

## LABORATORY REPORT

If you have any questions concerning this report, please do not hesitate to call us at (800) 332-4345 or (574) 233-4777.

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## STATE CERTIFICATION LIST

State	Certification	State	Certification
Alabama	40700	Missouri	880
Alaska	IN00035	Montana	CERT0026
Arizona	AZ0432	Nebraska	NE-OS-05-04
Arkansas	IN00035	Nevada	IN00035
California	2920	New Hampshire*	2124
Colorado	IN00035	New Jersey*	IN598
Colorado Radiochemistry	IN00035	New Mexico	IN00035
Connecticut	PH-0132	New York*	11398
Delaware	IN035	North Carolina	18700
Florida*	E87775	North Dakota	R-035
Georgia	929	Ohio	87775
Hawaii	IN035	Oklahoma	D9508
Idaho	IN00035	Oregon (Primary AB)*	4074
Illinois*	200001	Pennsylvania*	68-00466
Illinois Microbiology	17767	Puerto Rico	IN00035
Illinois Radiochemistry	IN00035	Rhode Island	LAO00343
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-18-12
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA014	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	460275
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
EPA	IN00035		

\*NELAP/TNI Recognized Accreditation Bodies



Eaton Analytical

110 South Hill Street  
South Bend, IN 46617  
Tel: (574) 233-4777  
Fax: (574) 233-8207  
1 800 332 4345

## Laboratory Report

Client: Great Lakes Water Authority  
Attn: Mary Lynn Semegen  
10100 East Jefferson Avenue  
Detroit, MI 48214

Report: 473610  
Priority: Standard Written  
Status: Final  
PWS ID: MI2838

### Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
4513303	Southwest Raw	7110 B	12/12/19 10:59	Client	12/13/19 09:30
4513304	Southwest Raw	7500-Ra B	12/12/19 10:59	Client	12/13/19 09:30
4513304	Southwest Raw	7500-Ra D	12/12/19 10:59	Client	12/13/19 09:30
4513305	Southwest Raw	525.2	12/12/19 10:50	Client	12/13/19 09:30
4513306	Southwest Raw	505	12/12/19 11:05	Client	12/13/19 09:30
4513307	Southwest Tap	7110 B	12/12/19 11:22	Client	12/13/19 09:30
4513308	Southwest Tap	7500-Ra B	12/12/19 11:22	Client	12/13/19 09:30
4513308	Southwest Tap	7500-Ra D	12/12/19 11:22	Client	12/13/19 09:30
4513309	Southwest Tap	525.2	12/12/19 11:34	Client	12/13/19 09:30
4513310	Southwest Tap	505	12/12/19 11:07	Client	12/13/19 09:30
4513311	SouthwestFilterWashWater	7110 B	12/12/19 10:30	Client	12/13/19 09:30
4513312	SouthwestFilterWashWater	7500-Ra B	12/12/19 10:30	Client	12/13/19 09:30
4513312	SouthwestFilterWashWater	7500-Ra D	12/12/19 10:30	Client	12/13/19 09:30

### Report Summary

Note: In the Method 525.2 analysis, the Anthracene recovery in the LFB at 2.0 ug/L (44%) was outside the acceptance limits of 70-130%. Any result is potentially low biased.

Note: In the Method 525.2 analysis, the Benzo(a)pyrene recovery in the LFB at 2.0 ug/L (65%) was outside the acceptance limits of 70-130%. Any result is potentially low biased.

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Karen Fullmer at (574) 233-4777.

Note: This report may not be reproduced, except in full, without written approval from EEA.

Authorized Signature

Title

01/15/2020

Date

Client Name: Great Lakes Water Authority  
Report #: 473610

Sampling Point: Southwest Raw

PWS ID: MI2838

Radionuclides										
Analyte ID #	Analyte	Method	Reg Limit	MDA 95**	MRL	Result	Units	Preparation Date	Analyzed	EEA ID #
---	Gross Alpha	7110 B	15 *	0.90	3.0	<b>1.5 ± 1.0</b>	pCi/L	12/17/19 15:10	12/26/19 13:45	4513303
13982-63-3	Radium-226	7500-Ra B	---	0.17	1.0	<b>0.35 ± 0.22</b>	pCi/L	12/21/19 14:30	01/03/20 13:51	4513304
15262-20-1	Radium-228	7500-Ra D	---	0.45	1.0	<b>0.72 ± 0.47</b>	pCi/L	12/21/19 14:30	01/07/20 14:02	4513304
---	Combined Radium	calc.	5 *	0.45	1.0	<b>1.07 ± 0.52</b>	pCi/L	12/21/19 14:30	01/07/20 14:02	4513304

\*\* Minimum Detectable Activity (MDA95) shall be that concentration which can be counted with a precision of plus or minus 100% at the 95 % confidence level.

Semi-volatile Organic Chemicals										
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed	EEA ID #	
12674-11-2	Aroclor 1016	505	---	0.08	< 0.08	ug/L	12/23/19 16:18	12/24/19 00:57	4513306	
11104-28-2	Aroclor 1221	505	---	0.19	< 0.19	ug/L	12/23/19 16:18	12/24/19 00:57	4513306	
11141-16-5	Aroclor 1232	505	---	0.23	< 0.23	ug/L	12/23/19 16:18	12/24/19 00:57	4513306	
53469-21-9	Aroclor 1242	505	---	0.26	< 0.26	ug/L	12/23/19 16:18	12/24/19 00:57	4513306	
12672-29-6	Aroclor 1248	505	---	0.1	< 0.1	ug/L	12/23/19 16:18	12/24/19 00:57	4513306	
11097-69-1	Aroclor 1254	505	---	0.1	< 0.1	ug/L	12/23/19 16:18	12/24/19 00:57	4513306	
11096-82-5	Aroclor 1260	505	---	0.2	< 0.2	ug/L	12/23/19 16:18	12/24/19 00:57	4513306	
83-32-9	Acenaphthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
208-96-8	Acenaphthylene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
120-12-7	Anthracene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
56-55-3	Benzo(a)anthracene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
205-99-2	Benzo(b)fluoranthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
207-08-9	Benzo(k)fluoranthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
191-24-2	Benzo(g,h,i)perylene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
50-32-8	Benzo(a)pyrene	525.2	0.2 *	0.02	< 0.02	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
218-01-9	Chrysene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
53-70-3	Dibenzo(a,h)anthracene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
206-44-0	Fluoranthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
86-73-7	Fluorene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
193-39-5	Indeno(1,2,3-cd)pyrene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
90-12-0	1-Methylnaphthalene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
91-57-6	2-Methylnaphthalene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
91-20-3	Naphthalene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
85-01-8	Phenanthrene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	
129-00-0	Pyrene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 08:27	4513305	

Any positive Aroclor result would require analysis for total PCB as decachlorobiphenyl by method 508A (MCL = 0.5 ug/L)

\$ The state of origin does not offer certification for this parameter.

Sampling Point: Southwest Tap

PWS ID: MI2838

Radionuclides										
Analyte ID #	Analyte	Method	Reg Limit	MDA 95**	MRL	Result	Units	Preparation Date	Analyzed	EEA ID #
---	Gross Alpha	7110 B	15 *	0.93	3.0	0.16 ± 0.72	pCi/L	12/17/19 15:35	12/26/19 16:39	4513307
13982-63-3	Radium-226	7500-Ra B	---	0.11	1.0	<b>0.45 ± 0.19</b>	pCi/L	12/21/19 14:30	01/07/20 11:59	4513308
15262-20-1	Radium-228	7500-Ra D	---	0.45	1.0	0.24 ± 0.43	pCi/L	12/21/19 14:30	01/07/20 14:01	4513308
---	Combined Radium	calc.	5 *	0.45	1.0	<b>0.69 ± 0.47</b>	pCi/L	12/21/19 14:30	01/07/20 14:01	4513308

\*\* Minimum Detectable Activity (MDA95) shall be that concentration which can be counted with a precision of plus or minus 100% at the 95 % confidence level.

Semi-volatile Organic Chemicals										
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed	EEA ID #	
12674-11-2	Aroclor 1016	505	---	0.08	< 0.08	ug/L	12/23/19 16:18	12/24/19 01:22	4513310	
11104-28-2	Aroclor 1221	505	---	0.19	< 0.19	ug/L	12/23/19 16:18	12/24/19 01:22	4513310	
11141-16-5	Aroclor 1232	505	---	0.23	< 0.23	ug/L	12/23/19 16:18	12/24/19 01:22	4513310	
53469-21-9	Aroclor 1242	505	---	0.26	< 0.26	ug/L	12/23/19 16:18	12/24/19 01:22	4513310	
12672-29-6	Aroclor 1248	505	---	0.1	< 0.1	ug/L	12/23/19 16:18	12/24/19 01:22	4513310	
11097-69-1	Aroclor 1254	505	---	0.1	< 0.1	ug/L	12/23/19 16:18	12/24/19 01:22	4513310	
11096-82-5	Aroclor 1260	505	---	0.2	< 0.2	ug/L	12/23/19 16:18	12/24/19 01:22	4513310	
83-32-9	Acenaphthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
208-96-8	Acenaphthylene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
120-12-7	Anthracene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
56-55-3	Benzo(a)anthracene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
205-99-2	Benzo(b)fluoranthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
207-08-9	Benzo(k)fluoranthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
191-24-2	Benzo(g,h,i)perylene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
50-32-8	Benzo(a)pyrene	525.2	0.2 *	0.02	< 0.02	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
218-01-9	Chrysene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
53-70-3	Dibenzo(a,h)anthracene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
206-44-0	Fluoranthene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
86-73-7	Fluorene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
193-39-5	Indeno(1,2,3-cd)pyrene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
90-12-0	1-Methylnaphthalene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
91-57-6	2-Methylnaphthalene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
91-20-3	Naphthalene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
85-01-8	Phenanthrene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	
129-00-0	Pyrene \$	525.2	---	0.1	< 0.1	ug/L	12/20/19 08:13	01/10/20 09:08	4513309	

Any positive Aroclor result would require analysis for total PCB as decachlorobiphenyl by method 508A (MCL = 0.5 ug/L)

\$ The state of origin does not offer certification for this parameter.



## Lab Definitions

**Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC)** - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis. CCL, CCM, and CCH are the CCC standards at low, mid, and high concentration levels, respectively.

**Internal Standards (IS)** - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

**Laboratory Duplicate (LD)** - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

**Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS)** - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control. FBL, FBM, and FBH are the LFB samples at low, mid, and high concentration levels, respectively.

**Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB)** - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

**Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB)** - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

**Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD)** - is a sample aliquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix. SDL, SDM, and SDH / LFSMDL, LFSMDM, and LFSMDH are the MSD or LFSMD at low, mid, and high concentration levels, respectively.

**Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM)** - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results. MSL, MSM, and MSH / LFSML, LFSMM, and LFSMH are the MS or LFSM at low, mid, and high concentration levels, respectively.

**Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV)** - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

**Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS)** - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

**Surrogate Standard (SS) / Surrogate Analyte (SUR)** - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.





Eaton Analytical

110 S. Hill Street  
South Bend, IN 46617  
T: 1.800.332.4345  
F: 1.574.233.8207

Order # **386377**

Batch # **473610**

www.eatonanalytical.com

Shaded area for EEA use only

### CHAIN OF CUSTODY RECORD

Page 1 of 1

REPORT TO: Great Lakes Water Authority, Mary Lynn Semegen 10100 E. Jefferson Avenue, Detroit, MI 48214	SAMPLER (Signature) <i>J. Collins</i>	PWS ID# <b>2838 Michigan</b>	STATE (of sample origin) <b>Michigan</b>	PROJECT NAME Water Works Park Bromate / Bromide	PO# <b>0015286</b>
BILL TO: Water Board Building 735 Randolph, Detroit, MI 48226	Compliance Monitoring Yes <input checked="" type="checkbox"/> NO <input type="checkbox"/>	POPULATION SERVED: <b>3,700,000 Detroit River</b>	SOURCE WATER: <b>Detroit River</b>	SAMPLE REMARKS <i>826/1228</i>	CHLORINATED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
Lab Number	SAMPLING SITE <i>Grp 50 Alpha</i>	TEST NAME			
1 <i>Sep. batch</i>	Southwest Raw	<b>Complete Metals</b>			
2 <i>4 4513305</i>	Southwest Raw <i>4513303</i>	Radiologicals			
3 <i>4513305</i>	Southwest Raw	PAHs			
4 <i>4513306</i>	Southwest Raw	PCBs			
5 <i>Sep. batch</i>	Southwest Tap	<b>Complete Metals</b>			
6	Southwest Tap <i>4513307</i>	Radiologicals			
7 <i>4513309</i>	Southwest Tap	PAHs			
8 <i>4513310</i>	Southwest Tap	PCBs			
9 <i>Sep. batch</i>	Southwest Filter Wash Water	<b>Complete Metals</b>			
10	Southwest Filter Wash Water	Radiologicals			
11	<i>4513311</i>				
12					
13					
14					

RELINQUISHED BY: (Signature) <i>J. Collins</i>	RECEIVED BY: (Signature)	DATE 12-12-19	TIME 2:00 PM
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME

LAB COMMENTS  
**Filters Received = 2x4L jug each site**  
*Rads Ambient*

CONDITIONS UPON RECEIPT (check one):  
 Iced  Ambient or *0.2* °C Upon Receipt

**MATRIX CODES:**  
DW = DRINKING WATER  
SW = SURFACE WATER  
FB = FILTER BACKWASH WATER

**TURN-AROUND TIME (TAT) - SURCHARGES**

SW = Standard Written (15 working days)	0%
RV* = Rush Verbal (5 Working days)	50%
RW* = Rush Written (5 working days)	75%

\* Please call. Expedited service not available for all services.

**IV\*** = Immediate Verbal (3 working days) **100%**  
**IV\*** = Immediate Written (3 working days) **125%**  
**SP\*** = Weekend, Holiday **CALL**  
**STAT\*** = Less than 48 hours **CALL**

Samples received unannounced with less than 48 hours holding time remaining may be subject to additional charges.

06-LO-F0435 Issue 4.0 Effective Date: 2014-05-01

*55 12-13-19*