	Date	Time	Received By	Date	Time
Fred Hotash TO RTI COOLER	10/23/14	1100	STORAGE	10/23/14	1100
RTI Cooler	10/24/14	10:00	Ordo Flores	10/24/14	10:00

TURNAROUND DESIRED: Standard ☐ RUSH: Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

ALL REPORTING IS VIA THE RTI "FLASHPOINT" ONLINE SYSTEM UNLESS OTHERWISE SPECIFIED

FOR LAB USE ONLY

Temp of samples: 5.2 °C On Wet Ice ? YES

Comments:

Distribution: White and Yellow - Lab, Pink - Field

See reverse side for Laboratory Terms and Conditions of Service

MATRIX CODES: A = AIR; DW = DRINKING WATER; GW = GROUNDWATER; L = LIQUID; M = MISCELLANEOUS; O = OIL; S = SOIL; SO = SOLID; SL = SLUDGE; SV = SOLVENT WASTE; W = WASTE; WP = WIPE; WW = WASTE WATER

CHAIN OF CUSTODY RECORD

RTI LABORATORIES, INC.

1410 A92

PAGE 2 OF 2

NELAC Cert #000973 | MBE Cert #R-8150-2-424 | SBA 8(a) / SDB

ENVIRONMENTAL SCIENCES LAB
RTI LABORATORIES, INC.
31628 Glendale Street
Livonia, MI 48150-1827
Phone (734) 422-8000
Fax (734) 422-5342
www.rtilab.com

Please Include Email Address of Report Recipient !!!

SUBMITTING COMPANY: RTI		REPORT TO: Ms. Pam Horner	BILL TO: P.O. #
PROJECT NAME: St Mary's River	PROJECT #: DC04 / QUOTE #: 13453	COMPANY: USACE - Detroit	COMPANY
SAMPLING LOCATION (STATE or COUNTRY): St Claire MI		ADDRESS: 477 Michigan Ave.	ADDRESS
SPECIAL INSTRUCTIONS / COMMENTS		CITY, STATE, ZIP: Detoit ,MI	CITY, STATE, ZIP
		PHONE: 313-226-6748	EMAIL (OR FAX IF NO EMAIL AVAILABLE)
SAMPLER'S PRINTED NAME: Fred Holtash, Gerard LaLonde, Andrew Mrazik	SAMPLER'S SIGNATURE		

ANALYTICAL PARAMETERS

ITEM NUMBER	SAMPLE I.D.	DATE SAMPLED	TIME SAMPLED (24-hour format)	MATRIX CODE (see codes below)	NBR OF BOTTLES	NBR OF CONTAINERS AND PRESERVATIVES: NONE	HCL	HNO_3	H_2SO_4	NaOH	Methanol	OTHER	PESTS, PCBs, PAH	TOC, COD, OIL & GREASE	% VOLATILE RESIDUE (SM-2540G), Cyanide	GRAIN SIZE (WET SIEVE)	METALS, %MOISTURE/ NUTS	%RESIDUE IN PLACE DENSITY	SPECIFIC GRAVITY				Comments
13	SM-14-20	10/21/14	1227	s	3	3							X	X	X	X	X	X	X				
14	SM-14-21	10/21/14	1158	s	3	3							X	X	X	X	X	X	X				
15	SM-14-22	10/21/14	1112	s	3	3							X	X	X	X	X	X	X				
16	SM-14-23	10/21/14	1040	s	3	3							X	X	X	X	X	X	X				
17	SM-14-24	10/21/14	1013	s	3	3							X	X	X	X	X	X	X				
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Relinquished By	Date	Time	Received By	Date	Time
Fred Holtash TO RTI COOLER	10/23/14	1100	STORAGE	10/23/14	1100
RTI Cooler	10/24/14	10:00	[signature]	10-24-14	10:00

REPORT TRANSMITTAL DESIRED:
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE
ALL REPORTING IS VIA THE RTI "FLASHPOINT" ONLINE SYSTEM UNLESS OTHERWISE SPECIFIED

FOR LAB USE ONLY
Temp of samples 4.8 °C On Wet Ice ? YES
Comments

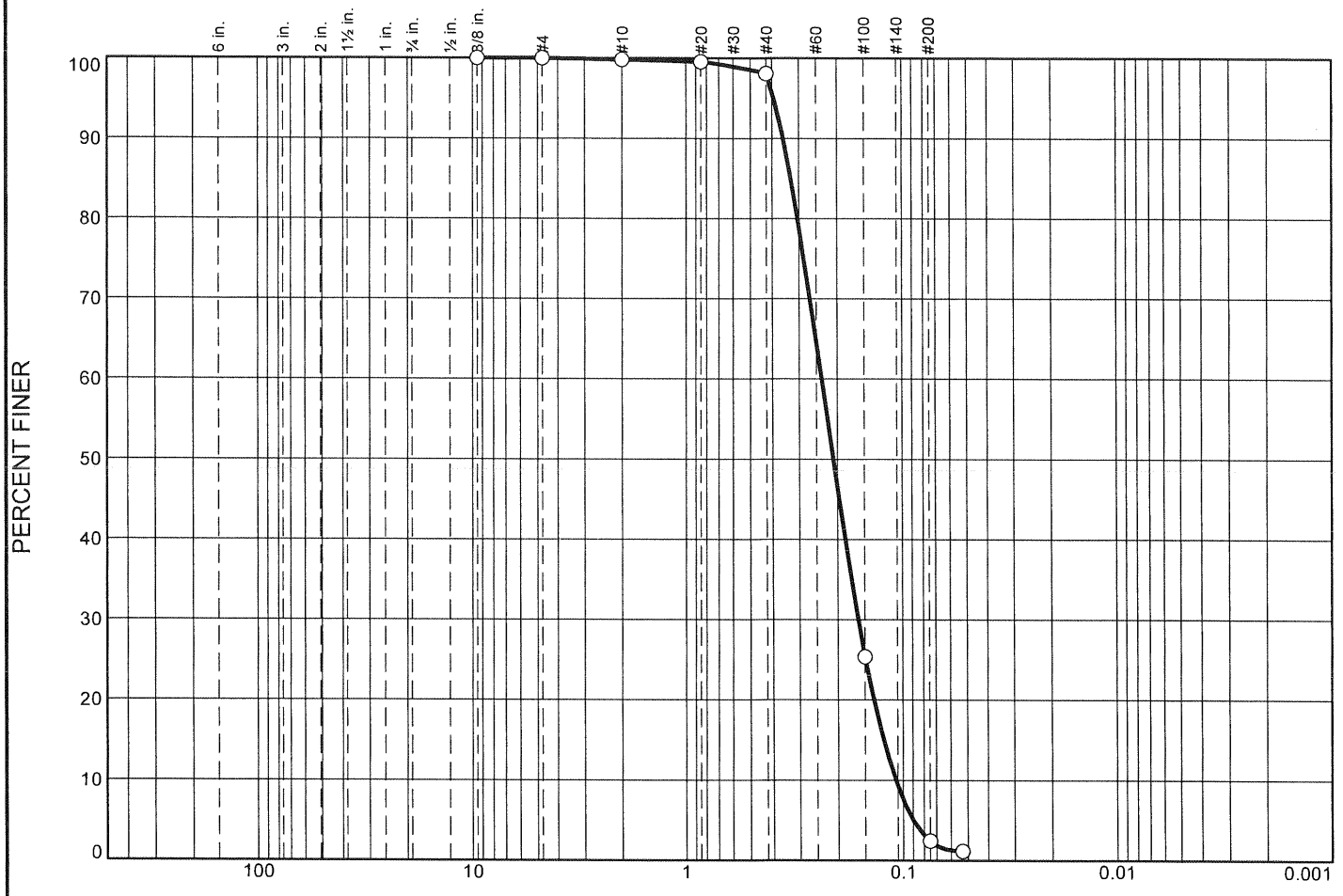
TURNAROUND DESIRED: Standard ☐ RUSH: Next BD ☐ 2nd BD ☐ 3rd BD ☐
Note: RUSH requests will incur surcharges!

Distribution: White and Yellow - Lab, Pink - Field

See reverse side for Laboratory Terms and Conditions of Service

MATRIX CODES: A = AIR, BD = BOLID, DW = DRINKING WATER, BL = BLUDGE, GW = GROUNDWATER, SV = SOLVENT WASTE, L = LIQUID, W = WASTE, M = MISCELLANEOUS, WP = WIPE, O = OIL, WW = WASTE WATER, S = SOIL

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	1.7	95.7	2.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3283	0.2361	0.2091	0.1609	0.1231	0.1081	1.01	2.18

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-07 **Sample Number:** 1410A92-001A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-07
Sample Number: 1410A92-001A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
111.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.50	455.30	99.8
		#20	474.80	474.50	99.6
		#40	477.90	476.30	98.1
		#100	438.40	357.40	25.4
		#200	340.40	314.80	2.4
		#270	392.30	390.90	1.2

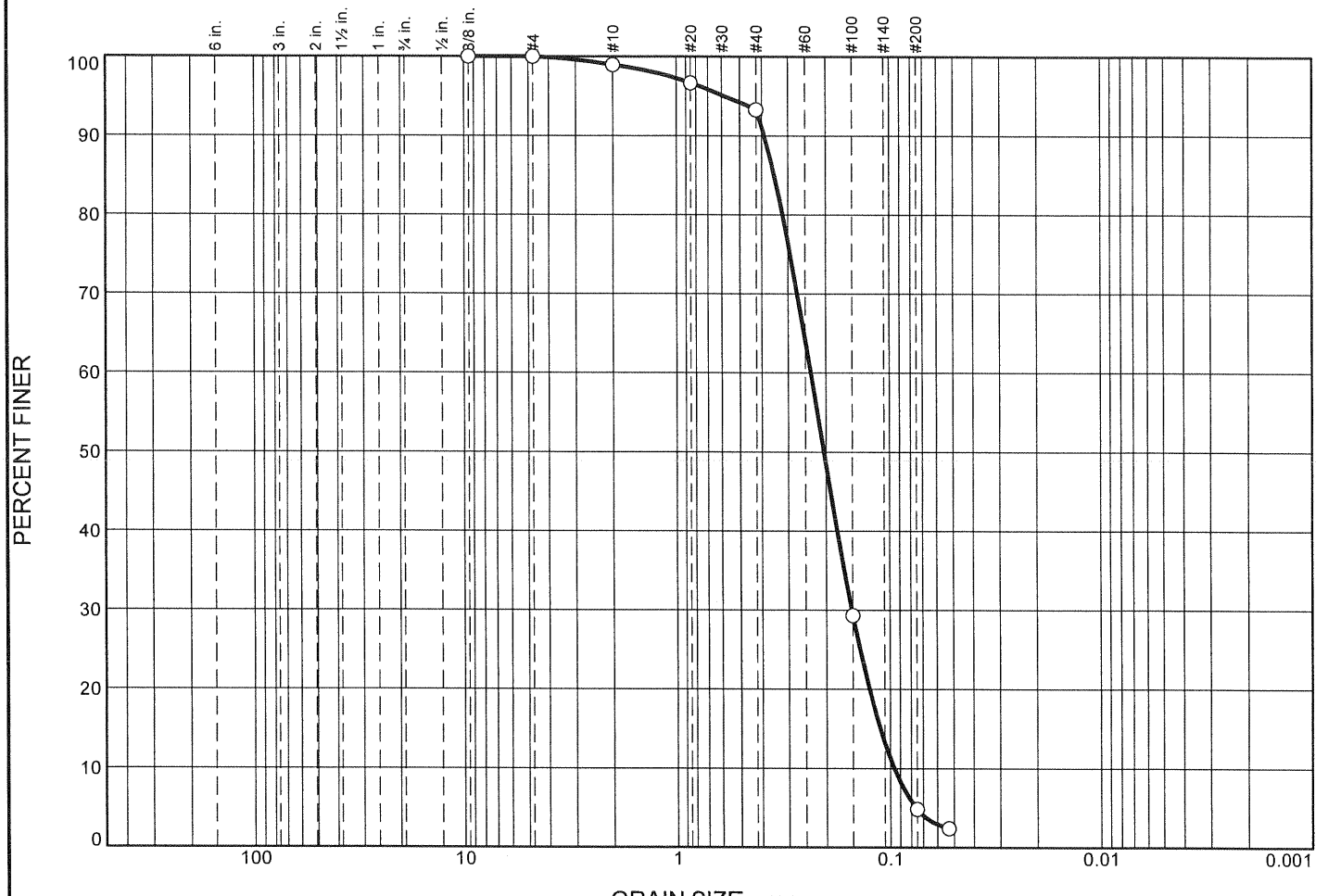
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.2	1.7	95.7	97.6			2.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1081	0.1231	0.1365	0.1609	0.2091	0.2361	0.3052	0.3283	0.3563	0.3928

Fineness Modulus	C_u	C_c
0.97	2.18	1.01

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.0	5.7	88.5	4.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3483	0.2354	0.2048	0.1517	0.1114	0.0959	1.02	2.46

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-08 **Sample Number:** 1410A92-002A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-08
Sample Number: 1410A92-002A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
144.90	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	456.80	455.30	99.0
		#20	477.80	474.50	96.7
		#40	481.20	476.30	93.3
		#100	450.10	357.40	29.3
		#200	350.30	314.80	4.8
		#270	394.40	390.90	2.4

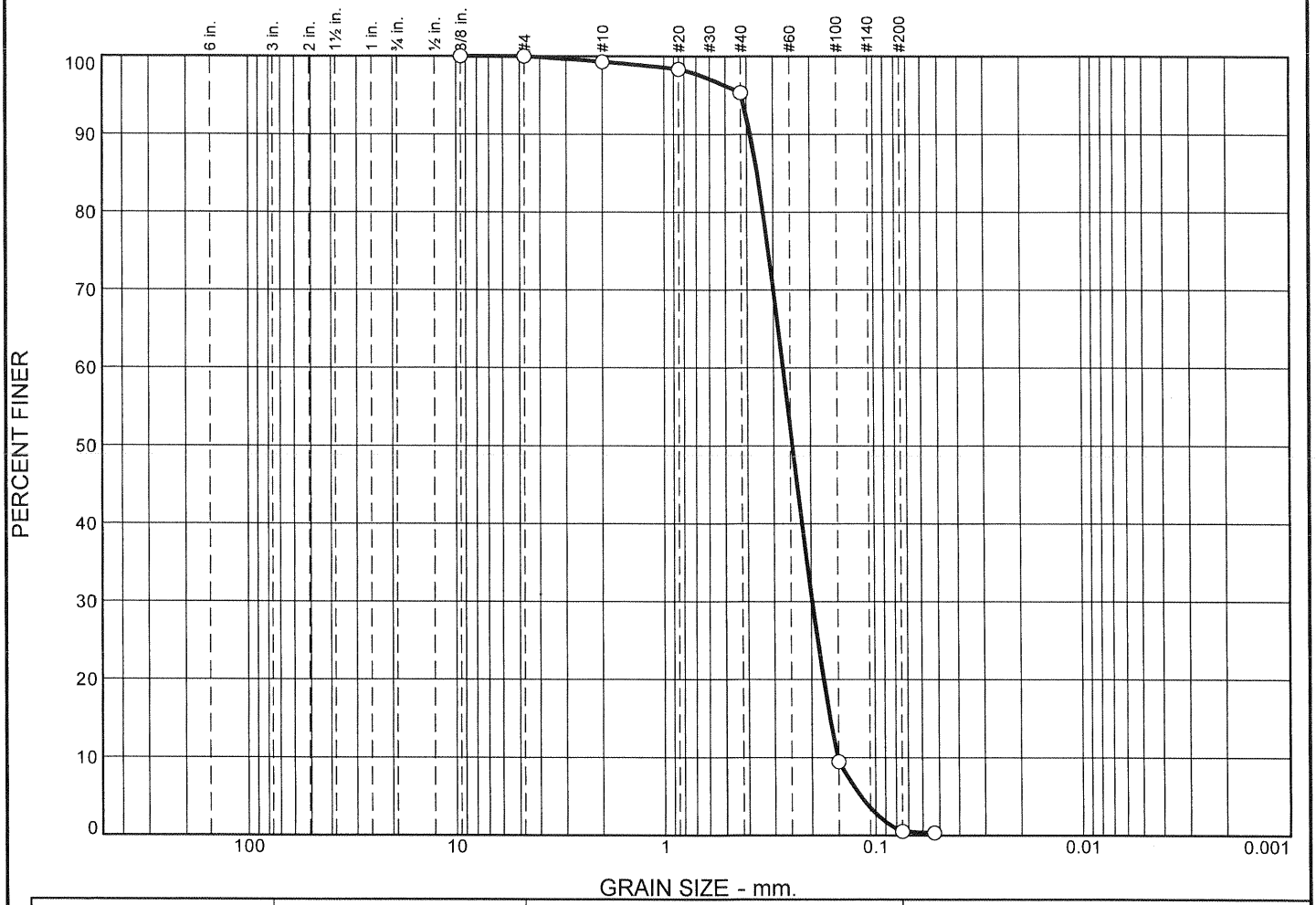
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.0	5.7	88.5	95.2			4.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0959	0.1114	0.1254	0.1517	0.2048	0.2354	0.3182	0.3483	0.3877	0.5808

Fineness Modulus	C_u	C_c
1.02	2.46	1.02

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.7	3.9	94.9	0.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3584	0.2701	0.2441	0.1982	0.1644	0.1515	0.96	1.78

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-10 **Sample Number:** 1410A92-003A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-10
Sample Number: 1410A92-003A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
116.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	456.10	455.30	99.3
		#20	475.60	474.50	98.4
		#40	479.80	476.30	95.4
		#100	457.40	357.40	9.5
		#200	325.20	314.80	0.5
		#270	391.10	390.90	0.3

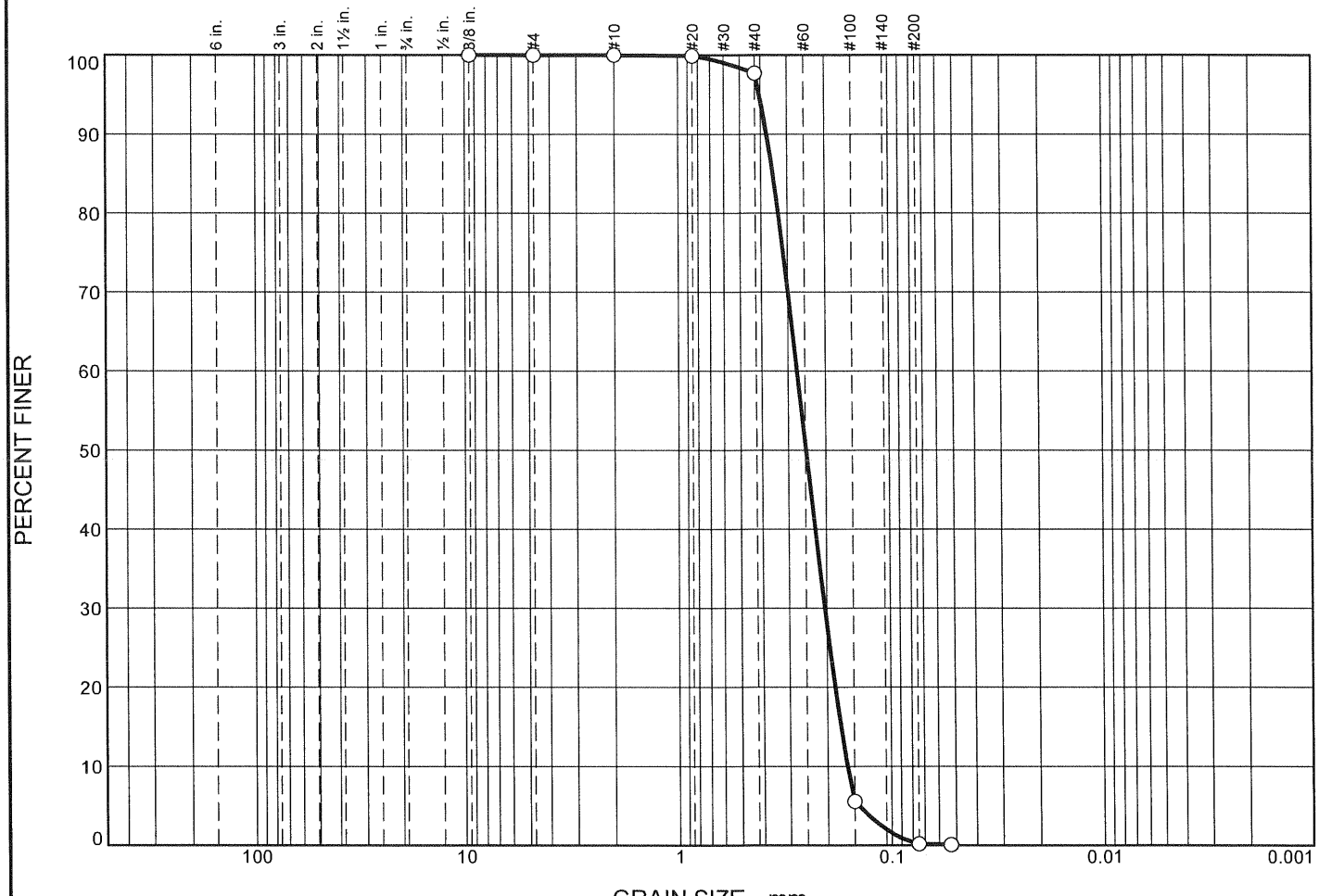
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.7	3.9	94.9	99.5			0.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1515	0.1644	0.1760	0.1982	0.2441	0.2701	0.3362	0.3584	0.3853	0.4217

Fineness Modulus	C_u	C_c
1.25	1.78	0.96

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	2.3	97.5	0.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3518	0.2720	0.2477	0.2046	0.1730	0.1616	0.95	1.68

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-11 **Sample Number:** 1410A92-004A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-11
Sample Number: 1410A92-004A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
114.90	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	474.60	474.50	99.9
		#40	478.80	476.30	97.7
		#100	463.30	357.40	5.6
		#200	321.00	314.80	0.2
		#270	391.00	390.90	0.1

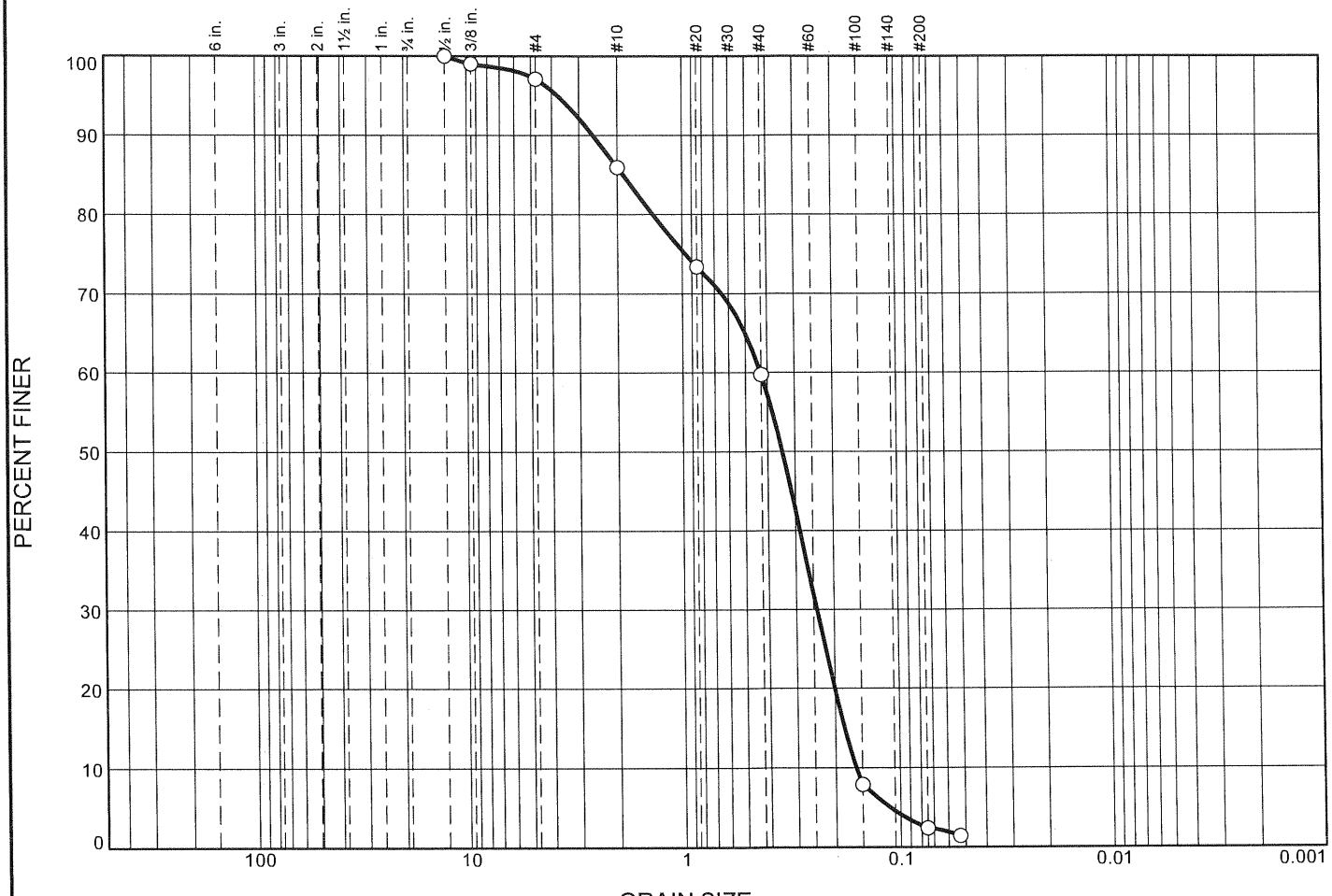
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.3	97.5	99.8			0.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1616	0.1730	0.1838	0.2046	0.2477	0.2720	0.3323	0.3518	0.3750	0.4041

Fineness Modulus	C_u	C_c
1.25	1.68	0.95

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.9	11.2	26.1	57.4	2.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.8846	0.4276	0.3434	0.2411	0.1811	0.1601	0.85	2.67

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-12 **Sample Number:** 1410A92-005A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

2/18/2015

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-12
Sample Number: 1410A92-005A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
103.90	0.00	.5	1.00	1.00	100.0
		.375	543.00	542.00	99.0
		#4	500.20	498.20	97.1
		#10	466.90	455.30	85.9
		#20	487.50	474.50	73.4
		#40	490.50	476.30	59.8
		#100	411.30	357.40	7.9
		#200	320.50	314.80	2.4
		#270	391.90	390.90	1.4

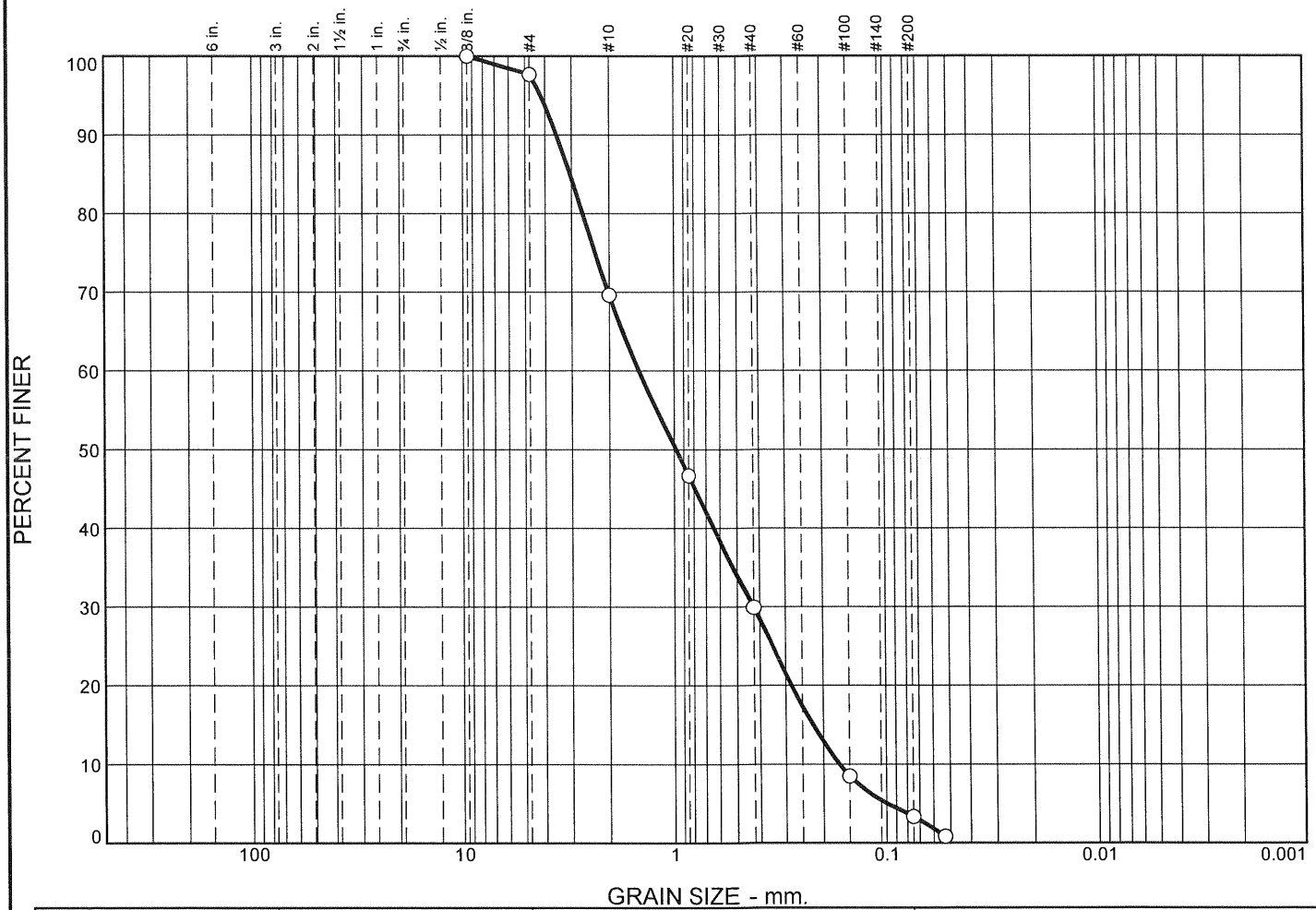
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.9	2.9	11.2	26.1	57.4	94.7			2.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1601	0.1811	0.2008	0.2411	0.3434	0.4276	1.3685	1.8846	2.5884	3.7566

Fineness Modulus	C_u	C_c
2.18	2.67	0.85

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.3	28.1	39.7	26.5	3.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.0482	1.4568	0.9776	0.4259	0.2230	0.1678	0.74	8.68

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-13 **Sample Number:** 1410A92-006A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-13
Sample Number: 1410A92-006A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
95.50	0.00	.375	542.00	542.00	100.0
		#4	500.40	498.20	97.7
		#10	482.10	455.30	69.6
		#20	496.40	474.50	46.7
		#40	492.30	476.30	29.9
		#100	377.90	357.40	8.5
		#200	319.70	314.80	3.4
		#270	393.30	390.90	0.8

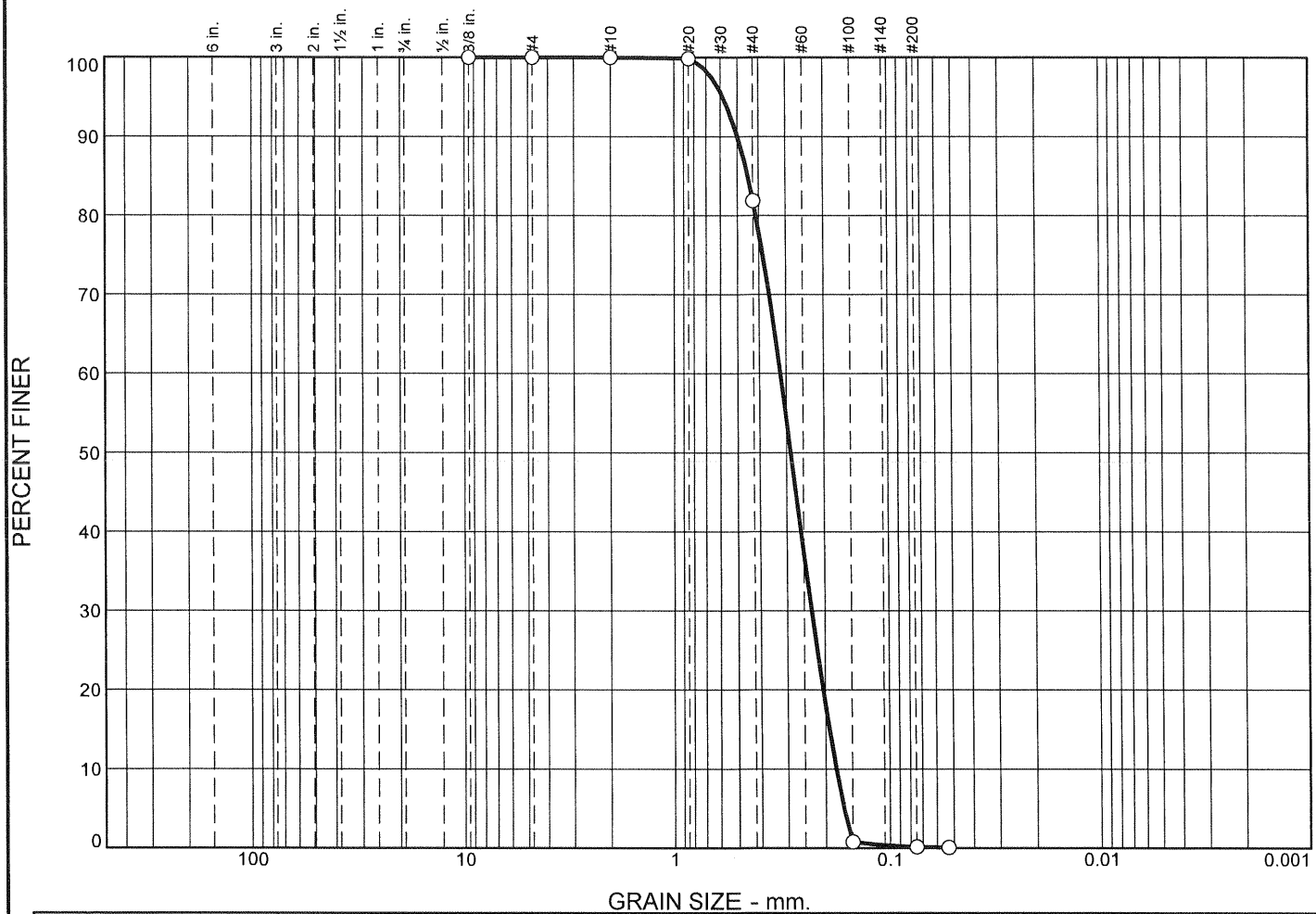
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.3	2.3	28.1	39.7	26.5	94.3			3.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1678	0.2230	0.2811	0.4259	0.9776	1.4568	2.6603	3.0482	3.5276	4.1939

Fineness Modulus	C_u	C_c
3.04	8.68	0.74

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	18.1	81.8	0.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4488	0.3199	0.2866	0.2305	0.1922	0.1789	0.93	1.79

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-14 **Sample Number:** 1410A92-007A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-14
Sample Number: 1410A92-007A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
152.90	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	474.70	474.50	99.9
		#40	503.80	476.30	81.9
		#100	481.40	357.40	0.8
		#200	315.80	314.80	0.1
		#270	391.00	390.90	0.1

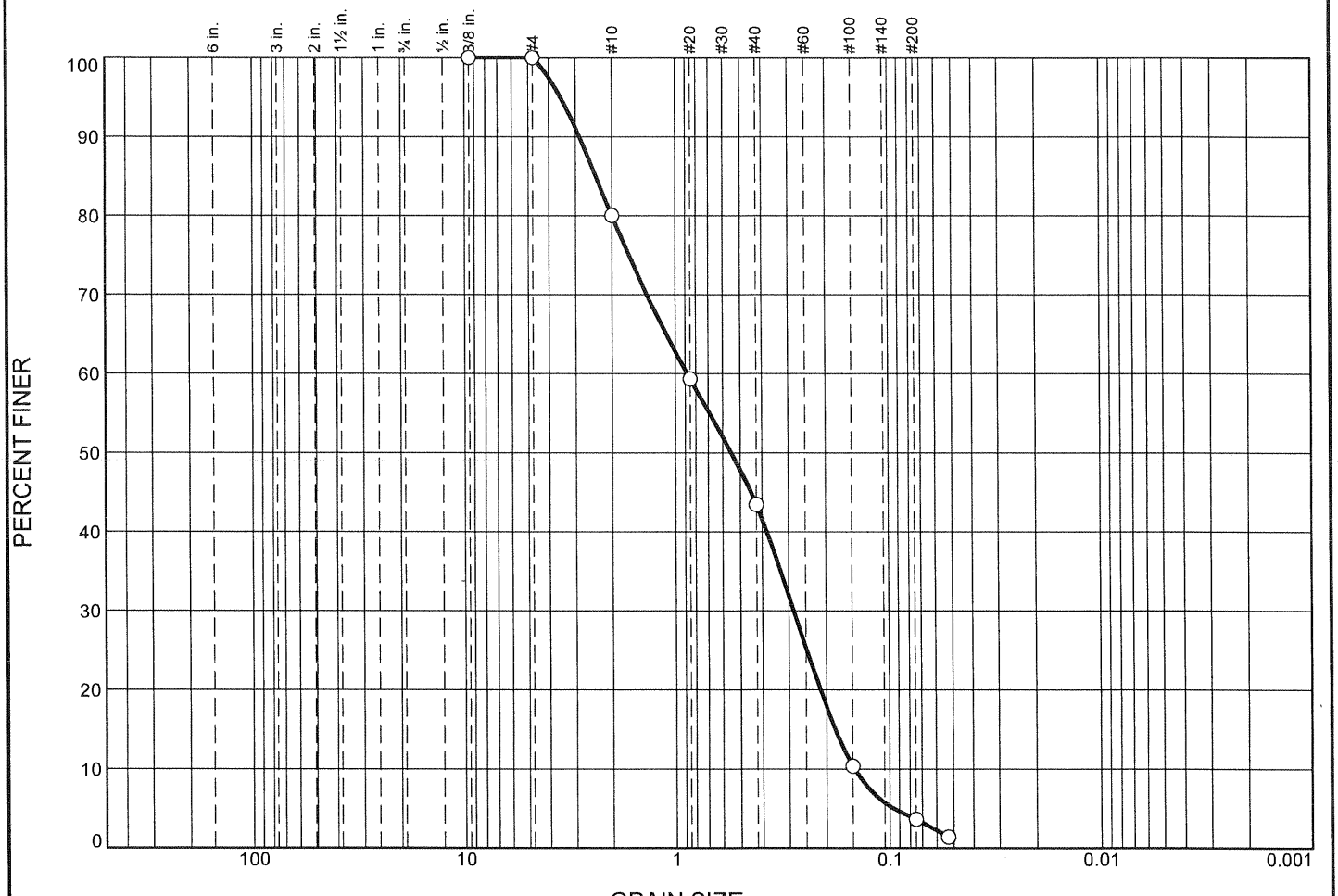
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	18.1	81.8	99.9			0.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1789	0.1922	0.2050	0.2305	0.2866	0.3199	0.4125	0.4488	0.4993	0.5827

Fineness Modulus	C_u	C_c
1.49	1.79	0.93

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	19.9	36.7	39.8	3.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.3885	0.8776	0.5473	0.2848	0.1814	0.1473	0.63	5.96

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-15 **Sample Number:** 1410A92-008A

Remarks:

○ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-15
Sample Number: 1410A92-008A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
115.80	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	478.40	455.30	80.1
		#20	498.50	474.50	59.3
		#40	494.70	476.30	43.4
		#100	395.70	357.40	10.4
		#200	322.60	314.80	3.6
		#270	393.50	390.90	1.4

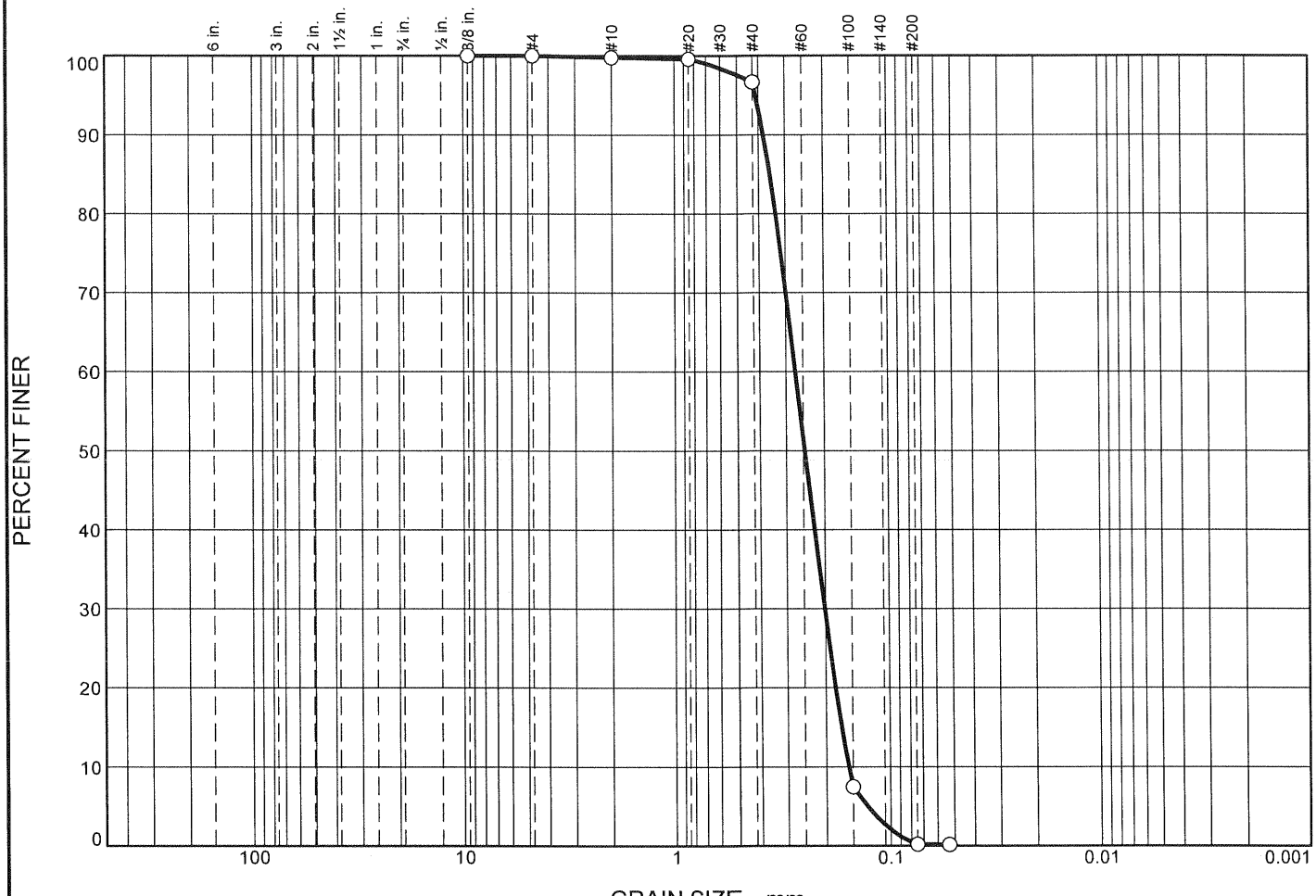
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	19.9	36.7	39.8	96.4			3.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1473	0.1814	0.2136	0.2848	0.5473	0.8776	1.9962	2.3885	2.8696	3.5261

Fineness Modulus	C_u	C_c
2.54	5.96	0.63

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	3.1	96.5	0.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3547	0.2711	0.2460	0.2015	0.1689	0.1568	0.96	1.73

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-16 **Sample Number:** 1410A92-009A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-16
Sample Number: 1410A92-009A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
147.20	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.60	455.30	99.8
		#20	474.80	474.50	99.6
		#40	480.60	476.30	96.7
		#100	488.70	357.40	7.5
		#200	325.50	314.80	0.2
		#270	391.00	390.90	0.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.2	3.1	96.5	99.8			0.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1568	0.1689	0.1801	0.2015	0.2460	0.2711	0.3339	0.3547	0.3794	0.4113

Fineness Modulus	C_u	C_c
1.24	1.73	0.96

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.6	8.5	81.6	8.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3560	0.2074	0.1742	0.1240	0.0919	0.0799	0.93	2.59

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-17 **Sample Number:** 1410A92-010A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-17
Sample Number: 1410A92-010A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
140.70	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	457.50	455.30	98.4
		#20	480.10	474.50	94.5
		#40	482.70	476.30	89.9
		#100	426.00	357.40	41.2
		#200	361.00	314.80	8.3
		#270	396.40	390.90	4.4

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.6	8.5	81.6	91.7			8.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0799	0.0919	0.1027	0.1240	0.1742	0.2074	0.3112	0.3560	0.4268	1.0282

Fineness Modulus	C_u	C_c
0.92	2.59	0.93

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.3	7.0	80.2	11.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3169	0.1770	0.1493	0.1092	0.0825	0.0709	0.95	2.50

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-18 **Sample Number:** 1410A92-011A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-18
Sample Number: 1410A92-011A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
167.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	457.40	455.30	98.7
		#20	480.20	474.50	95.3
		#40	482.40	476.30	91.7
		#100	426.70	357.40	50.3
		#200	379.70	314.80	11.5
		#270	400.00	390.90	6.1

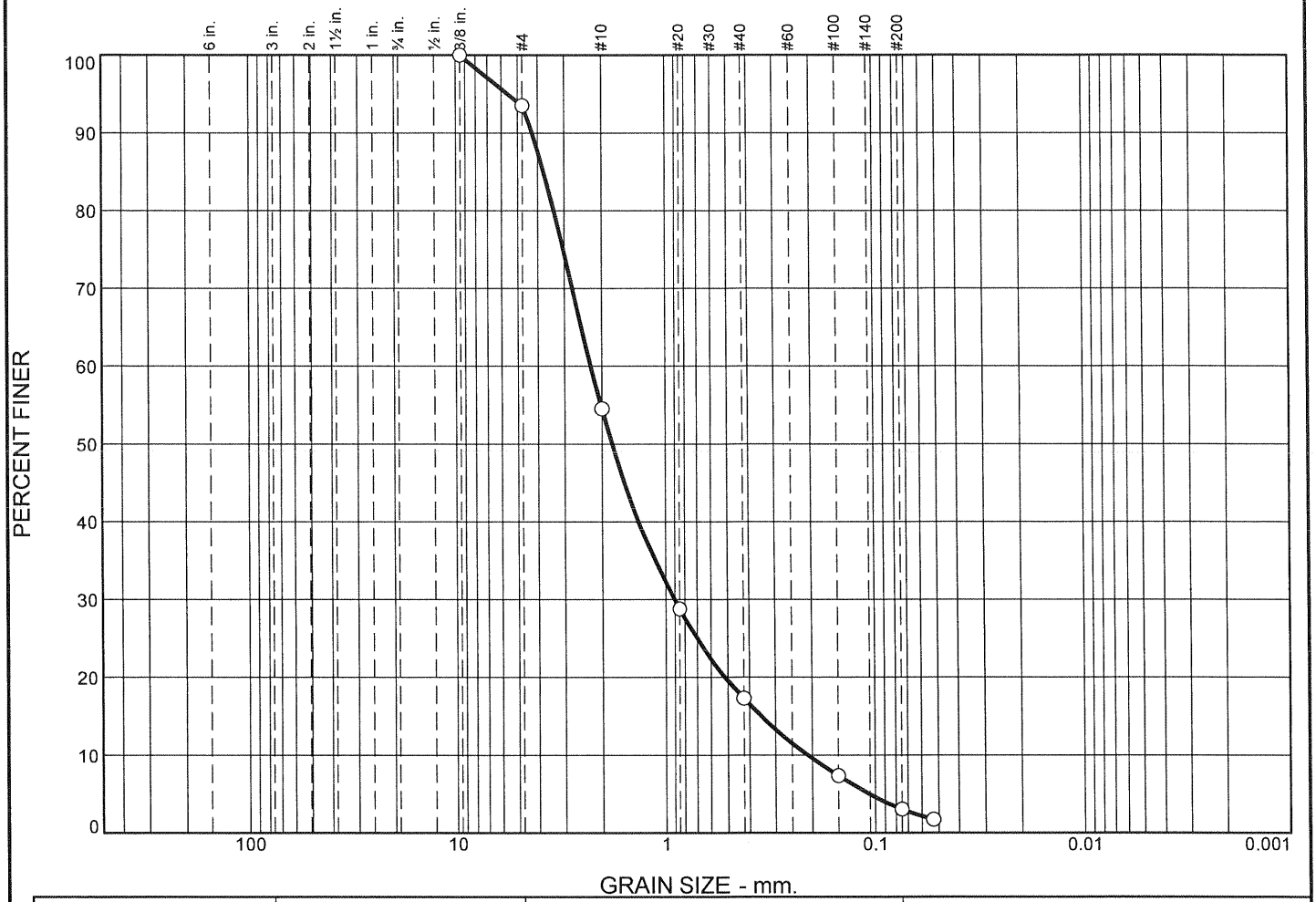
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.3	7.0	80.2	88.5			11.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0709	0.0825	0.0918	0.1092	0.1493	0.1770	0.2728	0.3169	0.3867	0.6745

Fineness Modulus	C_u	C_c
0.76	2.50	0.95

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	6.5	39.0	37.2	14.3	3.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.7550	2.2495	1.7945	0.9010	0.3515	0.2103	1.72	10.70

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-19 **Sample Number:** 1410A92-012A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-19
Sample Number: 1410A92-012A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
46.20	0.00	.375	542.00	542.00	100.0
		#4	501.20	498.20	93.5
		#10	473.30	455.30	54.5
		#20	486.40	474.50	28.8
		#40	481.60	476.30	17.3
		#100	362.00	357.40	7.4
		#200	316.80	314.80	3.0
		#270	391.50	390.90	1.7

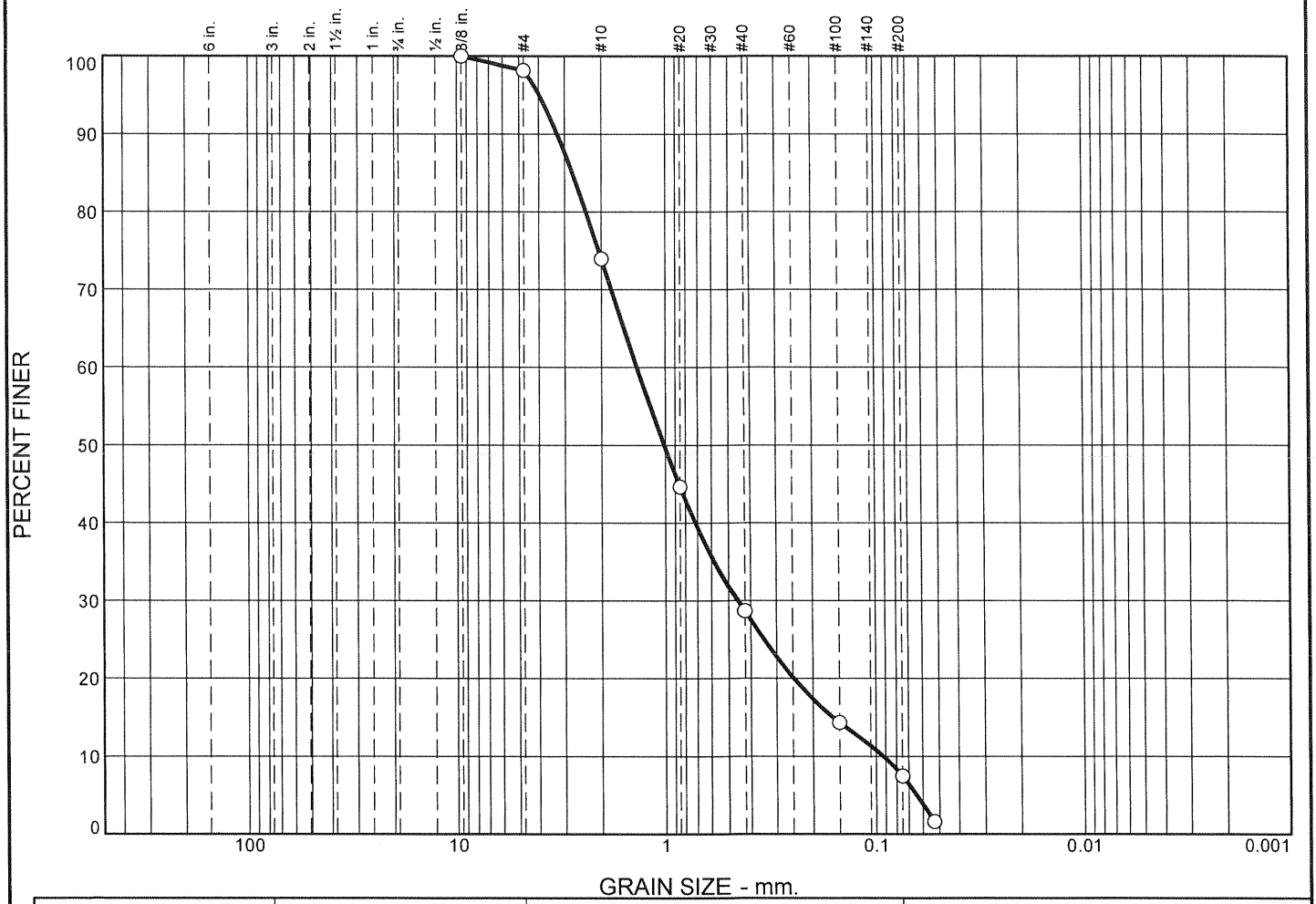
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	6.5	6.5	39.0	37.2	14.3	90.5			3.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2103	0.3515	0.5153	0.9010	1.7945	2.2495	3.3628	3.7550	4.2591	5.5743

Fineness Modulus	C_u	C_c
3.65	10.70	1.72

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.8	24.3	45.2	21.2	7.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.7545	1.3594	1.0128	0.4557	0.1607	0.0923	1.66	14.73

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-20 **Sample Number:** 1410A92-013A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-20
Sample Number: 1410A92-013A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
49.50	0.00	.375	542.00	542.00	100.0
		#4	499.10	498.20	98.2
		#10	467.30	455.30	73.9
		#20	489.00	474.50	44.6
		#40	484.20	476.30	28.7
		#100	364.50	357.40	14.3
		#200	318.20	314.80	7.5
		#270	393.80	390.90	1.6

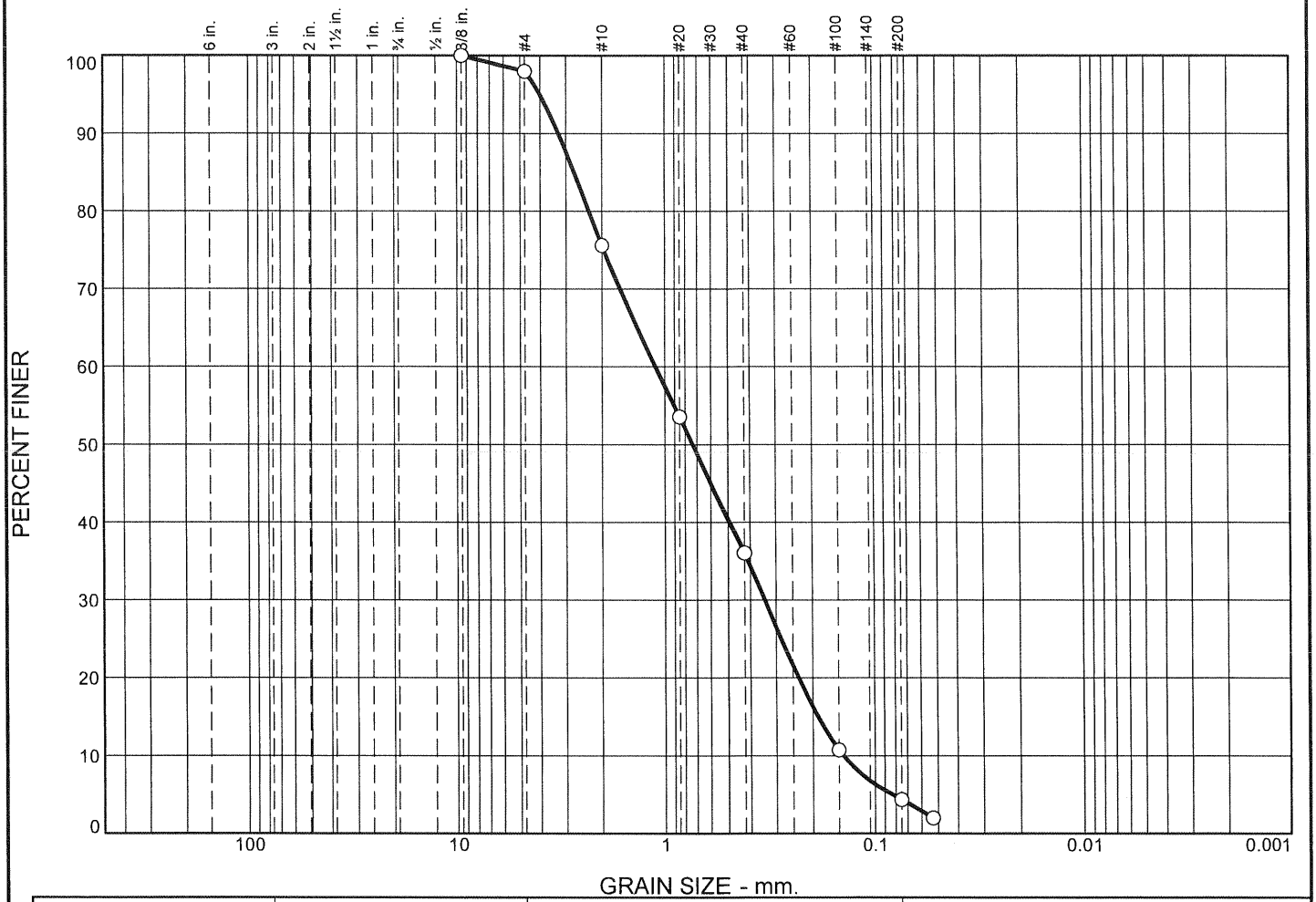
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.8	1.8	24.3	45.2	21.2	90.7			7.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0923	0.1607	0.2468	0.4557	1.0128	1.3594	2.3727	2.7545	3.2487	3.9686

Fineness Modulus	C_u	C_c
2.94	14.73	1.66

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.0	22.4	39.5	31.7	4.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.7367	1.1083	0.7345	0.3406	0.1887	0.1426	0.73	7.77

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-21 **Sample Number:** 1410A92-014A

Remarks:

○ 11/05/2014

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-21
Sample Number: 1410A92-014A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
54.90	0.00	.375	542.00	542.00	100.0
		#4	499.30	498.20	98.0
		#10	467.60	455.30	75.6
		#20	486.60	474.50	53.6
		#40	485.90	476.30	36.1
		#100	371.30	357.40	10.7
		#200	318.30	314.80	4.4
		#270	392.20	390.90	2.0

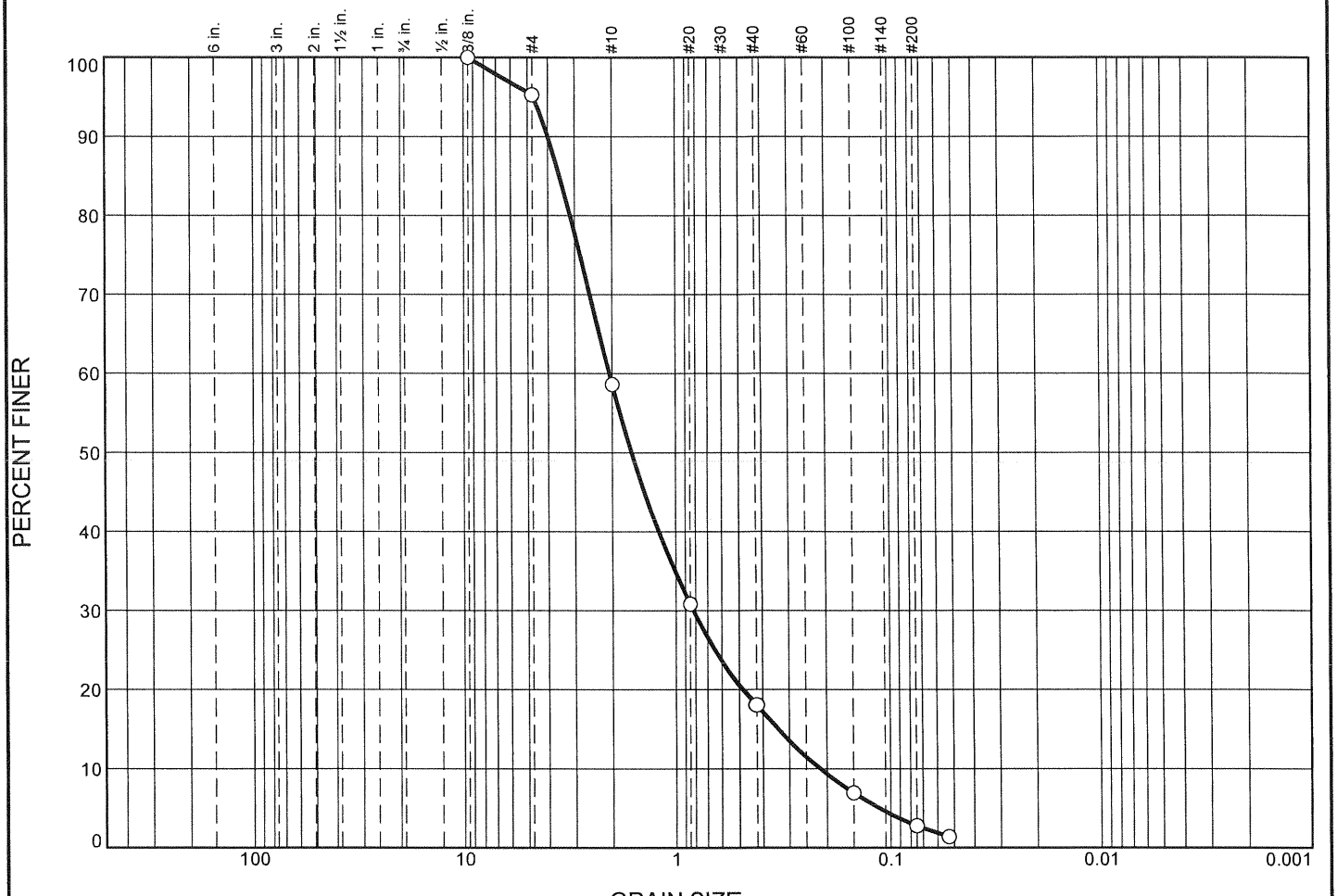
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.0	2.0	22.4	39.5	31.7	93.6			4.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1426	0.1887	0.2341	0.3406	0.7345	1.1083	2.3182	2.7367	3.2616	4.0086

Fineness Modulus	C_u	C_c
2.78	7.77	0.73

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.7	36.7	40.5	15.3	2.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.5244	2.0633	1.6195	0.8196	0.3393	0.2152	1.51	9.59

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-22 **Sample Number:** 1410A92-015A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-22
Sample Number: 1410A92-015A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
36.00	0.00	.375	542.00	542.00	100.0
		#4	499.90	498.20	95.3
		#10	468.50	455.30	58.6
		#20	484.50	474.50	30.8
		#40	480.90	476.30	18.1
		#100	361.40	357.40	6.9
		#200	316.30	314.80	2.8
		#270	391.40	390.90	1.4

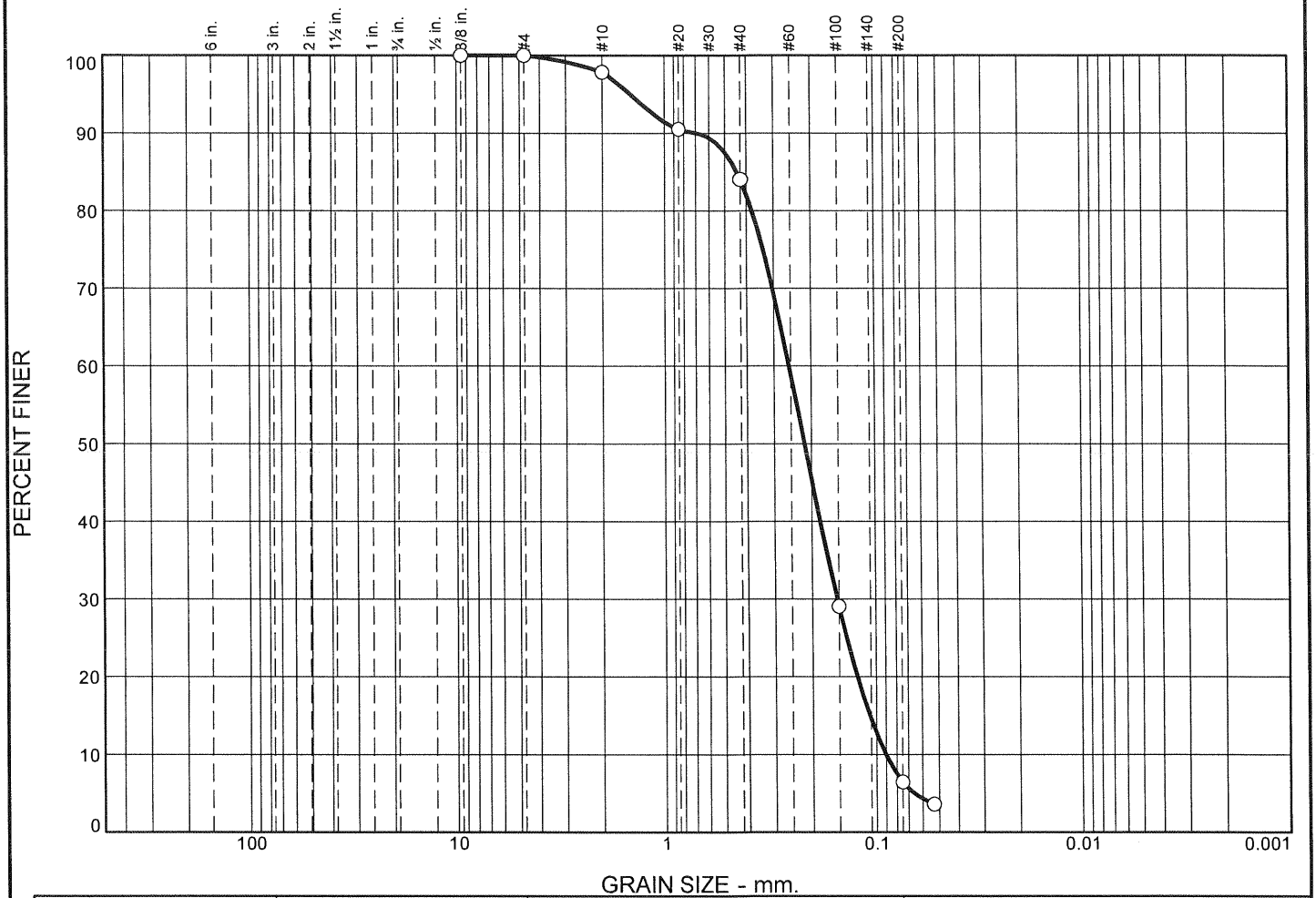
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.7	4.7	36.7	40.5	15.3	92.5			2.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2152	0.3393	0.4833	0.8196	1.6195	2.0633	3.1473	3.5244	4.0016	4.6979

Fineness Modulus	C_u	C_c
3.55	9.59	1.51

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	2.1	13.9	77.5	6.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4404	0.2548	0.2159	0.1527	0.1074	0.0902	1.02	2.83

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-23 **Sample Number:** 1410A92-016A

Remarks:

○ 11/05/2014

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-23
Sample Number: 1410A92-016A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
66.40	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	456.70	455.30	97.9
		#20	479.40	474.50	90.5
		#40	480.60	476.30	84.0
		#100	393.90	357.40	29.1
		#200	329.80	314.80	6.5
		#270	392.80	390.90	3.6

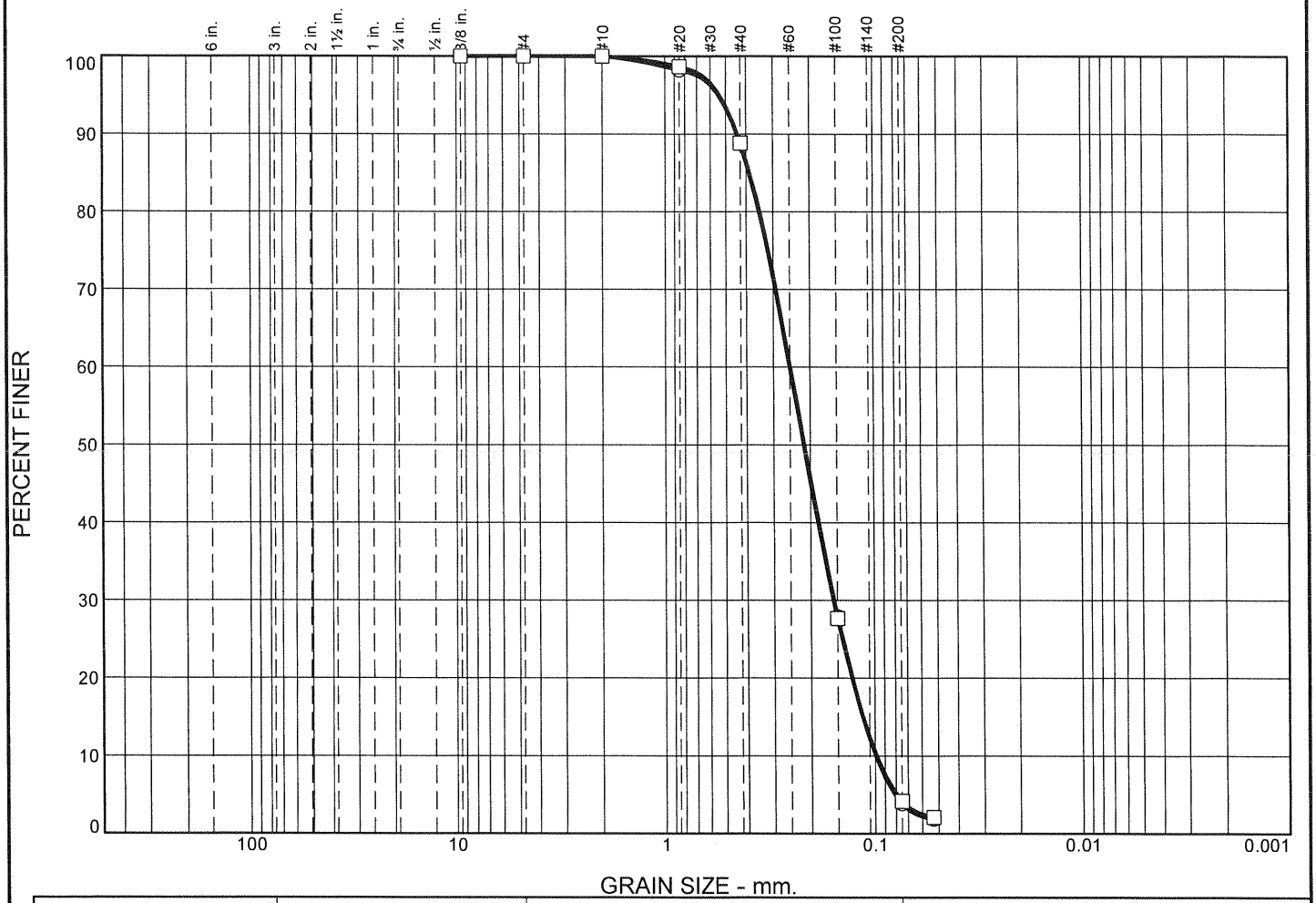
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	2.1	13.9	77.5	93.5			6.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0902	0.1074	0.1230	0.1527	0.2159	0.2548	0.3775	0.4404	0.7013	1.4599

Fineness Modulus	C_u	C_c
1.21	2.83	1.02

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	11.2	84.9	3.9	
□	0.0	0.0	0.0	0.0	11.2	84.6	4.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3864	0.2490	0.2140	0.1557	0.1143	0.0991	0.98	2.51
□			0.3868	0.2501	0.2150	0.1564	0.1142	0.0985	0.99	2.54

	Material Description	USCS	AASHTO
○			
□			

Project No. DC04 **Client:** USACE-Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-24 **Sample Number:** 1410A92-017A

□ **Source of Sample:** SM-14-24 **Sample Number:** 1410A92-017A dup

Remarks:

○ 11/05/2014

□ 11/05/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-24
Sample Number: 1410A92-017A
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
80.30	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	475.90	474.50	98.3
		#40	483.90	476.30	88.8
		#100	406.30	357.40	27.9
		#200	334.10	314.80	3.9
		#270	392.50	390.90	1.9

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	11.2	84.9	96.1			3.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0991	0.1143	0.1284	0.1557	0.2140	0.2490	0.3480	0.3864	0.4404	0.5433

Fineness Modulus	C_u	C_c
1.05	2.51	0.98

GRAIN SIZE DISTRIBUTION TEST DATA

11/6/2014

Client: USACE-Detroit District
Project: St. Marys Sampling
Project Number: DC04
Location: SM-14-24
Sample Number: 1410A92-017A dup
Testing Remarks: 11/05/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
81.30	0.00	.375	542.00	542.00	100.0
		#4	498.20	498.20	100.0
		#10	455.30	455.30	100.0
		#20	475.60	474.50	98.6
		#40	484.30	476.30	88.8
		#100	407.10	357.40	27.7
		#200	333.90	314.80	4.2
		#270	392.60	390.90	2.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	11.2	84.6	95.8			4.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0985	0.1142	0.1287	0.1564	0.2150	0.2501	0.3488	0.3868	0.4399	0.5371

Fineness Modulus	C_u	C_c
1.05	2.54	0.99

RTI LABORATORIES, INC.

RTI Laboratories
31628 Glendale St.
Livonia, MI 48150
TEL: (734) 422-8000
Website: www.rtilab.com

Monday, February 22, 2016

Pam Horner
USACE- Detroit District
Environmental Analysis Branch
477 Michigan Ave.
Detroit, MI 48226
TEL: (313) 226-6748
FAX:

RE: St Marys Sampling

Work Order #: 1411615

Dear Pam Horner:

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

This report may only be reproduced in its entirety. Individual pages, reproduced without supporting documentation, do not contain related information and may be misinterpreted by other data reviewers.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Fred J Hoitash

Fred Hoitash

Director, Sales and Field Services

RTI Laboratories - Workorder Sample Summary

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling

Lab Sample ID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
1411615-001A	SM-14-01		11/11/2014 10:26 AM	11/13/2014 8:45 AM	Soil
1411615-001B	SM-14-01		11/11/2014 10:26 AM	11/13/2014 8:45 AM	Soil
1411615-001C	SM-14-01		11/11/2014 10:26 AM	11/13/2014 8:45 AM	Soil
1411615-002A	SM-14-29		11/11/2014 12:28 PM	11/13/2014 8:45 AM	Soil
1411615-002B	SM-14-29		11/11/2014 12:28 PM	11/13/2014 8:45 AM	Soil
1411615-002C	SM-14-29		11/11/2014 12:28 PM	11/13/2014 8:45 AM	Soil

Client: USACE- Detroit District

Project: St Marys Sampling

Concentrations reported with a J flag in the Qual field are values below the reporting limit (RL) but greater than the established method detection limit (MDL). There is greater uncertainty associated with these results and data should be considered as estimated. These analytes are not routinely reviewed nor narrated below as to their potential for being laboratory artifacts.

Concentrations reported with an E flag in the Qual field are values that exceed the upper quantification range. There is greater uncertainty associated with these results and data should be considered as estimated.

Any comments or problems with the analytical events associated with this report are noted below.

Sample Analysis:
Samples were analyzed at the RTI Laboratories
- Particle Size Analysis - ASTM-D422
- Soil Density/Specific Gravity - ASTM D854
- Ammonia - EPA350.1
- TKN (Total Kjeldahl Nitrogen) - EPA351.2
- Chemical Oxygen Demand, COD - EPA410.4M
- Percent Moisture - ASTM-D2216
- Total, Fixed and Volatile Solids in Solids - SM2540G
- Total Phosphorus - A4500-P-F
- Metals, ICP/OES - SW6010C
- Mercury - SW7471A
- Organochlorine Pesticides - SW8081B
- Polychlorinated Biphenyls - SW8082A
- Semi-Volatile Organic Compounds - SW8270D
- Cyanide - SW9012B
- Organic Carbon - SW9060A
- Hexane Extractable Materials (HEM) - SW9071B

Revision 02/15/16:
The original data for cadmium was reported using the 226.502 wavelength on the ICP/AES instrument. All of the internal standards and associated QC responded in a fashion typical for dredged materials. This wavelength has been the primary wavelength for soils at RTI and has not previously had known positive bias from interferences.
During the client's review of the data a request was made for RTI to investigate the cadmium reported at the 226.502 wavelength. The data reported by RTI indicated positive concentrations at levels an order of magnitude higher than past data at this site.
The data, calibration curves and all associated QC was reprocessed using the 228.802 wavelength for cadmium. Several of the prepared samples were also analyzed on the ICP/MS instrument. The cadmium concentration of the data reprocessed at the 228.802 wavelength matched the concentrations from the ICP/MS analyses and the historic data.
Based on RTI's internal investigation and the historic data at this site, RTI has reprocessed all of the cadmium data, calibration and QC using the 228.802 wavelength. All of the cadmium data and QC in this work order has been revised.
For reference, the 228.802 wavelength was used to process the most recent round of Performance evaluation samples and both soil and water samples passed. RTI had previously passed all of these samples using the 226.502 wavelength.

Analytical Comments for Test ASTM-D422, Analytical RunNo 73593, Batch ID R73593:
Sample 1411615-001ADUP: RPD for Medium Sand exceeded control limits.

Analytical Comments for Test SW_6010S, Analytical RunNo 73443, Batch ID R73443:
Sample CRQL-111914: CRQL exceeded control limits.
Sample CRQL-111914-2: CRQL exceeded control limits.
Sample CRQL-111914-5: CRQL exceeded control limits.

Analytical Comments for Test SW_8270S, Analytical RunNo 73869, Batch ID R73869:
Sample CCVE S7 111414: Ending CCV results for Benzo(g,h,i)perylene exceeded the 50% criteria.

Analytical Comments for Test SW_8270S, Analytical RunNo 73976, Batch ID 35213:
Sample LCS-35213: Recoveries for Aniline, 2,4-Dinitrophenol, and Pyridine exceeded control limits.
Sample CCVE S7 112514A: Ending CCV results for Hexachlorocyclopentadiene, Hexachloroethane, Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene exceeded the 50% criteria.

Analytical Comments for Test SW_8270S, Analytical RunNo 73976, Batch ID R73976:
Sample CCV S7 120214: CCV results for Pentachlorophenol and Phenol exceeded the 20% criteria.

Analytical Comments for Test SW_8270S, Analytical RunNo 73977, Batch ID R73977:
Sample ICV S7 111415: ICV results for Benzoic acid and Bis(2-chloroisopropyl) ether exceeded the 20% criteria. Results are biased high. Sample results are ND.
Sample CCV S7 120514: CCV results for Benzoic acid and Bis(2-chloroisopropyl) ether exceeded the 20% criteria. Results are biased high; sample results are ND.
Sample CCVE S7 111414: Ending CCVE results for Benzo(g,h,i)perylene, Benzoic acid, Hexachlorocyclopentadiene and Hexachloroethane exceeded the 50% criteria.
Analytical Comments for SW6010C, Sample CRQL-111914-2, Batch ID R84175 : Cadmium exceeded control limit.
Analytical Comments for SW6010C, Sample CRQL-111914-5, Batch ID R84175 : Cadmium exceeded control limit.
Analytical Comments for SW6010C, Sample CRQL-111914, Batch ID R84175 : Cadmium exceeded control limit.

RTI Laboratories - Analytical Report

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District
Project: St Marys Sampling
Lab ID: 1411615-001
Client Sample ID: SM-14-01

Collection Date: 11/11/2014 10:26:00 AM
Matrix: Soil

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.361					deg min		
Longitude	-084 12.984					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/26/2014 9:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.85	U	0.69	0.85	2.2	µg/Kg-dry	1	11/26/2014 1:34 PM
4,4'-DDE	0.85	U	0.40	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
4,4'-DDT	0.85	U	0.45	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Aldrin	0.85	U	0.43	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
alpha-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
alpha-Chlordane	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
beta-BHC	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Chlordane (Technical)	17	U	4.4	17	21	µg/Kg-dry	1	11/26/2014 1:34 PM
delta-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Dieldrin	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Endosulfan I	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Endosulfan II	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Endosulfan sulfate	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Endrin	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Endrin aldehyde	0.85	U	0.50	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Endrin ketone	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
gamma-BHC	0.85	U	0.39	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
gamma-Chlordane	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Heptachlor	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Heptachlor epoxide	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Methoxychlor	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:34 PM
Toxaphene	17	U	6.4	17	21	µg/Kg-dry	1	11/26/2014 1:34 PM
Surr: Decachlorobiphenyl	86.8			55-130		%Rec	1	11/26/2014 1:34 PM
Surr: Tetrachloro-m-xylene	76.1			42-129		%Rec	1	11/26/2014 1:34 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: MB**
Aroclor 1016	8.5	U	3.8	8.5	42	µg/Kg-dry	1	11/29/2014 10:06 AM
Aroclor 1221		U	3.8		42	µg/Kg-dry	1	11/29/2014 10:06 AM
Aroclor 1232		U	5.7		42	µg/Kg-dry	1	11/29/2014 10:06 AM
Aroclor 1242		U	4.7		42	µg/Kg-dry	1	11/29/2014 10:06 AM
Aroclor 1248		U	4.5		42	µg/Kg-dry	1	11/29/2014 10:06 AM
Aroclor 1254		U	5.4		42	µg/Kg-dry	1	11/29/2014 10:06 AM
Aroclor 1260	8.5	U	3.7	8.5	42	µg/Kg-dry	1	11/29/2014 10:06 AM
Aroclor 1262		U	5.0		42	µg/Kg-dry	1	11/29/2014 10:06 AM
Total PCBs		U	3.7		42	µg/Kg-dry	1	11/29/2014 10:06 AM
Surr: Tetrachloro-m-xylene	85.8			44-130		%Rec	1	11/29/2014 10:06 AM
Surr: Decachlorobiphenyl	105			60-125		%Rec	1	11/29/2014 10:06 AM

RTI Laboratories - Analytical Report

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client:	USACE- Detroit District	**Collection Date:**	11/11/2014 10:26:00 AM
Project:	St Marys Sampling		
Lab ID:	1411615-001	**Matrix:**	Soil
Client Sample ID:	SM-14-01		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	63		0.86	1.2	6.2	mg/Kg-dry	10	12/1/2014 7:50 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.66	U	0.43	0.66	1.3	mg/Kg-dry	1	11/20/2014 4:38 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,100	J	570	780	1,600	µg/Kg-dry	1	11/19/2014 10:45 AM
Barium	7,200	J	230	3,900	7,800	µg/Kg-dry	1	11/19/2014 10:45 AM
Cadmium	67	J	26	39	200	µg/Kg-dry	1	11/19/2014 10:45 AM
Chromium	3,300		64	310	390	µg/Kg-dry	1	11/19/2014 10:45 AM
Copper	1,500	J	330	780	3,900	µg/Kg-dry	1	11/19/2014 10:45 AM
Iron	3,300,000		24,000	39,000	120,000	µg/Kg-dry	10	11/19/2014 11:17 AM
Lead	750	J	490	780	3,900	µg/Kg-dry	1	11/19/2014 10:45 AM
Manganese	33,000		140	200	780	µg/Kg-dry	1	11/19/2014 10:45 AM
Nickel	2,000	J	220	780	3,900	µg/Kg-dry	1	11/19/2014 10:45 AM
Selenium	1,200	U	910	1,200	1,600	µg/Kg-dry	1	11/19/2014 10:45 AM
Silver	200	U	64	200	780	µg/Kg-dry	1	11/19/2014 10:45 AM
Zinc	4,800		300	390	3,900	µg/Kg-dry	1	11/19/2014 10:45 AM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	5.8	U	0.81	5.8	12	µg/Kg-dry	1	11/18/2014 8:26 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: MB**
2-Methylnaphthalene	21	U	10	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Acenaphthene	21	U	9.5	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Acenaphthylene	21	U	9.1	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Anthracene	21	U	10	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Benzo(a)anthracene	21	U	14	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Benzo(a)pyrene	21	U	13	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Benzo(b)fluoranthene	21	U	12	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Benzo(g,h,i)perylene	21	U	15	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Benzo(k)fluoranthene	43	U	22	43	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Chrysene	21	U	12	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Dibenzo (a,h) anthracene	43	U	34	43	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Fluoranthene	21	U	21	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Fluorene	21	U	12	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Indeno(1,2,3-cd)pyrene	43	U	11	43	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Naphthalene	21	U	8.3	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Phenanthrene	21	U	11	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Pyrene	21	U	13	21	210	µg/Kg-dry	1	12/5/2014 7:04 PM
Surr: 2-Fluorobiphenyl	85.0			44-115		%Rec	1	12/5/2014 7:04 PM
Surr: Nitrobenzene-d5	87.1			37-122		%Rec	1	12/5/2014 7:04 PM
Surr: Terphenyl-d14	104			54-127		%Rec	1	12/5/2014 7:04 PM

RTI Laboratories - Analytical Report

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client:	USACE- Detroit District	**Collection Date:**	11/11/2014 10:26:00 AM
Project:	St Marys Sampling		
Lab ID:	1411615-001	**Matrix:**	Soil
Client Sample ID:	SM-14-01		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.20 (850-um)	100		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.40 (425-um)	100		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.100 (150-um)	12		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.200 (75-um)	1.9		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No. 270 (53-um)	1.0		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
Non-retained material	1.0		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Coarse Sand	0.10	U	0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Medium Sand	0.10		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Fine Sand	98		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Silt	1.9		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	24.3					lbs/gal	1	11/25/2014 12:00 AM
Density Temperature	21.0					°C	1	11/25/2014 12:00 AM
Specific Gravity at 20 deg. C	2.91						1	11/25/2014 12:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	17		4.9	4.9	4.9	mg/Kg-dry	1	11/24/2014 4:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	86		25	25	25	mg/Kg-dry	1	11/24/2014 4:30 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	390	J	190	260	520	mg/Kg-dry	19.920 31873	11/25/2014 9:40 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	23		1.0	1.0	1.0	wt%	1	11/17/2014 6:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	77		0.10	0.20	0.50	%	1	11/17/2014 6:00 PM
Total Volatile Solids	0.17		0.10	0.10	0.10	%	1	11/17/2014 6:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,400	U	620	1,400	1,700	mg/Kg-dry	1	11/21/2014 3:51 PM

Client:	USACE- Detroit District	**Collection Date:**	11/11/2014 12:28:00 PM
Project:	St Marys Sampling		
Lab ID:	1411615-002	**Matrix:**	Soil
Client Sample ID:	SM-14-29		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 17.327					deg min		
Longitude	-084 12.802					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	11/26/2014 9:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3550C**			**Analyst: JD1**
4,4'-DDD	0.85	U	0.69	0.85	2.2	µg/Kg-dry	1	11/26/2014 1:59 PM
4,4'-DDE	0.85	U	0.40	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
4,4'-DDT	0.85	U	0.44	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Aldrin	0.85	U	0.43	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
alpha-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
alpha-Chlordane	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
beta-BHC	0.85	U	0.45	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Chlordane (Technical)	17	U	4.4	17	21	µg/Kg-dry	1	11/26/2014 1:59 PM
delta-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Dieldrin	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Endosulfan I	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Endosulfan II	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Endosulfan sulfate	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Endrin	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Endrin aldehyde	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Endrin ketone	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
gamma-BHC	0.85	U	0.39	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
gamma-Chlordane	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Heptachlor	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Heptachlor epoxide	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Methoxychlor	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	11/26/2014 1:59 PM
Toxaphene	17	U	6.3	17	21	µg/Kg-dry	1	11/26/2014 1:59 PM
Surr: Decachlorobiphenyl	84.1			55-130		%Rec	1	11/26/2014 1:59 PM
Surr: Tetrachloro-m-xylene	72.9			42-129		%Rec	1	11/26/2014 1:59 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3550C**			**Analyst: MB**
Aroclor 1016	8.4	U	3.8	8.4	42	µg/Kg-dry	1	11/29/2014 10:30 AM
Aroclor 1221		U	3.8		42	µg/Kg-dry	1	11/29/2014 10:30 AM
Aroclor 1232		U	5.7		42	µg/Kg-dry	1	11/29/2014 10:30 AM
Aroclor 1242		U	4.7		42	µg/Kg-dry	1	11/29/2014 10:30 AM
Aroclor 1248		U	4.4		42	µg/Kg-dry	1	11/29/2014 10:30 AM
Aroclor 1254		U	5.3		42	µg/Kg-dry	1	11/29/2014 10:30 AM
Aroclor 1260	8.4	U	3.7	8.4	42	µg/Kg-dry	1	11/29/2014 10:30 AM
Aroclor 1262		U	5.0		42	µg/Kg-dry	1	11/29/2014 10:30 AM
Total PCBs		U	3.7		42	µg/Kg-dry	1	11/29/2014 10:30 AM
Surr: Tetrachloro-m-xylene	75.7			44-130		%Rec	1	11/29/2014 10:30 AM
Surr: Decachlorobiphenyl	89.4			60-125		%Rec	1	11/29/2014 10:30 AM

Client:	USACE- Detroit District	**Collection Date:**	11/11/2014 12:28:00 PM
Project:	St Marys Sampling		
Lab ID:	1411615-002	**Matrix:**	Soil
Client Sample ID:	SM-14-29		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Total Phosphorus			**Method: A4500-P-F**					**Analyst: AB2**
Phosphorus, Total (As P)	130		0.87	1.3	6.3	mg/Kg-dry	10	12/1/2014 7:50 AM
Cyanide			**Method: SW9012B**					**Analyst: AB2**
Cyanide, Total	0.65	U	0.43	0.65	1.3	mg/Kg-dry	1	11/20/2014 4:43 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,800		560	780	1,600	µg/Kg-dry	1	11/19/2014 10:46 AM
Barium	21,000		230	3,900	7,800	µg/Kg-dry	1	11/19/2014 10:46 AM
Cadmium	160	J	26	39	190	µg/Kg-dry	1	11/19/2014 10:46 AM
Chromium	11,000		64	310	390	µg/Kg-dry	1	11/19/2014 10:46 AM
Copper	5,800		320	780	3,900	µg/Kg-dry	1	11/19/2014 10:46 AM
Iron	8,700,000		24,000	39,000	120,000	µg/Kg-dry	10	11/19/2014 11:18 AM
Lead	2,600	J	480	780	3,900	µg/Kg-dry	1	11/19/2014 10:46 AM
Manganese	88,000		140	190	780	µg/Kg-dry	1	11/19/2014 10:46 AM
Nickel	6,500		220	780	3,900	µg/Kg-dry	1	11/19/2014 10:46 AM
Selenium	1,200	U	900	1,200	1,600	µg/Kg-dry	1	11/19/2014 10:46 AM
Silver	190	U	63	190	780	µg/Kg-dry	1	11/19/2014 10:46 AM
Zinc	12,000		300	390	3,900	µg/Kg-dry	1	11/19/2014 10:46 AM
Mercury			**Method: SW7471A**		**SW7471B**			**Analyst: AB2**
Mercury	8.4	J	0.84	6.0	12	µg/Kg-dry	1	11/18/2014 8:27 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3550C**			**Analyst: MB**
2-Methylnaphthalene	21	U	11	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Acenaphthene	21	U	9.5	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Acenaphthylene	21	U	9.2	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Anthracene	21	U	10	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Benzo(a)anthracene	16	J	14	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Benzo(a)pyrene	21	U	13	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Benzo(b)fluoranthene	17	J	12	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Benzo(g,h,i)perylene	21	U	15	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Benzo(k)fluoranthene	43	U	22	43	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Chrysene	14	J	12	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Dibenzo (a,h) anthracene	43	U	34	43	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Fluoranthene	24	J	21	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Fluorene	21	U	12	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Indeno(1,2,3-cd)pyrene	43	U	11	43	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Naphthalene	21	U	8.3	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Phenanthrene	15	J	11	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Pyrene	21	J	13	21	210	µg/Kg-dry	1	12/5/2014 7:31 PM
Surr: 2-Fluorobiphenyl	90.5			44-115		%Rec	1	12/5/2014 7:31 PM
Surr: Nitrobenzene-d5	91.3			37-122		%Rec	1	12/5/2014 7:31 PM
Surr: Terphenyl-d14	107			54-127		%Rec	1	12/5/2014 7:31 PM

RTI Laboratories - Analytical Report

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client:	USACE- Detroit District	**Collection Date:**	11/11/2014 12:28:00 PM
Project:	St Marys Sampling		
Lab ID:	1411615-002	**Matrix:**	Soil
Client Sample ID:	SM-14-29		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.10 (2-mm)	95		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.20 (850-um)	82		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.40 (425-um)	76		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.100 (150-um)	40		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No.200 (75-um)	15		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
No. 270 (53-um)	8.2		0.10	0.10	0.10	% Finer	1	11/24/2014 12:00 AM
Non-retained material	8.2		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Coarse Sand	5.2		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Medium Sand	19		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Fine Sand	61		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Silt	15		0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Clay	0.10	U	0.10	0.10	0.10	%	1	11/24/2014 12:00 AM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	20.8					lbs/gal	1	11/25/2014 12:00 AM
Density Temperature	21.0					°C	1	11/25/2014 12:00 AM
Specific Gravity at 20 deg. C	2.50						1	11/25/2014 12:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	36		4.6	4.6	4.6	mg/Kg-dry	1	11/24/2014 4:00 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	270		24	24	24	mg/Kg-dry	1	11/24/2014 4:30 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	3,100		160	230	450	mg/Kg-dry	17.421 60279	11/25/2014 9:40 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: NK**
Percent Moisture	23		1.0	1.0	1.0	wt%	1	11/17/2014 6:00 PM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	77		0.10	0.20	0.50	%	1	11/17/2014 6:00 PM
Total Volatile Solids	0.99		0.10	0.10	0.10	%	1	11/17/2014 6:00 PM
Organic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	3,800		1,100	2,500	3,100	mg/Kg-dry	1	11/21/2014 4:16 PM

RTI Laboratories - DATES REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1411615-001A	SM-14-01	11/11/2014 10:26 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/24/2014 12:00 AM	11/24/2014 12:00 AM
				ASTM-D854-Soil Density/Specific Gravity		11/25/2014 12:00 AM	11/25/2014 12:00 AM
1411615-001B	SM-14-01	11/11/2014 10:26 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		11/17/2014 8:30 AM	11/26/2014 9:00 AM
				SW_8081S-Organochlorine Pesticides		11/18/2014 12:41 PM	11/26/2014 1:34 PM
				SW_8082S-Polychlorinated Biphenyls		11/18/2014 12:44 PM	11/29/2014 10:06 AM
				SW_8270S-Semi-Volatile Organic Compounds		11/20/2014 12:45 PM	12/2/2014 6:07 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/20/2014 12:45 PM	12/5/2014 6:07 PM
				SW_8270S-Semi-Volatile Organic Compounds		11/20/2014 12:45 PM	12/5/2014 7:04 PM
1411615-001C	SM-14-01	11/11/2014 10:26 AM	Soil				
				EPA_350.1-S-Ammonia		11/21/2014 10:22 AM	11/24/2014 4:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/25/2014 9:40 AM	11/25/2014 9:40 AM
				SW_9012S-Cyanide		11/20/2014 9:00 AM	11/20/2014 4:38 PM
				SW_7471S-Mercury		11/17/2014 2:00 PM	11/18/2014 8:26 AM
				SW_6010S-Metals, ICP/OES		11/17/2014 8:00 AM	11/19/2014 10:45 AM
				SW_6010S-Metals, ICP/OES		11/17/2014 8:00 AM	11/19/2014 11:17 AM
				SW_9060S-Organic Carbon		11/20/2014 4:18 PM	11/21/2014 3:51 PM
				PMOIST-Percent Moisture		11/17/2014 6:00 PM	11/17/2014 6:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		11/21/2014 10:25 AM	11/24/2014 4:30 PM
				SM_4500-P-FS-Total Phosphorus		11/24/2014 11:15 AM	12/1/2014 7:50 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		11/17/2014 6:00 PM	11/17/2014 6:00 PM
1411615-002A	SM-14-29	11/11/2014 12:28 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		11/24/2014 12:00 AM	11/24/2014 12:00 AM
				ASTM-D854-Soil Density/Specific Gravity		11/25/2014 12:00 AM	11/25/2014 12:00 AM
1411615-002B	SM-14-29	11/11/2014 12:28 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		11/17/2014 8:30 AM	11/26/2014 9:00 AM
				SW_8081S-Organochlorine Pesticides		11/18/2014 12:41 PM	11/26/2014 1:59 PM
				SW_8082S-Polychlorinated Biphenyls		11/18/2014 12:44 PM	11/29/2014 10:30 AM

RTI Laboratories - DATES REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1411615-002B	SM-14-29	11/11/2014 12:28 PM	Soil				
				SW_8270S-Semi-Volatile Organic Compounds		11/20/2014 12:45 PM	12/5/2014 7:31 PM
1411615-002C	SM-14-29	11/11/2014 12:28 PM	Soil				
				EPA_350.1-S-Ammonia		11/21/2014 10:22 AM	11/24/2014 4:00 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		11/25/2014 9:40 AM	11/25/2014 9:40 AM
				SW_9012S-Cyanide		11/20/2014 9:00 AM	11/20/2014 4:43 PM
				SW_7471S-Mercury		11/17/2014 2:00 PM	11/18/2014 8:27 AM
				SW_6010S-Metals, ICP/OES		11/17/2014 8:00 AM	11/19/2014 10:46 AM
				SW_6010S-Metals, ICP/OES		11/17/2014 8:00 AM	11/19/2014 11:18 AM
				SW_9060S-Organic Carbon		11/20/2014 4:18 PM	11/21/2014 4:16 PM
				PMOIST-Percent Moisture		11/17/2014 6:00 PM	11/17/2014 6:00 PM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		11/21/2014 10:25 AM	11/24/2014 4:30 PM
				SM_4500-P-FS-Total Phosphorus		11/24/2014 11:15 AM	12/1/2014 7:50 AM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		11/17/2014 6:00 PM	11/17/2014 6:00 PM

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35147

Sample ID:	1411255-015CMS	Samp Type:	MS	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73443
Client ID:	ZZZZZZ	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1429451

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	28,000	2,600	32,200	1,305	84.1	82	111				
Barium	38,000	13,000	32,200	8,608	89.8	83	113				
Chromium	34,000	640	32,200	5,176	89.7	85	113				
Copper	32,000	6,400	32,200	2,467	90.8	81	117				
Iron	5,800,000	19,000	322,000	5,743,000	12.7	81	118				JQ
Lead	28,000	6,400	32,200	1,243	84.6	81	112				
Manganese	88,000	1,300	32,200	63,750	75.3	84	114				Q
Nickel	33,000	6,400	32,200	3,401	90.4	83	113				
Selenium	24,000	2,600	32,200	0	73.4	78	111				Q
Silver	30,000	1,300	32,200	0	91.7	82	112				
Zinc	35,000	6,400	32,200	7,883	83.5	82	113				

Sample ID:	1411255-015CMSD	Samp Type:	MSD	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73443
Client ID:	ZZZZZZ	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1429452

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	28,000	2,600	32,200	1,305	82.5	82	111	28,390	1.82	20	
Barium	38,000	13,000	32,200	8,608	92.5	83	113	37,510	2.31	20	
Chromium	35,000	640	32,200	5,176	93.7	85	113	34,060	3.68	20	
Copper	32,000	6,400	32,200	2,467	92.2	81	117	31,710	1.37	20	
Iron	6,100,000	19,000	322,000	5,743,000	123	81	118	5,784,000	5.97	20	JQ
Lead	29,000	6,400	32,200	1,243	85.5	81	112	28,500	0.949	20	
Manganese	96,000	1,300	32,200	63,750	102	84	114	88,000	9.20	20	
Nickel	33,000	6,400	32,200	3,401	93.2	83	113	32,510	2.73	20	
Selenium	24,000	2,600	32,200	0	74.7	78	111	23,650	1.74	20	Q
Silver	30,000	1,300	32,200	0	92.4	82	112	29,530	0.757	20	
Zinc	36,000	6,400	32,200	7,883	88.6	82	113	34,770	4.62	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35147

Sample ID:	MB-35147	Samp Type:	MBLK	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	11/17/2014	RunNo:	73443
Client ID:	PBS	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1429503

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	2,000	2,000									U
Barium	10,000	10,000									U
Chromium	500	500									U
Copper	740	5,000									J
Iron	15,000	15,000									U
Lead	5,000	5,000									U
Manganese	220	1,000									J
Nickel	5,000	5,000									U
Selenium	2,000	2,000									U
Silver	1,000	1,000									U
Zinc	710	5,000									J

Sample ID:	LCS-35147	Samp Type:	LCS	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	11/17/2014	RunNo:	73443
Client ID:	LCSS	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1429650

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	21,000	2,000	25,000	0	84.7	82	111				
Barium	23,000	10,000	25,000	0	93.0	83	113				
Chromium	23,000	500	25,000	0	91.9	85	113				
Copper	23,000	5,000	25,000	0	92.9	81	117				
Iron	240,000	15,000	250,000	0	95.2	81	118				
Lead	22,000	5,000	25,000	0	87.6	81	112				
Manganese	24,000	1,000	25,000	0	94.1	84	114				
Nickel	23,000	5,000	25,000	0	93.0	83	113				
Selenium	20,000	2,000	25,000	0	80.4	78	111				
Silver	23,000	1,000	25,000	0	91.6	82	112				
Zinc	22,000	5,000	25,000	0	89.8	82	113				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35147**

Sample ID:	1411255-015CMS	Samp Type:	MS	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	84175
Client ID:	ZZZZZZ	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1635146

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	30,000	320	32,200	0	92.4	82	113				

Sample ID:	1411255-015CMSD	Samp Type:	MSD	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	84175
Client ID:	ZZZZZZ	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1635147

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	30,000	320	32,200	0	92.6	82	113	29,760	0.169	20	

Sample ID:	MB-35147	Samp Type:	MBLK	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	11/17/2014	RunNo:	84175
Client ID:	PBS	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1635173

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	250	250									U

Sample ID:	LCS-35147	Samp Type:	LCS	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	11/17/2014	RunNo:	84175
Client ID:	LCSS	Batch ID:	35147	TestNo:	SW6010B	SW3050B		Analysis Date:	11/19/2014	SeqNo:	1635174

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Cadmium	23,000	250	25,000	0	93.5	82	113				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35159

Sample ID:	LCS-35159	Samp Type:	LCS	Test Code:	SW_9071	Units:	mg/Kg	Prep Date:	11/17/2014	RunNo:	73772	
Client ID:	LCSS	Batch ID:	35159	TestNo:	SW9071	SW3540C		Analysis Date:	11/26/2014	SeqNo:	1436343	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	960	98	1,308	0	73.3	70	120					

Sample ID:	MB-35159	Samp Type:	MBLK	Test Code:	SW_9071	Units:	mg/Kg	Prep Date:	11/17/2014	RunNo:	73772	
Client ID:	PBS	Batch ID:	35159	TestNo:	SW9071	SW3540C		Analysis Date:	11/26/2014	SeqNo:	1436344	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	98	98									U	

Sample ID:	1411255-013BMS	Samp Type:	MS	Test Code:	SW_9071	Units:	mg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73772	
Client ID:	ZZZZZZ	Batch ID:	35159	TestNo:	SW9071	SW3540C		Analysis Date:	11/26/2014	SeqNo:	1436346	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	1,400	130	1,730	0	83.0	70	120					

Sample ID:	1411255-013BMSD	Samp Type:	MSD	Test Code:	SW_9071	Units:	mg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73772	
Client ID:	ZZZZZZ	Batch ID:	35159	TestNo:	SW9071	SW3540C		Analysis Date:	11/26/2014	SeqNo:	1436347	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Oil & Grease, Total	1,400	130	1,728	0	83.0	70	120	1,436	0.132	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35164

Sample ID:	MB-35164	Samp Type:	MBLK	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	11/17/2014	RunNo:	73378	
Client ID:	PBS	Batch ID:	35164	TestNo:	SW7471A	SW7471B		Analysis Date:	11/18/2014	SeqNo:	1427915	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	9.1	9.1									U	

Sample ID:	LCS-35164	Samp Type:	LCS	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	11/17/2014	RunNo:	73378	
Client ID:	LCSS	Batch ID:	35164	TestNo:	SW7471A	SW7471B		Analysis Date:	11/18/2014	SeqNo:	1427916	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	47	9.0	44.78	0	105	80	124					

Sample ID:	1411255-008CMS	Samp Type:	MS	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73378	
Client ID:	ZZZZZZ	Batch ID:	35164	TestNo:	SW7471A	SW7471B		Analysis Date:	11/18/2014	SeqNo:	1427918	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	300	20	100.1	146.6	152	80	124				Q	

Sample ID:	1411255-008CMSD	Samp Type:	MSD	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73378	
Client ID:	ZZZZZZ	Batch ID:	35164	TestNo:	SW7471A	SW7471B		Analysis Date:	11/18/2014	SeqNo:	1427919	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	280	20	100.1	146.6	135	80	124	298.5	5.66	20	Q	

Sample ID:	1411255-015CMS	Samp Type:	MS	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73378	
Client ID:	ZZZZZZ	Batch ID:	35164	TestNo:	SW7471A	SW7471B		Analysis Date:	11/18/2014	SeqNo:	1427932	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	66	12	62.32	1.807	103	80	124					

Sample ID:	1411255-015CMSD	Samp Type:	MSD	Test Code:	SW_7471S	Units:	µg/Kg-dry	Prep Date:	11/17/2014	RunNo:	73378	
Client ID:	ZZZZZZ	Batch ID:	35164	TestNo:	SW7471A	SW7471B		Analysis Date:	11/18/2014	SeqNo:	1427933	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	62	12	59.45	1.807	101	80	124	65.69	5.77	20		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	LCS-35185	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73686
Client ID:	LCSS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434405

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	8.2	1.7	8.286	0	98.8	56	139				
4,4'-DDE	8.2	0.83	8.286	0	99.3	56	134				
4,4'-DDT	8.1	0.83	8.286	0	97.2	50	141				
Aldrin	8.2	0.83	8.286	0	99.0	45	136				
alpha-BHC	8.3	0.83	8.286	0	100	45	137				
alpha-Chlordane	8.2	0.83	8.286	0	99.5	54	133				
beta-BHC	8.3	0.83	8.286	0	100	50	136				
Chlordane (Technical)	17	17		0	0	43	149				U
delta-BHC	7.8	0.83	8.286	0	94.3	47	139				
Dieldrin	8.2	0.83	8.286	0	98.7	56	136				
Endosulfan I	8.2	0.83	8.286	0	98.8	53	132				
Endosulfan II	6.6	0.83	8.286	0	80.0	53	134				
Endosulfan sulfate	6.4	0.83	8.286	0	77.6	55	136				
Endrin	8.2	0.83	8.286	0	98.8	57	140				
Endrin aldehyde	6.7	0.83	8.286	0	81.1	35	137				
Endrin ketone	7.5	0.83	8.286	0	90.2	55	136				
gamma-BHC	8.3	0.83	8.286	0	101	49	135				
gamma-Chlordane	8.3	0.83	8.286	0	99.6	53	135				
Heptachlor	8.2	0.83	8.286	0	99.2	47	136				
Heptachlor epoxide	8.2	0.83	8.286	0	98.8	52	136				
Methoxychlor	6.2	0.83	8.286	0	74.7	52	143				
Toxaphene	17	17		0	0	33	141				U
Surr: Decachlorobiphenyl	8.1		8.286		97.6	55	130				
Surr: Tetrachloro-m-xylene	8.1		8.286		97.7	42	129				

Sample ID:	MB-35185	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73686
Client ID:	PBS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434406

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	1.6	1.6									U
4,4'-DDE	0.81	0.81									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	MB-35185	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73686
Client ID:	PBS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434406

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDT	0.81	0.81									U
Aldrin	0.81	0.81									U
alpha-BHC	0.81	0.81									U
alpha-Chlordane	0.81	0.81									U
beta-BHC	0.81	0.81									U
Chlordane (Technical)	16	16									U
delta-BHC	0.81	0.81									U
Dieldrin	0.81	0.81									U
Endosulfan I	0.81	0.81									U
Endosulfan II	0.81	0.81									U
Endosulfan sulfate	0.81	0.81									U
Endrin	0.81	0.81									U
Endrin aldehyde	0.81	0.81									U
Endrin ketone	0.81	0.81									U
gamma-BHC	0.81	0.81									U
gamma-Chlordane	0.81	0.81									U
Heptachlor	0.81	0.81									U
Heptachlor epoxide	0.81	0.81									U
Methoxychlor	0.81	0.81									U
Toxaphene	16	16									U
Surr: Decachlorobiphenyl	7.0		8.050		86.7	55	130				
Surr: Tetrachloro-m-xylene	6.5		8.050		80.7	42	129				

Sample ID:	1411545-001AMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73686
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434414

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	8.5	2.1	10.06	0	84.8	56	139				
4,4'-DDE	8.7	1.0	10.06	0	86.2	56	134				
4,4'-DDT	8.6	1.0	10.06	0	85.2	50	141				
Aldrin	8.5	1.0	10.06	0	84.8	45	136				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	1411545-001AMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73686
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434414

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
alpha-BHC	8.5	1.0	10.06	0	84.3	45	137				
alpha-Chlordane	8.5	1.0	10.06	0	84.2	54	133				
beta-BHC	8.7	1.0	10.06	0	86.7	50	136				
Chlordane (Technical)	20	20		0	0	43	149				U
delta-BHC	8.6	1.0	10.06	0	85.5	47	139				
Dieldrin	8.6	1.0	10.06	0	85.0	56	136				
Endosulfan I	8.5	1.0	10.06	0	84.1	53	132				
Endosulfan II	8.6	1.0	10.06	0	85.8	53	134				
Endosulfan sulfate	8.5	1.0	10.06	0	84.5	55	136				
Endrin	9.0	1.0	10.06	0	89.6	57	140				
Endrin aldehyde	8.7	1.0	10.06	0	86.1	35	137				
Endrin ketone	8.6	1.0	10.06	0	85.6	55	136				
gamma-BHC	8.6	1.0	10.06	0	85.5	49	135				
gamma-Chlordane	8.6	1.0	10.06	0	85.6	53	135				
Heptachlor	8.6	1.0	10.06	0	85.5	47	136				
Heptachlor epoxide	8.4	1.0	10.06	0	83.4	52	136				
Methoxychlor	9.2	1.0	10.06	0	91.9	52	143				
Toxaphene	20	20		0	0	33	141				U
Surr: Decachlorobiphenyl	8.5		10.06		85.0	55	130				
Surr: Tetrachloro-m-xylene	7.9		10.06		78.1	42	129				

Sample ID:	1411545-001AMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73686
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434415

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	7.9	2.1	10.13	0	77.6	56	139	8.537	8.17	25	
4,4'-DDE	7.9	1.0	10.13	0	78.4	56	134	8.677	8.79	25	
4,4'-DDT	8.2	1.0	10.13	0	81.1	50	141	8.574	4.27	25	
Aldrin	8.1	1.0	10.13	0	79.5	45	136	8.530	5.76	25	
alpha-BHC	8.0	1.0	10.13	0	78.9	45	137	8.483	5.99	25	
alpha-Chlordane	7.6	1.0	10.13	0	75.4	54	133	8.478	10.4	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	1411545-001AMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73686
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434415

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
beta-BHC	8.0	1.0	10.13	0	79.3	50	136	8.726	8.18	25	
Chlordane (Technical)	20	20		0	0	43	149	0	0	25	U
delta-BHC	8.1	1.0	10.13	0	79.7	47	139	8.605	6.39	25	
Dieldrin	7.9	1.0	10.13	0	77.6	56	136	8.555	8.36	25	
Endosulfan I	7.6	1.0	10.13	0	75.0	53	132	8.463	10.8	25	
Endosulfan II	7.9	1.0	10.13	0	78.1	53	134	8.633	8.73	25	
Endosulfan sulfate	7.9	1.0	10.13	0	77.7	55	136	8.501	7.64	25	
Endrin	8.4	1.0	10.13	0	82.9	57	140	9.013	7.02	25	
Endrin aldehyde	7.6	1.0	10.13	0	75.2	35	137	8.666	12.8	25	
Endrin ketone	8.1	1.0	10.13	0	79.7	55	136	8.615	6.47	25	
gamma-BHC	8.1	1.0	10.13	0	79.8	49	135	8.600	6.11	25	
gamma-Chlordane	7.8	1.0	10.13	0	77.4	53	135	8.616	9.37	25	
Heptachlor	8.1	1.0	10.13	0	80.4	47	136	8.599	5.37	25	
Heptachlor epoxide	7.8	1.0	10.13	0	77.1	52	136	8.393	7.18	25	
Methoxychlor	9.0	1.0	10.13	0	88.3	52	143	9.247	3.23	25	
Toxaphene	20	20		0	0	33	141	0	0	25	U
Surr: Decachlorobiphenyl	8.5		10.13		83.9	55	130		0	25	
Surr: Tetrachloro-m-xylene	7.5		10.13		74.3	42	129		0	25	

Sample ID:	LCS-35185	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	LCSS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434429

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	7.9	1.7	8.286	0	95.6	56	139				
4,4'-DDE	8.0	0.83	8.286	0	96.0	56	134				
4,4'-DDT	7.8	0.83	8.286	0	94.2	50	141				
Aldrin	8.1	0.83	8.286	0	97.2	45	136				
alpha-BHC	8.1	0.83	8.286	0	98.1	45	137				
alpha-Chlordane	8.0	0.83	8.286	0	96.3	54	133				
beta-BHC	8.2	0.83	8.286	0	98.9	50	136				
Chlordane (Technical)	17	17		0	0	43	149				U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	LCS-35185	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	LCSS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434429

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
delta-BHC	7.5	0.83	8.286	0	90.3	47	139				
Dieldrin	7.9	0.83	8.286	0	95.5	56	136				
Endosulfan I	8.0	0.83	8.286	0	96.2	53	132				
Endosulfan II	6.4	0.83	8.286	0	77.3	53	134				
Endosulfan sulfate	6.3	0.83	8.286	0	75.8	55	136				
Endrin	7.9	0.83	8.286	0	95.9	57	140				
Endrin aldehyde	6.5	0.83	8.286	0	78.4	35	137				
Endrin ketone	7.3	0.83	8.286	0	88.2	55	136				
gamma-BHC	8.1	0.83	8.286	0	98.0	49	135				
gamma-Chlordane	8.0	0.83	8.286	0	96.7	53	135				
Heptachlor	8.1	0.83	8.286	0	97.4	47	136				
Heptachlor epoxide	8.0	0.83	8.286	0	96.8	52	136				
Methoxychlor	6.2	0.83	8.286	0	74.3	52	143				
Toxaphene	17	17		0	0	33	141				U
Surr: Decachlorobiphenyl	8.2		8.286		99.1	55	130				
Surr: Tetrachloro-m-xylene	8.0		8.286		96.7	42	129				

Sample ID:	MB-35185	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	PBS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434430

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	1.6	1.6									U
4,4'-DDE	0.81	0.81									U
4,4'-DDT	0.81	0.81									U
Aldrin	0.81	0.81									U
alpha-BHC	0.81	0.81									U
alpha-Chlordane	0.81	0.81									U
beta-BHC	0.81	0.81									U
Chlordane (Technical)	16	16									U
delta-BHC	0.81	0.81									U
Dieldrin	0.81	0.81									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	MB-35185	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	PBS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434430

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Endosulfan I	0.81	0.81									U
Endosulfan II	0.81	0.81									U
Endosulfan sulfate	0.81	0.81									U
Endrin	0.81	0.81									U
Endrin aldehyde	0.81	0.81									U
Endrin ketone	0.81	0.81									U
gamma-BHC	0.81	0.81									U
gamma-Chlordane	0.81	0.81									U
Heptachlor	0.81	0.81									U
Heptachlor epoxide	0.81	0.81									U
Methoxychlor	0.81	0.81									U
Toxaphene	16	16									U
Surr: Decachlorobiphenyl	6.9		8.050		85.5	55	130				
Surr: Tetrachloro-m-xylene	6.6		8.050		82.4	42	129				

Sample ID:	1411545-001AMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434438

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	8.8	2.1	10.06	0	87.2	56	139				
4,4'-DDE	8.7	1.0	10.06	0	86.9	56	134				
4,4'-DDT	8.9	1.0	10.06	0	88.0	50	141				
Aldrin	8.6	1.0	10.06	0	85.6	45	136				
alpha-BHC	8.8	1.0	10.06	0	87.8	45	137				
alpha-Chlordane	8.6	1.0	10.06	0	85.2	54	133				
beta-BHC	9.2	1.0	10.06	0	91.8	50	136				
Chlordane (Technical)	20	20		0	0	43	149				U
delta-BHC	8.7	1.0	10.06	0	86.5	47	139				
Dieldrin	8.6	1.0	10.06	0	85.6	56	136				
Endosulfan I	8.7	1.0	10.06	0	86.2	53	132				
Endosulfan II	8.8	1.0	10.06	0	87.5	53	134				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	1411545-001AMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434438

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Endosulfan sulfate	8.7	1.0	10.06	0	86.1	55	136				
Endrin	9.4	1.0	10.06	0	93.3	57	140				
Endrin aldehyde	8.9	1.0	10.06	0	88.1	35	137				
Endrin ketone	8.9	1.0	10.06	0	88.9	55	136				
gamma-BHC	8.7	1.0	10.06	0	86.6	49	135				
gamma-Chlordane	8.5	1.0	10.06	0	84.2	53	135				
Heptachlor	8.6	1.0	10.06	0	85.9	47	136				
Heptachlor epoxide	8.6	1.0	10.06	0	85.5	52	136				
Methoxychlor	8.9	1.0	10.06	0	88.3	52	143				
Toxaphene	20	20		0	0	33	141				U
Surr: Decachlorobiphenyl	8.7		10.06		86.0	55	130				
Surr: Tetrachloro-m-xylene	8.0		10.06		79.9	42	129				

Sample ID:	1411545-001AMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434439

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	8.1	2.1	10.13	0	79.6	56	139	8.779	8.52	25	
4,4'-DDE	8.1	1.0	10.13	0	80.4	56	134	8.744	7.08	25	
4,4'-DDT	8.4	1.0	10.13	0	82.6	50	141	8.860	5.65	25	
Aldrin	8.0	1.0	10.13	0	78.5	45	136	8.615	7.99	25	
alpha-BHC	8.4	1.0	10.13	0	82.9	45	137	8.832	5.04	25	
alpha-Chlordane	7.9	1.0	10.13	0	78.0	54	133	8.573	8.09	25	
beta-BHC	8.3	1.0	10.13	0	81.4	50	136	9.239	11.3	25	
Chlordane (Technical)	20	20		0	0	43	149	0	0	25	U
delta-BHC	8.0	1.0	10.13	0	79.1	47	139	8.701	8.16	25	
Dieldrin	8.0	1.0	10.13	0	78.7	56	136	8.617	7.69	25	
Endosulfan I	8.0	1.0	10.13	0	79.2	53	132	8.672	7.80	25	
Endosulfan II	7.9	1.0	10.13	0	77.5	53	134	8.802	11.4	25	
Endosulfan sulfate	7.9	1.0	10.13	0	77.5	55	136	8.662	9.73	25	
Endrin	8.7	1.0	10.13	0	85.9	57	140	9.384	7.49	25	

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WO#: 1411615

Date Reported: 2/22/2016
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35185

Sample ID:	1411545-001AMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73687
Client ID:	ZZZZZZ	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	11/26/2014	SeqNo:	1434439

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Endrin aldehyde	7.4	1.0	10.13	0	73.5	35	137	8.869	17.4	25	
Endrin ketone	8.2	1.0	10.13	0	81.2	55	136	8.945	8.37	25	
gamma-BHC	8.1	1.0	10.13	0	80.3	49	135	8.713	6.89	25	
gamma-Chlordane	7.8	1.0	10.13	0	76.7	53	135	8.470	8.59	25	
Heptachlor	8.1	1.0	10.13	0	79.7	47	136	8.647	6.82	25	
Heptachlor epoxide	7.9	1.0	10.13	0	78.3	52	136	8.604	8.06	25	
Methoxychlor	8.1	1.0	10.13	0	80.1	52	143	8.884	9.03	25	
Toxaphene	20	20		0	0	33	141	0	0	25	U
Surr: Decachlorobiphenyl	8.2		10.13		81.2	55	130		0	25	
Surr: Tetrachloro-m-xylene	7.6		10.13		74.9	42	129		0	25	

Sample ID:	LCS-35185	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	74628
Client ID:	LCSS	Batch ID:	35185	TestNo:	SW8081A	SW3550C		Analysis Date:	1/9/2015	SeqNo:	1449558

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	9.1	1.7	8.286	0	110	56	139				
4,4'-DDE	9.1	0.83	8.286	0	109	56	134				
4,4'-DDT	9.2	0.83	8.286	0	111	50	141				
Aldrin	8.2	0.83	8.286	0	99.2	45	136				
alpha-BHC	7.5	0.83	8.286	0	90.4	45	137				
alpha-Chlordane	9.0	0.83	8.286	0	109	54	133				
beta-BHC	7.6	0.83	8.286	0	91.4	50	136				
Chlordane (Technical)	17	17	8.286	0	0	43	149				QU
delta-BHC	7.0	0.83	8.286	0	84.6	47	139				
Dieldrin	9.0	0.83	8.286	0	109	56	136				
Endosulfan I	8.9	0.83	8.286	0	107	53	132				
Endosulfan II	7.4	0.83	8.286	0	89.0	53	134				
Endosulfan sulfate	7.0	0.83	8.286	0	84.2	55	136				
Endrin	9.9	0.83	8.286	0	119	57	140				
Endrin aldehyde	7.1	0.83	8.286	0	85.1	35	137				
Endrin ketone	8.0	0.83	8.286	0	96.5	55	136				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35185**

Sample ID:	**LCS-35185**	Samp Type:	**LCS**	Test Code:	**SW_8081S**	Units:	**µg/Kg**	Prep Date:	**11/18/2014**	RunNo:	**74628**
Client ID:	**LCSS**	Batch ID:	**35185**	TestNo:	**SW8081A**	**SW3550C**		Analysis Date:	**1/9/2015**	SeqNo:	**1449558**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
gamma-BHC	7.6	0.83	8.286	0	92.3	49	135				
gamma-Chlordane	8.9	0.83	8.286	0	107	53	135				
Heptachlor	8.0	0.83	8.286	0	96.2	47	136				
Heptachlor epoxide	8.7	0.83	8.286	0	105	52	136				
Methoxychlor	7.0	0.83	8.286	0	84.6	52	143				
Toxaphene	17	17	8.286	0	0	33	141				QU
Surr: Decachlorobiphenyl	9.0		8.286		108	55	130				
Surr: Tetrachloro-m-xylene	7.4		8.286		88.8	42	129				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35188

Sample ID:	1411401-006AMS	Samp Type:	MS	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73703
Client ID:	ZZZZZZ	Batch ID:	35188	TestNo:	SW8082	SW3550C		Analysis Date:	11/29/2014	SeqNo:	1434650

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	210	48	242.4	0	88.2	46	129				
Aroclor 1260	220	48	242.4	0	92.2	45	134				
Surr: Tetrachloro-m-xylene	8.4		12.12		69.1	44	130				
Surr: Decachlorobiphenyl	11		12.12		89.2	40	135				

Sample ID:	1411401-006AMSD	Samp Type:	MSD	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	11/18/2014	RunNo:	73703
Client ID:	ZZZZZZ	Batch ID:	35188	TestNo:	SW8082	SW3550C		Analysis Date:	11/29/2014	SeqNo:	1434651

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	200	48	244.6	0	80.8	46	129	213.9	7.84	25	
Aroclor 1260	210	48	244.6	0	85.8	45	134	223.6	6.35	25	
Surr: Tetrachloro-m-xylene	8.0		12.23		65.5	44	130		0	25	
Surr: Decachlorobiphenyl	10		12.23		83.2	40	135		0	25	

Sample ID:	LCS-35188	Samp Type:	LCS	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73703
Client ID:	LCSS	Batch ID:	35188	TestNo:	SW8082	SW3550C		Analysis Date:	11/29/2014	SeqNo:	1434664

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	140	33	164.5	0	86.3	46	129				
Aroclor 1260	150	33	164.5	0	94.0	45	134				
Surr: Tetrachloro-m-xylene	6.0		8.226		72.8	44	130				
Surr: Decachlorobiphenyl	7.7		8.226		93.5	40	135				

Sample ID:	MB-35188	Samp Type:	MBLK	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	11/18/2014	RunNo:	73703
Client ID:	PBS	Batch ID:	35188	TestNo:	SW8082	SW3550C		Analysis Date:	11/29/2014	SeqNo:	1434665

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	33	33									U
Aroclor 1221	33	33									U
Aroclor 1232	33	33									U
Aroclor 1242	33	33									U
Aroclor 1248	33	33									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35188**

Sample ID:	**MB-35188**	Samp Type:	**MBLK**	Test Code:	**SW_8082S**	Units:	**µg/Kg**	Prep Date:	**11/18/2014**	RunNo:	**73703**
Client ID:	**PBS**	Batch ID:	**35188**	TestNo:	**SW8082**	**SW3550C**		Analysis Date:	**11/29/2014**	SeqNo:	**1434665**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1254	33	33									U
Aroclor 1260	33	33									U
Aroclor 1262	33	33									U
Total PCBs	33	33									U
Surr: Tetrachloro-m-xylene	6.3		8.286		76.1	44	130				
Surr: Decachlorobiphenyl	7.5		8.286		90.9	60	125				

Sample ID:	**LCS-35188**	Samp Type:	**LCS**	Test Code:	**SW_8082S**	Units:	**µg/Kg**	Prep Date:	**11/18/2014**	RunNo:	**74777**
Client ID:	**LCSS**	Batch ID:	**35188**	TestNo:	**SW8082**	**SW3550C**		Analysis Date:	**1/14/2015**	SeqNo:	**1450952**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	180	33	164.5	0	107	46	129				
Aroclor 1260	170	33	164.5	0	106	45	134				
Surr: Tetrachloro-m-xylene	7.6		8.226		92.0	44	130				
Surr: Decachlorobiphenyl	8.2		8.226		99.2	40	135				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35208**

Sample ID:	MB-35208	Samp Type:	MBLK	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	11/20/2014	RunNo:	73567	
Client ID:	PBS	Batch ID:	35208	TestNo:	SW9012A			Analysis Date:	11/20/2014	SeqNo:	1432191	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	1.0	1.0									U	

Sample ID:	LCS-35208	Samp Type:	LCS	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	11/20/2014	RunNo:	73567	
Client ID:	LCSS	Batch ID:	35208	TestNo:	SW9012A			Analysis Date:	11/20/2014	SeqNo:	1432192	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	1.9	1.0	2.000	0	93.6	76	120					

Sample ID:	1411615-001CMS	Samp Type:	MS	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73567	
Client ID:	SM-14-01MS1	Batch ID:	35208	TestNo:	SW9012A			Analysis Date:	11/20/2014	SeqNo:	1432194	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	7.1	1.3	6.506	0	109	76	120					

Sample ID:	1411615-001CMSD	Samp Type:	MSD	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73567	
Client ID:	SM-14-01SD1	Batch ID:	35208	TestNo:	SW9012A			Analysis Date:	11/20/2014	SeqNo:	1432195	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	6.9	1.3	6.454	0	107	76	120	7.084	2.56	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35213

Sample ID:	1411401-011AMS	Samp Type:	MS	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73977
Client ID:	ZZZZZZ	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/5/2014	SeqNo:	1440121

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	880	280	1,154	0	76.2	38	122				
Acenaphthene	920	280	1,154	0	80.0	40	123				
Acenaphthylene	940	280	1,154	13.48	80.3	32	132				
Anthracene	1,100	280	1,154	25.78	92.8	47	123				
Benzo(a)anthracene	1,100	280	1,154	78.52	86.9	49	126				
Benzo(a)pyrene	1,200	280	1,154	83.80	97.7	45	129				
Benzo(b)fluoranthene	1,300	280	1,154	127.2	102	45	132				
Benzo(g,h,i)perylene	660	280	1,154	29.89	54.8	43	134				
Benzo(k)fluoranthene	1,300	280	1,154	57.43	105	47	132				
Chrysene	1,100	280	1,154	94.35	90.3	50	124				
Dibenzo (a,h) anthracene	830	280	1,154	0	72.3	45	134				
Fluoranthene	1,200	280	1,154	195.7	87.2	50	127				
Fluorene	1,000	280	1,154	0	88.4	43	125				
Indeno(1,2,3-cd)pyrene	790	280	1,154	32.23	66.0	45	133				
Naphthalene	810	280	1,154	0	70.2	35	123				
Phenanthrene	1,100	280	1,154	83.21	85.7	50	121				
Pyrene	1,200	280	1,154	180.5	86.5	47	127				
Surr: 2,4,6-Tribromophenol	1,600		1,443		113	39	132				
Surr: 2-Fluorobiphenyl	1,100		1,443		77.1	44	115				
Surr: 2-Fluorophenol	1,100		1,443		76.7	35	115				
Surr: Nitrobenzene-d5	1,200		1,443		80.1	37	122				
Surr: Phenol-d5	1,200		1,443		81.1	33	122				
Surr: Terphenyl-d14	1,500		1,443		103	54	127				

Sample ID:	1411401-011AMSD	Samp Type:	MSD	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73977
Client ID:	ZZZZZZ	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/5/2014	SeqNo:	1440122

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	910	280	1,170	0	77.9	38	122	879.5	3.60	25	
Acenaphthene	920	280	1,170	0	78.7	40	123	923.9	0.369	25	
Acenaphthylene	950	280	1,170	13.48	79.9	32	132	940.7	0.779	25	

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WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35213

Sample ID:	1411401-011AMSD	Samp Type:	MSD	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73977
Client ID:	ZZZZZZ	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/5/2014	SeqNo:	1440122

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Anthracene	1,100	280	1,170	25.78	91.1	47	123	1,097	0.472	25	
Benzo(a)anthracene	1,100	280	1,170	78.52	88.3	49	126	1,081	2.71	25	
Benzo(a)pyrene	1,200	280	1,170	83.80	95.4	45	129	1,211	0.932	25	
Benzo(b)fluoranthene	1,300	280	1,170	127.2	101	45	132	1,303	0.532	25	
Benzo(g,h,i)perylene	580	280	1,170	29.89	46.8	43	134	661.9	13.7	25	
Benzo(k)fluoranthene	1,300	280	1,170	57.43	108	47	132	1,265	4.08	25	
Chrysene	1,100	280	1,170	94.35	86.2	50	124	1,137	3.08	25	
Dibenzo (a,h) anthracene	740	280	1,170	0	63.3	45	134	834.5	11.9	25	
Fluoranthene	1,200	280	1,170	195.7	87.8	50	127	1,202	1.67	25	
Fluorene	1,000	280	1,170	0	86.2	43	125	1,020	1.19	25	
Indeno(1,2,3-cd)pyrene	690	280	1,170	32.23	56.6	45	133	794.1	13.4	25	
Naphthalene	830	280	1,170	0	71.2	35	123	810.3	2.82	25	
Phenanthrene	1,100	280	1,170	83.21	84.2	50	121	1,073	0.459	25	
Pyrene	1,200	280	1,170	180.5	88.5	47	127	1,178	3.08	25	
Surr: 2,4,6-Tribromophenol	1,600		1,462		109	39	132		0	25	
Surr: 2-Fluorobiphenyl	1,100		1,462		77.2	44	115		0	25	
Surr: 2-Fluorophenol	1,100		1,462		77.1	35	115		0	25	
Surr: Nitrobenzene-d5	1,200		1,462		80.0	37	122		0	25	
Surr: Phenol-d5	1,200		1,462		83.8	33	122		0	25	
Surr: Terphenyl-d14	1,500		1,462		103	54	127		0	25	

Sample ID:	MB-35213	Samp Type:	MBLK	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	11/20/2014	RunNo:	73976
Client ID:	PBS	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/2/2014	SeqNo:	1440134

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	160	160									U
Acenaphthene	160	160									U
Acenaphthylene	160	160									U
Anthracene	160	160									U
Benzo(a)anthracene	160	160									U
Benzo(a)pyrene	160	160									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35213**

Sample ID:	MB-35213	Samp Type:	MBLK	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	11/20/2014	RunNo:	73976
Client ID:	PBS	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/2/2014	SeqNo:	1440134

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Benzo(b)fluoranthene	160	160									U
Benzo(g,h,i)perylene	160	160									U
Benzo(k)fluoranthene	160	160									U
Chrysene	160	160									U
Dibenzo (a,h) anthracene	160	160									U
Fluoranthene	160	160									U
Fluorene	160	160									U
Indeno(1,2,3-cd)pyrene	160	160									U
Naphthalene	160	160									U
Phenanthrene	160	160									U
Pyrene	160	160									U
Surr: 2,4,6-Tribromophenol	370		825.4		44.8	39	132				
Surr: 2-Fluorobiphenyl	750		825.4		90.4	44	115				
Surr: 2-Fluorophenol	450		825.4		54.8	35	115				
Surr: Nitrobenzene-d5	670		825.4		81.6	37	122				
Surr: Phenol-d5	580		825.4		70.2	33	122				
Surr: Terphenyl-d14	880		825.4		107	54	127				

Sample ID:	LCS-35213	Samp Type:	LCS	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	11/20/2014	RunNo:	73976
Client ID:	LCSS	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/2/2014	SeqNo:	1440135

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	520	160	664.7	0	77.8	38	122				
Acenaphthene	510	160	664.7	0	76.3	40	123				
Acenaphthylene	510	160	664.7	0	76.7	32	132				
Anthracene	550	160	664.7	0	82.0	47	123				
Benzo(a)anthracene	520	160	664.7	0	78.9	49	126				
Benzo(a)pyrene	540	160	664.7	0	80.7	45	129				
Benzo(b)fluoranthene	530	160	664.7	0	79.4	45	132				
Benzo(g,h,i)perylene	510	160	664.7	0	77.0	43	134				
Benzo(k)fluoranthene	600	160	664.7	0	90.8	47	132				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35213**

Sample ID:	LCS-35213	Samp Type:	LCS	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	11/20/2014	RunNo:	73976
Client ID:	LCSS	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/2/2014	SeqNo:	1440135

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Chrysene	530	160	664.7	0	79.6	50	124				
Dibenzo (a,h) anthracene	540	160	664.7	0	81.8	45	134				
Fluoranthene	570	160	664.7	0	86.0	50	127				
Fluorene	550	160	664.7	0	82.5	43	125				
Indeno(1,2,3-cd)pyrene	520	160	664.7	0	78.3	45	133				
Naphthalene	480	160	664.7	0	71.7	35	123				
Phenanthrene	550	160	664.7	0	82.4	50	121				
Pyrene	530	160	664.7	0	79.8	47	127				
Surr: 2,4,6-Tribromophenol	610		830.8		73.2	39	132				
Surr: 2-Fluorobiphenyl	690		830.8		82.9	44	115				
Surr: 2-Fluorophenol	520		830.8		62.9	35	115				
Surr: Nitrobenzene-d5	620		830.8		74.8	37	122				
Surr: Phenol-d5	610		830.8		73.8	33	122				
Surr: Terphenyl-d14	780		830.8		93.7	54	127				

Sample ID:	1411401-011AMS	Samp Type:	MS	Test Code:	SW_8270S-LL	Units:	µg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73870
Client ID:	ZZZZZZ	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/5/2014	SeqNo:	1438091

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	880	12	1,154	10.55	75.3	38	122				
Acenaphthene	920	12	1,154	5.860	79.5	40	123				
Acenaphthylene	940	12	1,154	13.48	80.3	32	132				
Anthracene	1,100	12	1,154	25.78	92.8	47	123				
Benzo(a)anthracene	1,100	12	1,154	78.52	86.9	49	126				
Benzo(a)pyrene	1,200	12	1,154	83.80	97.7	45	129				
Benzo(b)fluoranthene	1,300	12	1,154	127.2	102	45	132				
Benzo(g,h,i)perylene	660	12	1,154	29.89	54.8	43	134				
Benzo(k)fluoranthene	1,300	12	1,154	57.43	105	47	132				
Chrysene	1,100	12	1,154	94.35	90.3	50	124				
Dibenzo (a,h) anthracene	830	12	1,154	10.55	71.4	45	134				
Fluoranthene	1,200	12	1,154	195.7	87.2	50	127				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35213

Sample ID:	1411401-011AMS	Samp Type:	MS	Test Code:	SW_8270S-LL	Units:	µg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73870
Client ID:	ZZZZZZ	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/5/2014	SeqNo:	1438091

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Fluorene	1,000	12	1,154	11.13	87.4	43	125				
Indeno(1,2,3-cd)pyrene	790	12	1,154	32.23	66.0	45	133				
Naphthalene	810	12	1,154	9.962	69.3	35	123				
Phenanthrene	1,100	12	1,154	83.21	85.7	50	121				
Pyrene	1,200	12	1,154	180.5	86.5	47	127				
Surr: 2,4,6-Tribromophenol	1,600		1,443		113	39	132				
Surr: 2-Fluorobiphenyl	1,100		1,443		77.1	44	115				
Surr: 2-Fluorophenol	1,100		1,443		76.7	35	115				
Surr: Nitrobenzene-d5	1,200		1,443		80.1	37	122				
Surr: Phenol-d5	1,200		1,443		81.1	33	122				
Surr: Terphenyl-d14	1,500		1,443		103	54	127				

Sample ID:	1411401-011AMSD	Samp Type:	MSD	Test Code:	SW_8270S-LL	Units:	µg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73870
Client ID:	ZZZZZZ	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/5/2014	SeqNo:	1438092

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	910	12	1,170	10.55	77.0	38	122	879.5	3.60	25	
Acenaphthene	920	12	1,170	5.860	78.2	40	123	923.9	0.369	25	
Acenaphthylene	950	12	1,170	13.48	79.9	32	132	940.7	0.779	25	
Anthracene	1,100	12	1,170	25.78	91.1	47	123	1,097	0.472	25	
Benzo(a)anthracene	1,100	12	1,170	78.52	88.3	49	126	1,081	2.71	25	
Benzo(a)pyrene	1,200	12	1,170	83.80	95.4	45	129	1,211	0.932	25	
Benzo(b)fluoranthene	1,300	12	1,170	127.2	101	45	132	1,303	0.532	25	
Benzo(g,h,i)perylene	580	12	1,170	29.89	46.8	43	134	661.9	13.7	25	
Benzo(k)fluoranthene	1,300	12	1,170	57.43	108	47	132	1,265	4.08	25	
Chrysene	1,100	12	1,170	94.35	86.2	50	124	1,137	3.08	25	
Dibenzo (a,h) anthracene	740	12	1,170	10.55	62.4	45	134	834.5	11.9	25	
Fluoranthene	1,200	12	1,170	195.7	87.8	50	127	1,202	1.67	25	
Fluorene	1,000	12	1,170	11.13	85.2	43	125	1,020	1.19	25	
Indeno(1,2,3-cd)pyrene	690	12	1,170	32.23	56.6	45	133	794.1	13.4	25	
Naphthalene	830	12	1,170	9.962	70.4	35	123	810.3	2.82	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35213**

Sample ID:	1411401-011AMSD	Samp Type:	MSD	Test Code:	SW_8270S-LL	Units:	µg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73870
Client ID:	ZZZZZZ	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/5/2014	SeqNo:	1438092

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Phenanthrene	1,100	12	1,170	83.21	84.2	50	121	1,073	0.459	25	
Pyrene	1,200	12	1,170	180.5	88.5	47	127	1,178	3.08	25	
Surr: 2,4,6-Tribromophenol	1,600		1,462		109	39	132		0	25	
Surr: 2-Fluorobiphenyl	1,100		1,462		77.2	44	115		0	25	
Surr: 2-Fluorophenol	1,100		1,462		77.1	35	115		0	25	
Surr: Nitrobenzene-d5	1,200		1,462		80.0	37	122		0	25	
Surr: Phenol-d5	1,200		1,462		83.8	33	122		0	25	
Surr: Terphenyl-d14	1,500		1,462		103	54	127		0	25	

Sample ID:	MB-35213	Samp Type:	MBLK	Test Code:	SW_8270S-LL	Units:	µg/Kg	Prep Date:	11/20/2014	RunNo:	73781
Client ID:	PBS	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/2/2014	SeqNo:	1440462

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	6.6	6.6									U
Acenaphthene	6.6	6.6									U
Acenaphthylene	6.6	6.6									U
Anthracene	6.6	6.6									U
Benzo(a)anthracene	6.6	6.6									U
Benzo(a)pyrene	6.6	6.6									U
Benzo(b)fluoranthene	6.6	6.6									U
Benzo(g,h,i)perylene	6.6	6.6									U
Benzo(k)fluoranthene	6.6	6.6									U
Chrysene	6.6	6.6									U
Dibenzo (a,h) anthracene	6.6	6.6									U
Fluoranthene	6.6	6.6									U
Fluorene	6.6	6.6									U
Indeno(1,2,3-cd)pyrene	6.6	6.6									U
Naphthalene	6.6	6.6									U
Phenanthrene	6.6	6.6									U
Pyrene	6.6	6.6									U
Surr: 2,4,6-Tribromophenol	370		825.4		44.8	39	132				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 35213

Sample ID:	MB-35213	Samp Type:	MBLK	Test Code:	SW_8270S-LL	Units:	µg/Kg	Prep Date:	11/20/2014	RunNo:	73781
Client ID:	PBS	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/2/2014	SeqNo:	1440462

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Surr: 2-Fluorobiphenyl	750		825.4		90.4	44	115				
Surr: 2-Fluorophenol	450		825.4		54.8	35	115				
Surr: Nitrobenzene-d5	670		825.4		81.6	37	122				
Surr: Phenol-d5	580		825.4		70.2	33	122				
Surr: Terphenyl-d14	880		825.4		107	54	127				

Sample ID:	LCS-35213	Samp Type:	LCS	Test Code:	SW_8270S-LL	Units:	µg/Kg	Prep Date:	11/20/2014	RunNo:	73781
Client ID:	LCSS	Batch ID:	35213	TestNo:	SW8270C	SW3550C		Analysis Date:	12/2/2014	SeqNo:	1440463

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	520	6.6	664.7	0	77.8	38	122				
Acenaphthene	510	6.6	664.7	0	76.3	40	123				
Acenaphthylene	510	6.6	664.7	0	76.7	32	132				
Anthracene	550	6.6	664.7	0	82.0	47	123				
Benzo(a)anthracene	520	6.6	664.7	0	78.9	49	126				
Benzo(a)pyrene	540	6.6	664.7	0	80.7	45	129				
Benzo(b)fluoranthene	530	6.6	664.7	0	79.4	45	132				
Benzo(g,h,i)perylene	510	6.6	664.7	0	77.0	43	134				
Benzo(k)fluoranthene	600	6.6	664.7	0	90.8	47	132				
Chrysene	530	6.6	664.7	0	79.6	50	124				
Dibenzo (a,h) anthracene	540	6.6	664.7	0	81.8	45	134				
Fluoranthene	570	6.6	664.7	0	86.0	50	127				
Fluorene	550	6.6	664.7	0	82.5	43	125				
Indeno(1,2,3-cd)pyrene	520	6.6	664.7	0	78.3	45	133				
Naphthalene	480	6.6	664.7	0	71.7	35	123				
Phenanthrene	550	6.6	664.7	0	82.4	50	121				
Pyrene	530	6.6	664.7	0	79.8	47	127				
Surr: 2,4,6-Tribromophenol	610		830.8		73.2	39	132				
Surr: 2-Fluorobiphenyl	690		830.8		82.9	44	115				
Surr: 2-Fluorophenol	520		830.8		62.9	35	115				
Surr: Nitrobenzene-d5	620		830.8		74.8	37	122				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35213**

Sample ID:	**LCS-35213**	Samp Type:	**LCS**	Test Code:	**SW_8270S-LL**	Units:	**µg/Kg**	Prep Date:	**11/20/2014**	RunNo:	**73781**
Client ID:	**LCSS**	Batch ID:	**35213**	TestNo:	**SW8270C**	**SW3550C**		Analysis Date:	**12/2/2014**	SeqNo:	**1440463**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Surr: Phenol-d5	610		830.8		73.8	33	122				
Surr: Terphenyl-d14	780		830.8		93.7	54	127				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35217**

Sample ID:	MB-35217	Samp Type:	MBLK	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73587
Client ID:	PBS	Batch ID:	35217	TestNo:	SW9060			Analysis Date:	11/21/2014	SeqNo:	1432485

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Organic Carbon, Total	2,000	2,000									U

Sample ID:	LCS-35217	Samp Type:	LCS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73587
Client ID:	LCSS	Batch ID:	35217	TestNo:	SW9060			Analysis Date:	11/21/2014	SeqNo:	1432486

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Organic Carbon, Total	18,000	2,000	20,000	0	92.5	80	120				

Sample ID:	1411401-006BMS	Samp Type:	MS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73587
Client ID:	ZZZZZZ	Batch ID:	35217	TestNo:	SW9060			Analysis Date:	11/21/2014	SeqNo:	1432492

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Organic Carbon, Total	56,000	2,700	27,090	23,030	122	70	130				

Sample ID:	1411401-006BMSD	Samp Type:	MSD	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	11/20/2014	RunNo:	73587
Client ID:	ZZZZZZ	Batch ID:	35217	TestNo:	SW9060			Analysis Date:	11/21/2014	SeqNo:	1432493

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Organic Carbon, Total	55,000	2,700	27,260	23,030	118	70	130	55,960	1.38	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35225**

Sample ID:	LCS-35225	Samp Type:	LCS	Test Code:	EPA_350.1-S	Units:	mg/Kg	Prep Date:	11/21/2014	RunNo:	73623	
Client ID:	LCSS	Batch ID:	35225	TestNo:	E350.1			Analysis Date:	11/24/2014	SeqNo:	1433100	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	99	4.0	100.0	0	99.1	80	120					

Sample ID:	MB-35225	Samp Type:	MBLK	Test Code:	EPA_350.1-S	Units:	mg/Kg	Prep Date:	11/21/2014	RunNo:	73623	
Client ID:	PBS	Batch ID:	35225	TestNo:	E350.1			Analysis Date:	11/24/2014	SeqNo:	1433101	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	4.0	4.0									U	

Sample ID:	1411615-001CDUP	Samp Type:	DUP	Test Code:	EPA_350.1-S	Units:	mg/Kg-dry	Prep Date:	11/21/2014	RunNo:	73623	
Client ID:	SM-14-01LR1	Batch ID:	35225	TestNo:	E350.1			Analysis Date:	11/24/2014	SeqNo:	1433103	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	16	4.9						16.84	4.16	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35226**

Sample ID:	**LCS-35226**	Samp Type:	**LCS**	Test Code:	**EPA_351.2-S**	Units:	**mg/Kg**	Prep Date:	**11/21/2014**	RunNo:	**73626**
Client ID:	**LCSS**	Batch ID:	**35226**	TestNo:	**E351.2**			Analysis Date:	**11/24/2014**	SeqNo:	**1433118**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	200	20	200.0	0	98.9	80	120				

Sample ID:	**MB-35226**	Samp Type:	**MBLK**	Test Code:	**EPA_351.2-S**	Units:	**mg/Kg**	Prep Date:	**11/21/2014**	RunNo:	**73626**
Client ID:	**PBS**	Batch ID:	**35226**	TestNo:	**E351.2**			Analysis Date:	**11/24/2014**	SeqNo:	**1433119**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	20	20									U

Sample ID:	**1411615-001CDUP**	Samp Type:	**DUP**	Test Code:	**EPA_351.2-S**	Units:	**mg/Kg-dry**	Prep Date:	**11/21/2014**	RunNo:	**73626**
Client ID:	**SM-14-01LR1**	Batch ID:	**35226**	TestNo:	**E351.2**			Analysis Date:	**11/24/2014**	SeqNo:	**1433121**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	83	25						86.38	4.57	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 35243**

Sample ID:	MB-35243	Samp Type:	MBLK	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	11/24/2014	RunNo:	73711	
Client ID:	PBS	Batch ID:	35243	TestNo:	A4500-P-F			Analysis Date:	12/1/2014	SeqNo:	1434940	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	0.50	0.50									U	

Sample ID:	LCS-35243	Samp Type:	LCS	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	11/24/2014	RunNo:	73711	
Client ID:	LCSS	Batch ID:	35243	TestNo:	A4500-P-F			Analysis Date:	12/1/2014	SeqNo:	1434941	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	10	0.50	9.901	0	105	80	120					

Sample ID:	1411615-001CMS	Samp Type:	MS	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	11/24/2014	RunNo:	73711	
Client ID:	SM-14-01MS1	Batch ID:	35243	TestNo:	A4500-P-F			Analysis Date:	12/1/2014	SeqNo:	1434947	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	220	13	126.8	62.72	121	75	125					

Sample ID:	1411615-001CMSD	Samp Type:	MSD	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	11/24/2014	RunNo:	73711	
Client ID:	SM-14-01SD1	Batch ID:	35243	TestNo:	A4500-P-F			Analysis Date:	12/1/2014	SeqNo:	1434948	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	190	13	129.3	62.72	100	75	125	216.4	11.6	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R73394**

Sample ID:	**1411618-002CDUP**	Samp Type:	**DUP**	Test Code:	**PMOIST**	Units:	**wt%**	Prep Date:	**11/17/2014**	RunNo:	**73394**	
Client ID:	**ZZZZZZ**	Batch ID:	**R73394**	TestNo:	**D2216**			Analysis Date:	**11/17/2014**	SeqNo:	**1428411**	

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	22	1.0						21.86	0.696	20	

Sample ID:	**1411615-001CDUP**	Samp Type:	**DUP**	Test Code:	**PMOIST**	Units:	**wt%**	Prep Date:	**11/17/2014**	RunNo:	**73394**	
Client ID:	**SM-14-01LR1**	Batch ID:	**R73394**	TestNo:	**D2216**			Analysis Date:	**11/17/2014**	SeqNo:	**1428413**	

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	25	1.0						23.45	4.95	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R73444**

Sample ID:	**1411615-001CDUP**	Samp Type:	**DUP**	Test Code:	**SM_2540G**	Units:	**%**	Prep Date:	**11/17/2014**	RunNo:	**73444**		
Client ID:	**SM-14-01LR1**	Batch ID:	**R73444**	TestNo:	**A2540G**			Analysis Date:	**11/17/2014**	SeqNo:	**1429449**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Solids	75	0.50						76.55	1.57	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R73474**

Sample ID:	**1411615-001CDUP**	Samp Type:	**DUP**	Test Code:	**SM_2540G**	Units:	**%**	Prep Date:	**11/17/2014**	RunNo:	**73474**		
Client ID:	**SM-14-01LR1**	Batch ID:	**R73474**	TestNo:	**A2540G**			Analysis Date:	**11/17/2014**	SeqNo:	**1430152**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Volatile Solids	0.17	0.10						0.1737	0.290	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R73593

Sample ID:	**1411615-001ADUP**	Samp Type:	**DUP**	Test Code:	**ASTM-D422**	Units:	**% Finer**	Prep Date:	**11/24/2014**	RunNo:	**73593**	
Client ID:	**SM-14-01LR1**	Batch ID:	**R73593**	TestNo:	**ASTM-D422**			Analysis Date:	**11/24/2014**	SeqNo:	**1432677**	

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
No. 4 (4.75-mm)	100	0.10						100.0	0	25	
No.10 (2-mm)	100	0.10						100.0	0	25	
No.20 (850-um)	100	0.10						100.0	0.100	25	
No.40 (425-um)	100	0.10						99.90	0.200	25	
No.100 (150-um)	13	0.10						11.50	13.0	25	
No.200 (75-um)	2.1	0.10						1.900	10.0	25	
No. 270 (53-um)	1.1	0.10						1.000	9.52	25	
Non-retained material	1.1	0.10						1.000	9.52	25	
Coarse Gravel	0.10	0.10						0	0	25	U
Fine Gravel	0.10	0.10						0	0	25	U
Coarse Sand	0.10	0.10						0	0	25	U
Medium Sand	0.30	0.10						0.1000	100	25	R
Fine Sand	98	0.10						98.00	0.409	25	
Silt	2.1	0.10						1.900	10.0	25	
Clay	0.10	0.10						0	0	25	U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R73625**

Sample ID:	**1411615-001ADUP**	Samp Type:	**DUP**	Test Code:	**ASTM-D854**	Units:	**lbs/gal**	Prep Date:	**11/25/2014**	RunNo:	**73625**		
Client ID:	**SM-14-01LR1**	Batch ID:	**R73625**	TestNo:	**D854**			Analysis Date:	**11/25/2014**	SeqNo:	**1433114**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Density	23.5							24.27	3.08	20	
Density Temperature	21.0							21.00	0	20	
Specific Gravity at 20 deg. C	2.83							2.915	3.09	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R73641

Sample ID:	MB-112514	Samp Type:	MBLK	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	11/25/2014	RunNo:	73641	
Client ID:	PBS	Batch ID:	R73641	TestNo:	E410.4			Analysis Date:	11/25/2014	SeqNo:	1433364	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	20	20									U	

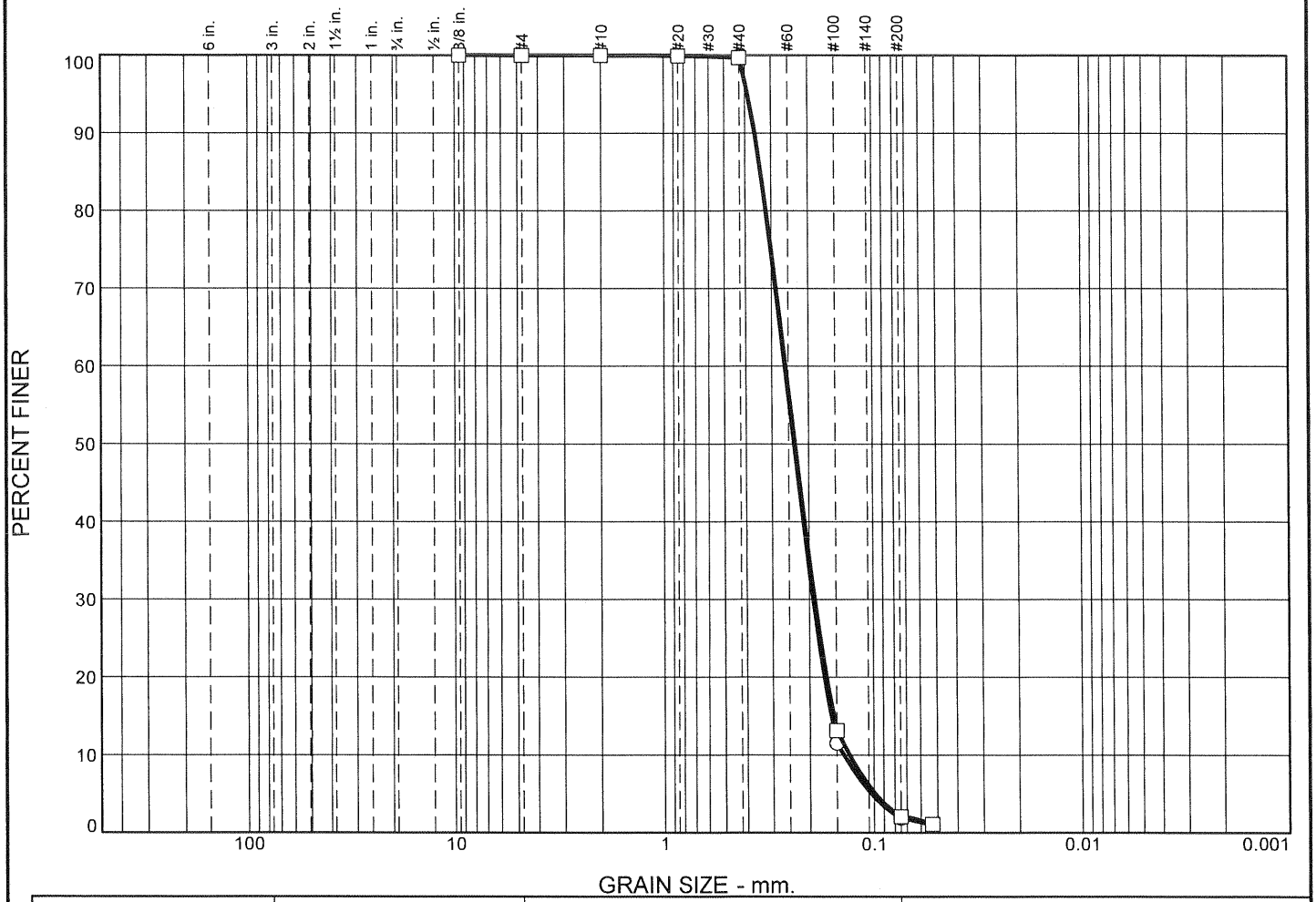
Sample ID:	LCS-112514	Samp Type:	LCS	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	11/25/2014	RunNo:	73641	
Client ID:	LCSS	Batch ID:	R73641	TestNo:	E410.4			Analysis Date:	11/25/2014	SeqNo:	1433365	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	92	20	100.0	0	92.0	80	120					

Sample ID:	1411615-001CMS	Samp Type:	MS	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	11/25/2014	RunNo:	73641	
Client ID:	SM-14-01MS1	Batch ID:	R73641	TestNo:	E410.4			Analysis Date:	11/25/2014	SeqNo:	1433374	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	13,000	520	13,010	390.3	98.2	70	130					

Sample ID:	1411615-001CMSD	Samp Type:	MSD	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	11/25/2014	RunNo:	73641	
Client ID:	SM-14-01SD1	Batch ID:	R73641	TestNo:	E410.4			Analysis Date:	11/25/2014	SeqNo:	1433375	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	13,000	520	13,010	390.3	97.6	70	130	13,170	0.595	25		

Sample ID:	MB-112514-2	Samp Type:	MBLK	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	11/25/2014	RunNo:	73641	
Client ID:	PBS	Batch ID:	R73641	TestNo:	E410.4			Analysis Date:	11/25/2014	SeqNo:	1433378	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	20	20									U	

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	98.0	1.9	
□	0.0	0.0	0.0	0.0	0.3	97.6	2.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3381	0.2596	0.2355	0.1920	0.1589	0.1393	1.02	1.86
□			0.3370	0.2573	0.2329	0.1888	0.1549	0.1309	1.06	1.97

	Material Description	USCS	AASHTO
○			
□			

Project No. DC04 **Client:** USACE-DETROIT DISTIRCT

Project: ST. MARYS SAMPLING

○ **Source of Sample:** SM-14-01 **Sample Number:** 1411615-001A

□ **Source of Sample:** SM-14-01 **Sample Number:** 1411615-001A DUP

RTI LABORATORIES

Livonia, Michigan

Remarks:

○ 11/24/2014

□ 11/24/2014

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/24/2014

Client: USACE-DETROIT DISTIRCT
Project: ST. MARYS SAMPLING
Project Number: DC04
Location: SM-14-01
Sample Number: 1411615-001A
Testing Remarks: 11/24/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
148.30	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	455.00	455.00	100.0
		#20	474.20	474.20	100.0
		#40	476.10	475.90	99.9
		#100	488.30	357.30	11.5
		#200	328.90	314.60	1.9
		#270	391.90	390.60	1.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	98.0	98.1			1.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1393	0.1589	0.1705	0.1920	0.2355	0.2596	0.3190	0.3381	0.3604	0.3878

Fineness Modulus	C_u	C_c
1.14	1.86	1.02

GRAIN SIZE DISTRIBUTION TEST DATA

11/24/2014

Client: USACE-DETROIT DISTIRCT
Project: ST. MARYS SAMPLING
Project Number: DC04
Location: SM-14-01
Sample Number: 1411615-001A DUP
Testing Remarks: 11/24/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
149.30	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	455.00	455.00	100.0
		#20	474.30	474.20	99.9
		#40	476.20	475.90	99.7
		#100	486.60	357.30	13.1
		#200	331.10	314.60	2.1
		#270	392.10	390.60	1.1

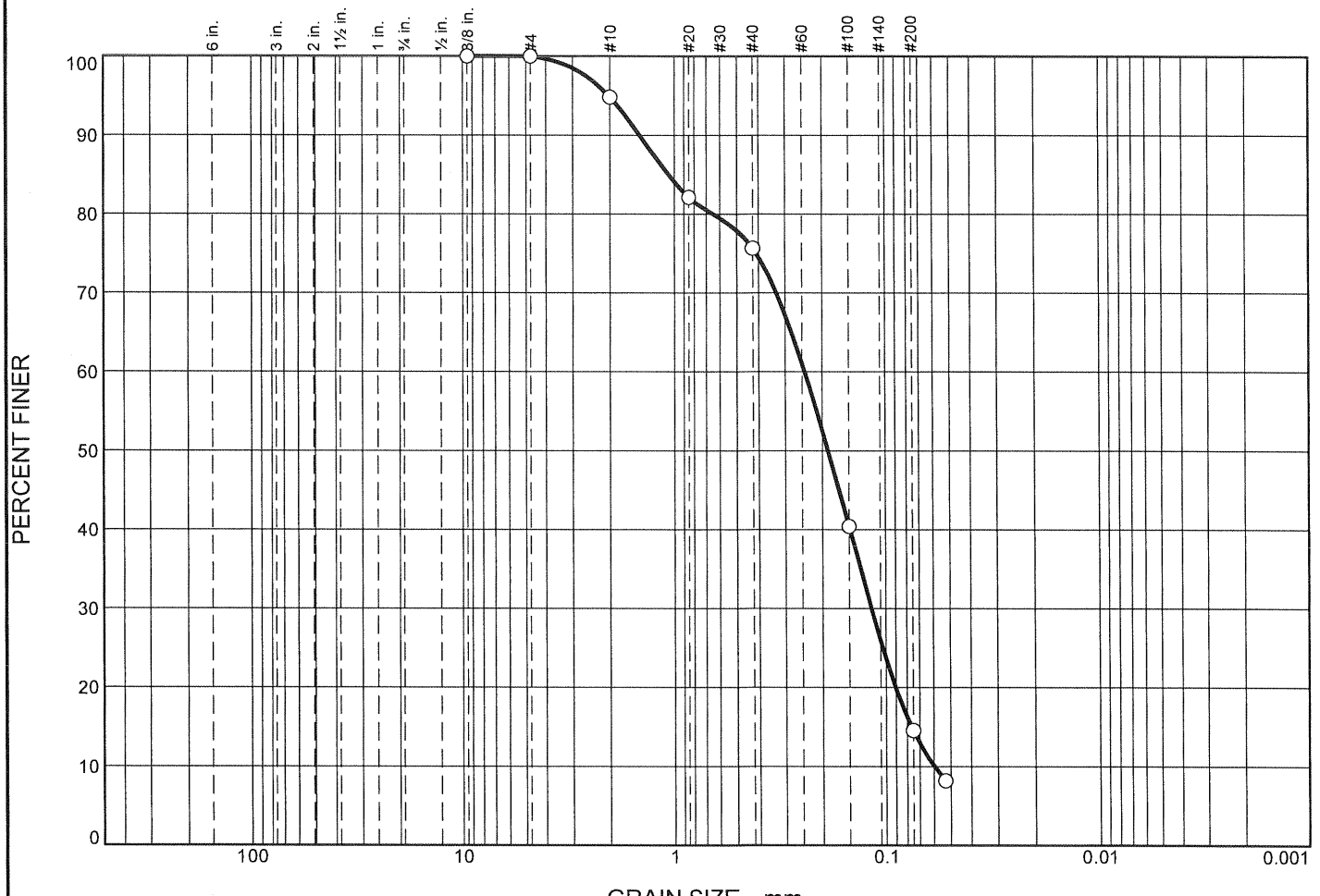
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.3	97.6	97.9			2.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1309	0.1549	0.1668	0.1888	0.2329	0.2573	0.3176	0.3370	0.3597	0.3878

Fineness Modulus	C_u	C_c
1.12	1.97	1.06

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	5.2	19.1	61.1	14.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.0654	0.2428	0.1881	0.1174	0.0763	0.0596	0.95	4.08

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-DETROIT DISTIRCT

Project: ST. MARYS SAMPLING

○ **Source of Sample:** SM-14-29 **Sample Number:** 1411615-002A

RTI LABORATORIES

Livonia, Michigan

Remarks:

○ 11/24/2014

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/24/2014

Client: USACE-DETROIT DISTIRCT
Project: ST. MARYS SAMPLING
Project Number: DC04
Location: SM-14-29
Sample Number: 1411615-002A
Testing Remarks: 11/24/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
145.50	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	462.50	455.00	94.8
		#20	492.70	474.20	82.1
		#40	485.30	475.90	75.7
		#100	408.60	357.30	40.4
		#200	352.20	314.60	14.6
		#270	399.90	390.60	8.2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	5.2	19.1	61.1	85.4			14.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0596	0.0763	0.0902	0.1174	0.1881	0.2428	0.6461	1.0654	1.4525	2.0246

Fineness Modulus	C_u	C_c
1.30	4.08	0.95

RTI Laboratories - Definitions and Acronyms

WO#: 1411615

Date Reported: 2/22/2016
Revision v3

DEFINITIONS:

DF: Dilution factor; the dilution factor applied to the prepared sample.

DL: Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.

DUP: Duplicate; aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently, used to calculate Precision (%RPD).

LCS: Laboratory Control Sample; prepared by adding a known amount of target analytes to a specified amount of clean matrix and prepared with the batch of samples, used to calculate Accuracy (%REC).

LCSD: A duplicate LCS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

LOD: Limit of Detection; a laboratory verified concentration that can be detected at three times greater than the noise level. This concentration is equal to or greater than the DL.

LOQ: Limit of Quantitation; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below the LOQ are reported with a "J" qualifier.

MBLK: Method Blank; a sample of similar matrix that does not contain target analytes or interference that may impact the analytical results and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedure, used to assess and verify that the analytical process is free of contamination.

Mg/Kg or mg/L: Units of part per million (PPM) – milligram per Kilogram (W/W) or milligram per Liter (W/V).

MS: Matrix Spike; prepared by adding a known amount of target analytes to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available, used to calculate Accuracy (%REC)

MSD: A duplicate MS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

% REC: Percent Recovery of a known spike (SPK); a measure of accuracy expressed as a percentage of a measured (recovered) concentration compared to the known concentration (SPK) added to the sample. This is compared to the Low Limit and High Limit.

% RPD: Relative Percent Difference; a measure of precision expressed as a percentage of the difference between two duplicates relative to the average concentration. This is compared to the RPD Limit.

Qual: Qualifier that applies to the analyte reported

SPK: Spike; used in the QC section for both SPK Value and SPK Ref Val

Ug/Kg or ug/L: Units of part per billion (PPB) – microgram per Kilogram (W/W) or microgram per Liter (W/V).

QUALIFIERS:

*: Reported value exceeds the maximum allowed concentration by regulation or permit.

B: Analyte detected in the associated Method Blank at a concentration greater than 1/2 the LOQ

G: ICB/CCB result is greater than the MDL

H: Holding time for preparation or analysis has been exceeded

J: Estimated result. Greater uncertainty is associated with this result and data reported is estimated.

M: Manual Integration used to determine area response

P: Second column RPD exceeds 40%

Q: % REC exceeded control limits. When applied to sample analytes - denotes an associated LCS recovery that exceeded control limits.

R: % RPD exceeds control limits

T: MBLK result is greater than 1/2 of the LOQ

U: The analyte concentration is less than the DL. The result is reported as less than the LOD

X: Matrix spike recovery for the noted analyte exceeded control limits. Applied to the MS/MSD parent sample.

Y: Percent Difference/Drift in the associated CCV exceeded acceptance criteria.

Z: Percent Difference/Drift in the associated ICV exceeded acceptance criteria.

CHAIN OF CUSTODY RECORD

RTI LABORATORIES, INC.

1411615

A2LA Cert #570.01/02 | NELAC Cert #000973 | MBE Cert #R-8150-2-424 | 8(a) / SDB

PAGE: 1 OF: 1

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Livonia, MI 48150-1827
Phone (734) 422-8000
Fax (734) 422-5342
www.rtilab.com

Please Include Email Address of Report Recipient !!!

SUBMITTING COMPANY: RTI Laboratories, Inc		REPORT TO: Ms. Pam Horner	BILL TO: P.O. #
PROJECT NAME: St Mary's River	PROJECT #: DC04 / QUOTE #: 13453	COMPANY: USACE - Detroit	COMPANY: USA12
SAMPLING LOCATION (STATE or COUNTRY): St Claire MI		ADDRESS: 477 Michigan Ave.	ADDRESS:
SPECIAL INSTRUCTIONS / COMMENTS:		CITY, STATE, ZIP: Detoit ,Mi	CITY, STATE, ZIP
		PHONE: 313-226-6748	EMAIL (OR FAX IF NO EMAIL AVAILABLE):
SAMPLER'S PRINTED NAME: Fred Hoitash	SAMPLER'S SIGNATURE: [signature]		

ANALYTICAL PARAMETERS

ITEM NUMBER	SAMPLE I.D.	DATE SAMPLED	TIME SAMPLED (24-hour format)	MATRIX CODE (see codes below)	NBR OF BOTTLES	NBR OF CONTAINERS AND PRESERVATIVES: NONE	HCL	HNO_3	H_2SO_4	NaOH	Methanol	OTHER	PESTS,PCB,PAH,	TOC,COD,OIL & GREASE	%VOLATILE RESIDUE(SM-2540G),Cyanide	GRAIN SIZE (WET SIEVE)	METALS, %MOISTURE/ NUTS	%RESIDUE,IN PLACE DENSITY	SPECIFIC GRAVITY	See Quote			Comments
1	SM-14-01	11/11/14	1026	s	3	3							X	X	X	X	X	X	X	X			
2	SM-14-29	11/11/14	1218	s	3	3							X	X	X	X	X	X	X	X			
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Relinquished By:	Date	Time	Received By:	Date	Time
[signature] To Cooler	11/13/14	0845	Cooler/Storage	11/13/14	0845
			[signature]	11/15/14	8:40

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

ALL REPORTING IS VIA THE RTI "FLASHPOINT" ONLINE SYSTEM UNLESS OTHERWISE SPECIFIED

FOR LAB USE ONLY

Temp of samples 2-4 °C On Wet Ice ? Y

Comments:

TURNAROUND DESIRED: Standard ☐ RUSH: Next BD ☐ 2nd BD ☐ 3rd BD ☐

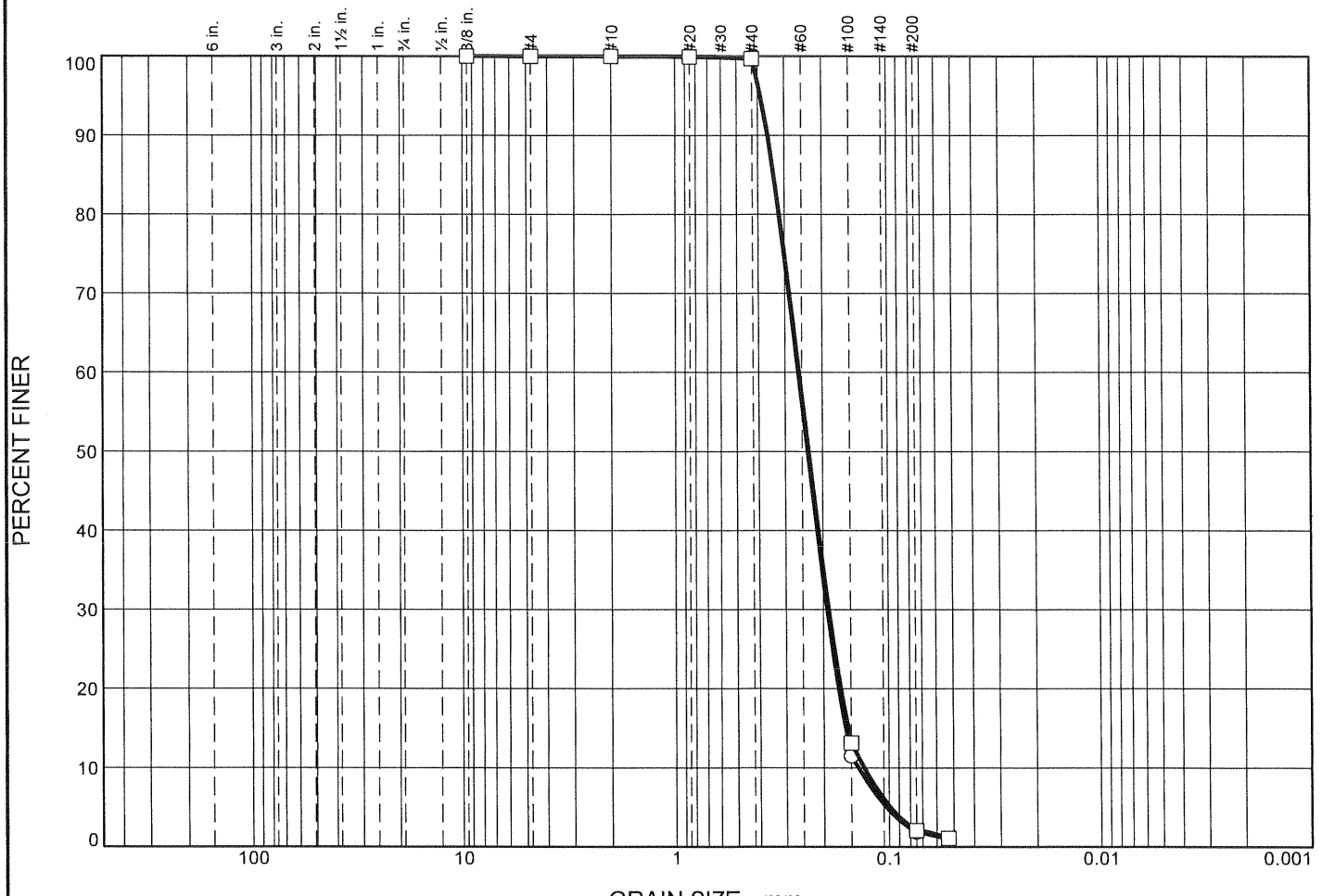
Note: RUSH requests will incur surcharges!

Distribution: White and Yellow - Lab; Pink - Field

See reverse side for Laboratory Terms and Conditions of Service

MATRIX CODES: A = AIR, SD = SOLID, DW = DRINKING WATER, SL = SLUDGE, GW = GROUNDWATER, SV = SOLVENT WASTE, L = LIQUID, W = WASTE, M = MISCELLANEOUS, WP = WIPE, O = OIL, WW = WASTE WATER, S = SOIL

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	98.0	1.9	
□	0.0	0.0	0.0	0.0	0.3	97.6	2.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3381	0.2596	0.2355	0.1920	0.1589	0.1393	1.02	1.86
□			0.3370	0.2573	0.2329	0.1888	0.1549	0.1309	1.06	1.97

	Material Description	USCS	AASHTO
○			
□			

Project No. DC04 **Client:** USACE-DETROIT DISTIRCT

Project: ST. MARYS SAMPLING

○ **Source of Sample:** SM-14-01 **Sample Number:** 1411615-001A

□ **Source of Sample:** SM-14-01 **Sample Number:** 1411615-001A DUP

Remarks:

○ 11/24/2014

□ 11/24/2014

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/24/2014

Client: USACE-DETROIT DISTIRCT
Project: ST. MARYS SAMPLING
Project Number: DC04
Location: SM-14-01
Sample Number: 1411615-001A
Testing Remarks: 11/24/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
148.30	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	455.00	455.00	100.0
		#20	474.20	474.20	100.0
		#40	476.10	475.90	99.9
		#100	488.30	357.30	11.5
		#200	328.90	314.60	1.9
		#270	391.90	390.60	1.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	98.0	98.1			1.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1393	0.1589	0.1705	0.1920	0.2355	0.2596	0.3190	0.3381	0.3604	0.3878

Fineness Modulus	C_u	C_c
1.14	1.86	1.02

GRAIN SIZE DISTRIBUTION TEST DATA

11/24/2014

Client: USACE-DETROIT DISTIRCT
Project: ST. MARYS SAMPLING
Project Number: DC04
Location: SM-14-01
Sample Number: 1411615-001A DUP
Testing Remarks: 11/24/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
149.30	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	455.00	455.00	100.0
		#20	474.30	474.20	99.9
		#40	476.20	475.90	99.7
		#100	486.60	357.30	13.1
		#200	331.10	314.60	2.1
		#270	392.10	390.60	1.1

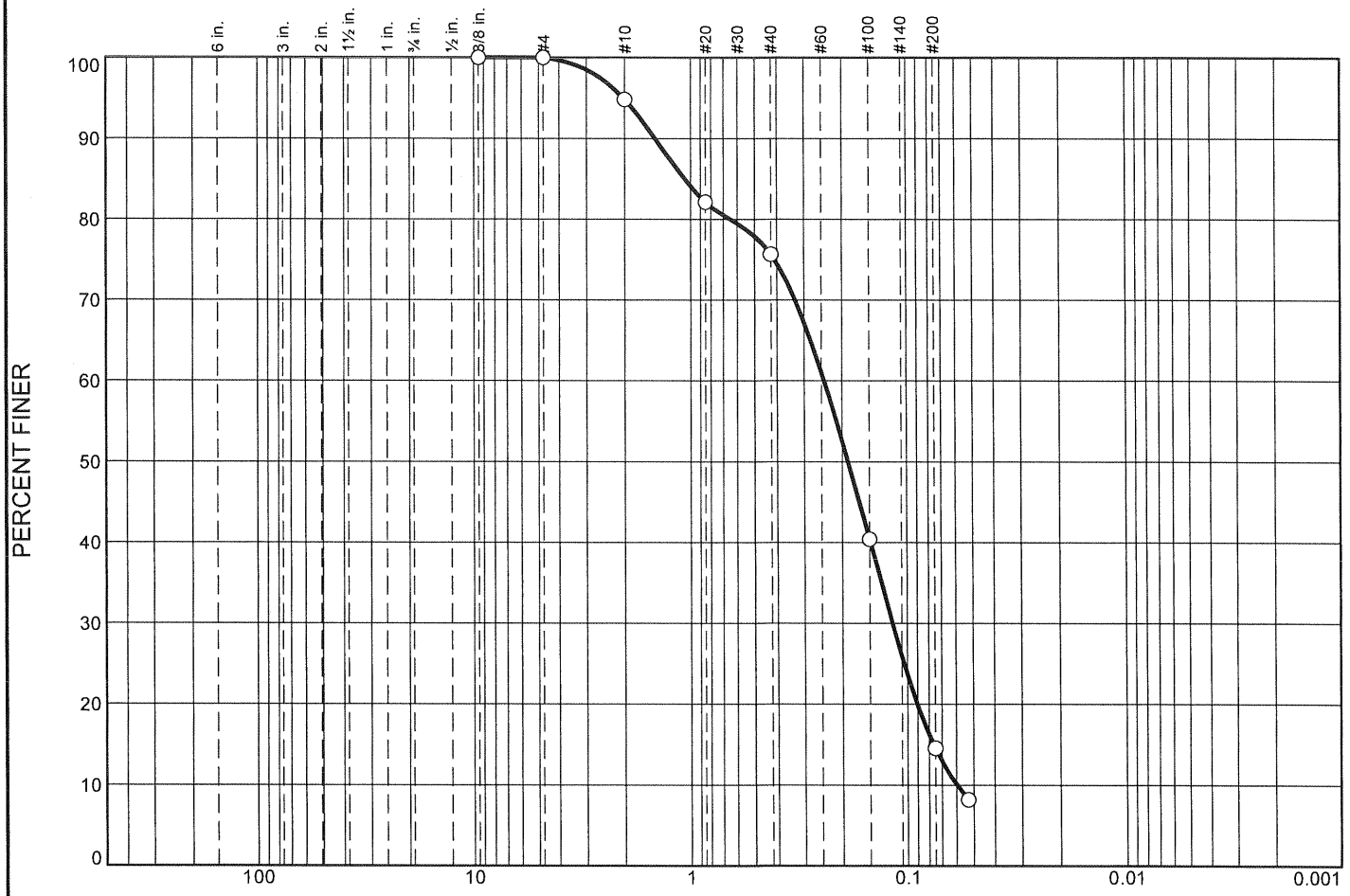
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.3	97.6	97.9			2.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1309	0.1549	0.1668	0.1888	0.2329	0.2573	0.3176	0.3370	0.3597	0.3878

Fineness Modulus	C_u	C_c
1.12	1.97	1.06

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	5.2	19.1	61.1	14.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.0654	0.2428	0.1881	0.1174	0.0763	0.0596	0.95	4.08

	Material Description	USCS	AASHTO
○			

Project No. DC04 **Client:** USACE-DETROIT DISTIRCT

Project: ST. MARYS SAMPLING

○ **Source of Sample:** SM-14-29 **Sample Number:** 1411615-002A

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Livonia, Michigan

Remarks:

○ 11/24/2014

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

11/24/2014

Client: USACE-DETROIT DISTIRCT
Project: ST. MARYS SAMPLING
Project Number: DC04
Location: SM-14-29
Sample Number: 1411615-002A
Testing Remarks: 11/24/2014
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
145.50	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	462.50	455.00	94.8
		#20	492.70	474.20	82.1
		#40	485.30	475.90	75.7
		#100	408.60	357.30	40.4
		#200	352.20	314.60	14.6
		#270	399.90	390.60	8.2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	5.2	19.1	61.1	85.4			14.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0596	0.0763	0.0902	0.1174	0.1881	0.2428	0.6461	1.0654	1.4525	2.0246

Fineness Modulus	C_u	C_c
1.30	4.08	0.95

RTI LABORATORIES, INC.

RTI Laboratories
31628 Glendale St.
Livonia, MI 48150
TEL: (734) 422-8000
Website: www.rtilab.com

Wednesday, August 26, 2015

Pam Horner
USACE- Detroit District
Environmental Analysis Branch
477 Michigan Ave.
Detroit, MI 48226
TEL:
FAX:

RE: St Marys Sampling

Work Order #: 1505725

Dear Pam Horner:

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

This report may only be reproduced in its entirety. Individual pages, reproduced without supporting documentation, do not contain related information and may be misinterpreted by other data reviewers.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Fred J Hoitash

Fred Hoitash

Director, Sales and Field Services

RTI Laboratories - Workorder Sample Summary

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling

Lab Sample ID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
1505725-001A	SM-14-02 (0-21)		5/20/2015 9:02 AM	5/22/2015 12:45 PM	Soil
1505725-001B	SM-14-02 (0-21)		5/20/2015 9:02 AM	5/22/2015 12:45 PM	Soil
1505725-001C	SM-14-02 (0-21)		5/20/2015 9:02 AM	5/22/2015 12:45 PM	Soil
1505725-002A	SM-14-02 (21-41)		5/20/2015 9:02 AM	5/22/2015 12:45 PM	Soil
1505725-002B	SM-14-02 (21-41)		5/20/2015 9:02 AM	5/22/2015 12:45 PM	Soil
1505725-002C	SM-14-02 (21-41)		5/20/2015 9:02 AM	5/22/2015 12:45 PM	Soil
1505725-003A	SM-14-03		5/20/2015 10:16 AM	5/22/2015 12:45 PM	Soil
1505725-003B	SM-14-03		5/20/2015 10:16 AM	5/22/2015 12:45 PM	Soil
1505725-003C	SM-14-03		5/20/2015 10:16 AM	5/22/2015 12:45 PM	Soil
1505725-004A	SM-14-04		5/20/2015 10:32 AM	5/22/2015 12:45 PM	Soil
1505725-004B	SM-14-04		5/20/2015 10:32 AM	5/22/2015 12:45 PM	Soil
1505725-004C	SM-14-04		5/20/2015 10:32 AM	5/22/2015 12:45 PM	Soil
1505725-005A	SM-14-05		5/20/2015 10:52 AM	5/22/2015 12:45 PM	Soil
1505725-005B	SM-14-05		5/20/2015 10:52 AM	5/22/2015 12:45 PM	Soil
1505725-005C	SM-14-05		5/20/2015 10:52 AM	5/22/2015 12:45 PM	Soil
1505725-006A	SM-14-06		5/20/2015 11:09 AM	5/22/2015 12:45 PM	Soil
1505725-006B	SM-14-06		5/20/2015 11:09 AM	5/22/2015 12:45 PM	Soil
1505725-006C	SM-14-06		5/20/2015 11:09 AM	5/22/2015 12:45 PM	Soil
1505725-007A	SM-14-09		5/20/2015 11:32 AM	5/22/2015 12:45 PM	Soil
1505725-007B	SM-14-09		5/20/2015 11:32 AM	5/22/2015 12:45 PM	Soil
1505725-007C	SM-14-09		5/20/2015 11:32 AM	5/22/2015 12:45 PM	Soil
1505725-008A	SM-14-30		5/20/2015 12:35 PM	5/22/2015 12:45 PM	Soil
1505725-008B	SM-14-30		5/20/2015 12:35 PM	5/22/2015 12:45 PM	Soil
1505725-008C	SM-14-30		5/20/2015 12:35 PM	5/22/2015 12:45 PM	Soil
1505725-009A	SM-14-25		5/20/2015 2:40 PM	5/22/2015 12:45 PM	Soil
1505725-009B	SM-14-25		5/20/2015 2:40 PM	5/22/2015 12:45 PM	Soil
1505725-009C	SM-14-25		5/20/2015 2:40 PM	5/22/2015 12:45 PM	Soil
1505725-010A	SM-14-26		5/20/2015 3:22 PM	5/22/2015 12:45 PM	Soil
1505725-010B	SM-14-26		5/20/2015 3:22 PM	5/22/2015 12:45 PM	Soil
1505725-010C	SM-14-26		5/20/2015 3:22 PM	5/22/2015 12:45 PM	Soil
1505725-011A	SM-14-27		5/20/2015 3:34 PM	5/22/2015 12:45 PM	Soil
1505725-011B	SM-14-27		5/20/2015 3:34 PM	5/22/2015 12:45 PM	Soil
1505725-011C	SM-14-27		5/20/2015 3:34 PM	5/22/2015 12:45 PM	Soil
1505725-012A	SM-14-28		5/20/2015 3:58 PM	5/22/2015 12:45 PM	Soil
1505725-012B	SM-14-28		5/20/2015 3:58 PM	5/22/2015 12:45 PM	Soil
1505725-012C	SM-14-28		5/20/2015 3:58 PM	5/22/2015 12:45 PM	Soil

RTI Laboratories - Case Narrative

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling

WorkOrder Narrative:
1505725: Concentrations reported with a J flag in the Qual field are values below the reporting limit (RL) but greater than the established method detection limit (MDL). There is greater uncertainty associated with these results and data should be considered as estimated. These analytes are not routinely reviewed nor narrated below as to their potential for being laboratory artifacts.

Concentrations reported with an E flag in the Qual field are values that exceed the upper quantification range. There is greater uncertainty associated with these results and data should be considered as estimated.

Any comments or problems with the analytical events associated with this report are noted below.

Prep Batch (SW_3546-PAH) / 36701:
1505725-003B 425825: Sample 1505725-003B: possible double surrogate. MG 5/29/2015
1505725-008B 425825: Sample 1505725-008B: possible double surrogate. MG 5/29/2015

Prep Batch (SW_3546-PEST) / 36702:
LCS-36702 425830: Sample concentrated below .5ml

Analytical Comments for Test SW_8082S, Analytical RunNo 77927, Batch ID 36703:
MB-36703 1510012: Sample MB-36703, DCB exceeded control limits.
1505725-005B 1509996: Sample 1505725-005B, DCB exceeded control limits.
1505725-007B 1509998: Sample 1505725-007B, DCB exceeded control limits.
1505725-011B 1510002: Sample 1505725-011B, DCB exceeded control limits.
1505725-011B 1510129: Sample 1505725-012B, DCB exceeded control limits.

Analytical Comments for Test ASTM-D422, Analytical RunNo 77981, Batch ID R77981:
1505725-001ADUP 1511184: Sample 1505725-001ADUP, RPD results for several analytes exceeded control limits.

Analytical Comments for Test SW_6010S, Analytical RunNo 77727, Batch ID 36671:
1505725-001CMS 1506030: Sample 1505725-001CMS, Recoveries for several analytes exceeded control limits.
1505725-001CMSD 1506031: Sample 1505725-001CMSD, Recoveries for several analytes exceeded control limits.

Analytical Comments for Test SW_8081S, Analytical RunNo 78141, Batch ID 36702:
LCS-36702 1514123: Sample LCS-36702, Endrin exceeded acceptance criteria
1505725-001BMS 1514126: Sample 1505725-001BMS, Heptachlor epoxide exceeded acceptance criteria

Analytical Comments for Test SW_8081S, Analytical RunNo 78141, Batch ID R78141:
CCB1 060515E5 1514121: Sample CCB1 060515E5, TCMX-surr. Exceeded control limit
CCB3 060515E5 1514141: Sample CCB3 060515E5, TCMX-surr. Exceeded control limit

Analytical Comments for Test SW_8270S, Analytical RunNo 77997, Batch ID 36701:
MB-36701 1511540: Sample MB-36701, 2,4,6-Tribromophenol surrogate exceeded control limit.

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 9:02:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-001	**Matrix:**	Soil
Client Sample ID:	SM-14-02 (0-21)		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.325'N					deg min		
Longitude	084 12.969'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.87	U	0.70	0.87	2.2	µg/Kg-dry	1	6/9/2015 2:19 PM
4,4'-DDE	0.87	U	0.41	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
4,4'-DDT	0.87	U	0.45	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Aldrin	0.87	U	0.44	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
alpha-BHC	0.87	U	0.38	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
alpha-Chlordane	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
beta-BHC	0.87	U	0.46	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Chlordane (Technical)	17	U	4.5	17	22	µg/Kg-dry	1	6/9/2015 2:19 PM
delta-BHC	0.87	U	0.38	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Dieldrin	0.87	U	0.47	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Endosulfan I	0.87	U	0.49	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Endosulfan II	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Endosulfan sulfate	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Endrin	0.87	U	0.50	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Endrin aldehyde	0.87	U	0.51	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Endrin ketone	0.87	U	0.47	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
gamma-BHC	0.87	U	0.39	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
gamma-Chlordane	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Heptachlor	0.87	U	0.47	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Heptachlor epoxide	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Methoxychlor	0.87	U	0.49	0.87	1.1	µg/Kg-dry	1	6/9/2015 2:19 PM
Toxaphene	17	U	6.5	17	22	µg/Kg-dry	1	6/9/2015 2:19 PM
Surr: Decachlorobiphenyl	77.5			55-130		%REC	1	6/9/2015 2:19 PM
Surr: Tetrachloro-m-xylene	61.0			42-129		%REC	1	6/9/2015 2:19 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.6	U	3.9	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1221	8.6	U	3.9	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1232	8.6	U	5.8	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1242	8.6	U	4.8	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1248	8.6	U	4.5	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1254	8.6	U	5.5	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1260	8.6	U	3.8	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1262	8.6	U	5.1	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Aroclor 1268	8.6	U	3.2	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Total PCBs	8.6	U	3.8	8.6	43	µg/Kg-dry	1	6/2/2015 3:59 PM
Surr: Tetrachloro-m-xylene	57.1			44-130		%REC	1	6/2/2015 3:59 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 9:02:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-001	**Matrix:**	Soil
Client Sample ID:	SM-14-02 (0-21)		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	63.4			60-125		%REC	1	6/2/2015 3:59 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	86		0.88	1.3	6.3	mg/Kg-dry	10	6/9/2015 12:52 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.58	U	0.38	0.58	1.2	mg/Kg-dry	1	6/8/2015 12:33 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	980	U	710	980	2,000	µg/Kg-dry	1	5/28/2015 10:29 AM
Barium	11,000		290	4,900	9,800	µg/Kg-dry	1	5/28/2015 10:29 AM
Cadmium	49	U	32	49	240	µg/Kg-dry	1	5/28/2015 10:29 AM
Chromium	13,000		80	390	490	µg/Kg-dry	1	5/28/2015 10:29 AM
Copper	4,300	J	410	980	4,900	µg/Kg-dry	1	5/28/2015 10:29 AM
Iron	5,500,000		30,000	49,000	150,000	µg/Kg-dry	10	5/28/2015 11:40 AM
Lead	1,300	J	610	980	4,900	µg/Kg-dry	1	5/28/2015 10:29 AM
Manganese	58,000		180	240	980	µg/Kg-dry	1	5/28/2015 10:29 AM
Nickel	4,400	J	280	980	4,900	µg/Kg-dry	1	5/28/2015 10:29 AM
Selenium	1,500	U	1,100	1,500	2,000	µg/Kg-dry	1	5/28/2015 10:29 AM
Silver	83	J	80	240	980	µg/Kg-dry	1	5/28/2015 10:29 AM
Zinc	6,500		380	490	4,900	µg/Kg-dry	1	5/28/2015 10:29 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	6.0	J	0.93	6.6	13	µg/Kg-dry	1	5/27/2015 11:44 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Acenaphthene	22	U	9.7	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Acenaphthylene	22	U	9.3	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Benzo(a)anthracene	22	U	14	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Benzo(a)pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Benzo(g,h,i)perylene	22	U	15	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Benzo(k)fluoranthene	43	U	23	43	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Chrysene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Dibenzo (a,h) anthracene	43	U	34	43	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Fluoranthene	22	U	21	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Fluorene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Indeno(1,2,3-cd)pyrene	43	U	11	43	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Naphthalene	22	U	8.4	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Phenanthrene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 2:49 AM
Surr: 2-Fluorobiphenyl	56.8			44-115		%REC	1	6/3/2015 2:49 AM
Surr: Nitrobenzene-d5	54.1			37-122		%REC	1	6/3/2015 2:49 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 9:02:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-001	**Matrix:**	Soil
Client Sample ID:	SM-14-02 (0-21)		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	69.3			54-127		%REC	1	6/3/2015 2:49 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	99		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	98		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	97		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	41		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	7.4		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	4.6		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	4.6		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	0.80		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	2.3		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	90		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	17.6					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.12						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	140		5.3	5.3	5.3	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	220		26	26	26	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,400		220	310	620	mg/Kg-dry	23.584 90566	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	24		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	75		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	0.27		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,300	J	680	1,500	1,900	mg/Kg-dry	1	6/16/2015 11:34 AM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 9:02:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-002	**Matrix:**	Soil
Client Sample ID:	SM-14-02 (21-41)		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.325'N					deg min		
Longitude	084 12.969'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	160	U	160	160	160	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	1.1	U	0.91	1.1	2.9	µg/Kg-dry	1	6/9/2015 3:34 PM
4,4'-DDE	1.1	U	0.53	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
4,4'-DDT	1.1	U	0.59	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Aldrin	1.1	U	0.57	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
alpha-BHC	1.1	U	0.49	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
alpha-Chlordane	1.1	U	0.63	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
beta-BHC	1.1	U	0.60	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Chlordane (Technical)	22	U	5.8	22	28	µg/Kg-dry	1	6/9/2015 3:34 PM
delta-BHC	1.1	U	0.49	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Dieldrin	1.1	U	0.61	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Endosulfan I	1.1	U	0.63	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Endosulfan II	1.1	U	0.62	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Endosulfan sulfate	1.1	U	0.63	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Endrin	1.1	U	0.64	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Endrin aldehyde	1.1	U	0.66	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Endrin ketone	1.1	U	0.61	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
gamma-BHC	1.1	U	0.51	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
gamma-Chlordane	1.1	U	0.63	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Heptachlor	1.1	U	0.61	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Heptachlor epoxide	1.1	U	0.62	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Methoxychlor	1.1	U	0.64	1.1	1.4	µg/Kg-dry	1	6/9/2015 3:34 PM
Toxaphene	22	U	8.4	22	28	µg/Kg-dry	1	6/9/2015 3:34 PM
Surr: Decachlorobiphenyl	82.0			55-130		%REC	1	6/9/2015 3:34 PM
Surr: Tetrachloro-m-xylene	63.3			42-129		%REC	1	6/9/2015 3:34 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	11	U	5.1	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1221	11	U	5.0	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1232	11	U	7.6	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1242	11	U	6.3	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1248	11	U	5.9	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1254	11	U	7.1	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1260	11	U	4.9	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1262	11	U	6.7	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Aroclor 1268	11	U	4.1	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Total PCBs	11	U	4.9	11	56	µg/Kg-dry	1	6/2/2015 4:23 PM
Surr: Tetrachloro-m-xylene	55.7			44-130		%REC	1	6/2/2015 4:23 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 9:02:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-002	**Matrix:**	Soil
Client Sample ID:	SM-14-02 (21-41)		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	61.1			60-125		%REC	1	6/2/2015 4:23 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	130		1.2	1.7	8.5	mg/Kg-dry	10	6/9/2015 12:52 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.88	U	0.58	0.88	1.8	mg/Kg-dry	1	6/8/2015 12:33 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,600	U	1,200	1,600	3,200	µg/Kg-dry	1	5/28/2015 10:47 AM
Barium	230,000		480	8,100	16,000	µg/Kg-dry	1	5/28/2015 10:47 AM
Cadmium	81	U	53	81	400	µg/Kg-dry	1	5/28/2015 10:47 AM
Chromium	61,000		130	650	810	µg/Kg-dry	1	5/28/2015 10:47 AM
Copper	33,000		670	1,600	8,100	µg/Kg-dry	1	5/28/2015 10:47 AM
Iron	36,000,000		50,000	81,000	240,000	µg/Kg-dry	10	5/28/2015 11:42 AM
Lead	8,400		1,000	1,600	8,100	µg/Kg-dry	1	5/28/2015 10:47 AM
Manganese	590,000		3,000	4,000	16,000	µg/Kg-dry	10	5/28/2015 11:42 AM
Nickel	48,000		460	1,600	8,100	µg/Kg-dry	1	5/28/2015 10:47 AM
Selenium	2,400	U	1,900	2,400	3,200	µg/Kg-dry	1	5/28/2015 10:47 AM
Silver	250	J	130	400	1,600	µg/Kg-dry	1	5/28/2015 10:47 AM
Zinc	47,000		620	810	8,100	µg/Kg-dry	1	5/28/2015 10:47 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	17	J	1.3	9.4	19	µg/Kg-dry	1	5/27/2015 11:46 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	28	U	14	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Acenaphthene	28	U	12	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Acenaphthylene	28	U	12	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Anthracene	28	U	14	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Benzo(a)anthracene	28	U	19	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Benzo(a)pyrene	28	U	17	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Benzo(b)fluoranthene	28	U	15	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Benzo(g,h,i)perylene	28	U	20	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Benzo(k)fluoranthene	56	U	29	56	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Chrysene	28	U	16	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Dibenzo (a,h) anthracene	56	U	44	56	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Fluoranthene	28	U	27	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Fluorene	28	U	16	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Indeno(1,2,3-cd)pyrene	56	U	14	56	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Naphthalene	28	U	11	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Phenanthrene	28	U	15	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Pyrene	28	U	17	28	270	µg/Kg-dry	1	6/3/2015 3:15 AM
Surr: 2-Fluorobiphenyl	57.3			44-115		%REC	1	6/3/2015 3:15 AM
Surr: Nitrobenzene-d5	55.4			37-122		%REC	1	6/3/2015 3:15 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 9:02:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-002	**Matrix:**	Soil
Client Sample ID:	SM-14-02 (21-41)		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	63.2			54-127		%REC	1	6/3/2015 3:15 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	87		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	60		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	39		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	25		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	12		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	5.4		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	1.9		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	1.9		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	13		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	27		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	35		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	20		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	16.8					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.01						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	250		6.8	6.8	6.8	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	610		34	34	34	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,300		300	420	840	mg/Kg-dry	24.875 62189	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	41		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	59		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	2.2		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,800		660	1,400	1,800	mg/Kg-dry	1	6/16/2015 12:12 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:16:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-003	**Matrix:**	Soil
Client Sample ID:	SM-14-03		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.275'N					deg min		
Longitude	084 12.358'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.86	U	0.70	0.86	2.2	µg/Kg-dry	1	6/9/2015 3:59 PM
4,4'-DDE	0.86	U	0.41	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
4,4'-DDT	0.86	U	0.45	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Aldrin	0.86	U	0.43	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
alpha-BHC	0.86	U	0.38	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
alpha-Chlordane	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
beta-BHC	0.86	U	0.46	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Chlordane (Technical)	17	U	4.5	17	22	µg/Kg-dry	1	6/9/2015 3:59 PM
delta-BHC	0.86	U	0.38	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Dieldrin	0.86	U	0.46	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Endosulfan I	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Endosulfan II	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Endosulfan sulfate	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Endrin	0.86	U	0.49	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Endrin aldehyde	0.86	U	0.50	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Endrin ketone	0.86	U	0.47	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
gamma-BHC	0.86	U	0.39	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
gamma-Chlordane	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Heptachlor	0.86	U	0.47	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Heptachlor epoxide	0.86	U	0.48	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Methoxychlor	0.86	U	0.49	0.86	1.1	µg/Kg-dry	1	6/9/2015 3:59 PM
Toxaphene	17	U	6.5	17	22	µg/Kg-dry	1	6/9/2015 3:59 PM
Surr: Decachlorobiphenyl	78.6			55-130		%REC	1	6/9/2015 3:59 PM
Surr: Tetrachloro-m-xylene	58.3			42-129		%REC	1	6/9/2015 3:59 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.6	U	3.9	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1221	8.6	U	3.9	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1232	8.6	U	5.8	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1242	8.6	U	4.8	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1248	8.6	U	4.5	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1254	8.6	U	5.4	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1260	8.6	U	3.8	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1262	8.6	U	5.1	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Aroclor 1268	8.6	U	3.1	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Total PCBs	8.6	U	3.8	8.6	42	µg/Kg-dry	1	6/2/2015 4:47 PM
Surr: Tetrachloro-m-xylene	59.8			44-130		%REC	1	6/2/2015 4:47 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:16:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-003	**Matrix:**	Soil
Client Sample ID:	SM-14-03		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	67.8			60-125		%REC	1	6/2/2015 4:47 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	66		0.88	1.3	6.4	mg/Kg-dry	10	6/9/2015 12:52 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	1.1	J	0.41	0.62	1.2	mg/Kg-dry	1	6/8/2015 12:47 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,200	U	900	1,200	2,500	µg/Kg-dry	1	5/28/2015 10:48 AM
Barium	9,000	J	370	6,200	12,000	µg/Kg-dry	1	5/28/2015 10:48 AM
Cadmium	62	U	41	62	310	µg/Kg-dry	1	5/28/2015 10:48 AM
Chromium	3,400		100	490	620	µg/Kg-dry	1	5/28/2015 10:48 AM
Copper	2,100	J	510	1,200	6,200	µg/Kg-dry	1	5/28/2015 10:48 AM
Iron	3,100,000		3,900	6,200	19,000	µg/Kg-dry	1	5/28/2015 10:48 AM
Lead	1,000	J	770	1,200	6,200	µg/Kg-dry	1	5/28/2015 10:48 AM
Manganese	36,000		230	310	1,200	µg/Kg-dry	1	5/28/2015 10:48 AM
Nickel	1,700	J	350	1,200	6,200	µg/Kg-dry	1	5/28/2015 10:48 AM
Selenium	1,900	U	1,400	1,900	2,500	µg/Kg-dry	1	5/28/2015 10:48 AM
Silver	310	U	100	310	1,200	µg/Kg-dry	1	5/28/2015 10:48 AM
Zinc	3,600	J	480	620	6,200	µg/Kg-dry	1	5/28/2015 10:48 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	4.6	J	1.1	7.6	15	µg/Kg-dry	1	5/27/2015 11:47 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	21	U	10	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Acenaphthene	21	U	9.5	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Acenaphthylene	21	U	9.1	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Anthracene	21	U	10	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Benzo(a)anthracene	21	U	14	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Benzo(a)pyrene	21	U	13	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Benzo(b)fluoranthene	21	U	12	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Benzo(g,h,i)perylene	21	U	15	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Benzo(k)fluoranthene	43	U	22	43	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Chrysene	21	U	12	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Dibenzo (a,h) anthracene	43	U	34	43	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Fluoranthene	21	U	21	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Fluorene	21	U	12	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Indeno(1,2,3-cd)pyrene	43	U	11	43	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Naphthalene	21	U	8.3	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Phenanthrene	21	U	11	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Pyrene	21	U	13	21	210	µg/Kg-dry	1	6/3/2015 3:41 AM
Surr: 2-Fluorobiphenyl	50.9			44-115		%REC	1	6/3/2015 3:41 AM
Surr: Nitrobenzene-d5	48.0			37-122		%REC	1	6/3/2015 3:41 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:16:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-003	**Matrix:**	Soil
Client Sample ID:	SM-14-03		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	72.8			54-127		%REC	1	6/3/2015 3:41 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	68		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	15		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	14		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	14		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	0.10		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	0.30		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	84		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	20.6					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.47						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	240		5.2	5.2	5.2	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	500		26	26	26	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	310	J	170	240	470	mg/Kg-dry	18.181 81818	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	23		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	76		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	0.17		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,500	U	700	1,500	1,900	mg/Kg-dry	1	6/16/2015 12:24 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:32:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-004	**Matrix:**	Soil
Client Sample ID:	SM-14-04		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.214'N					deg min		
Longitude	084 12.942'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.88	U	0.72	0.88	2.2	µg/Kg-dry	1	6/9/2015 4:24 PM
4,4'-DDE	0.88	U	0.42	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
4,4'-DDT	0.88	U	0.46	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Aldrin	0.88	U	0.45	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
alpha-BHC	0.88	U	0.39	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
alpha-Chlordane	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
beta-BHC	0.88	U	0.47	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Chlordane (Technical)	18	U	4.6	18	22	µg/Kg-dry	1	6/9/2015 4:24 PM
delta-BHC	0.88	U	0.39	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Dieldrin	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Endosulfan I	0.88	U	0.50	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Endosulfan II	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Endosulfan sulfate	0.88	U	0.50	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Endrin	0.88	U	0.51	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Endrin aldehyde	0.88	U	0.52	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Endrin ketone	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
gamma-BHC	0.88	U	0.40	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
gamma-Chlordane	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Heptachlor	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Heptachlor epoxide	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Methoxychlor	0.88	U	0.51	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:24 PM
Toxaphene	18	U	6.6	18	22	µg/Kg-dry	1	6/9/2015 4:24 PM
Surr: Decachlorobiphenyl	89.3			55-130		%REC	1	6/9/2015 4:24 PM
Surr: Tetrachloro-m-xylene	64.0			42-129		%REC	1	6/9/2015 4:24 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.8	U	4.0	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1221	8.8	U	4.0	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1232	8.8	U	5.9	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1242	8.8	U	4.9	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1248	8.8	U	4.6	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1254	8.8	U	5.6	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1260	8.8	U	3.9	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1262	8.8	U	5.2	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Aroclor 1268	8.8	U	3.2	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Total PCBs	8.8	U	3.9	8.8	44	µg/Kg-dry	1	6/2/2015 6:00 PM
Surr: Tetrachloro-m-xylene	55.8			44-130		%REC	1	6/2/2015 6:00 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:32:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-004	**Matrix:**	Soil
Client Sample ID:	SM-14-04		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	63.1			60-125		%REC	1	6/2/2015 6:00 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	84		0.95	1.4	6.9	mg/Kg-dry	10	6/9/2015 12:52 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.55	U	0.36	0.55	1.1	mg/Kg-dry	1	6/8/2015 12:33 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,200	J	920	1,300	2,500	µg/Kg-dry	1	5/28/2015 10:50 AM
Barium	9,400	J	380	6,300	13,000	µg/Kg-dry	1	5/28/2015 10:50 AM
Cadmium	63	U	42	63	320	µg/Kg-dry	1	5/28/2015 10:50 AM
Chromium	4,000		100	510	630	µg/Kg-dry	1	5/28/2015 10:50 AM
Copper	2,000	J	530	1,300	6,300	µg/Kg-dry	1	5/28/2015 10:50 AM
Iron	3,400,000		40,000	63,000	190,000	µg/Kg-dry	10	5/28/2015 11:45 AM
Lead	1,300	J	790	1,300	6,300	µg/Kg-dry	1	5/28/2015 10:50 AM
Manganese	41,000		230	320	1,300	µg/Kg-dry	1	5/28/2015 10:50 AM
Nickel	2,100	J	360	1,300	6,300	µg/Kg-dry	1	5/28/2015 10:50 AM
Selenium	1,900	U	1,500	1,900	2,500	µg/Kg-dry	1	5/28/2015 10:50 AM
Silver	110	J	100	320	1,300	µg/Kg-dry	1	5/28/2015 10:50 AM
Zinc	4,600	J	490	630	6,300	µg/Kg-dry	1	5/28/2015 10:50 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	3.7	J	0.78	5.6	11	µg/Kg-dry	1	5/27/2015 11:49 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Acenaphthene	22	U	9.8	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Acenaphthylene	22	U	9.4	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Benzo(a)anthracene	22	U	15	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Benzo(a)pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Benzo(g,h,i)perylene	22	U	16	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Benzo(k)fluoranthene	44	U	23	44	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Chrysene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Dibenzo (a,h) anthracene	44	U	35	44	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Fluoranthene	22	U	21	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Fluorene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Indeno(1,2,3-cd)pyrene	44	U	11	44	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Naphthalene	22	U	8.6	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Phenanthrene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 4:07 AM
Surr: 2-Fluorobiphenyl	59.1			44-115		%REC	1	6/3/2015 4:07 AM
Surr: Nitrobenzene-d5	56.2			37-122		%REC	1	6/3/2015 4:07 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:32:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-004	**Matrix:**	Soil
Client Sample ID:	SM-14-04		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	64.7			54-127		%REC	1	6/3/2015 4:07 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	99		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	98		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	97		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	63		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	13		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	7.8		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	7.8		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	0.80		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	2.2		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	84		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	18.8					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.26						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	170		5.3	5.3	5.3	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	410		27	27	27	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,700		200	280	560	mg/Kg-dry	21.097 04641	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	25		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	75		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	0.73		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	920	J	610	1,300	1,700	mg/Kg-dry	1	6/16/2015 12:35 PM

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WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:52:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-005	**Matrix:**	Soil
Client Sample ID:	SM-14-05		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.147'N					deg min		
Longitude	084 12.924'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.88	U	0.71	0.88	2.2	µg/Kg-dry	1	6/9/2015 4:49 PM
4,4'-DDE	0.88	U	0.41	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
4,4'-DDT	0.88	U	0.46	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Aldrin	0.88	U	0.44	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
alpha-BHC	0.88	U	0.38	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
alpha-Chlordane	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
beta-BHC	0.88	U	0.47	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Chlordane (Technical)	17	U	4.6	17	22	µg/Kg-dry	1	6/9/2015 4:49 PM
delta-BHC	0.88	U	0.38	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Dieldrin	0.88	U	0.47	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Endosulfan I	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Endosulfan II	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Endosulfan sulfate	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Endrin	0.88	U	0.50	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Endrin aldehyde	0.88	U	0.51	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Endrin ketone	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
gamma-BHC	0.88	U	0.40	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
gamma-Chlordane	0.88	U	0.49	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Heptachlor	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Heptachlor epoxide	0.88	U	0.48	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Methoxychlor	0.88	U	0.50	0.88	1.1	µg/Kg-dry	1	6/9/2015 4:49 PM
Toxaphene	17	U	6.6	17	22	µg/Kg-dry	1	6/9/2015 4:49 PM
Surr: Decachlorobiphenyl	71.5			55-130		%REC	1	6/9/2015 4:49 PM
Surr: Tetrachloro-m-xylene	55.5			42-129		%REC	1	6/9/2015 4:49 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.7	U	3.9	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1221	8.7	U	3.9	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1232	8.7	U	5.9	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1242	8.7	U	4.9	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1248	8.7	U	4.6	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1254	8.7	U	5.5	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1260	8.7	U	3.8	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1262	8.7	U	5.2	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Aroclor 1268	8.7	U	3.2	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Total PCBs	8.7	U	3.8	8.7	43	µg/Kg-dry	1	6/2/2015 6:24 PM
Surr: Tetrachloro-m-xylene	58.3			44-130		%REC	1	6/2/2015 6:24 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:52:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-005	**Matrix:**	Soil
Client Sample ID:	SM-14-05		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	58.8	Q		60-125		%REC	1	6/2/2015 6:24 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	210		0.94	1.3	6.7	mg/Kg-dry	10	6/9/2015 12:05 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.61	U	0.40	0.61	1.2	mg/Kg-dry	1	6/8/2015 12:39 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	980	U	710	980	2,000	µg/Kg-dry	1	5/28/2015 10:51 AM
Barium	8,700	J	290	4,900	9,800	µg/Kg-dry	1	5/28/2015 10:51 AM
Cadmium	49	U	32	49	250	µg/Kg-dry	1	5/28/2015 10:51 AM
Chromium	4,100		81	390	490	µg/Kg-dry	1	5/28/2015 10:51 AM
Copper	1,800	J	410	980	4,900	µg/Kg-dry	1	5/28/2015 10:51 AM
Iron	3,700,000		31,000	49,000	150,000	µg/Kg-dry	10	5/28/2015 11:46 AM
Lead	1,200	J	610	980	4,900	µg/Kg-dry	1	5/28/2015 10:51 AM
Manganese	47,000		180	250	980	µg/Kg-dry	1	5/28/2015 10:51 AM
Nickel	1,900	J	280	980	4,900	µg/Kg-dry	1	5/28/2015 10:51 AM
Selenium	1,500	U	1,100	1,500	2,000	µg/Kg-dry	1	5/28/2015 10:51 AM
Silver	110	J	80	250	980	µg/Kg-dry	1	5/28/2015 10:51 AM
Zinc	4,100	J	380	490	4,900	µg/Kg-dry	1	5/28/2015 10:51 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	3.3	J	1.0	7.3	15	µg/Kg-dry	1	5/27/2015 11:51 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Acenaphthene	22	U	9.7	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Acenaphthylene	22	U	9.3	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Benzo(a)anthracene	22	U	14	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Benzo(a)pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Benzo(g,h,i)perylene	22	U	15	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Benzo(k)fluoranthene	44	U	23	44	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Chrysene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Dibenzo (a,h) anthracene	44	U	35	44	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Fluoranthene	22	U	21	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Fluorene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Indeno(1,2,3-cd)pyrene	44	U	11	44	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Naphthalene	22	U	8.5	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Phenanthrene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 4:32 AM
Surr: 2-Fluorobiphenyl	61.1			44-115		%REC	1	6/3/2015 4:32 AM
Surr: Nitrobenzene-d5	59.6			37-122		%REC	1	6/3/2015 4:32 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 10:52:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-005	**Matrix:**	Soil
Client Sample ID:	SM-14-05		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	66.6			54-127		%REC	1	6/3/2015 4:32 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	59		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	4.7		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	2.8		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	2.8		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	0.10		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	0.10		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	95		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	18.1					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.18						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	130		5.3	5.3	5.3	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	280		27	27	27	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	630		160	230	450	mg/Kg-dry	16.949 15254	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	25		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	75		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	0.14		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,600	U	720	1,600	2,000	mg/Kg-dry	1	6/16/2015 12:48 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 11:09:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-006	**Matrix:**	Soil
Client Sample ID:	SM-14-06		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.079'N					deg min		
Longitude	084 12.911'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	120	U	120	120	120	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.85	U	0.69	0.85	2.1	µg/Kg-dry	1	6/9/2015 5:14 PM
4,4'-DDE	0.85	U	0.40	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
4,4'-DDT	0.85	U	0.44	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Aldrin	0.85	U	0.43	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
alpha-BHC	0.85	U	0.37	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
alpha-Chlordane	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
beta-BHC	0.85	U	0.45	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Chlordane (Technical)	17	U	4.4	17	21	µg/Kg-dry	1	6/9/2015 5:14 PM
delta-BHC	0.85	U	0.37	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Dieldrin	0.85	U	0.46	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Endosulfan I	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Endosulfan II	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Endosulfan sulfate	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Endrin	0.85	U	0.49	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Endrin aldehyde	0.85	U	0.49	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Endrin ketone	0.85	U	0.46	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
gamma-BHC	0.85	U	0.38	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
gamma-Chlordane	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Heptachlor	0.85	U	0.46	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Heptachlor epoxide	0.85	U	0.47	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Methoxychlor	0.85	U	0.48	0.85	1.0	µg/Kg-dry	1	6/9/2015 5:14 PM
Toxaphene	17	U	6.3	17	21	µg/Kg-dry	1	6/9/2015 5:14 PM
Surr: Decachlorobiphenyl	79.6			55-130		%REC	1	6/9/2015 5:14 PM
Surr: Tetrachloro-m-xylene	59.3			42-129		%REC	1	6/9/2015 5:14 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.4	U	3.8	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1221	8.4	U	3.8	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1232	8.4	U	5.7	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1242	8.4	U	4.7	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1248	8.4	U	4.4	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1254	8.4	U	5.3	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1260	8.4	U	3.7	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1262	8.4	U	5.0	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Aroclor 1268	8.4	U	3.1	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Total PCBs	8.4	U	3.7	8.4	42	µg/Kg-dry	1	6/2/2015 6:48 PM
Surr: Tetrachloro-m-xylene	57.6			44-130		%REC	1	6/2/2015 6:48 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 11:09:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-006	**Matrix:**	Soil
Client Sample ID:	SM-14-06		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	60.3			60-125		%REC	1	6/2/2015 6:48 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	170		0.86	1.2	6.2	mg/Kg-dry	10	6/9/2015 12:05 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.48	U	0.32	0.48	0.97	mg/Kg-dry	1	6/8/2015 12:39 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	870	J	710	980	2,000	µg/Kg-dry	1	5/28/2015 10:52 AM
Barium	15,000		290	4,900	9,800	µg/Kg-dry	1	5/28/2015 10:52 AM
Cadmium	49	U	32	49	250	µg/Kg-dry	1	5/28/2015 10:52 AM
Chromium	13,000		81	390	490	µg/Kg-dry	1	5/28/2015 10:52 AM
Copper	4,700	J	410	980	4,900	µg/Kg-dry	1	5/28/2015 10:52 AM
Iron	4,900,000		31,000	49,000	150,000	µg/Kg-dry	10	5/28/2015 11:47 AM
Lead	3,200	J	610	980	4,900	µg/Kg-dry	1	5/28/2015 10:52 AM
Manganese	67,000		180	250	980	µg/Kg-dry	1	5/28/2015 10:52 AM
Nickel	3,900	J	280	980	4,900	µg/Kg-dry	1	5/28/2015 10:52 AM
Selenium	1,500	U	1,100	1,500	2,000	µg/Kg-dry	1	5/28/2015 10:52 AM
Silver	100	J	80	250	980	µg/Kg-dry	1	5/28/2015 10:52 AM
Zinc	10,000		380	490	4,900	µg/Kg-dry	1	5/28/2015 10:52 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	5.7	J	0.97	6.9	14	µg/Kg-dry	1	5/27/2015 11:52 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	21	U	10	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Acenaphthene	21	U	9.3	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Acenaphthylene	21	U	8.9	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Anthracene	21	U	10	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Benzo(a)anthracene	21	U	14	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Benzo(a)pyrene	21	U	13	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Benzo(b)fluoranthene	21	U	11	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Benzo(g,h,i)perylene	21	U	15	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Benzo(k)fluoranthene	42	U	22	42	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Chrysene	21	U	12	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Dibenzo (a,h) anthracene	42	U	33	42	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Fluoranthene	21	U	20	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Fluorene	21	U	12	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Indeno(1,2,3-cd)pyrene	42	U	11	42	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Naphthalene	21	U	8.1	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Phenanthrene	21	U	11	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Pyrene	21	U	13	21	200	µg/Kg-dry	1	6/3/2015 4:58 AM
Surr: 2-Fluorobiphenyl	62.5			44-115		%REC	1	6/3/2015 4:58 AM
Surr: Nitrobenzene-d5	59.7			37-122		%REC	1	6/3/2015 4:58 AM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 11:09:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-006	**Matrix:**	Soil
Client Sample ID:	SM-14-06		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	71.2			54-127		%REC	1	6/3/2015 4:58 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	98		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	98		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	58		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	14		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	9.3		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	9.3		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	0.50		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	2.0		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	83		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	20.3					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.44						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	64		5.1	5.1	5.1	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	200		25	25	25	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,000		180	240	490	mg/Kg-dry	19.230 76923	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	21		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	77		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	0.28		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,100	J	690	1,500	1,900	mg/Kg-dry	1	6/16/2015 12:59 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 11:32:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-007	**Matrix:**	Soil
Client Sample ID:	SM-14-09		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 21.018'N					deg min		
Longitude	084 12.899'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.87	U	0.70	0.87	2.2	µg/Kg-dry	1	6/9/2015 5:39 PM
4,4'-DDE	0.87	U	0.41	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
4,4'-DDT	0.87	U	0.45	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Aldrin	0.87	U	0.44	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
alpha-BHC	0.87	U	0.38	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
alpha-Chlordane	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
beta-BHC	0.87	U	0.46	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Chlordane (Technical)	17	U	4.5	17	22	µg/Kg-dry	1	6/9/2015 5:39 PM
delta-BHC	0.87	U	0.38	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Dieldrin	0.87	U	0.47	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Endosulfan I	0.87	U	0.49	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Endosulfan II	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Endosulfan sulfate	0.87	U	0.49	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Endrin	0.87	U	0.50	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Endrin aldehyde	0.87	U	0.51	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Endrin ketone	0.87	U	0.47	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
gamma-BHC	0.87	U	0.39	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
gamma-Chlordane	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Heptachlor	0.87	U	0.47	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Heptachlor epoxide	0.87	U	0.48	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Methoxychlor	0.87	U	0.50	0.87	1.1	µg/Kg-dry	1	6/9/2015 5:39 PM
Toxaphene	17	U	6.5	17	22	µg/Kg-dry	1	6/9/2015 5:39 PM
Surr: Decachlorobiphenyl	61.0			55-130		%REC	1	6/9/2015 5:39 PM
Surr: Tetrachloro-m-xylene	45.9			42-129		%REC	1	6/9/2015 5:39 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.6	U	3.9	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1221	8.6	U	3.9	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1232	8.6	U	5.8	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1242	8.6	U	4.8	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1248	8.6	U	4.5	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1254	8.6	U	5.5	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1260	8.6	U	3.8	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1262	8.6	U	5.1	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Aroclor 1268	8.6	U	3.2	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Total PCBs	8.6	U	3.8	8.6	43	µg/Kg-dry	1	6/2/2015 7:12 PM
Surr: Tetrachloro-m-xylene	47.3			44-130		%REC	1	6/2/2015 7:12 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 11:32:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-007	**Matrix:**	Soil
Client Sample ID:	SM-14-09		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	51.0	Q		60-125		%REC	1	6/2/2015 7:12 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	210		0.91	1.3	6.5	mg/Kg-dry	10	6/9/2015 12:05 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.59	U	0.39	0.59	1.2	mg/Kg-dry	1	6/8/2015 12:41 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,000	U	740	1,000	2,000	µg/Kg-dry	1	5/28/2015 10:54 AM
Barium	12,000		300	5,100	10,000	µg/Kg-dry	1	5/28/2015 10:54 AM
Cadmium	51	U	34	51	250	µg/Kg-dry	1	5/28/2015 10:54 AM
Chromium	7,800		84	410	510	µg/Kg-dry	1	5/28/2015 10:54 AM
Copper	3,100	J	420	1,000	5,100	µg/Kg-dry	1	5/28/2015 10:54 AM
Iron	4,300,000		32,000	51,000	150,000	µg/Kg-dry	10	5/28/2015 11:49 AM
Lead	2,200	J	630	1,000	5,100	µg/Kg-dry	1	5/28/2015 10:54 AM
Manganese	62,000		190	250	1,000	µg/Kg-dry	1	5/28/2015 10:54 AM
Nickel	2,900	J	290	1,000	5,100	µg/Kg-dry	1	5/28/2015 10:54 AM
Selenium	1,500	U	1,200	1,500	2,000	µg/Kg-dry	1	5/28/2015 10:54 AM
Silver	100	J	83	250	1,000	µg/Kg-dry	1	5/28/2015 10:54 AM
Zinc	7,500		390	510	5,100	µg/Kg-dry	1	5/28/2015 10:54 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	6.1	J	0.83	5.9	12	µg/Kg-dry	1	5/27/2015 11:54 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	21	U	10	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Acenaphthene	21	U	9.4	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Acenaphthylene	21	U	9.0	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Anthracene	21	U	10	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Benzo(a)anthracene	21	U	14	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Benzo(a)pyrene	13	J	13	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Benzo(b)fluoranthene	16	J	11	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Benzo(g,h,i)perylene	21	U	15	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Benzo(k)fluoranthene	42	U	22	42	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Chrysene	21	U	12	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Dibenzo (a,h) anthracene	42	U	33	42	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Fluoranthene	21	U	20	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Fluorene	21	U	12	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Indeno(1,2,3-cd)pyrene	42	U	11	42	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Naphthalene	21	U	8.2	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Phenanthrene	21	U	11	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Pyrene	14	J	13	21	200	µg/Kg-dry	1	6/3/2015 5:24 AM
Surr: 2-Fluorobiphenyl	46.8			44-115		%REC	1	6/3/2015 5:24 AM
Surr: Nitrobenzene-d5	45.4			37-122		%REC	1	6/3/2015 5:24 AM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 11:32:00 AM
Project:	St Marys Sampling		
Lab ID:	1505725-007	**Matrix:**	Soil
Client Sample ID:	SM-14-09		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	56.6			54-127		%REC	1	6/3/2015 5:24 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	98		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	96		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	94		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	54		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	13		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	7.6		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	7.6		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	0.10		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	2.2		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	3.5		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	82		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	21.4					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.57						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	63		5.2	5.2	5.2	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	240		26	26	26	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,100		140	200	400	mg/Kg-dry	15.290 51988	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	23		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	77		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	0.76		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	1,400	J	700	1,500	1,900	mg/Kg-dry	1	6/16/2015 1:15 PM

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WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 12:35:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-008	**Matrix:**	Soil
Client Sample ID:	SM-14-30		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 17.314'N					deg min		
Longitude	084 12.960'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	150	U	150	150	150	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	1.0	U	0.84	1.0	2.6	µg/Kg-dry	1	6/9/2015 6:04 PM
4,4'-DDE	1.0	U	0.49	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
4,4'-DDT	1.0	U	0.54	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Aldrin	1.0	U	0.52	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
alpha-BHC	1.0	U	0.45	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
alpha-Chlordane	1.0	U	0.58	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
beta-BHC	1.0	U	0.55	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Chlordane (Technical)	20	U	5.4	20	26	µg/Kg-dry	1	6/9/2015 6:04 PM
delta-BHC	1.0	U	0.45	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Dieldrin	1.0	U	0.56	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Endosulfan I	1.0	U	0.58	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Endosulfan II	1.0	U	0.57	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Endosulfan sulfate	1.0	U	0.58	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Endrin	1.0	U	0.59	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Endrin aldehyde	1.0	U	0.60	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Endrin ketone	1.0	U	0.56	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
gamma-BHC	1.0	U	0.47	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
gamma-Chlordane	1.0	U	0.58	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Heptachlor	1.0	U	0.56	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Heptachlor epoxide	1.0	U	0.57	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Methoxychlor	1.0	U	0.59	1.0	1.3	µg/Kg-dry	1	6/9/2015 6:04 PM
Toxaphene	20	U	7.7	20	26	µg/Kg-dry	1	6/9/2015 6:04 PM
Surr: Decachlorobiphenyl	73.4			55-130		%REC	1	6/9/2015 6:04 PM
Surr: Tetrachloro-m-xylene	56.3			42-129		%REC	1	6/9/2015 6:04 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	10	U	4.6	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1221	10	U	4.6	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1232	10	U	6.9	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1242	10	U	5.7	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1248	10	U	5.4	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1254	10	U	6.5	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1260	10	U	4.5	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1262	10	U	6.1	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Aroclor 1268	10	U	3.8	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Total PCBs	10	U	4.5	10	51	µg/Kg-dry	1	6/2/2015 7:37 PM
Surr: Tetrachloro-m-xylene	58.2			44-130		%REC	1	6/2/2015 7:37 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 12:35:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-008	**Matrix:**	Soil
Client Sample ID:	SM-14-30		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	61.5			60-125		%REC	1	6/2/2015 7:37 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	230		1.1	1.6	7.8	mg/Kg-dry	10	6/9/2015 12:05 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.55	U	0.36	0.55	1.1	mg/Kg-dry	1	6/8/2015 12:39 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,200	U	880	1,200	2,400	µg/Kg-dry	1	5/28/2015 10:55 AM
Barium	49,000		360	6,100	12,000	µg/Kg-dry	1	5/28/2015 10:55 AM
Cadmium	61	U	40	61	300	µg/Kg-dry	1	5/28/2015 10:55 AM
Chromium	23,000		100	490	610	µg/Kg-dry	1	5/28/2015 10:55 AM
Copper	14,000		500	1,200	6,100	µg/Kg-dry	1	5/28/2015 10:55 AM
Iron	14,000,000		38,000	61,000	180,000	µg/Kg-dry	10	5/28/2015 11:50 AM
Lead	4,700	J	760	1,200	6,100	µg/Kg-dry	1	5/28/2015 10:55 AM
Manganese	180,000		220	300	1,200	µg/Kg-dry	1	5/28/2015 10:55 AM
Nickel	13,000		340	1,200	6,100	µg/Kg-dry	1	5/28/2015 10:55 AM
Selenium	1,800	U	1,400	1,800	2,400	µg/Kg-dry	1	5/28/2015 10:55 AM
Silver	130	J	99	300	1,200	µg/Kg-dry	1	5/28/2015 10:55 AM
Zinc	20,000		470	610	6,100	µg/Kg-dry	1	5/28/2015 10:55 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	17		0.91	6.4	13	µg/Kg-dry	1	5/27/2015 11:56 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	25	U	12	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Acenaphthene	25	U	11	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Acenaphthylene	25	U	11	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Anthracene	25	U	12	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Benzo(a)anthracene	25	U	17	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Benzo(a)pyrene	25	U	15	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Benzo(b)fluoranthene	16	J	14	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Benzo(g,h,i)perylene	25	U	18	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Benzo(k)fluoranthene	51	U	26	51	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Chrysene	25	U	14	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Dibenzo (a,h) anthracene	51	U	40	51	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Fluoranthene	25	U	24	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Fluorene	25	U	14	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Indeno(1,2,3-cd)pyrene	51	U	13	51	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Naphthalene	25	U	9.9	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Phenanthrene	25	U	13	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Pyrene	25	U	16	25	240	µg/Kg-dry	1	6/3/2015 5:48 AM
Surr: 2-Fluorobiphenyl	105			44-115		%REC	1	6/3/2015 5:48 AM
Surr: Nitrobenzene-d5	99.4			37-122		%REC	1	6/3/2015 5:48 AM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District
Project: St Marys Sampling
Lab ID: 1505725-008
Client Sample ID: SM-14-30

Collection Date: 5/20/2015 12:35:00 PM
Matrix: Soil

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	138	Q		54-127		%REC	1	6/3/2015 5:48 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	96		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	72		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	58		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	51		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	40		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	26		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	12		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	12		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	4.5		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	23		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	22		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	25		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	17.5					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	2.10						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	130		6.2	6.2	6.2	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	380		31	31	31	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	340	U	240	340	680	mg/Kg-dry	21.929 82456	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	35		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	71		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	1.6		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	7,400		650	1,400	1,800	mg/Kg-dry	1	6/16/2015 1:28 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 2:40:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-009	**Matrix:**	Soil
Client Sample ID:	SM-14-25		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 13.016'N					deg min		
Longitude	084 09.888'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	160	U	160	160	160	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	1.1	U	0.87	1.1	2.7	µg/Kg-dry	1	6/9/2015 6:33 PM
4,4'-DDE	1.1	U	0.51	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
4,4'-DDT	1.1	U	0.56	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Aldrin	1.1	U	0.54	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
alpha-BHC	1.1	U	0.47	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
alpha-Chlordane	1.1	U	0.60	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
beta-BHC	1.1	U	0.57	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Chlordane (Technical)	21	U	5.6	21	27	µg/Kg-dry	1	6/9/2015 6:33 PM
delta-BHC	1.1	U	0.47	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Dieldrin	1.1	U	0.58	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Endosulfan I	1.1	U	0.60	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Endosulfan II	1.1	U	0.60	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Endosulfan sulfate	1.1	U	0.60	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Endrin	1.1	U	0.62	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Endrin aldehyde	1.1	U	0.63	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Endrin ketone	1.1	U	0.59	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
gamma-BHC	1.1	U	0.49	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
gamma-Chlordane	1.1	U	0.60	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Heptachlor	1.1	U	0.59	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Heptachlor epoxide	1.1	U	0.59	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Methoxychlor	1.1	U	0.61	1.1	1.3	µg/Kg-dry	1	6/9/2015 6:33 PM
Toxaphene	21	U	8.0	21	27	µg/Kg-dry	1	6/9/2015 6:33 PM
Surr: Decachlorobiphenyl	71.8			55-130		%REC	1	6/9/2015 6:33 PM
Surr: Tetrachloro-m-xylene	71.5			42-129		%REC	1	6/9/2015 6:33 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	11	U	4.8	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1221	11	U	4.8	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1232	11	U	7.2	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1242	11	U	6.0	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1248	11	U	5.6	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1254	11	U	6.8	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1260	11	U	4.7	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1262	11	U	6.4	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Aroclor 1268	11	U	3.9	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Total PCBs	11	U	4.7	11	53	µg/Kg-dry	1	6/2/2015 8:50 PM
Surr: Tetrachloro-m-xylene	63.8			44-130		%REC	1	6/2/2015 8:50 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 2:40:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-009	**Matrix:**	Soil
Client Sample ID:	SM-14-25		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	65.8			60-125		%REC	1	6/2/2015 8:50 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	200		1.2	1.7	8.4	mg/Kg-dry	10	6/9/2015 12:05 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.78	U	0.51	0.78	1.6	mg/Kg-dry	1	6/8/2015 12:39 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,800	J	1,000	1,400	2,800	µg/Kg-dry	1	5/28/2015 10:56 AM
Barium	210,000		410	6,900	14,000	µg/Kg-dry	1	5/28/2015 10:56 AM
Cadmium	69	U	46	69	350	µg/Kg-dry	1	5/28/2015 10:56 AM
Chromium	65,000		110	550	690	µg/Kg-dry	1	5/28/2015 10:56 AM
Copper	32,000		570	1,400	6,900	µg/Kg-dry	1	5/28/2015 10:56 AM
Iron	36,000,000		430,000	690,000	2,100,000	µg/Kg-dry	100	5/28/2015 12:03 PM
Lead	7,200		860	1,400	6,900	µg/Kg-dry	1	5/28/2015 10:56 AM
Manganese	650,000		2,600	3,500	14,000	µg/Kg-dry	10	5/28/2015 11:51 AM
Nickel	48,000		390	1,400	6,900	µg/Kg-dry	1	5/28/2015 10:56 AM
Selenium	2,100	U	1,600	2,100	2,800	µg/Kg-dry	1	5/28/2015 10:56 AM
Silver	220	J	110	350	1,400	µg/Kg-dry	1	5/28/2015 10:56 AM
Zinc	47,000		530	690	6,900	µg/Kg-dry	1	5/28/2015 10:56 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	24		1.3	9.4	19	µg/Kg-dry	1	5/27/2015 11:57 AM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	27	U	13	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Acenaphthene	27	U	12	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Acenaphthylene	27	U	12	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Anthracene	27	U	13	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Benzo(a)anthracene	27	U	18	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Benzo(a)pyrene	27	U	16	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Benzo(b)fluoranthene	27	U	15	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Benzo(g,h,i)perylene	27	U	19	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Benzo(k)fluoranthene	54	U	28	54	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Chrysene	27	U	15	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Dibenzo (a,h) anthracene	54	U	43	54	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Fluoranthene	27	U	26	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Fluorene	27	U	15	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Indeno(1,2,3-cd)pyrene	54	U	14	54	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Naphthalene	27	U	11	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Phenanthrene	27	U	14	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Pyrene	27	U	16	27	260	µg/Kg-dry	1	6/3/2015 6:14 AM
Surr: 2-Fluorobiphenyl	54.6			44-115		%REC	1	6/3/2015 6:14 AM
Surr: Nitrobenzene-d5	53.4			37-122		%REC	1	6/3/2015 6:14 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 2:40:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-009	**Matrix:**	Soil
Client Sample ID:	SM-14-25		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	59.5			54-127		%REC	1	6/3/2015 6:14 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	84		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	54		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	32		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	20		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	9.2		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	4.0		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	0.90		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	0.90		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	16		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	30		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	34		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	16		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	15.6					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	1.87						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	110		6.5	6.5	6.5	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	360		33	33	33	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	1,000		230	310	630	mg/Kg-dry	19.305 01931	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	39		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	63		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	2.1		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	5,400		710	1,600	1,900	mg/Kg-dry	1	6/16/2015 1:46 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:22:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-010	**Matrix:**	Soil
Client Sample ID:	SM-14-26		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 12.994'N					deg min		
Longitude	084 09.873'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.89	U	0.72	0.89	2.2	µg/Kg-dry	1	6/9/2015 7:08 PM
4,4'-DDE	0.89	U	0.42	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
4,4'-DDT	0.89	U	0.46	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Aldrin	0.89	U	0.45	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
alpha-BHC	0.89	U	0.39	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
alpha-Chlordane	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
beta-BHC	0.89	U	0.47	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Chlordane (Technical)	18	U	4.6	18	22	µg/Kg-dry	1	6/9/2015 7:08 PM
delta-BHC	0.89	U	0.39	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Dieldrin	0.89	U	0.48	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Endosulfan I	0.89	U	0.50	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Endosulfan II	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Endosulfan sulfate	0.89	U	0.50	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Endrin	0.89	U	0.51	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Endrin aldehyde	0.89	U	0.52	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Endrin ketone	0.89	U	0.48	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
gamma-BHC	0.89	U	0.40	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
gamma-Chlordane	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Heptachlor	0.89	U	0.48	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Heptachlor epoxide	0.89	U	0.49	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Methoxychlor	0.89	U	0.51	0.89	1.1	µg/Kg-dry	1	6/9/2015 7:08 PM
Toxaphene	18	U	6.6	18	22	µg/Kg-dry	1	6/9/2015 7:08 PM
Surr: Decachlorobiphenyl	80.8			55-130		%REC	1	6/9/2015 7:08 PM
Surr: Tetrachloro-m-xylene	72.0			42-129		%REC	1	6/9/2015 7:08 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.8	U	4.0	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1221	8.8	U	4.0	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1232	8.8	U	5.9	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1242	8.8	U	4.9	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1248	8.8	U	4.6	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1254	8.8	U	5.6	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1260	8.8	U	3.9	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1262	8.8	U	5.2	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Aroclor 1268	8.8	U	3.2	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Total PCBs	8.8	U	3.9	8.8	44	µg/Kg-dry	1	6/2/2015 9:14 PM
Surr: Tetrachloro-m-xylene	58.6			44-130		%REC	1	6/2/2015 9:14 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:22:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-010	**Matrix:**	Soil
Client Sample ID:	SM-14-26		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	61.2			60-125		%REC	1	6/2/2015 9:14 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	200		0.92	1.3	6.6	mg/Kg-dry	10	6/9/2015 12:06 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.60	U	0.39	0.60	1.2	mg/Kg-dry	1	6/8/2015 12:39 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,200	J	810	1,100	2,200	µg/Kg-dry	1	5/28/2015 10:58 AM
Barium	190,000		330	5,600	11,000	µg/Kg-dry	1	5/28/2015 10:58 AM
Cadmium	56	U	37	56	280	µg/Kg-dry	1	5/28/2015 10:58 AM
Chromium	61,000		92	450	560	µg/Kg-dry	1	5/28/2015 10:58 AM
Copper	31,000		460	1,100	5,600	µg/Kg-dry	1	5/28/2015 10:58 AM
Iron	34,000,000		350,000	560,000	1,700,000	µg/Kg-dry	100	5/28/2015 12:04 PM
Lead	7,500		690	1,100	5,600	µg/Kg-dry	1	5/28/2015 10:58 AM
Manganese	630,000		2,100	2,800	11,000	µg/Kg-dry	10	5/28/2015 11:53 AM
Nickel	46,000		310	1,100	5,600	µg/Kg-dry	1	5/28/2015 10:58 AM
Selenium	1,700	U	1,300	1,700	2,200	µg/Kg-dry	1	5/28/2015 10:58 AM
Silver	140	J	91	280	1,100	µg/Kg-dry	1	5/28/2015 10:58 AM
Zinc	42,000		430	560	5,600	µg/Kg-dry	1	5/28/2015 10:58 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	17		1.1	7.8	16	µg/Kg-dry	1	5/27/2015 12:02 PM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Acenaphthene	22	U	9.7	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Acenaphthylene	22	U	9.3	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Anthracene	22	U	11	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Benzo(a)anthracene	22	U	14	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Benzo(a)pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Benzo(b)fluoranthene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Benzo(g,h,i)perylene	22	U	15	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Benzo(k)fluoranthene	44	U	23	44	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Chrysene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Dibenzo (a,h) anthracene	44	U	35	44	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Fluoranthene	22	U	21	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Fluorene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Indeno(1,2,3-cd)pyrene	44	U	11	44	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Naphthalene	22	U	8.5	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Phenanthrene	22	U	12	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Pyrene	22	U	13	22	210	µg/Kg-dry	1	6/3/2015 6:39 AM
Surr: 2-Fluorobiphenyl	61.8			44-115		%REC	1	6/3/2015 6:39 AM
Surr: Nitrobenzene-d5	60.6			37-122		%REC	1	6/3/2015 6:39 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:22:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-010	**Matrix:**	Soil
Client Sample ID:	SM-14-26		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	67.0			54-127		%REC	1	6/3/2015 6:39 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	97		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	73		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	48		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	32		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	17		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	7.5		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	1.9		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	1.9		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	3.4		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	24		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	41		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	24		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	15.8					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	1.89						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	56		5.3	5.3	5.3	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	180		26	26	26	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	980		190	270	530	mg/Kg-dry	20.080 32129	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	24		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	74		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	2.0		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	9,100		720	1,600	2,000	mg/Kg-dry	1	6/16/2015 1:59 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:34:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-011	**Matrix:**	Soil
Client Sample ID:	SM-14-27		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 12.967'N					deg min		
Longitude	084 09.863'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	130	U	130	130	130	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.85	U	0.69	0.85	2.2	µg/Kg-dry	1	6/9/2015 8:43 PM
4,4'-DDE	0.85	U	0.40	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
4,4'-DDT	0.85	U	0.45	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Aldrin	0.85	U	0.43	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
alpha-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
alpha-Chlordane	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
beta-BHC	0.85	U	0.45	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Chlordane (Technical)	17	U	4.4	17	21	µg/Kg-dry	1	6/9/2015 8:43 PM
delta-BHC	0.85	U	0.37	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Dieldrin	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Endosulfan I	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Endosulfan II	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Endosulfan sulfate	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Endrin	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Endrin aldehyde	0.85	U	0.50	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Endrin ketone	0.85	U	0.46	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
gamma-BHC	0.85	U	0.39	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
gamma-Chlordane	0.85	U	0.48	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Heptachlor	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Heptachlor epoxide	0.85	U	0.47	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Methoxychlor	0.85	U	0.49	0.85	1.1	µg/Kg-dry	1	6/9/2015 8:43 PM
Toxaphene	17	U	6.4	17	21	µg/Kg-dry	1	6/9/2015 8:43 PM
Surr: Decachlorobiphenyl	67.3			55-130		%REC	1	6/9/2015 8:43 PM
Surr: Tetrachloro-m-xylene	57.1			42-129		%REC	1	6/9/2015 8:43 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	8.5	U	3.8	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1221	8.5	U	3.8	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1232	8.5	U	5.7	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1242	8.5	U	4.7	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1248	8.5	U	4.5	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1254	8.5	U	5.4	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1260	8.5	U	3.7	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1262	8.5	U	5.0	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Aroclor 1268	8.5	U	3.1	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Total PCBs	8.5	U	3.7	8.5	42	µg/Kg-dry	1	6/2/2015 9:38 PM
Surr: Tetrachloro-m-xylene	53.3			44-130		%REC	1	6/2/2015 9:38 PM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:34:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-011	**Matrix:**	Soil
Client Sample ID:	SM-14-27		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	58.3	Q		60-125		%REC	1	6/2/2015 9:38 PM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	170		0.90	1.3	6.5	mg/Kg-dry	10	6/9/2015 12:06 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.60	U	0.39	0.60	1.2	mg/Kg-dry	1	6/5/2015 4:59 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,300	J	760	1,000	2,100	µg/Kg-dry	1	5/28/2015 11:07 AM
Barium	180,000		310	5,200	10,000	µg/Kg-dry	1	5/28/2015 11:07 AM
Cadmium	52	U	34	52	260	µg/Kg-dry	1	5/28/2015 11:07 AM
Chromium	54,000		86	420	520	µg/Kg-dry	1	5/28/2015 11:07 AM
Copper	32,000		430	1,000	5,200	µg/Kg-dry	1	5/28/2015 11:07 AM
Iron	33,000,000		330,000	520,000	1,600,000	µg/Kg-dry	100	5/28/2015 12:08 PM
Lead	7,100		650	1,000	5,200	µg/Kg-dry	1	5/28/2015 11:07 AM
Manganese	570,000		1,900	2,600	10,000	µg/Kg-dry	10	5/28/2015 12:05 PM
Nickel	41,000		290	1,000	5,200	µg/Kg-dry	1	5/28/2015 11:07 AM
Selenium	1,600	U	1,200	1,600	2,100	µg/Kg-dry	1	5/28/2015 11:07 AM
Silver	130	J	85	260	1,000	µg/Kg-dry	1	5/28/2015 11:07 AM
Zinc	38,000		400	520	5,200	µg/Kg-dry	1	5/28/2015 11:07 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	13		0.91	6.5	13	µg/Kg-dry	1	5/27/2015 12:04 PM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	21	U	11	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Acenaphthene	21	U	9.5	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Acenaphthylene	21	U	9.2	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Anthracene	21	U	10	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Benzo(a)anthracene	21	U	14	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Benzo(a)pyrene	21	U	13	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Benzo(b)fluoranthene	21	U	12	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Benzo(g,h,i)perylene	21	U	15	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Benzo(k)fluoranthene	43	U	22	43	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Chrysene	21	U	12	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Dibenzo (a,h) anthracene	43	U	34	43	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Fluoranthene	21	U	21	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Fluorene	21	U	12	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Indeno(1,2,3-cd)pyrene	43	U	11	43	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Naphthalene	21	U	8.3	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Phenanthrene	21	U	11	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Pyrene	21	U	13	21	210	µg/Kg-dry	1	6/3/2015 7:04 AM
Surr: 2-Fluorobiphenyl	68.0			44-115		%REC	1	6/3/2015 7:04 AM
Surr: Nitrobenzene-d5	64.6			37-122		%REC	1	6/3/2015 7:04 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:34:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-011	**Matrix:**	Soil
Client Sample ID:	SM-14-27		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	72.8			54-127		%REC	1	6/3/2015 7:04 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	96		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	74		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	51		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	34		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	18		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	6.9		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	1.1		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	1.1		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	3.9		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	23		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	39		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	27		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	15.8					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	1.90						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	55		5.3	5.3	5.3	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	270		26	26	26	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	290	J	160	230	450	mg/Kg-dry	17.123 28767	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	24		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	76		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	2.3		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	3,400	U	1,600	3,400	4,300	mg/Kg-dry	1	6/16/2015 2:53 PM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:58:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-012	**Matrix:**	Soil
Client Sample ID:	SM-14-28		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Field Parameters			**Method:**					**Analyst:**
Latitude	46 12.948'N					deg min		
Longitude	084 09.844'W					deg min		
Hexane Extractable Materials (HEM)			**Method: SW9071B**		**SW3540C**			**Analyst: NS1**
Oil & Grease, Total	140	U	140	140	140	mg/Kg-dry	1	6/3/2015 10:00 AM
Organochlorine Pesticides			**Method: SW8081B**		**SW3546**			**Analyst: RV**
4,4'-DDD	0.91	U	0.74	0.91	2.3	µg/Kg-dry	1	6/9/2015 9:08 PM
4,4'-DDE	0.91	U	0.43	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
4,4'-DDT	0.91	U	0.48	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Aldrin	0.91	U	0.46	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
alpha-BHC	0.91	U	0.40	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
alpha-Chlordane	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
beta-BHC	0.91	U	0.49	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Chlordane (Technical)	18	U	4.7	18	23	µg/Kg-dry	1	6/9/2015 9:08 PM
delta-BHC	0.91	U	0.40	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Dieldrin	0.91	U	0.49	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Endosulfan I	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Endosulfan II	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Endosulfan sulfate	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Endrin	0.91	U	0.52	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Endrin aldehyde	0.91	U	0.53	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Endrin ketone	0.91	U	0.50	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
gamma-BHC	0.91	U	0.41	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
gamma-Chlordane	0.91	U	0.51	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Heptachlor	0.91	U	0.50	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Heptachlor epoxide	0.91	U	0.50	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Methoxychlor	0.91	U	0.52	0.91	1.1	µg/Kg-dry	1	6/9/2015 9:08 PM
Toxaphene	18	U	6.8	18	23	µg/Kg-dry	1	6/9/2015 9:08 PM
Surr: Decachlorobiphenyl	62.8			55-130		%REC	1	6/9/2015 9:08 PM
Surr: Tetrachloro-m-xylene	53.6			42-129		%REC	1	6/9/2015 9:08 PM
Polychlorinated Biphenyls			**Method: SW8082A**		**SW3546**			**Analyst: BK**
Aroclor 1016	9.1	U	4.1	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1221	9.1	U	4.1	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1232	9.1	U	6.1	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1242	9.1	U	5.1	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1248	9.1	U	4.8	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1254	9.1	U	5.8	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1260	9.1	U	4.0	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1262	9.1	U	5.4	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Aroclor 1268	9.1	U	3.3	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Total PCBs	9.1	U	4.0	9.1	45	µg/Kg-dry	1	6/3/2015 9:38 AM
Surr: Tetrachloro-m-xylene	45.5			44-130		%REC	1	6/3/2015 9:38 AM

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:58:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-012	**Matrix:**	Soil
Client Sample ID:	SM-14-28		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Decachlorobiphenyl	48.9	Q		60-125		%REC	1	6/3/2015 9:38 AM
Total Phosphorus			**Method: A4500-P-F**					**Analyst: EL**
Phosphorus, Total (As P)	180		0.98	1.4	7.0	mg/Kg-dry	10	6/9/2015 12:09 PM
Cyanide			**Method: SW9012B**					**Analyst: EL**
Cyanide, Total	0.53	U	0.35	0.53	1.1	mg/Kg-dry	1	6/5/2015 3:27 PM
Metals, ICP/OES			**Method: SW6010C**		**SW3050B**			**Analyst: MK**
Arsenic	1,100	U	800	1,100	2,200	µg/Kg-dry	1	5/28/2015 11:09 AM
Barium	140,000		330	5,500	11,000	µg/Kg-dry	1	5/28/2015 11:09 AM
Cadmium	55	U	36	55	270	µg/Kg-dry	1	5/28/2015 11:09 AM
Chromium	46,000		90	440	550	µg/Kg-dry	1	5/28/2015 11:09 AM
Copper	24,000		460	1,100	5,500	µg/Kg-dry	1	5/28/2015 11:09 AM
Iron	26,000,000		34,000	55,000	160,000	µg/Kg-dry	10	5/28/2015 12:07 PM
Lead	5,800		680	1,100	5,500	µg/Kg-dry	1	5/28/2015 11:09 AM
Manganese	500,000		2,000	2,700	11,000	µg/Kg-dry	10	5/28/2015 12:07 PM
Nickel	34,000		310	1,100	5,500	µg/Kg-dry	1	5/28/2015 11:09 AM
Selenium	1,600	U	1,300	1,600	2,200	µg/Kg-dry	1	5/28/2015 11:09 AM
Silver	120	J	90	270	1,100	µg/Kg-dry	1	5/28/2015 11:09 AM
Zinc	32,000		420	550	5,500	µg/Kg-dry	1	5/28/2015 11:09 AM
Mercury			**Method: SW7471A**					**Analyst: AB2**
Mercury	24		1.0	7.1	14	µg/Kg-dry	1	5/27/2015 12:05 PM
Polynuclear Aromatic Hydrocarbons Semi-Volatile Organic Compounds			**Method: SW8270D**		**SW3546**			**Analyst: MB**
2-Methylnaphthalene	23	U	11	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Acenaphthene	23	U	10	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Acenaphthylene	23	U	10	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Anthracene	23	U	11	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Benzo(a)anthracene	23	U	15	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Benzo(a)pyrene	23	U	14	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Benzo(b)fluoranthene	23	U	13	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Benzo(g,h,i)perylene	23	U	17	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Benzo(k)fluoranthene	47	U	24	47	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Chrysene	23	U	13	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Dibenzo (a,h) anthracene	47	U	37	47	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Fluoranthene	23	U	22	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Fluorene	23	U	13	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Indeno(1,2,3-cd)pyrene	47	U	12	47	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Naphthalene	23	U	9.1	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Phenanthrene	23	U	12	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Pyrene	23	U	14	23	220	µg/Kg-dry	1	6/3/2015 7:29 AM
Surr: 2-Fluorobiphenyl	59.8			44-115		%REC	1	6/3/2015 7:29 AM
Surr: Nitrobenzene-d5	56.0			37-122		%REC	1	6/3/2015 7:29 AM

RTI Laboratories - Analytical Report

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client:	USACE- Detroit District	**Collection Date:**	5/20/2015 3:58:00 PM
Project:	St Marys Sampling		
Lab ID:	1505725-012	**Matrix:**	Soil
Client Sample ID:	SM-14-28		

Analysis	Result	Qual	DL	LOD	LOQ	Units	DF	Date Analyzed
Surr: Terphenyl-d14	65.2			54-127		%REC	1	6/3/2015 7:29 AM
Particle Size Analysis			**Method: ASTM-D422**					**Analyst: EL**
0.375 in	100		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 4 (4.75-mm)	92		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.10 (2-mm)	73		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.20 (850-um)	54		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.40 (425-um)	37		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.100 (150-um)	22		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No.200 (75-um)	6.6		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
No. 270 (53-um)	0.80		0.10	0.10	0.10	% Finer	1	6/4/2015 1:48 PM
Non-retained material	0.80		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Gravel	0.10	U	0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Gravel	7.6		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Coarse Sand	20		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Medium Sand	36		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Fine Sand	31		0.10	0.10	0.10	%	1	6/4/2015 1:48 PM
Soil Density/Specific Gravity			**Method: ASTM D854**					**Analyst: EL**
Density	15.1					lbs/gal	1	6/4/2015 10:00 AM
Density Temperature	22.0					°C	1	6/4/2015 10:00 AM
Specific Gravity at 20 deg. C	1.81						1	6/4/2015 10:00 AM
Ammonia			**Method: EPA350.1**					**Analyst: NK**
Nitrogen, Ammonia	48		5.6	5.6	5.6	mg/Kg-dry	1	6/9/2015 3:30 PM
TKN (Total Kjeldahl Nitrogen)			**Method: EPA351.2**					**Analyst: NK**
Nitrogen, Kjeldahl, Total	160		28	28	28	mg/Kg-dry	1	6/9/2015 2:00 PM
Chemical Oxygen Demand, COD			**Method: EPA410.4M**					**Analyst: NK**
Chemical Oxygen Demand	430	J	220	310	620	mg/Kg-dry	22.123 89381	6/1/2015 10:00 AM
Percent Moisture			**Method: ASTM-D2216**					**Analyst: EG**
Percent Moisture	29		1.0	1.0	1.0	wt%	1	6/2/2015 11:30 AM
Total, Fixed and Volatile Solids in Solids			**Method: SM2540G**					**Analyst: NK**
Total Solids	76		0.10	0.20	0.50	%	1	5/26/2015 3:25 PM
Total Volatile Solids	1.6		0.10	0.10	0.10	%	1	5/26/2015 3:25 PM
Inorganic Carbon			**Method: SW9060A**					**Analyst: NK**
Organic Carbon, Total	2,700	J	1,600	3,400	4,300	mg/Kg-dry	1	6/16/2015 3:27 PM

RTI Laboratories - DATES REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-001A	SM-14-02 (0-21)	5/20/2015 9:02 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-001B	SM-14-02 (0-21)	5/20/2015 9:02 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 2:19 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 3:59 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 2:49 AM
1505725-001C	SM-14-02 (0-21)	5/20/2015 9:02 AM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:33 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 11:34 AM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:44 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:29 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:40 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 12:37 PM	6/9/2015 12:52 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-002A	SM-14-02 (21-41)	5/20/2015 9:02 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-002B	SM-14-02 (21-41)	5/20/2015 9:02 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 3:34 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 4:23 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 3:15 AM

RTI Laboratories - DATES REPORT

WO#: 1505725

Date Reported: 8/26/2015
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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-002C	SM-14-02 (21-41)	5/20/2015 9:02 AM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:33 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 12:12 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:46 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:47 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:42 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 12:37 PM	6/9/2015 12:52 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-003A	SM-14-03	5/20/2015 10:16 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-003B	SM-14-03	5/20/2015 10:16 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 3:59 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 4:47 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 3:41 AM
1505725-003C	SM-14-03	5/20/2015 10:16 AM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:33 PM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:47 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 12:24 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:47 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:48 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:43 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM

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WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-003C	SM-14-03	5/20/2015 10:16 AM	Soil				
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 12:37 PM	6/9/2015 12:52 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-004A	SM-14-04	5/20/2015 10:32 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-004B	SM-14-04	5/20/2015 10:32 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 4:24 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 6:00 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 4:07 AM
1505725-004C	SM-14-04	5/20/2015 10:32 AM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:33 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 12:35 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:49 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:50 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:45 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 12:37 PM	6/9/2015 12:52 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-005A	SM-14-05	5/20/2015 10:52 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-005B	SM-14-05	5/20/2015 10:52 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM

RTI Laboratories - DATES REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-005B	SM-14-05	5/20/2015 10:52 AM	Soil				
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 4:49 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 6:24 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 4:32 AM
1505725-005C	SM-14-05	5/20/2015 10:52 AM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:39 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 12:48 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:51 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:51 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:46 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:05 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-006A	SM-14-06	5/20/2015 11:09 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-006B	SM-14-06	5/20/2015 11:09 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 5:14 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 6:48 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 4:58 AM
1505725-006C	SM-14-06	5/20/2015 11:09 AM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:39 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 12:59 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:52 AM

RTI Laboratories - DATES REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-006C	SM-14-06	5/20/2015 11:09 AM	Soil				
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:52 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:47 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:05 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-007A	SM-14-09	5/20/2015 11:32 AM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-007B	SM-14-09	5/20/2015 11:32 AM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 5:39 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 7:12 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 5:24 AM
1505725-007C	SM-14-09	5/20/2015 11:32 AM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:41 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 1:15 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:54 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:54 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:49 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:05 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-008A	SM-14-30	5/20/2015 12:35 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-008A	SM-14-30	5/20/2015 12:35 PM	Soil				
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-008B	SM-14-30	5/20/2015 12:35 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 6:04 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 7:37 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 5:48 AM
1505725-008C	SM-14-30	5/20/2015 12:35 PM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:39 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 1:28 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:56 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:55 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:50 AM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:05 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-009A	SM-14-25	5/20/2015 2:40 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-009B	SM-14-25	5/20/2015 2:40 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 6:33 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 8:50 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 6:14 AM
1505725-009C	SM-14-25	5/20/2015 2:40 PM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-009C	SM-14-25	5/20/2015 2:40 PM	Soil				
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:39 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 1:46 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 11:57 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:56 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:51 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 12:03 PM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:05 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-010A	SM-14-26	5/20/2015 3:22 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-010B	SM-14-26	5/20/2015 3:22 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 7:08 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 9:14 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 6:39 AM
1505725-010C	SM-14-26	5/20/2015 3:22 PM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/2/2015 5:56 PM	6/8/2015 12:39 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 1:59 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 12:02 PM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 10:58 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:53 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 12:04 PM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-010C	SM-14-26	5/20/2015 3:22 PM	Soil				
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:06 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-011A	SM-14-27	5/20/2015 3:34 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM
1505725-011B	SM-14-27	5/20/2015 3:34 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 8:43 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 9:38 PM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 7:04 AM
1505725-011C	SM-14-27	5/20/2015 3:34 PM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/3/2015 10:00 AM	6/5/2015 4:59 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 2:53 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 12:04 PM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:07 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:30 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 12:05 PM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 12:08 PM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:06 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM
1505725-012A	SM-14-28	5/20/2015 3:58 PM	Soil				
				Field-Field Parameters			
				ASTM-D422-Particle Size Analysis		6/4/2015 1:48 PM	6/4/2015 1:48 PM
				ASTM-D854-Soil Density/Specific Gravity		6/4/2015 10:00 AM	6/4/2015 10:00 AM

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Client: USACE- Detroit District

Project: St Marys Sampling

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
1505725-012B	SM-14-28	5/20/2015 3:58 PM	Soil				
				SW_9071-Hexane Extractable Materials (HEM)		5/29/2015 9:23 AM	6/3/2015 10:00 AM
				SW_8081S-Organochlorine Pesticides		5/29/2015 7:41 AM	6/9/2015 9:08 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/2/2015 10:02 PM
				SW_8082S-Polychlorinated Biphenyls		5/29/2015 7:41 AM	6/3/2015 9:38 AM
				SW_8270S-Semi-Volatile Organic Compounds		5/29/2015 7:40 AM	6/3/2015 7:29 AM
1505725-012C	SM-14-28	5/20/2015 3:58 PM	Soil				
				EPA_350.1-S-Ammonia		6/2/2015 1:35 PM	6/9/2015 3:30 PM
				EPA_410.4-S-Chemical Oxygen Demand, COD		6/1/2015 10:00 AM	6/1/2015 10:00 AM
				SW_9012S-Cyanide		6/3/2015 10:00 AM	6/5/2015 3:27 PM
				SW_9060S-Inorganic Carbon		6/2/2015 10:13 AM	6/16/2015 3:27 PM
				SW_7471S-Mercury		5/27/2015 9:00 AM	5/27/2015 12:05 PM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:09 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 11:31 AM
				SW_6010S-Metals, ICP/OES		5/27/2015 8:25 AM	5/28/2015 12:07 PM
				PMOIST-Percent Moisture		6/2/2015 11:30 AM	6/2/2015 11:30 AM
				EPA_351.2-S-TKN (Total Kjeldahl Nitrogen)		6/2/2015 1:35 PM	6/9/2015 2:00 PM
				SM_4500-P-FS-Total Phosphorus		6/5/2015 2:16 PM	6/9/2015 12:09 PM
				SM_2540G-Total, Fixed and Volatile Solids in Solids		5/26/2015 3:25 PM	5/26/2015 3:25 PM

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Date Reported: 8/26/2015
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36668**

Sample ID:	MB-36668	Samp Type:	MBLK	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	5/27/2015	RunNo:	77680	
Client ID:	PBS	Batch ID:	36668	TestNo:	SW7471A			Analysis Date:	5/27/2015	SeqNo:	1505281	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	1.5	7.8									J	

Sample ID:	LCS-36668	Samp Type:	LCS	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	5/27/2015	RunNo:	77680	
Client ID:	LCSS	Batch ID:	36668	TestNo:	SW7471A			Analysis Date:	5/27/2015	SeqNo:	1505282	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	42	8.7	43.48	0	97.7	80	124					

Sample ID:	1505720-001AMS	Samp Type:	MS	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	5/27/2015	RunNo:	77680	
Client ID:	ZZZZZZ	Batch ID:	36668	TestNo:	SW7471A			Analysis Date:	5/27/2015	SeqNo:	1505284	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	52	11	52.63	6.375	85.9	80	124					

Sample ID:	1505720-001AMSD	Samp Type:	MSD	Test Code:	SW_7471S	Units:	µg/Kg	Prep Date:	5/27/2015	RunNo:	77680	
Client ID:	ZZZZZZ	Batch ID:	36668	TestNo:	SW7471A			Analysis Date:	5/27/2015	SeqNo:	1505285	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Mercury	54	10	51.72	6.375	91.8	80	124	51.58	4.30	20		

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Date Reported: 8/26/2015
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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36671

Sample ID:	MB-36671	Samp Type:	MBLK	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	5/27/2015	RunNo:	77727
Client ID:	PBS	Batch ID:	36671	TestNo:	SW6010B	SW3050B		Analysis Date:	5/28/2015	SeqNo:	1506027

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	1,000	2,000									U
Barium	5,000	10,000									U
Cadmium	50	250									U
Chromium	400	500									U
Copper	1,000	5,000									U
Iron	5,000	15,000									U
Lead	1,000	5,000									U
Manganese	250	1,000									U
Nickel	1,000	5,000									U
Selenium	1,500	2,000									U
Silver	100	1,000									J
Zinc	500	5,000									U

Sample ID:	1505725-001CMS	Samp Type:	MS	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	5/27/2015	RunNo:	77727
Client ID:	SM-14-02 (0-21)	Batch ID:	36671	TestNo:	SW6010B	SW3050B		Analysis Date:	5/28/2015	SeqNo:	1506030

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	24,000	2,000	24,570	0	97.4	82	111				
Barium	42,000	9,800	24,570	10,820	126	83	113				Q
Cadmium	24,000	250	24,570	0	97.5	82	113				
Chromium	34,000	490	24,570	13,300	82.9	85	113				Q
Copper	30,000	4,900	24,570	4,257	104	81	117				
Iron	4,600,000	15,000	245,700	5,337,000	-311	81	118				JQ
Lead	25,000	4,900	24,570	1,300	97.5	81	112				
Manganese	79,000	980	24,570	57,740	85.4	84	114				
Nickel	32,000	4,900	24,570	4,393	114	83	113				Q
Selenium	22,000	2,000	24,570	0	89.2	78	111				
Silver	26,000	980	24,570	83.27	106	82	112				
Zinc	29,000	4,900	24,570	6,510	89.7	82	113				

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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36671

Sample ID:	1505725-001CMSD	Samp Type:	MSD	Test Code:	SW_6010S	Units:	µg/Kg-dry	Prep Date:	5/27/2015	RunNo:	77727
Client ID:	SM-14-02 (0-21)	Batch ID:	36671	TestNo:	SW6010B	SW3050B		Analysis Date:	5/28/2015	SeqNo:	1506031

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	24,000	2,000	24,390	0	97.2	82	111	23,920	0.917	20	
Barium	41,000	9,800	24,390	10,820	122	83	113	41,760	3.06	20	Q
Cadmium	24,000	240	24,390	0	97.1	82	113	23,960	1.15	20	
Chromium	34,000	490	24,390	13,300	84.9	85	113	33,650	1.06	20	Q
Copper	29,000	4,900	24,390	4,257	103	81	117	29,900	1.43	20	
Iron	4,800,000	15,000	243,900	5,337,000	-232	81	118	4,573,000	4.22	20	JQ
Lead	25,000	4,900	24,390	1,300	97.8	81	112	25,250	0.389	20	
Manganese	81,000	980	24,390	57,740	94.1	84	114	78,720	2.48	20	
Nickel	32,000	4,900	24,390	4,393	115	83	113	32,320	0.0827	20	Q
Selenium	23,000	2,000	24,390	0	94.5	78	111	21,930	5.02	20	
Silver	26,000	980	24,390	83.27	106	82	112	26,140	1.19	20	
Zinc	29,000	4,900	24,390	6,510	92.8	82	113	28,560	2.00	20	

Sample ID:	LCS-36671	Samp Type:	LCS	Test Code:	SW_6010S	Units:	µg/Kg	Prep Date:	5/27/2015	RunNo:	77727
Client ID:	LCSS	Batch ID:	36671	TestNo:	SW6010B	SW3050B		Analysis Date:	5/28/2015	SeqNo:	1506240

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Arsenic	24,000	2,000	25,000	0	96.2	82	111				
Barium	27,000	10,000	25,000	0	107	83	113				
Cadmium	24,000	250	25,000	0	96.6	82	113				
Chromium	26,000	500	25,000	0	102	85	113				
Copper	27,000	5,000	25,000	0	107	81	117				
Iron	260,000	15,000	250,000	0	105	81	118				
Lead	25,000	5,000	25,000	0	99.9	81	112				
Manganese	27,000	1,000	25,000	0	106	84	114				
Nickel	26,000	5,000	25,000	0	104	83	113				
Selenium	24,000	2,000	25,000	0	97.1	78	111				
Silver	26,000	1,000	25,000	0	105	82	112				
Zinc	23,000	5,000	25,000	0	91.5	82	113				

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Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36701**

Sample ID:	MB-36701	Samp Type:	MBLK	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	77997
Client ID:	PBS	Batch ID:	36701	TestNo:	SW8270C	SW3546		Analysis Date:	6/3/2015	SeqNo:	1511540

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	17	160									U
Acenaphthene	17	160									U
Acenaphthylene	17	160									U
Anthracene	17	160									U
Benzo(a)anthracene	17	160									U
Benzo(a)pyrene	17	160									U
Benzo(b)fluoranthene	17	160									U
Benzo(g,h,i)perylene	17	160									U
Benzo(k)fluoranthene	33	160									U
Chrysene	17	160									U
Dibenzo (a,h) anthracene	33	160									U
Fluoranthene	17	160									U
Fluorene	17	160									U
Indeno(1,2,3-cd)pyrene	33	160									U
Naphthalene	17	160									U
Phenanthrene	17	160									U
Pyrene	17	160									U
Surr: 2-Fluorobiphenyl	640		830.3		76.9	44	115				
Surr: Nitrobenzene-d5	600		830.3		72.2	37	122				
Surr: Terphenyl-d14	730		830.3		87.3	54	127				

Sample ID:	LCS-36701	Samp Type:	LCS	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	77997
Client ID:	LCSS	Batch ID:	36701	TestNo:	SW8270C	SW3546		Analysis Date:	6/3/2015	SeqNo:	1511541

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	540	160	656.2	0	81.9	38	122				
Acenaphthene	500	160	656.2	0	76.3	40	123				
Acenaphthylene	530	160	656.2	0	80.3	32	132				
Anthracene	530	160	656.2	0	81.3	47	123				
Benzo(a)anthracene	540	160	656.2	0	82.3	49	126				
Benzo(a)pyrene	540	160	656.2	0	82.5	45	129				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36701

Sample ID:	LCS-36701	Samp Type:	LCS	Test Code:	SW_8270S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	77997
Client ID:	LCSS	Batch ID:	36701	TestNo:	SW8270C	SW3546		Analysis Date:	6/3/2015	SeqNo:	1511541

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Benzo(b)fluoranthene	590	160	656.2	0	90.0	45	132				
Benzo(g,h,i)perylene	490	160	656.2	0	74.2	43	134				
Benzo(k)fluoranthene	530	160	656.2	0	80.7	47	132				
Chrysene	520	160	656.2	0	79.4	50	124				
Dibenzo (a,h) anthracene	540	160	656.2	0	82.2	45	134				
Fluoranthene	550	160	656.2	0	83.5	50	127				
Fluorene	550	160	656.2	0	83.5	43	125				
Indeno(1,2,3-cd)pyrene	530	160	656.2	0	80.3	45	133				
Naphthalene	490	160	656.2	0	75.2	35	123				
Phenanthrene	500	160	656.2	0	76.3	50	121				
Pyrene	550	160	656.2	0	83.1	47	127				
Surr: 2-Fluorobiphenyl	610		820.2		74.3	44	115				
Surr: Nitrobenzene-d5	600		820.2		73.7	37	122				
Surr: Terphenyl-d14	660		820.2		79.9	54	127				

Sample ID:	1505725-012BMS	Samp Type:	MS	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	77997
Client ID:	SM-14-28	Batch ID:	36701	TestNo:	SW8270C	SW3546		Analysis Date:	6/3/2015	SeqNo:	1511554

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	510	210	887.9	0	57.3	38	122				
Acenaphthene	490	210	887.9	0	55.5	40	123				
Acenaphthylene	530	210	887.9	0	59.3	32	132				
Anthracene	570	210	887.9	0	63.7	47	123				
Benzo(a)anthracene	580	210	887.9	0	65.5	49	126				
Benzo(a)pyrene	580	210	887.9	0	65.8	45	129				
Benzo(b)fluoranthene	650	210	887.9	0	72.7	45	132				
Benzo(g,h,i)perylene	530	210	887.9	0	59.9	43	134				
Benzo(k)fluoranthene	560	210	887.9	0	62.7	47	132				
Chrysene	550	210	887.9	0	61.6	50	124				
Dibenzo (a,h) anthracene	630	210	887.9	0	70.9	45	134				
Fluoranthene	590	210	887.9	0	66.3	50	127				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36701

Sample ID:	1505725-012BMS	Samp Type:	MS	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	77997
Client ID:	SM-14-28	Batch ID:	36701	TestNo:	SW8270C	SW3546		Analysis Date:	6/3/2015	SeqNo:	1511554

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Fluorene	560	210	887.9	0	63.2	43	125				
Indeno(1,2,3-cd)pyrene	590	210	887.9	0	66.1	45	133				
Naphthalene	460	210	887.9	0	52.0	35	123				
Phenanthrene	530	210	887.9	0	60.2	50	121				
Pyrene	590	210	887.9	0	66.1	47	127				
Surr: 2-Fluorobiphenyl	590		1,110		53.2	44	115				
Surr: Nitrobenzene-d5	570		1,110		51.5	37	122				
Surr: Terphenyl-d14	720		1,110		64.6	54	127				

Sample ID:	1505725-012BMSD	Samp Type:	MSD	Test Code:	SW_8270S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	77997
Client ID:	SM-14-28	Batch ID:	36701	TestNo:	SW8270C	SW3546		Analysis Date:	6/3/2015	SeqNo:	1511555

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
2-Methylnaphthalene	570	220	931.8	0	60.9	38	122	509.2	10.9	25	
Acenaphthene	560	220	931.8	0	59.8	40	123	492.8	12.4	25	
Acenaphthylene	590	220	931.8	0	63.6	32	132	526.5	11.8	25	
Anthracene	630	220	931.8	0	68.0	47	123	566.0	11.3	25	
Benzo(a)anthracene	640	220	931.8	0	68.3	49	126	582.0	8.93	25	
Benzo(a)pyrene	640	220	931.8	0	68.8	45	129	584.2	9.35	25	
Benzo(b)fluoranthene	700	220	931.8	0	75.3	45	132	645.9	8.33	25	
Benzo(g,h,i)perylene	590	220	931.8	0	63.3	43	134	532.3	10.3	25	
Benzo(k)fluoranthene	590	220	931.8	0	63.8	47	132	557.2	6.56	25	
Chrysene	600	220	931.8	0	64.5	50	124	547.4	9.42	25	
Dibenzo (a,h) anthracene	690	220	931.8	0	73.6	45	134	629.5	8.56	25	
Fluoranthene	650	220	931.8	0	69.3	50	127	589.1	9.17	25	
Fluorene	620	220	931.8	0	66.6	43	125	561.2	10.1	25	
Indeno(1,2,3-cd)pyrene	650	220	931.8	0	69.3	45	133	587.3	9.54	25	
Naphthalene	520	220	931.8	0	56.0	35	123	462.2	12.1	25	
Phenanthrene	590	220	931.8	0	63.7	50	121	535.0	10.5	25	
Pyrene	650	220	931.8	0	69.9	47	127	586.9	10.4	25	
Surr: 2-Fluorobiphenyl	670		1,165		57.1	44	115		0	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36701**

Sample ID:	**1505725-012BMSD**	Samp Type:	**MSD**	Test Code:	**SW_8270S**	Units:	**µg/Kg-dry**	Prep Date:	**5/29/2015**	RunNo:	**77997**		
Client ID:	**SM-14-28**	Batch ID:	**36701**	TestNo:	**SW8270C**	**SW3546**		Analysis Date:	**6/3/2015**	SeqNo:	**1511555**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	640		1,165		55.2	37	122		0	25	
Surr: Terphenyl-d14	790		1,165		68.0	54	127		0	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36702

Sample ID:	LCS-36702	Samp Type:	LCS	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	78141
Client ID:	LCSS	Batch ID:	36702	TestNo:	SW8081A	SW3546		Analysis Date:	6/9/2015	SeqNo:	1514123

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	6.3	1.7	8.286	0	76.5	56	139				
4,4'-DDE	6.2	0.83	8.286	0	74.3	56	134				
4,4'-DDT	6.4	0.83	8.286	0	77.0	50	141				
Aldrin	4.8	0.83	8.286	0	58.1	45	136				
alpha-BHC	4.6	0.83	8.286	0	55.6	45	137				
alpha-Chlordane	6.1	0.83	8.286	0	73.3	54	133				
beta-BHC	6.1	0.83	8.286	0	73.4	50	136				
Chlordane (Technical)	13	17	8.286	0	0	43	149				QU
delta-BHC	6.2	0.83	8.286	0	74.9	47	139				
Dieldrin	6.0	0.83	8.286	0	72.1	56	136				
Endosulfan I	5.7	0.83	8.286	0	69.0	53	132				
Endosulfan II	6.1	0.83	8.286	0	73.8	53	134				
Endosulfan sulfate	6.1	0.83	8.286	0	74.2	55	136				
Endrin	3.4	0.83	8.286	0	40.9	57	140				Q
Endrin aldehyde	5.4	0.83	8.286	0	64.8	35	137				
Endrin ketone	7.6	0.83	8.286	0	91.7	55	136				
gamma-BHC	5.0	0.83	8.286	0	60.0	49	135				
gamma-Chlordane	6.0	0.83	8.286	0	72.8	53	135				
Heptachlor	4.5	0.83	8.286	0	54.7	47	136				
Heptachlor epoxide	5.7	0.83	8.286	0	68.2	52	136				
Methoxychlor	6.5	0.83	8.286	0	78.2	52	143				
Toxaphene	13	17	8.286	0	0	33	141				QU
Surr: Decachlorobiphenyl	6.6		8.286		79.3	55	130				
Surr: Tetrachloro-m-xylene	3.7		8.286		44.6	42	129				

Sample ID:	MB-36702	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	78141
Client ID:	PBS	Batch ID:	36702	TestNo:	SW8081A	SW3546		Analysis Date:	6/9/2015	SeqNo:	1514124

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	0.66	1.7									U
4,4'-DDE	0.66	0.81									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36702

Sample ID:	MB-36702	Samp Type:	MBLK	Test Code:	SW_8081S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	78141
Client ID:	PBS	Batch ID:	36702	TestNo:	SW8081A	SW3546		Analysis Date:	6/9/2015	SeqNo:	1514124

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDT	0.66	0.81									U
Aldrin	0.66	0.81									U
alpha-BHC	0.66	0.81									U
alpha-Chlordane	0.66	0.81									U
beta-BHC	0.66	0.81									U
Chlordane (Technical)	13	16									U
delta-BHC	0.66	0.81									U
Dieldrin	0.66	0.81									U
Endosulfan I	0.66	0.81									U
Endosulfan II	0.66	0.81									U
Endosulfan sulfate	0.66	0.81									U
Endrin	0.66	0.81									U
Endrin aldehyde	0.66	0.81									U
Endrin ketone	0.66	0.81									U
gamma-BHC	0.66	0.81									U
gamma-Chlordane	0.66	0.81									U
Heptachlor	0.66	0.81									U
Heptachlor epoxide	0.66	0.81									U
Methoxychlor	0.66	0.81									U
Toxaphene	13	16									U
Surr: Decachlorobiphenyl	6.3		8.132		77.5	55	130				
Surr: Tetrachloro-m-xylene	4.4		8.132		53.6	42	129				

Sample ID:	1505725-001BMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	78141
Client ID:	SM-14-02 (0-21)	Batch ID:	36702	TestNo:	SW8081A	SW3546		Analysis Date:	6/9/2015	SeqNo:	1514126

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	10	2.2	10.79	0	92.9	56	139				
4,4'-DDE	12	1.1	10.79	0	107	56	134				
4,4'-DDT	9.8	1.1	10.79	0	90.6	50	141				
Aldrin	11	1.1	10.79	0	99.9	45	136				

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36702

Sample ID:	1505725-001BMS	Samp Type:	MS	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	78141
Client ID:	SM-14-02 (0-21)	Batch ID:	36702	TestNo:	SW8081A	SW3546		Analysis Date:	6/9/2015	SeqNo:	1514126

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
alpha-BHC	7.9	1.1	10.79	0	72.8	45	137				
alpha-Chlordane	11	1.1	10.79	0	105	54	133				
beta-BHC	8.5	1.1	10.79	0	78.7	50	136				
Chlordane (Technical)	17	22	10.79	0	0	43	149				QU
delta-BHC	9.9	1.1	10.79	0	91.7	47	139				
Dieldrin	11	1.1	10.79	0	101	56	136				
Endosulfan I	11	1.1	10.79	0	105	53	132				
Endosulfan II	9.4	1.1	10.79	0	87.4	53	134				
Endosulfan sulfate	10	1.1	10.79	0	93.3	55	136				
Endrin	11	1.1	10.79	0	103	57	140				
Endrin aldehyde	8.4	1.1	10.79	0	77.5	35	137				
Endrin ketone	9.4	1.1	10.79	0	87.2	55	136				
gamma-BHC	9.0	1.1	10.79	0	83.5	49	135				
gamma-Chlordane	11	1.1	10.79	0	97.5	53	135				
Heptachlor	8.9	1.1	10.79	0	82.2	47	136				
Heptachlor epoxide	35	1.1	10.79	0	329	52	136				Q
Methoxychlor	9.6	1.1	10.79	0	88.9	52	143				
Toxaphene	17	22	10.79	0	0	33	141				QU
Surr: Decachlorobiphenyl	10		10.79		94.0	55	130				
Surr: Tetrachloro-m-xylene	7.5		10.79		69.8	42	129				

Sample ID:	1505725-001BMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	78141
Client ID:	SM-14-02 (0-21)	Batch ID:	36702	TestNo:	SW8081A	SW3546		Analysis Date:	6/9/2015	SeqNo:	1514127

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
4,4'-DDD	9.3	2.2	10.86	0	85.7	56	139	10.02	7.40	25	
4,4'-DDE	11	1.1	10.86	0	98.6	56	134	11.58	7.90	25	
4,4'-DDT	9.0	1.1	10.86	0	82.9	50	141	9.771	8.24	25	
Aldrin	9.5	1.1	10.86	0	87.2	45	136	10.78	12.9	25	
alpha-BHC	6.7	1.1	10.86	0	62.1	45	137	7.854	15.2	25	
alpha-Chlordane	10	1.1	10.86	0	93.8	54	133	11.29	10.3	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36702

Sample ID:	1505725-001BMSD	Samp Type:	MSD	Test Code:	SW_8081S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	78141
Client ID:	SM-14-02 (0-21)	Batch ID:	36702	TestNo:	SW8081A	SW3546		Analysis Date:	6/9/2015	SeqNo:	1514127

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
beta-BHC	7.9	1.1	10.86	0	72.7	50	136	8.494	7.37	25	
Chlordane (Technical)	17	22	10.86	0	0	43	149	0	0	25	QU
delta-BHC	9.3	1.1	10.86	0	85.5	47	139	9.888	6.27	25	
Dieldrin	10	1.1	10.86	0	92.1	56	136	10.92	8.81	25	
Endosulfan I	10	1.1	10.86	0	93.9	53	132	11.28	10.1	25	
Endosulfan II	8.7	1.1	10.86	0	80.3	53	134	9.431	7.82	25	
Endosulfan sulfate	8.8	1.1	10.86	0	80.8	55	136	10.07	13.7	25	
Endrin	11	1.1	10.86	0	96.9	57	140	11.08	5.17	25	
Endrin aldehyde	7.8	1.1	10.86	0	72.0	35	137	8.364	6.78	25	
Endrin ketone	8.7	1.1	10.86	0	80.6	55	136	9.410	7.32	25	
gamma-BHC	8.0	1.1	10.86	0	74.0	49	135	9.005	11.4	25	
gamma-Chlordane	8.1	1.1	10.86	0	74.8	53	135	10.51	25.7	25	R
Heptachlor	7.6	1.1	10.86	0	70.1	47	136	8.868	15.3	25	
Heptachlor epoxide	15	1.1	10.86	0	135	52	136	35.49	83.4	25	R
Methoxychlor	8.9	1.1	10.86	0	82.2	52	143	9.595	7.25	25	
Toxaphene	17	22	10.86	0	0	33	141	0	0	25	QU
Surr: Decachlorobiphenyl	10		10.86		94.7	55	130		0	25	
Surr: Tetrachloro-m-xylene	6.5		10.86		59.9	42	129		0	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36703

Sample ID:	1505725-003BMS	Samp Type:	MS	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	77927
Client ID:	SM-14-03	Batch ID:	36703	TestNo:	SW8082	SW3546		Analysis Date:	6/2/2015	SeqNo:	1509993

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	130	42	212.6	0	61.6	46	129				
Aroclor 1260	140	42	212.6	0	64.8	45	134				
Surr: Tetrachloro-m-xylene	6.6		10.63		62.0	44	130				
Surr: Decachlorobiphenyl	6.7		10.63		63.3	40	135				

Sample ID:	1505725-003BMSD	Samp Type:	MSD	Test Code:	SW_8082S	Units:	µg/Kg-dry	Prep Date:	5/29/2015	RunNo:	77927
Client ID:	SM-14-03	Batch ID:	36703	TestNo:	SW8082	SW3546		Analysis Date:	6/2/2015	SeqNo:	1509994

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	120	42	210.3	0	55.6	46	129	130.8	11.2	25	
Aroclor 1260	130	42	210.3	0	60.0	45	134	137.8	8.84	25	
Surr: Tetrachloro-m-xylene	5.5		10.52		52.1	44	130		0	25	
Surr: Decachlorobiphenyl	6.1		10.52		58.0	40	135		0	25	

Sample ID:	LCS-36703	Samp Type:	LCS	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	77927
Client ID:	LCSS	Batch ID:	36703	TestNo:	SW8082	SW3546		Analysis Date:	6/2/2015	SeqNo:	1510011

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	98	33	165.0	0	59.3	46	129				
Aroclor 1260	110	33	165.0	0	66.1	45	134				
Surr: Tetrachloro-m-xylene	5.0		8.248		60.2	44	130				
Surr: Decachlorobiphenyl	5.4		8.248		65.2	40	135				

Sample ID:	MB-36703	Samp Type:	MBLK	Test Code:	SW_8082S	Units:	µg/Kg	Prep Date:	5/29/2015	RunNo:	77927
Client ID:	PBS	Batch ID:	36703	TestNo:	SW8082	SW3546		Analysis Date:	6/2/2015	SeqNo:	1510012

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1016	6.5	32									U
Aroclor 1221	6.5	32									U
Aroclor 1232	6.5	32									U
Aroclor 1242	6.5	32									U
Aroclor 1248	6.5	32									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36703**

Sample ID:	**MB-36703**	Samp Type:	**MBLK**	Test Code:	**SW_8082S**	Units:	**µg/Kg**	Prep Date:	**5/29/2015**	RunNo:	**77927**
Client ID:	**PBS**	Batch ID:	**36703**	TestNo:	**SW8082**	**SW3546**		Analysis Date:	**6/2/2015**	SeqNo:	**1510012**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Aroclor 1254	6.5	32									U
Aroclor 1260	6.5	32									U
Aroclor 1262	6.5	32									U
Aroclor 1268	6.5	32									U
Total PCBs	6.5	32									U
Surr: Tetrachloro-m-xylene	3.8		8.164		47.1	44	130				
Surr: Decachlorobiphenyl	4.9		8.164		59.6	60	125				Q

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36705**

Sample ID:	**LCS-36705**	Samp Type:	**LCS**	Test Code:	**SW_9071**	Units:	**mg/Kg**	Prep Date:	**5/29/2015**	RunNo:	**78039**	
Client ID:	**LCSS**	Batch ID:	**36705**	TestNo:	**SW9071**	**SW3540C**		Analysis Date:	**6/3/2015**	SeqNo:	**1511795**	

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Oil & Grease, Total	1,100	100	1,327	0	86.5	70	120				

Sample ID:	**MB-36705**	Samp Type:	**MBLK**	Test Code:	**SW_9071**	Units:	**mg/Kg**	Prep Date:	**5/29/2015**	RunNo:	**78039**	
Client ID:	**PBS**	Batch ID:	**36705**	TestNo:	**SW9071**	**SW3540C**		Analysis Date:	**6/3/2015**	SeqNo:	**1511796**	

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Oil & Grease, Total	99	99									U

Sample ID:	**1505725-012BMS**	Samp Type:	**MS**	Test Code:	**SW_9071**	Units:	**mg/Kg-dry**	Prep Date:	**5/29/2015**	RunNo:	**78039**	
Client ID:	**SM-14-28**	Batch ID:	**36705**	TestNo:	**SW9071**	**SW3540C**		Analysis Date:	**6/3/2015**	SeqNo:	**1511809**	

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Oil & Grease, Total	1,300	140	1,836	0	72.5	70	120				

Sample ID:	**1505725-012BMSD**	Samp Type:	**MSD**	Test Code:	**SW_9071**	Units:	**mg/Kg-dry**	Prep Date:	**5/29/2015**	RunNo:	**78039**	
Client ID:	**SM-14-28**	Batch ID:	**36705**	TestNo:	**SW9071**	**SW3540C**		Analysis Date:	**6/3/2015**	SeqNo:	**1511810**	

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Oil & Grease, Total	1,300	140	1,870	0	71.0	70	120	1,331	0.210	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36739

Sample ID:	MB-36739	Samp Type:	MBLK	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78329	
Client ID:	PBS	Batch ID:	36739	TestNo:	SW9060			Analysis Date:	6/16/2015	SeqNo:	1517970	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	1,600	2,000									U	

Sample ID:	LCS-36739	Samp Type:	LCS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78329	
Client ID:	LCSS	Batch ID:	36739	TestNo:	SW9060			Analysis Date:	6/16/2015	SeqNo:	1517971	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	21,000	2,000	20,000	0	104	80	120					

Sample ID:	1505725-001CMS	Samp Type:	MS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78329	
Client ID:	SM-14-02 (0-21)	Batch ID:	36739	TestNo:	SW9060			Analysis Date:	6/16/2015	SeqNo:	1517975	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	19,000	1,800	17,760	1,254	99.6	70	130					

Sample ID:	1505725-001CMSD	Samp Type:	MSD	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78329	
Client ID:	SM-14-02 (0-21)	Batch ID:	36739	TestNo:	SW9060			Analysis Date:	6/16/2015	SeqNo:	1517976	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	20,000	1,800	18,260	1,254	101	70	130	18,950	3.61	25		

Sample ID:	1505725-011CMS	Samp Type:	MS	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78329	
Client ID:	SM-14-27	Batch ID:	36739	TestNo:	SW9060			Analysis Date:	6/16/2015	SeqNo:	1517989	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	43,000	4,000	40,360	0	106	70	130					

Sample ID:	1505725-011CMSD	Samp Type:	MSD	Test Code:	SW_9060S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78329	
Client ID:	SM-14-27	Batch ID:	36739	TestNo:	SW9060			Analysis Date:	6/16/2015	SeqNo:	1517990	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Organic Carbon, Total	45,000	4,300	43,140	0	105	70	130	42,980	4.87	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36742

Sample ID:	MB-36742	Samp Type:	MBLK	Test Code:	EPA_350.1-S	Units:	mg/Kg	Prep Date:	6/2/2015	RunNo:	78130	
Client ID:	PBS	Batch ID:	36742	TestNo:	E350.1			Analysis Date:	6/9/2015	SeqNo:	1513937	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	4.0	4.0									U	

Sample ID:	LCS-36742	Samp Type:	LCS	Test Code:	EPA_350.1-S	Units:	mg/Kg	Prep Date:	6/2/2015	RunNo:	78130	
Client ID:	LCSS	Batch ID:	36742	TestNo:	E350.1			Analysis Date:	6/9/2015	SeqNo:	1513938	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	1,100	4.0	1,000	0	115	80	120					

Sample ID:	1505725-001CMS	Samp Type:	MS	Test Code:	EPA_350.1-S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78130	
Client ID:	SM-14-02 (0-21)	Batch ID:	36742	TestNo:	E350.1			Analysis Date:	6/9/2015	SeqNo:	1513940	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	680	5.3	658.5	136.4	82.4	75	125					

Sample ID:	1505725-001CMSD	Samp Type:	MSD	Test Code:	EPA_350.1-S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78130	
Client ID:	SM-14-02 (0-21)	Batch ID:	36742	TestNo:	E350.1			Analysis Date:	6/9/2015	SeqNo:	1513941	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	710	5.3	658.5	136.4	86.5	75	125	679.1	3.84	25		

Sample ID:	1505725-012CMS	Samp Type:	MS	Test Code:	EPA_350.1-S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78130	
Client ID:	SM-14-28	Batch ID:	36742	TestNo:	E350.1			Analysis Date:	6/9/2015	SeqNo:	1513953	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	680	5.6	701.9	48.13	89.9	75	125					

Sample ID:	1505725-012CMSD	Samp Type:	MSD	Test Code:	EPA_350.1-S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78130	
Client ID:	SM-14-28	Batch ID:	36742	TestNo:	E350.1			Analysis Date:	6/9/2015	SeqNo:	1513954	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Ammonia	700	5.6	701.9	48.13	93.3	75	125	679.4	3.39	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36743**

Sample ID:	**MB-36743**	Samp Type:	**MBLK**	Test Code:	**EPA_351.2-S**	Units:	**mg/Kg**	Prep Date:	**6/2/2015**	RunNo:	**78132**	
Client ID:	**PBS**	Batch ID:	**36743**	TestNo:	**E351.2**			Analysis Date:	**6/9/2015**	SeqNo:	**1513969**	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Kjeldahl, Total	20	20									U	

Sample ID:	**LCS-36743**	Samp Type:	**LCS**	Test Code:	**EPA_351.2-S**	Units:	**mg/Kg**	Prep Date:	**6/2/2015**	RunNo:	**78132**	
Client ID:	**LCSS**	Batch ID:	**36743**	TestNo:	**E351.2**			Analysis Date:	**6/9/2015**	SeqNo:	**1513970**	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Kjeldahl, Total	2,500	20	2,500	0	102	80	120					

Sample ID:	**1505725-012CMS**	Samp Type:	**MS**	Test Code:	**EPA_351.2-S**	Units:	**mg/Kg-dry**	Prep Date:	**6/2/2015**	RunNo:	**78132**	
Client ID:	**SM-14-28**	Batch ID:	**36743**	TestNo:	**E351.2**			Analysis Date:	**6/9/2015**	SeqNo:	**1513985**	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Kjeldahl, Total	1,300	28	1,404	159.3	79.8	75	125					

Sample ID:	**1505725-012CMSD**	Samp Type:	**MSD**	Test Code:	**EPA_351.2-S**	Units:	**mg/Kg-dry**	Prep Date:	**6/2/2015**	RunNo:	**78132**	
Client ID:	**SM-14-28**	Batch ID:	**36743**	TestNo:	**E351.2**			Analysis Date:	**6/9/2015**	SeqNo:	**1513986**	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Nitrogen, Kjeldahl, Total	1,300	28	1,404	159.3	84.6	75	125	1,280	5.09	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** 36747

Sample ID:	MB-36747	Samp Type:	MBLK	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	6/2/2015	RunNo:	78113	
Client ID:	PBS	Batch ID:	36747	TestNo:	SW9012A			Analysis Date:	6/8/2015	SeqNo:	1513625	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	0.50	1.0									U	

Sample ID:	LCS-36747	Samp Type:	LCS	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	6/2/2015	RunNo:	78113	
Client ID:	LCSS	Batch ID:	36747	TestNo:	SW9012A			Analysis Date:	6/8/2015	SeqNo:	1513626	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	2.1	1.0	2.000	0	104	76	120					

Sample ID:	1505626-003CMS	Samp Type:	MS	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78113	
Client ID:	ZZZZZZ	Batch ID:	36747	TestNo:	SW9012A			Analysis Date:	6/8/2015	SeqNo:	1513654	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	9.4	1.9	9.433	0	99.3	76	120					

Sample ID:	1505626-003CMSD	Samp Type:	MSD	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	6/2/2015	RunNo:	78113	
Client ID:	ZZZZZZ	Batch ID:	36747	TestNo:	SW9012A			Analysis Date:	6/8/2015	SeqNo:	1513655	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	8.0	1.8	8.993	0	89.4	76	120	9.367	15.2	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36781**

Sample ID:	MB-36781	Samp Type:	MBLK	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	6/3/2015	RunNo:	78082	
Client ID:	PBS	Batch ID:	36781	TestNo:	SW9012A			Analysis Date:	6/5/2015	SeqNo:	1512951	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	0.50	1.0									U	

Sample ID:	LCS-36781	Samp Type:	LCS	Test Code:	SW_9012S	Units:	mg/Kg	Prep Date:	6/3/2015	RunNo:	78082	
Client ID:	LCSS	Batch ID:	36781	TestNo:	SW9012A			Analysis Date:	6/5/2015	SeqNo:	1512952	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	2.0	1.0	2.000	0	100	76	120					

Sample ID:	1505725-011CMS	Samp Type:	MS	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	6/3/2015	RunNo:	78082	
Client ID:	SM-14-27	Batch ID:	36781	TestNo:	SW9012A			Analysis Date:	6/5/2015	SeqNo:	1512979	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	6.6	1.2	6.053	0	109	76	120					

Sample ID:	1505725-011CMSD	Samp Type:	MSD	Test Code:	SW_9012S	Units:	mg/Kg-dry	Prep Date:	6/3/2015	RunNo:	78082	
Client ID:	SM-14-27	Batch ID:	36781	TestNo:	SW9012A			Analysis Date:	6/5/2015	SeqNo:	1512980	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Cyanide, Total	6.5	1.2	6.053	0	107	76	120	6.582	1.19	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36791**

Sample ID:	MB-36791	Samp Type:	MBLK	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	6/5/2015	RunNo:	78153	
Client ID:	PBS	Batch ID:	36791	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514270	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	0.23	0.49									J	

Sample ID:	LCS-36791	Samp Type:	LCS	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	6/5/2015	RunNo:	78153	
Client ID:	LCSS	Batch ID:	36791	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514271	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	11	0.51	10.20	0	107	80	120					

Sample ID:	1505725-004CMS	Samp Type:	MS	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	6/5/2015	RunNo:	78153	
Client ID:	SM-14-04	Batch ID:	36791	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514296	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	230	6.7	134.6	83.53	109	75	125					

Sample ID:	1505725-004CMSD	Samp Type:	MSD	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	6/5/2015	RunNo:	78153	
Client ID:	SM-14-04	Batch ID:	36791	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514297	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Phosphorus, Total (As P)	240	6.9	137.4	83.53	115	75	125	230.2	4.88	25		

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID: 36796**

Sample ID:	MB-36796	Samp Type:	MBLK	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	6/5/2015	RunNo:	78149
Client ID:	PBS	Batch ID:	36796	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514211

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	0.18	0.49									J

Sample ID:	LCS-36796	Samp Type:	LCS	Test Code:	SM_4500-P-FS	Units:	mg/Kg	Prep Date:	6/5/2015	RunNo:	78149
Client ID:	LCSS	Batch ID:	36796	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514212

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	9.1	0.51	10.10	0	90.3	80	120				

Sample ID:	1505738-012CMS	Samp Type:	MS	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	6/5/2015	RunNo:	78149
Client ID:	ZZZZZZ	Batch ID:	36796	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514237

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	340	12	235.8	125.5	90.8	75	125				

Sample ID:	1505738-012CMSD	Samp Type:	MSD	Test Code:	SM_4500-P-FS	Units:	mg/Kg-dry	Prep Date:	6/5/2015	RunNo:	78149
Client ID:	ZZZZZZ	Batch ID:	36796	TestNo:	A4500-P-F			Analysis Date:	6/9/2015	SeqNo:	1514238

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Phosphorus, Total (As P)	350	11	228.8	125.5	98.1	75	125	339.5	2.99	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R77708**

Sample ID:	**1505725-001CDUP**	Samp Type:	**DUP**	Test Code:	**SM_2540G**	Units:	**%**	Prep Date:	**5/26/2015**	RunNo:	**77708**
Client ID:	**SM-14-02 (0-21)**	Batch ID:	**R77708**	TestNo:	**A2540G**			Analysis Date:	**5/26/2015**	SeqNo:	**1505443**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Solids	76	0.10						74.84	1.02	20	

Sample ID:	**1505725-012CDUP**	Samp Type:	**DUP**	Test Code:	**SM_2540G**	Units:	**%**	Prep Date:	**5/26/2015**	RunNo:	**77708**
Client ID:	**SM-14-28**	Batch ID:	**R77708**	TestNo:	**A2540G**			Analysis Date:	**5/26/2015**	SeqNo:	**1505455**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Solids	75	0.10						76.09	0.935	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R77778**

Sample ID:	**1505725-001CDUP**	Samp Type:	**DUP**	Test Code:	**SM_2540G**	Units:	**%**	Prep Date:	**5/26/2015**	RunNo:	**77778**
Client ID:	**SM-14-02 (0-21)**	Batch ID:	**R77778**	TestNo:	**A2540G**			Analysis Date:	**5/26/2015**	SeqNo:	**1506642**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Volatile Solids	0.25	0.10						0.2715	8.08	20	

Sample ID:	**1505725-012CDUP**	Samp Type:	**DUP**	Test Code:	**SM_2540G**	Units:	**%**	Prep Date:	**5/26/2015**	RunNo:	**77778**
Client ID:	**SM-14-28**	Batch ID:	**R77778**	TestNo:	**A2540G**			Analysis Date:	**5/26/2015**	SeqNo:	**1506654**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Total Volatile Solids	2.0	0.10						1.644	17.4	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** R77858

Sample ID:	MB-060115	Samp Type:	MBLK	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	6/1/2015	RunNo:	77858	
Client ID:	PBS	Batch ID:	R77858	TestNo:	E410.4			Analysis Date:	6/1/2015	SeqNo:	1508496	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	10	20									U	

Sample ID:	LCS-060115	Samp Type:	LCS	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	6/1/2015	RunNo:	77858	
Client ID:	LCSS	Batch ID:	R77858	TestNo:	E410.4			Analysis Date:	6/1/2015	SeqNo:	1508497	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	97	20	100.0	0	97.0	80	120					

Sample ID:	1505725-001CMS	Samp Type:	MS	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	6/1/2015	RunNo:	77858	
Client ID:	SM-14-02 (0-21)	Batch ID:	R77858	TestNo:	E410.4			Analysis Date:	6/1/2015	SeqNo:	1508500	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	15,000	620	15,530	776.6	91.6	70	130					

Sample ID:	1505725-001CMSD	Samp Type:	MSD	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	6/1/2015	RunNo:	77858	
Client ID:	SM-14-02 (0-21)	Batch ID:	R77858	TestNo:	E410.4			Analysis Date:	6/1/2015	SeqNo:	1508501	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	15,000	620	15,530	776.6	90.6	70	130	15,000	1.04	25		

Sample ID:	MB-2-060115	Samp Type:	MBLK	Test Code:	EPA_410.4-S	Units:	mg/Kg	Prep Date:	6/1/2015	RunNo:	77858	
Client ID:	PBS	Batch ID:	R77858	TestNo:	E410.4			Analysis Date:	6/1/2015	SeqNo:	1508512	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	10	20									U	

Sample ID:	1505725-011CMS	Samp Type:	MS	Test Code:	EPA_410.4-S	Units:	mg/Kg-dry	Prep Date:	6/1/2015	RunNo:	77858	
Client ID:	SM-14-27	Batch ID:	R77858	TestNo:	E410.4			Analysis Date:	6/1/2015	SeqNo:	1508515	
Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual	
Chemical Oxygen Demand	10,000	450	11,280	0	92.4	70	130					

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R77858**

Sample ID:	**1505725-011CMSD**	Samp Type:	**MSD**	Test Code:	**EPA_410.4-S**	Units:	**mg/Kg-dry**	Prep Date:	**6/1/2015**	RunNo:	**77858**
Client ID:	**SM-14-27**	Batch ID:	**R77858**	TestNo:	**E410.4**			Analysis Date:	**6/1/2015**	SeqNo:	**1508516**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Chemical Oxygen Demand	11,000	450	11,280	0	94.4	70	130	10,420	2.14	25	

Sample ID:	**MB-3-060115**	Samp Type:	**MBLK**	Test Code:	**EPA_410.4-S**	Units:	**mg/Kg**	Prep Date:	**6/1/2015**	RunNo:	**77858**
Client ID:	**PBS**	Batch ID:	**R77858**	TestNo:	**E410.4**			Analysis Date:	**6/1/2015**	SeqNo:	**1508519**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Chemical Oxygen Demand	10	20									U

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R77935**

Sample ID:	**1505626-006DDUP**	Samp Type:	**DUP**	Test Code:	**PMOIST**	Units:	**wt%**	Prep Date:	**6/2/2015**	RunNo:	**77935**
Client ID:	**ZZZZZZ**	Batch ID:	**R77935**	TestNo:	**D2216**			Analysis Date:	**6/2/2015**	SeqNo:	**1510244**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	39	1.0						41.43	6.55	20	

Sample ID:	**1505725-012CDUP**	Samp Type:	**DUP**	Test Code:	**PMOIST**	Units:	**wt%**	Prep Date:	**6/2/2015**	RunNo:	**77935**
Client ID:	**SM-14-28**	Batch ID:	**R77935**	TestNo:	**D2216**			Analysis Date:	**6/2/2015**	SeqNo:	**1510285**

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Percent Moisture	27	1.0						28.76	7.01	20	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R77981**

Sample ID:	**1505725-001ADUP**	Samp Type:	**DUP**	Test Code:	**ASTM-D422**	Units:	**% Finer**	Prep Date:	**6/4/2015**	RunNo:	**77981**		
Client ID:	**SM-14-02 (0-21)**	Batch ID:	**R77981**	TestNo:	**ASTM-D422**			Analysis Date:	**6/4/2015**	SeqNo:	**1511184**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
0.375 in	100	0.10						100.0	0	25	
No. 4 (4.75-mm)	100	0.10						100.0	0	25	
No.10 (2-mm)	97	0.10						99.20	2.45	25	
No.20 (850-um)	93	0.10						97.70	5.04	25	
No.40 (425-um)	91	0.10						96.90	6.06	25	
No.100 (150-um)	53	0.10						41.10	24.7	25	
No.200 (75-um)	12	0.10						7.400	51.3	25	R
No. 270 (53-um)	7.2	0.10						4.600	44.1	25	R
Non-retained material	7.2	0.10						4.600	44.1	25	R
Coarse Gravel	0.10	0.10						0	0	25	U
Fine Gravel	0.10	0.10						0	0	25	U
Coarse Sand	3.2	0.10						0.8000	120	25	R
Medium Sand	5.6	0.10						2.300	83.5	25	R
Fine Sand	79	0.10						89.50	12.8	25	

RTI Laboratories - QC SUMMARY REPORT

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

Client: USACE- Detroit District

Project: St Marys Sampling **Batch ID:** **R78406**

Sample ID:	**1505725-001ADUP**	Samp Type:	**DUP**	Test Code:	**ASTM-D854**	Units:	**lbs/gal**	Prep Date:	**6/4/2015**	RunNo:	**78406**		
Client ID:	**SM-14-02 (0-21)**	Batch ID:	**R78406**	TestNo:	**D854**			Analysis Date:	**6/4/2015**	SeqNo:	**1519386**		

Analyte	Result	LOQ	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Value	%RPD	RPDLimit	Qual
Density	19.2							17.64	8.24	20	
Density Temperature	22.0							22.00	0	20	
Specific Gravity at 20 deg. C	2.30							2.118	8.24	20	

RTI Laboratories - Definitions and Acronyms

WO#: 1505725

Date Reported: 8/26/2015
Revision v1

DEFINITIONS:

DF: Dilution factor; the dilution factor applied to the prepared sample.

DL: Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.

DUP: Duplicate; aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently, used to calculate Precision (%RPD).

LCS: Laboratory Control Sample; prepared by adding a known amount of target analytes to a specified amount of clean matrix and prepared with the batch of samples, used to calculate Accuracy (%REC).

LCSD: A duplicate LCS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

LOD: Limit of Detection; a laboratory verified concentration that can be detected at three times greater than the noise level. This concentration is equal to or greater than the DL.

LOQ: Limit of Quantitation; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below the LOQ are reported with a "J" qualifier.

MBLK: Method Blank; a sample of similar matrix that does not contain target analytes or interference that may impact the analytical results and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedure, used to assess and verify that the analytical process is free of contamination.

Mg/Kg or mg/L: Units of part per million (PPM) – milligram per Kilogram (W/W) or milligram per Liter (W/V).

MS: Matrix Spike; prepared by adding a known amount of target analytes to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available, used to calculate Accuracy (%REC)

MSD: A duplicate MS sample, used to calculate both Accuracy (%REC) and Precision (%RPD)

% REC: Percent Recovery of a known spike (SPK); a measure of accuracy expressed as a percentage of a measured (recovered) concentration compared to the known concentration (SPK) added to the sample. This is compared to the Low Limit and High Limit.

% RPD: Relative Percent Difference; a measure of precision expressed as a percentage of the difference between two duplicates relative to the average concentration. This is compared to the RPD Limit.

Qual: Qualifier that applies to the analyte reported

SPK: Spike; used in the QC section for both SPK Value and SPK Ref Val

Ug/Kg or ug/L: Units of part per billion (PPB) – microgram per Kilogram (W/W) or microgram per Liter (W/V).

QUALIFIERS:

*: Reported value exceeds the maximum allowed concentration by regulation or permit.

B: Analyte detected in the associated Method Blank at a concentration greater than 1/2 the LOQ

G: ICB/CCB result is greater than the MDL

H: Holding time for preparation or analysis has been exceeded

J: Estimated result. Greater uncertainty is associated with this result and data reported is estimated.

M: Manual Integration used to determine area response

P: Second column RPD exceeds 40%

Q: % REC exceeded control limits. When applied to sample analytes - denotes an associated LCS recovery that exceeded control limits.

R: % RPD exceeds control limits

T: MBLK result is greater than 1/2 of the LOQ

U: The analyte concentration is less than the DL. The result is reported as less than the LOD

X: Matrix spike recovery for the noted analyte exceeded control limits. Applied to the MS/MSD parent sample.

Y: Percent Difference/Drift in the associated CCV exceeded acceptance criteria.

Z: Percent Difference/Drift in the associated ICV exceeded acceptance criteria.

CHAIN OF CUSTODY

PAGE: 1 OF: 2

RTI LABORATORIES

Environmental Sciences Division
31628 Glendale Street
Livonia MI, 48150

Materials Testing Division
33080 Industrial Road
Livonia, MI 48150

PHONE: (734) 422-8000
FAX: (734) 422-5342
www.rtilab.com

RTI WORK ORDER NO: 1505725

Please Include Email Address of Report Recipient !!!

SUBMITTING COMPANY: RTI	REPORT TO (Name): PAM HORNER	BILL TO:
PROJECT NAME: / PROJECT #: / QUOTE #:	COMPANY: USA12 (CODE)	COMPANY:
SAMPLING LOCATION (STATE or COUNTRY):	ADDRESS:	ADDRESS:
SPECIAL INSTRUCTIONS / COMMENTS: A-151 : 2.8°C ~~AF~~ OCWD : 3.0°C	CITY, STATE, ZIP	CITY, STATE, ZIP
	PHONE: / EMAIL (OR FAX IF NO EMAIL AVAILABLE):	P.O NUMBER:
SAMPLER'S PRINTED NAME: FRED J HAITASH	SAMPLER'S SIGNATURE:	

ITEM NUMBER	SAMPLE I.D.	DATE SAMPLED	TIME SAMPLED (24-hour format)	MATRIX CODE (see codes below)	NBR OF BOTTLES	NBR OF CONTAINERS AND PRESERVATIVES: NONE	HCL	HNO_3	H_2SO_4	NaOH	Methanol	OTHER	TESTS REQUESTED: METALS 4 HG	PAH, PCB, PEST	TKN, NH3, T.P	TOC, COD, O&G	TVS, CN	ASTM-422	SG, PMDIST	pH Acceptable? Y N n/a (Lab only)	COMMENTS: Methanol Preserved Weights, HOT Sample Notation, Additional Sample Description, Air Volume, etc.
1	SM-14-02 (0-21)	5/20/15	0902	S	3								X	X	X	X	X	X	X	N/A	A-151
2	SM-14-02 (21-41)		0902 ~~1016~~	S	3								X	X	X	X	X	X	X	N/A	A-151
3	SM-14-03		1016	S	3								X	X	X	X	X	X	X	N/A	A-151
4	SM-14-04		1032	S	3								X	X	X	X	X	X	X	N/A	A-151
5	SM-14-05		1052	S	3								X	X	X	X	X	X	X	N/A	A-151
6	SM-14-06		1109	S	3								X	X	X	X	X	X	X	N/A	OCWD
7	SM-14-09		1132	S	3								X	X	X	X	X	X	X	N/A	A-151
8	SM-14-30		1235	S	3								X	X	X	X	X	X	X	N/A	OCWD
9	SM-14-25		1440	S	3								X	X	X	X	X	X	X	N/A	OCWD
10	SM-14-26		1522	S	3								X	X	X	X	X	X	X	N/A	OCWD

Relinquished By:	Date	Time	Received By:	Date	Time
FH				5-22-15	12:45
Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

ALL REPORTING IS VIA THE RTI "FLASHPOINT" ONLINE SYSTEM UNLESS OTHERWISE SPECIFIED

FOR LAB USE ONLY

Temp ~~of samples~~ Blanks 2.8, 3.0 °C On Wet Ice ? Yes

Comments:

TURNAROUND DESIRED: Standard ☐ **RUSH:** Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

Distribution: White - Lab; Pink - Field

See reverse side for Laboratory Terms and Conditions of Service

MATRIX CODES: A = AIR; DW = DRINKING WATER; GW = GROUNDWATER; L = LIQUID; O = OIL; WW = WASTE WATER; S = SOIL; SD = SOLID; SL = SLUDGE; SV = SOLVENT WASTE; W = WATER; WP = WIPE; SW = SURFACE WATER

CHAIN OF CUSTODY

PAGE: 2 OF: 2

RTI LABORATORIES

Environmental Sciences Division
31628 Glendale Street
Livonia MI, 48150

Materials Testing Division
33080 Industrial Road
Livonia, MI 48150

PHONE: (734) 422-8000
FAX: (734) 422-5342
www.rtilab.com

RTI WORK ORDER NO: 1505725

Please Include Email Address of Report Recipient !!!

SUBMITTING COMPANY: RTI		REPORT TO (Name): PAM HORNER	BILL TO:
PROJECT NAME: ST MARY'S RIVER	PROJECT #: DC04 / QUOTE #: 13453	COMPANY: USA12 (CODE)	COMPANY:
SAMPLING LOCATION (STATE or COUNTRY):		ADDRESS:	ADDRESS:
SPECIAL INSTRUCTIONS / COMMENTS:		CITY, STATE, ZIP	CITY, STATE, ZIP
		PHONE: EMAIL (OR FAX IF NO EMAIL AVAILABLE):	P.O NUMBER:
SAMPLER'S PRINTED NAME: FRED HOITHSN	SAMPLER'S SIGNATURE:		

ITEM NUMBER	SAMPLE I.D.	DATE SAMPLED	TIME SAMPLED (24-hour format)	MATRIX CODE (see codes below)	NBR OF BOTTLES	NBR OF CONTAINERS AND PRESERVATIVES: NONE	HCL	HNO_3	H_2SO_4	NaOH	Methanol	OTHER	TESTS REQUESTED: MB-ALS+Hg	PAH, PCB, PEST	TKN, NH_3, TP	TOC, COD, O&G	TVS, CN	ASTM-422	SG, PMOIST	pH Acceptable? Y N n/a (Lab only)	COMMENTS (Methanol Preserved Weights, HOT Sample Notation, Additional Sample Description, Air Volume, etc.)
11	SM-14-27	5/20/15	1534	S	3								X	X	X	X	X	X	X		OCWD
12	SM-14-28	5/20/15	1558	S	3								X	X	X	X	X	X	X		OCWD
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

Relinquished By:	Date	Time	Received By:	Date	Time
Fred Hoithsn	5/22/15	1140		5-22-15	12:45
Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

ALL REPORTING IS VIA THE RTI "FLASHPOINT" ONLINE SYSTEM UNLESS OTHERWISE SPECIFIED

FOR LAB USE ONLY

Temp of ~~samples~~ Blanks 2.8, 3.0 °C On Wet Ice ? YES

Comments:

TURNAROUND DESIRED: Standard ☐ **RUSH:** Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

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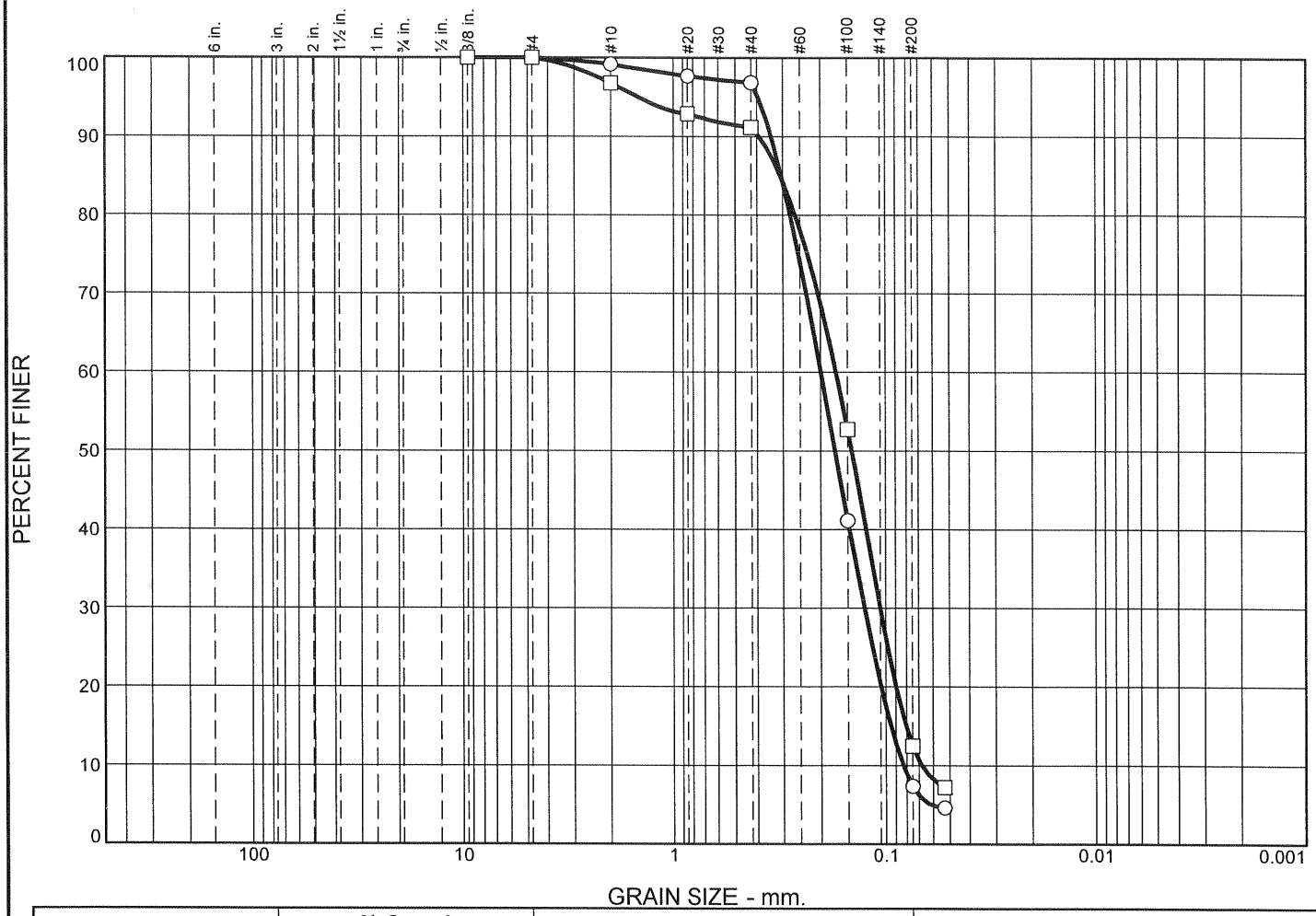
See reverse side for Laboratory Terms and Conditions of Service

MATRIX CODES: A = AIR; DW = DRINKING WATER; GW = GROUNDWATER; L = LIQUID; O = OIL; WW = WASTE WATER; S = SOIL; SD = SOLID; SL = SLUDGE; SV = SOLVENT WASTE; W = WATER; WP = WIPE; SW = SURFACE WATER

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.8	2.3	89.5	7.4	
□	0.0	0.0	0.0	3.2	5.6	78.7	12.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3056	0.1995	0.1716	0.1258	0.0947	0.0829	0.96	2.41
□			0.3087	0.1695	0.1437	0.1062	0.0804	0.0680	0.98	2.49

	Material Description	USCS	AASHTO
○			
□			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-02 (0-21) **Sample Number:** 1505725-001A

□ **Source of Sample:** SM-14-02 (0-21) **Sample Number:** 1505725-001A DUP

Remarks:

○ 4 JUNE 2015

□ 4 JUNE 2015

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-02 (0-21)
Sample Number: 1505725-001A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
146.90	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	452.20	451.00	99.2
		#20	476.40	474.20	97.7
		#40	477.10	475.90	96.9
		#100	420.40	338.50	41.1
		#200	364.40	314.80	7.4
		#270	394.70	390.70	4.6

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.8	2.3	89.5	92.6			7.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0614	0.0829	0.0947	0.1053	0.1258	0.1475	0.1716	0.1995	0.2772	0.3056	0.3417	0.3945

Fineness Modulus	C_u	C_c
0.80	2.41	0.96

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-02 (0-21)
Sample Number: 1505725-001A DUP
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
186.80	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	457.00	451.00	96.8
		#20	481.50	474.20	92.9
		#40	479.10	475.90	91.2
		#100	410.30	338.50	52.7
		#200	390.00	314.80	12.5
		#270	400.50	390.70	7.2

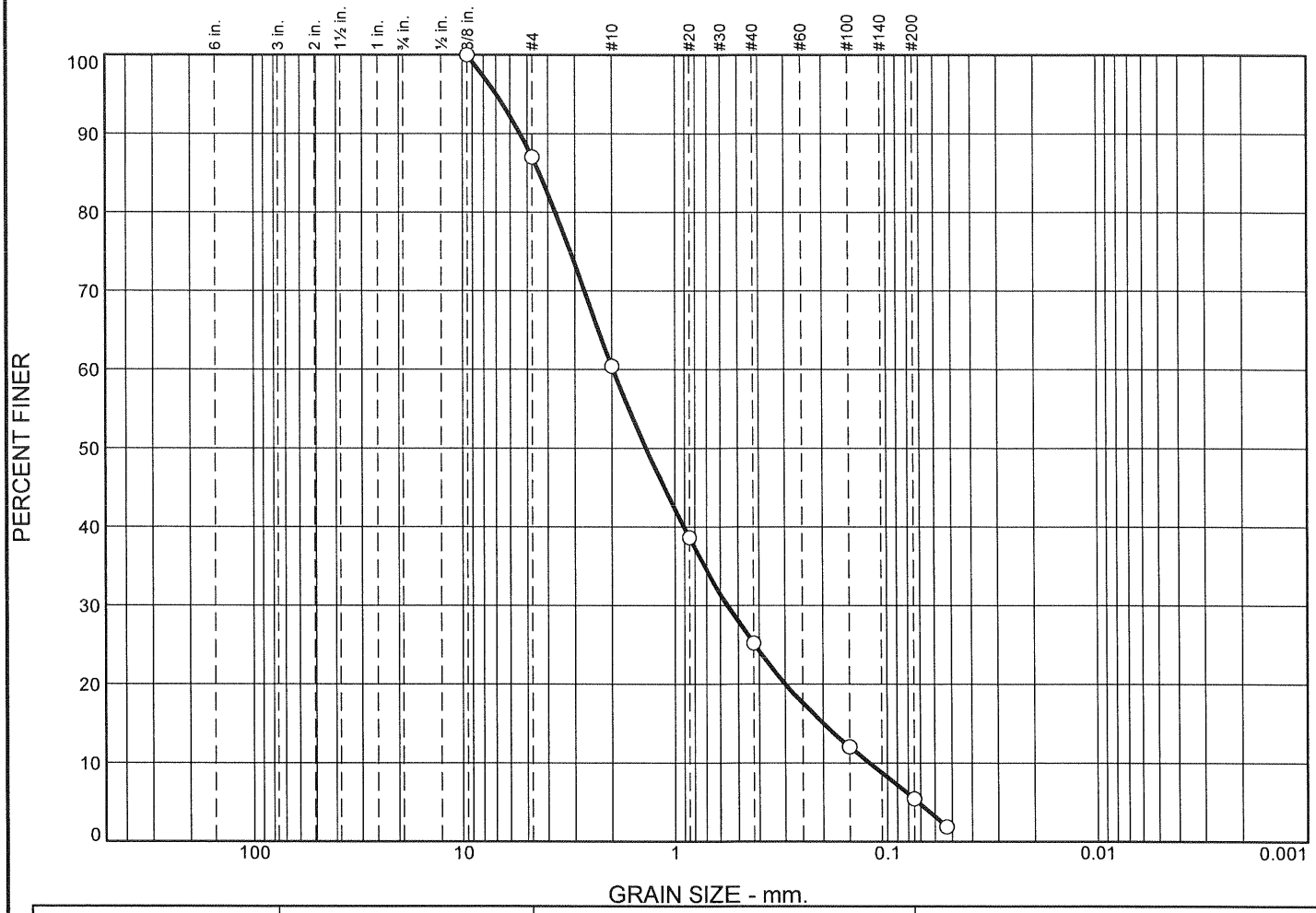
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	3.2	5.6	78.7	87.5			12.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0680	0.0804	0.0896	0.1062	0.1236	0.1437	0.1695	0.2626	0.3087	0.3902	1.4806

Fineness Modulus	C_u	C_c
0.80	2.49	0.98

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	13.0	26.6	35.2	19.8	5.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			4.3957	1.9726	1.3778	0.5562	0.1991	0.1213	1.29	16.26

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-02 (21-41) **Sample Number:** 1505725-002A

Remarks:

○ 4 JUNE 2015

RTI LABORATORIES

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-02 (21-41)
Sample Number: 1505725-002A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
95.50	0.00	.375	541.60	541.60	100.0
		#4	510.20	497.80	87.0
		#10	476.40	451.00	60.4
		#20	495.00	474.20	38.6
		#40	488.70	475.90	25.2
		#100	351.10	338.50	12.0
		#200	321.10	314.80	5.4
		#270	394.10	390.70	1.9

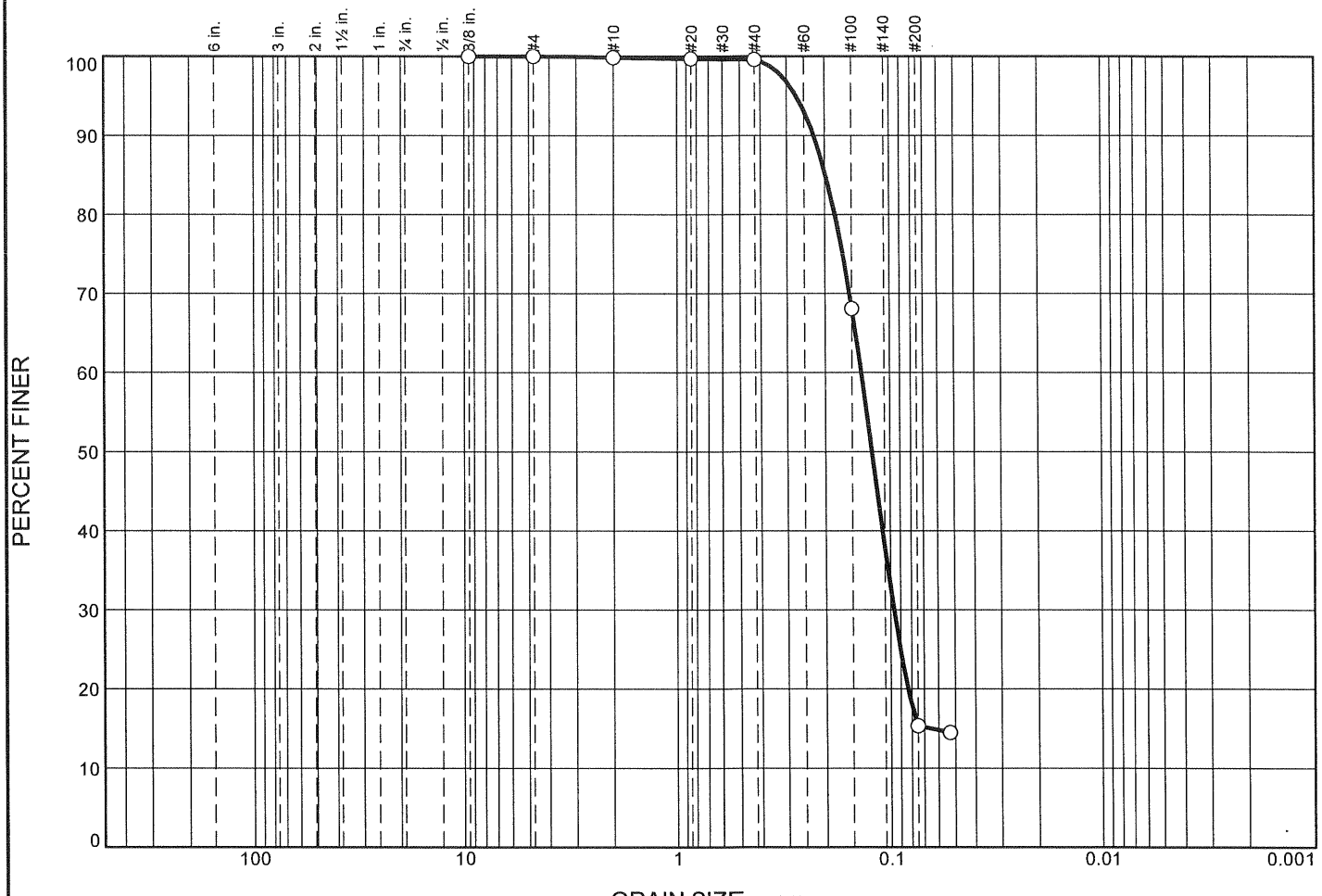
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	13.0	13.0	26.6	35.2	19.8	81.6			5.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0717	0.1213	0.1991	0.2996	0.5562	0.9045	1.3778	1.9726	3.6943	4.3957	5.3974	6.9855

Fineness Modulus	C_u	C_c
3.38	16.26	1.29

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.3	84.2	15.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1985	0.1358	0.1214	0.0965	0.0649			

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-03 **Sample Number:** 1505725-003A

Remarks:

○ 4 JUNE 2015

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-03
Sample Number: 1505725-003A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
201.30	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	451.30	451.00	99.9
		#20	474.50	474.20	99.7
		#40	476.10	475.90	99.6
		#100	401.90	338.50	68.1
		#200	448.00	341.80	15.4
		#270	392.40	390.70	14.5

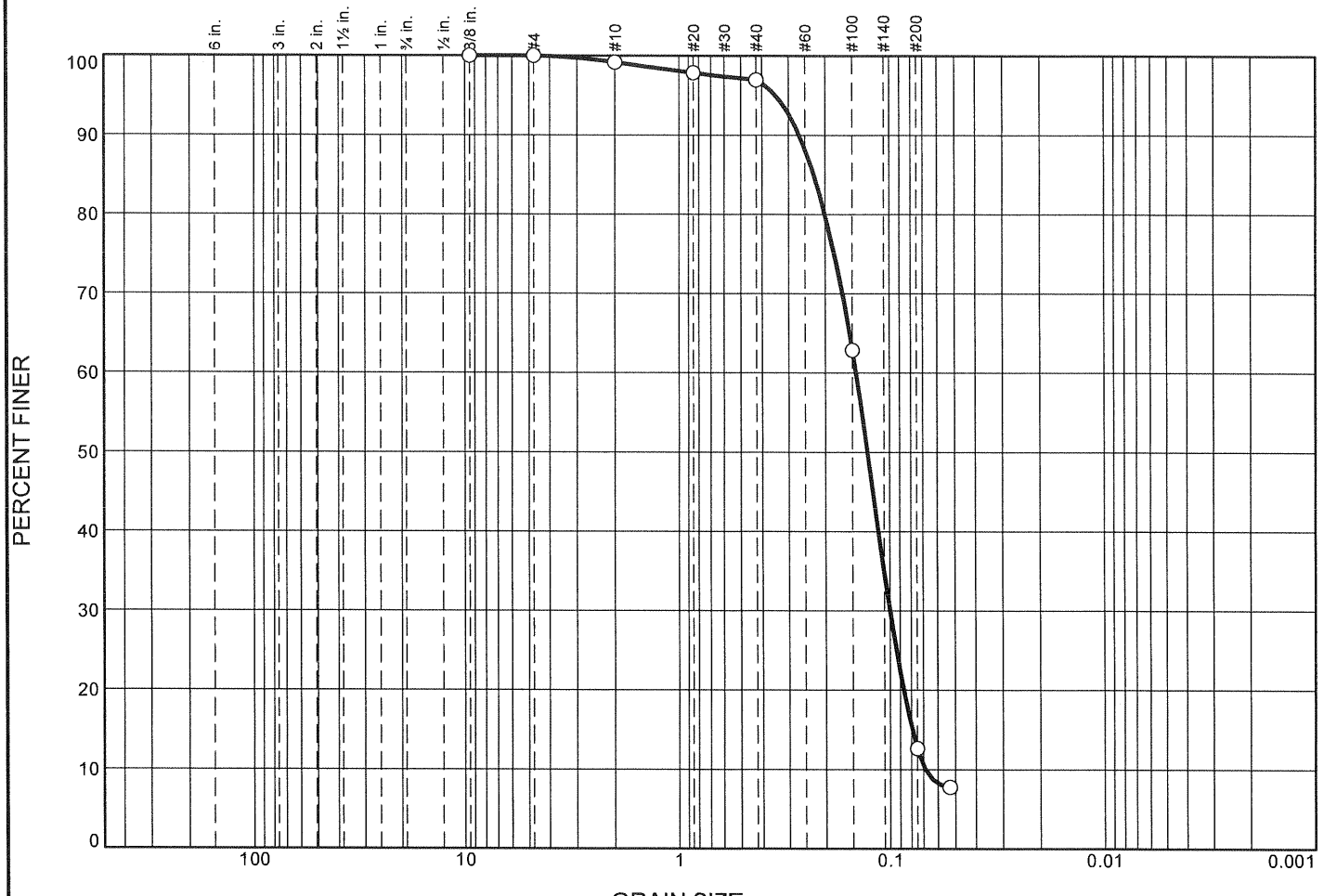
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	0.3	84.2	84.6			15.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0649	0.0833	0.0965	0.1087	0.1214	0.1358	0.1798	0.1985	0.2252	0.2707

Fineness Modulus
0.36

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.8	2.2	84.3	12.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○			0.2270	0.1443	0.1274	0.0999	0.0792	0.0685	1.01	2.11

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-04 **Sample Number:** 1505725-004A

Remarks:

○ 4 JUNE 2015

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-04
Sample Number: 1505725-004A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
196.00	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	452.60	451.00	99.2
		#20	476.80	474.20	97.9
		#40	477.60	475.90	97.0
		#100	405.40	338.50	62.9
		#200	413.20	314.80	12.7
		#270	400.30	390.70	7.8

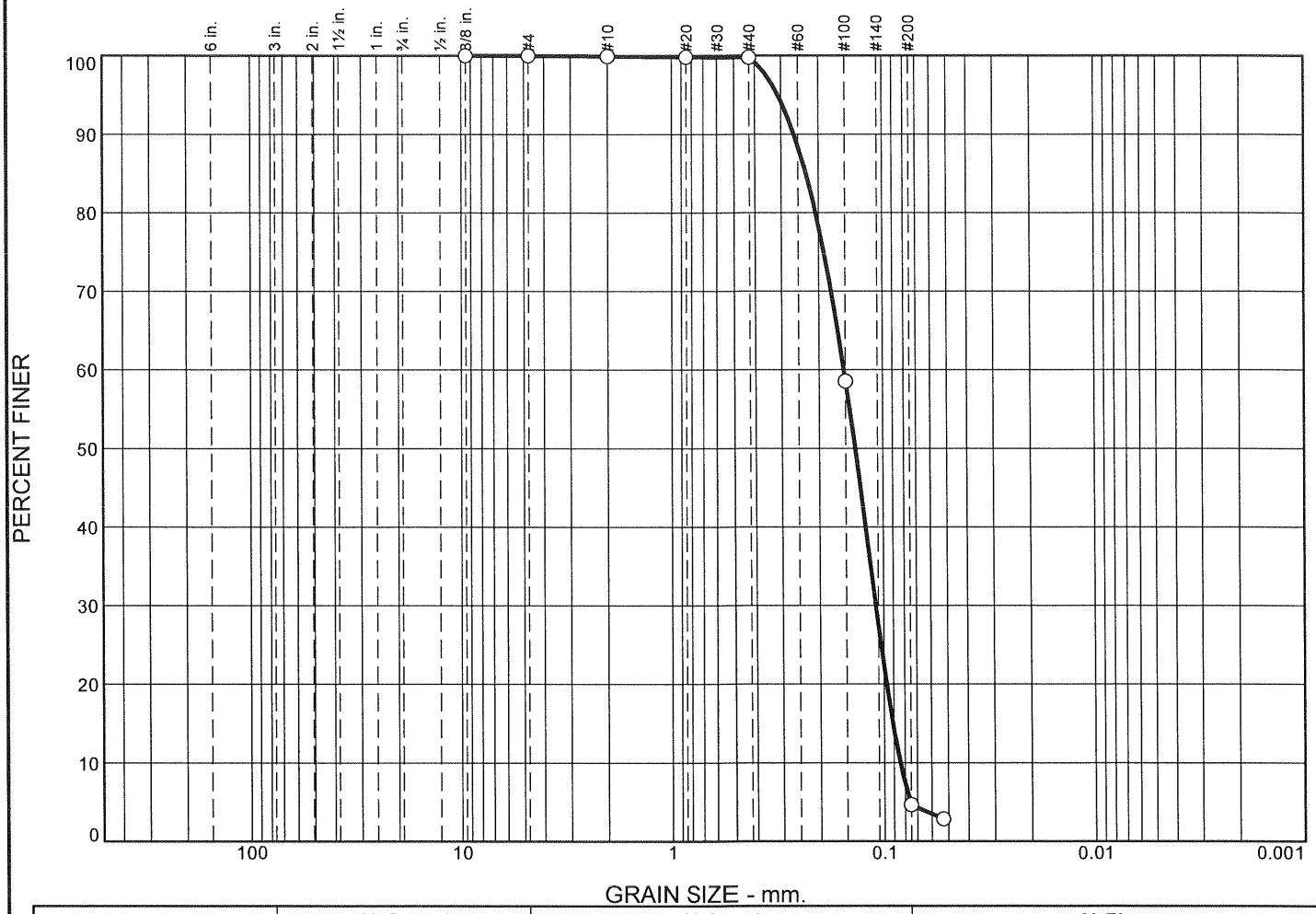
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.8	2.2	84.3	87.3			12.7

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0685	0.0792	0.0867	0.0999	0.1131	0.1274	0.1443	0.2010	0.2270	0.2663	0.3449

Fineness Modulus	C_u	C_c
0.49	2.11	1.01

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.1	95.1	4.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2297	0.1527	0.1358	0.1092	0.0909	0.0842	0.93	1.81

	Material Description	USCS	AASHTO
○		SP	

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-05 **Sample Number:** 1505725-005A

Remarks:

○ 4 JUNE 2015

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-05
Sample Number: 1505725-005A
USCS Classification: SP
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
176.20	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	451.10	451.00	99.9
		#20	474.40	474.20	99.8
		#40	476.00	475.90	99.8
		#100	411.10	338.50	58.6
		#200	409.80	314.80	4.7
		#270	393.90	390.70	2.8

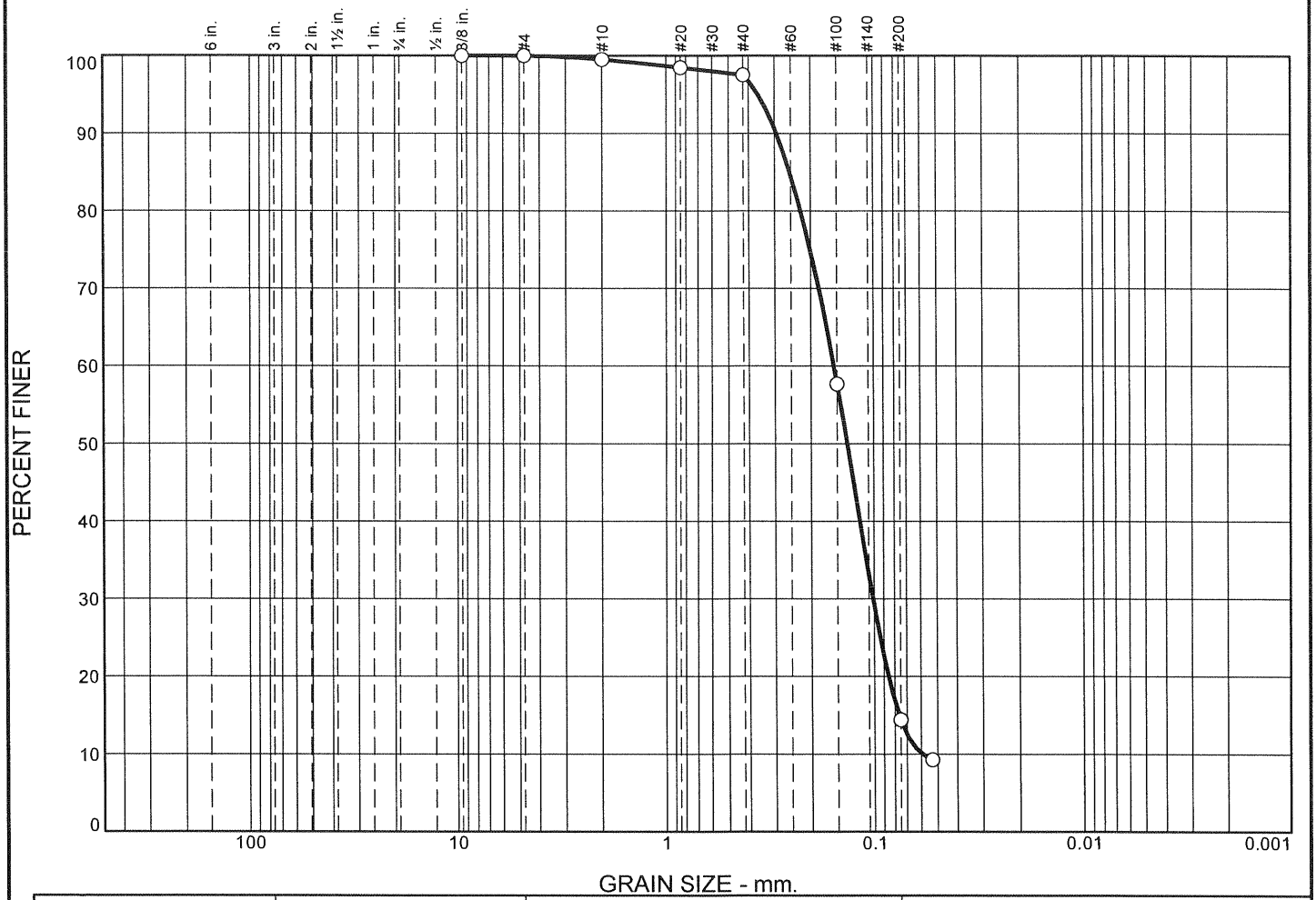
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	0.1	95.1	95.3			4.7

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0758	0.0842	0.0909	0.0971	0.1092	0.1218	0.1358	0.1527	0.2069	0.2297	0.2610	0.3106

Fineness Modulus	C_u	C_c
0.48	1.81	0.93

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.5	2.0	83.1	14.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2534	0.1554	0.1343	0.1013	0.0762	0.0591	1.12	2.63

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-06 **Sample Number:** 1505725-006A

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Remarks:

○ 4 JUNE 2015

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-06
Sample Number: 1505725-006A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
170.40	0.00	.375	541.60	541.60	100.0
		#4	497.80	497.80	100.0
		#10	451.80	451.00	99.5
		#20	476.00	474.20	98.5
		#40	477.50	475.90	97.5
		#100	406.40	338.50	57.7
		#200	388.50	314.80	14.4
		#270	399.50	390.70	9.3

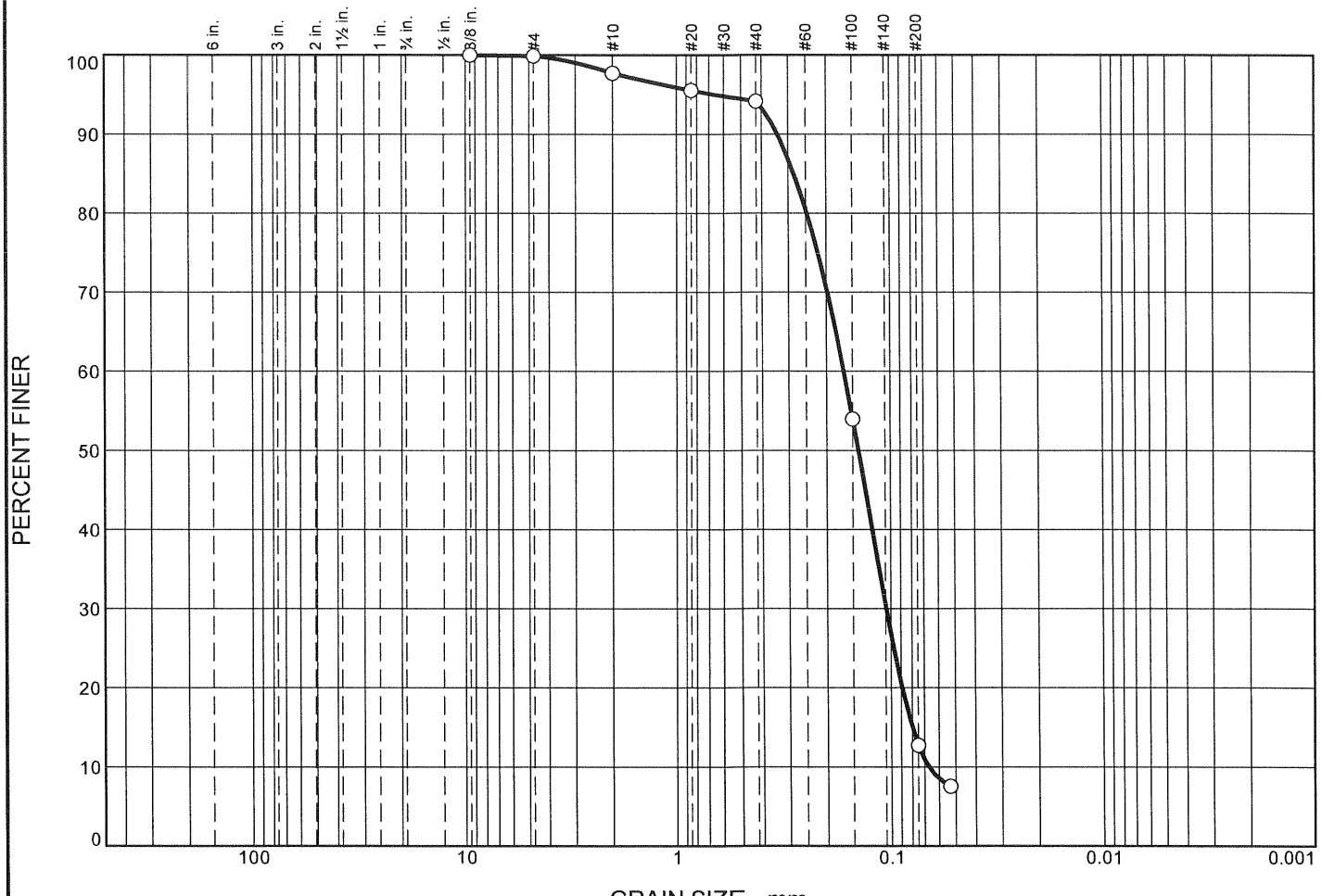
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.5	2.0	83.1	85.6			14.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0591	0.0762	0.0855	0.1013	0.1169	0.1343	0.1554	0.2242	0.2534	0.2939	0.3601

Fineness Modulus	C_u	C_c
0.55	2.63	1.12

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	2.2	3.5	81.5	12.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2831	0.1652	0.1412	0.1052	0.0798	0.0670	1.00	2.46

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-09 **Sample Number:** 1505725-007A

Remarks:

○ 4 JUNE 2015

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-09
Sample Number: 1505725-007A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
219.70	0.00	.375	541.60	541.60	100.0
		#4	498.00	497.80	99.9
		#10	455.80	451.00	97.7
		#20	479.00	474.20	95.5
		#40	478.90	475.90	94.2
		#100	426.80	338.50	54.0
		#200	405.40	314.80	12.7
		#270	402.10	390.70	7.6

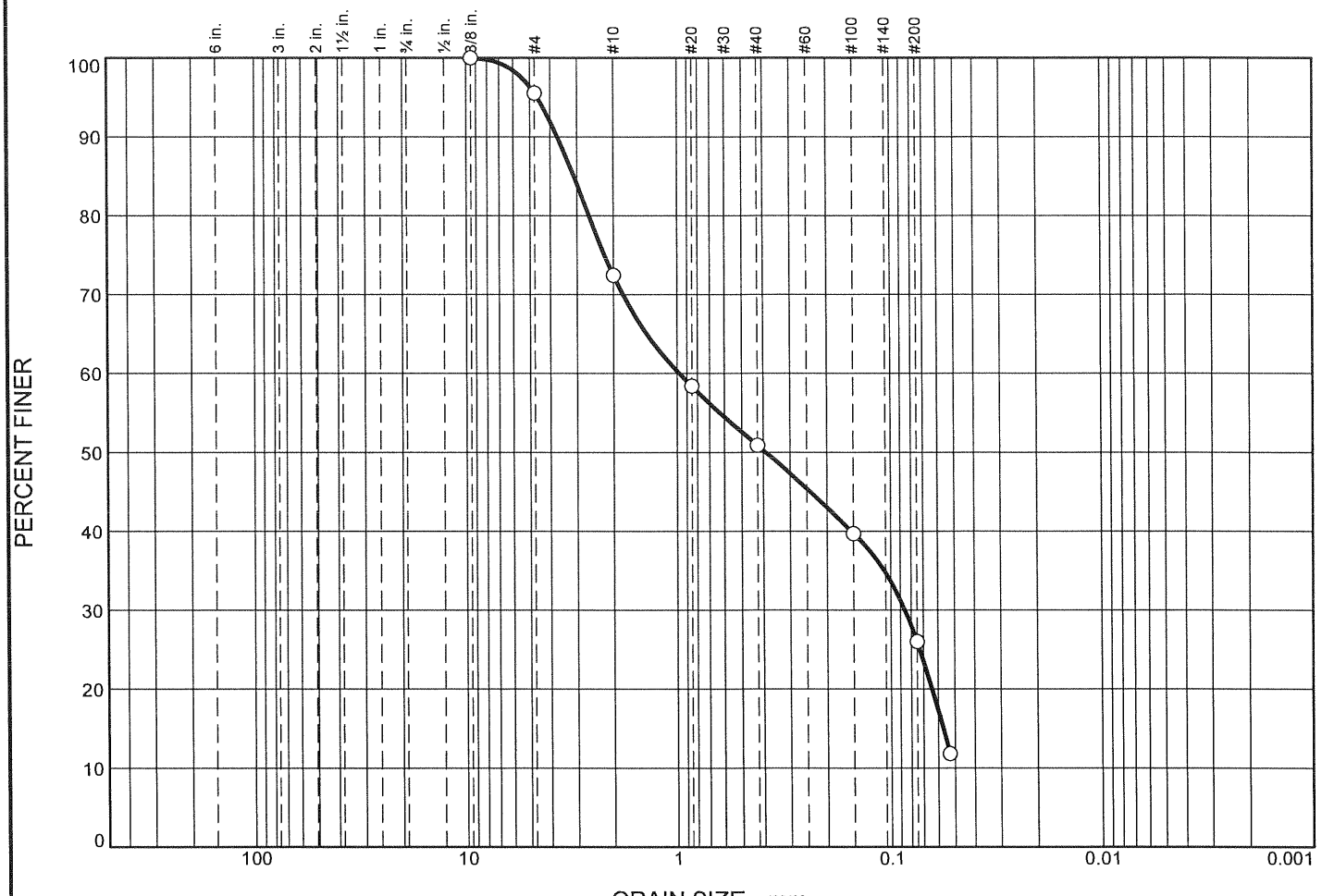
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	2.2	3.5	81.5	87.2			12.7

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0670	0.0798	0.0889	0.1052	0.1221	0.1412	0.1652	0.2467	0.2831	0.3375	0.6603

Fineness Modulus	C_u	C_c
0.70	2.46	1.00

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.5	23.1	21.5	24.9	26.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.1003	0.9741	0.3897	0.0856	0.0569			

Material Description	USCS	AASHTO
○		

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-30 **Sample Number:** 1505725-008A

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Livonia, Michigan

Remarks:

○ 4 JUNE 2015

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-30
Sample Number: 1505725-008A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
168.00	0.00	.375	541.60	541.60	100.0
		#4	505.30	497.80	95.5
		#10	489.80	451.00	72.4
		#20	497.80	474.20	58.4
		#40	488.50	475.90	50.9
		#100	357.30	338.50	39.7
		#200	337.80	314.80	26.0
		#270	414.50	390.70	11.8

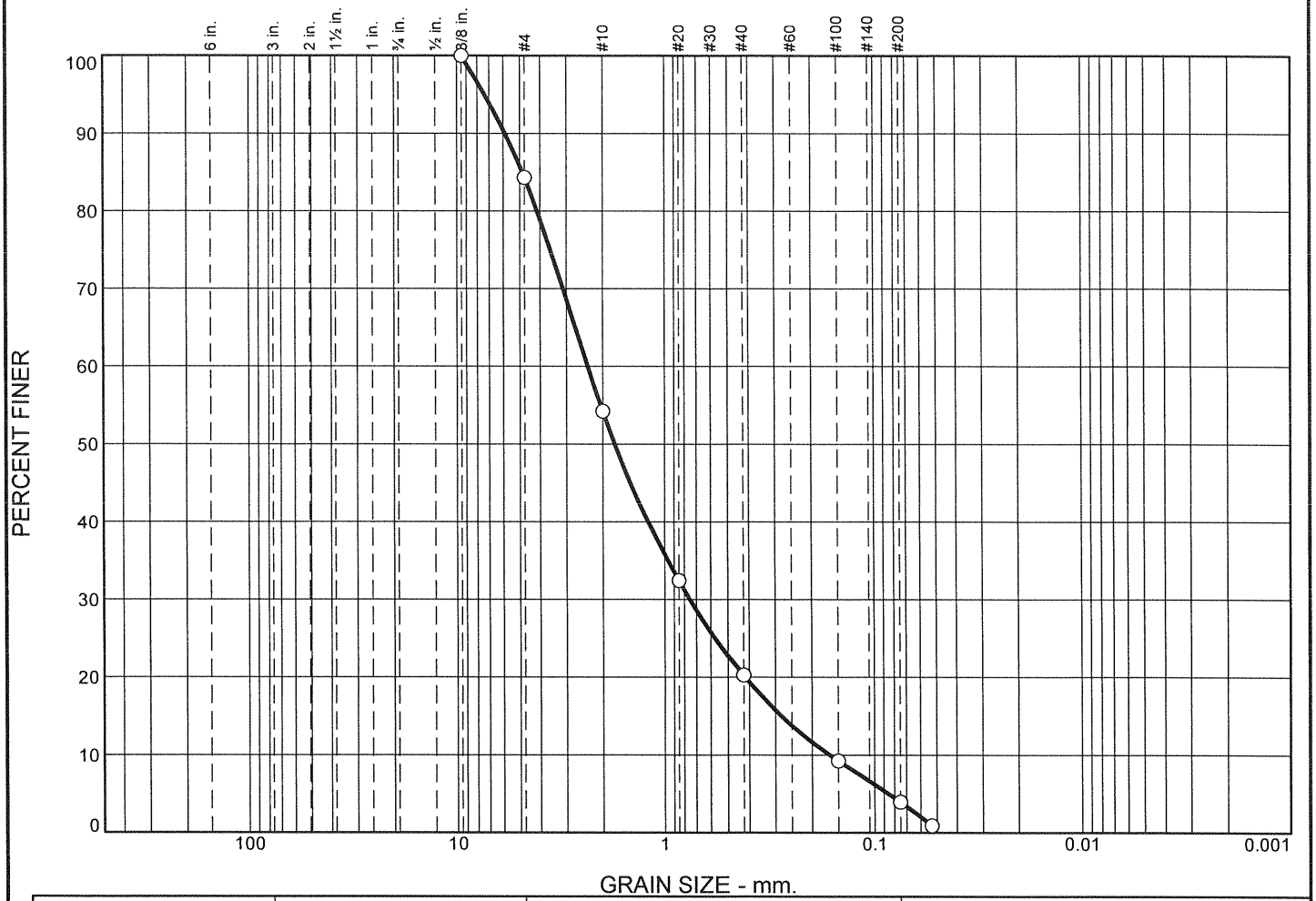
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.5	4.5	23.1	21.5	24.9	69.5			26.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0569	0.0640	0.0856	0.1538	0.3897	0.9741	2.6210	3.1003	3.7046	4.6108

Fineness Modulus
2.24

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	15.7	30.1	33.9	16.3	4.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			4.8649	2.3662	1.7469	0.7521	0.2801	0.1650	1.45	14.34

	Material Description	USCS	AASHTO
○		SW	

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-25 **Sample Number:** 1505725-009A

Remarks:

○ 4 JUNE 2015

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-25
Sample Number: 1505725-009A
USCS Classification: SW
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
144.00	0.00	.375	541.60	541.60	100.0
		#4	520.40	497.80	84.3
		#10	494.30	451.00	54.2
		#20	505.60	474.20	32.4
		#40	493.40	475.90	20.3
		#100	354.40	338.50	9.2
		#200	322.40	314.80	4.0
		#270	395.10	390.70	0.9

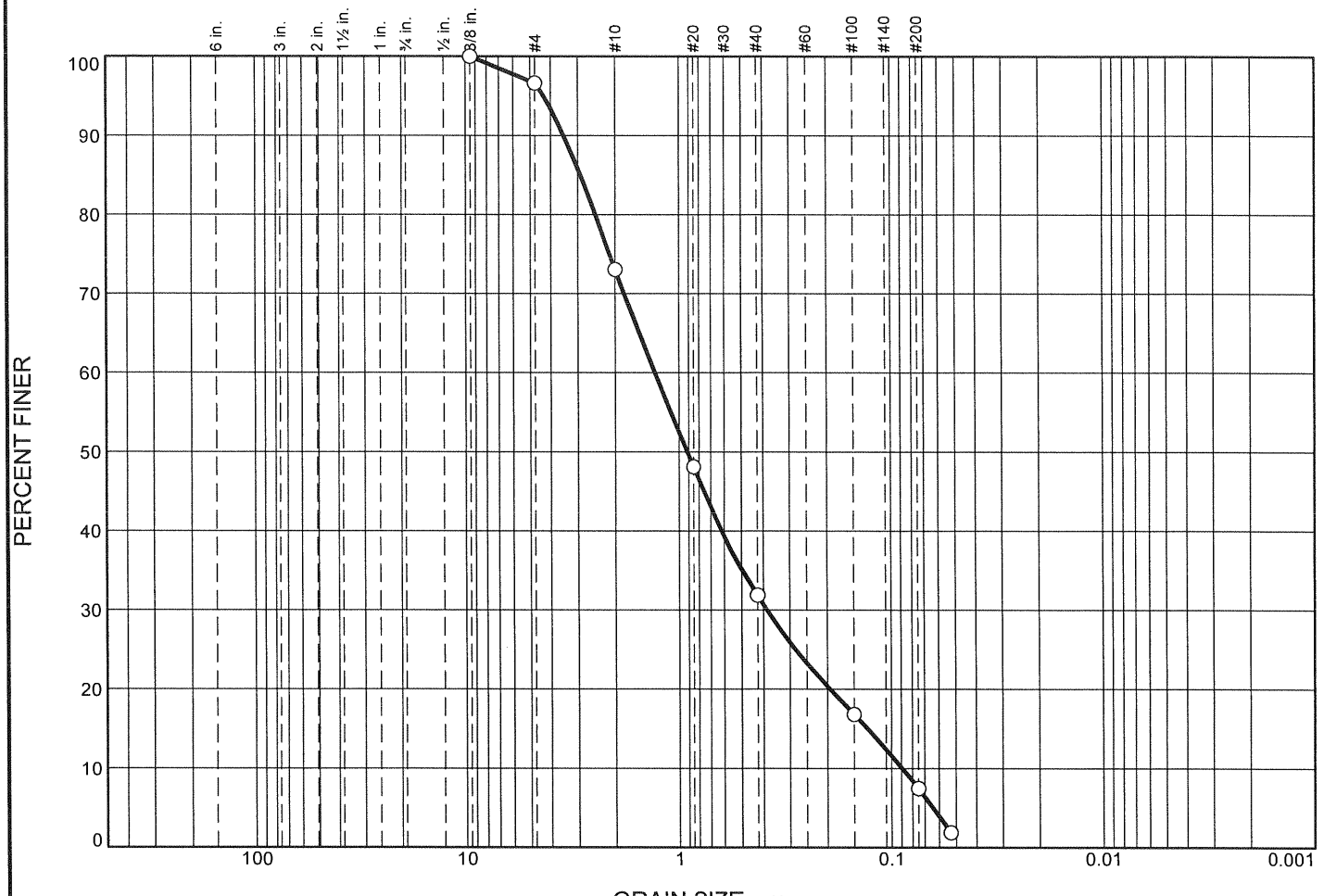
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	15.7	15.7	30.1	33.9	16.3	80.3			4.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0854	0.1650	0.2801	0.4169	0.7521	1.2009	1.7469	2.3662	4.1385	4.8649	5.8858	7.3799

Fineness Modulus	C_u	C_c
3.65	14.34	1.45

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	3.4	23.6	41.1	24.4	7.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.9176	1.3037	0.9120	0.3844	0.1297	0.0891	1.27	14.63

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-26 **Sample Number:** 1505725-010A

Remarks:

○ 4 JUNE 2015

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Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-26
Sample Number: 1505725-010A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
175.40	0.00	.375	541.60	541.60	100.0
		#4	503.70	497.80	96.6
		#10	492.40	451.00	73.0
		#20	517.90	474.20	48.1
		#40	504.40	475.90	31.9
		#100	364.90	338.50	16.8
		#200	331.20	314.80	7.5
		#270	400.50	390.70	1.9

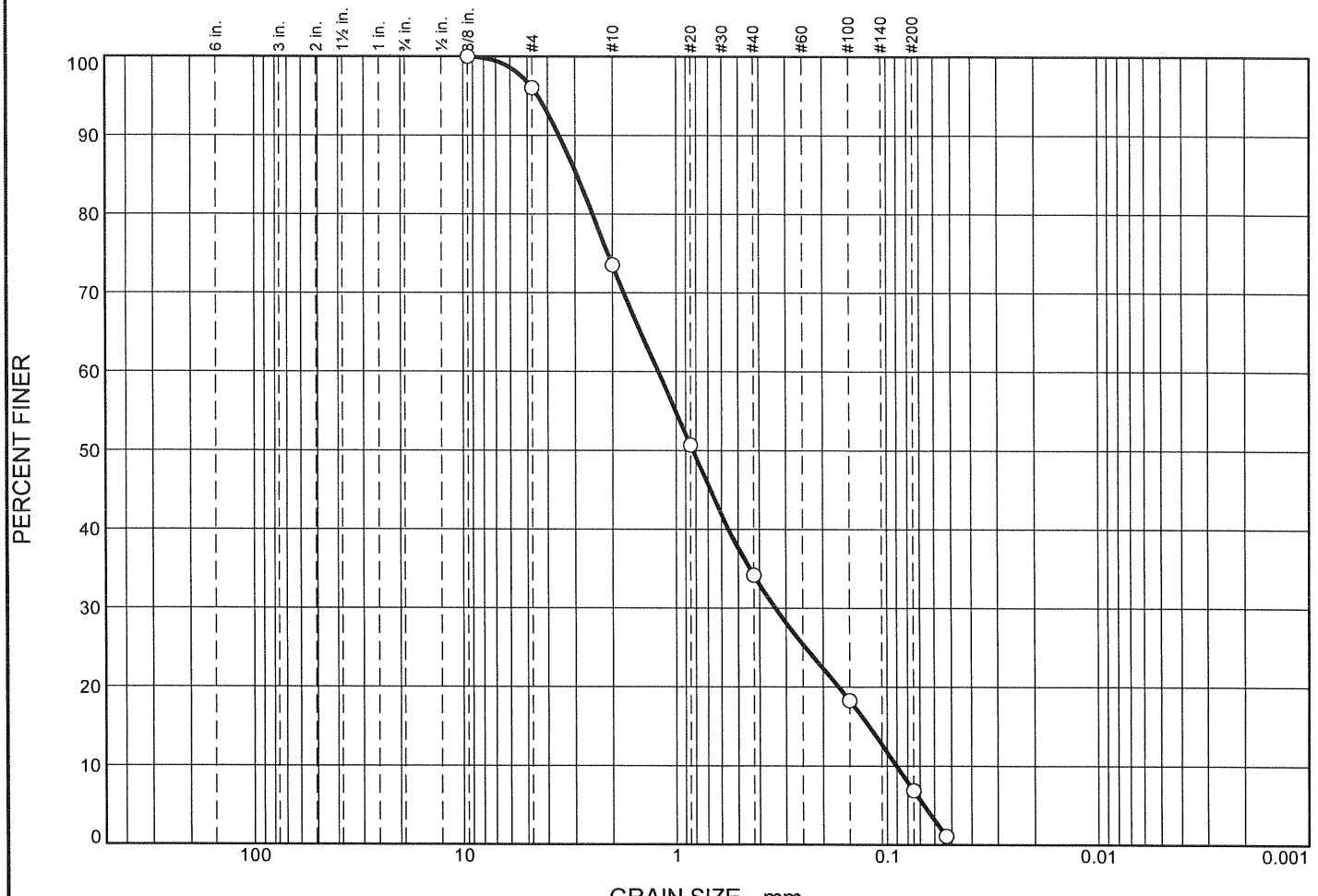
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.4	3.4	23.6	41.1	24.4	89.1			7.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0641	0.0891	0.1297	0.1941	0.3844	0.6170	0.9120	1.3037	2.4847	2.9176	3.4791	4.3216

Fineness Modulus	C_u	C_c
2.86	14.63	1.27

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	3.9	22.6	39.3	27.3	6.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.9433	1.2213	0.8275	0.3373	0.1216	0.0902	1.03	13.53

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-27 **Sample Number:** 1505725-011A

Remarks:

○ 4 JUNE 2015

RTI LABORATORIES

Livonia, Michigan

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-27
Sample Number: 1505725-011A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
240.70	0.00	.375	541.60	541.60	100.0
		#4	507.30	497.80	96.1
		#10	505.20	451.00	73.5
		#20	529.20	474.20	50.7
		#40	515.60	475.90	34.2
		#100	376.80	338.50	18.3
		#200	342.30	314.80	6.9
		#270	404.60	390.70	1.1

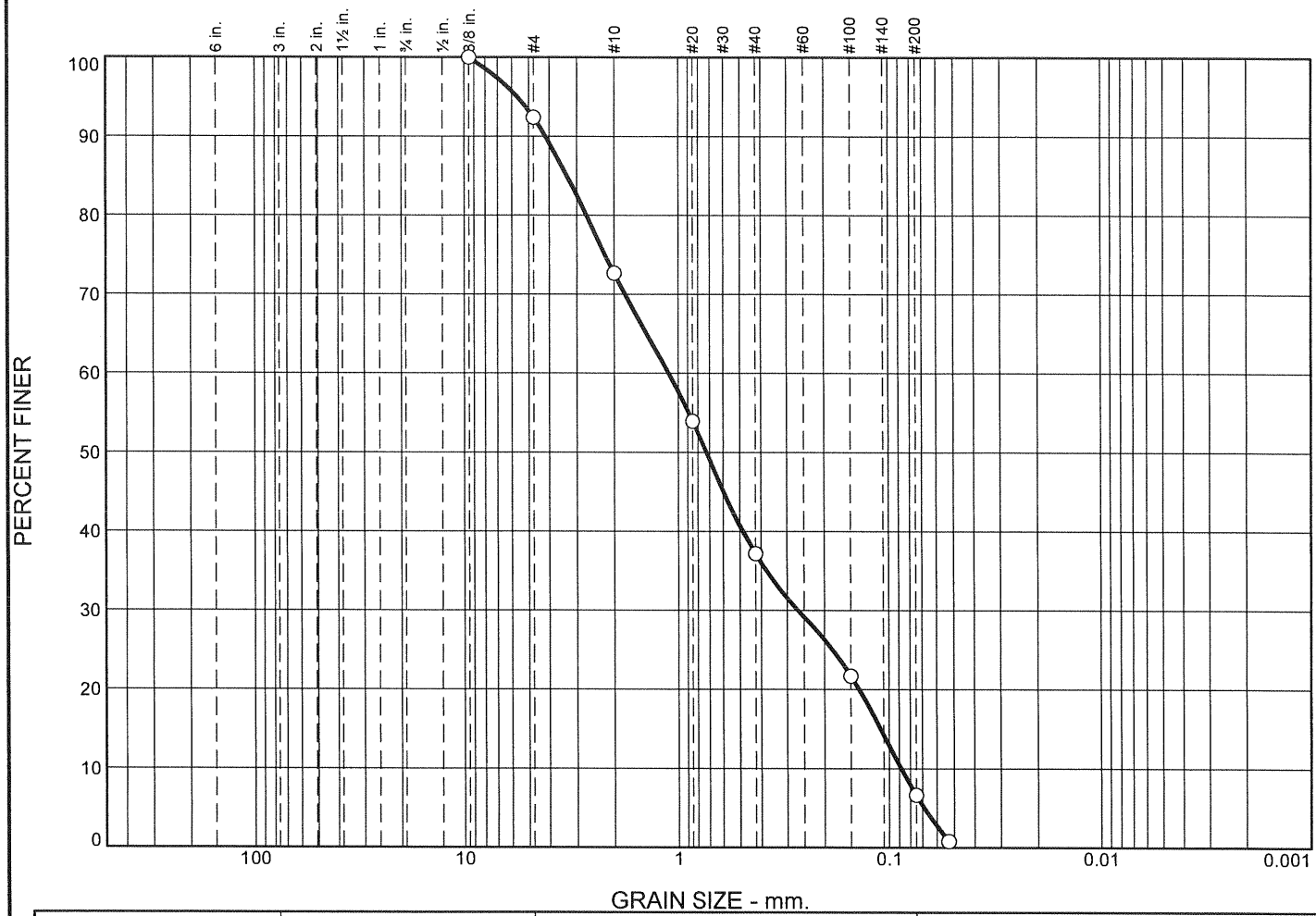
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.9	3.9	22.6	39.3	27.3	89.2			6.9

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0671	0.0902	0.1216	0.1688	0.3373	0.5541	0.8275	1.2213	2.4832	2.9433	3.5425	4.4587

Fineness Modulus	C_u	C_c
2.78	13.53	1.03

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	7.6	19.7	35.5	30.6	6.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			3.3212	1.1111	0.7255	0.2662	0.1096	0.0881	0.72	12.62

	Material Description	USCS	AASHTO
○			

Project No. **Client:** USACE- Detroit District

Project: St. Marys Sampling

○ **Source of Sample:** SM-14-28 **Sample Number:** 1505725-012A

RTI LABORATORIES

Livonia, Michigan

Remarks:

○ 4 JUNE 2015

Figure

Tested By: EL

GRAIN SIZE DISTRIBUTION TEST DATA

6/4/2015

Client: USACE- Detroit District
Project: St. Marys Sampling
Location: SM-14-28
Sample Number: 1505725-012A
Testing Remarks: 4 JUNE 2015
Tested by: EL

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
274.00	0.00	.375	541.60	541.60	100.0
		#4	518.60	497.80	92.4
		#10	505.10	451.00	72.7
		#20	525.50	474.20	53.9
		#40	521.80	475.90	37.2
		#100	380.90	338.50	21.7
		#200	356.10	314.80	6.6
		#270	406.70	390.70	0.8

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	7.6	7.6	19.7	35.5	30.6	85.8			6.6

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0686	0.0881	0.1096	0.1375	0.2662	0.4851	0.7255	1.1111	2.7035	3.3212	4.1712	5.6535

Fineness Modulus	C_u	C_c
2.71	12.62	0.72