



WATER OPERATING SERVICES  
 WATER QUALITY  
 10100 EAST JEFFERSON AVENUE  
 DETROIT, MICHIGAN 48214  
 PHONE: 313-926-8102 / 313-926-8127

### GLWA Water Treatment Plants' - Mineral Reports

		Sample Dates:		01/16/2018		01/16/2018		01/16/2018		01/16/2018		01/16/2018		01/16/2018			
		Lake Huron		Southwest		Belle Isle		Water Works Park		Northeast		Springwells					
Parameter	Formula	Units	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	MCL	Sec.Std	MDL		
Turbidity		NTU	1.50	0.05	2.70	0.03	1.90	0.07	0.10	0.05	0.3/95% (1)						
Total Solids		mg/L	108	113	125	127	123	127	123	137				500	10		
Total Dissolved Solids		mg/L	130	118	114	123	117	122	131	126				500	10		
Aluminum	Al	mg/L	0.138	0.103	0.169	0.078	0.260	0.117	0.169	0.066				0.05-0.2	0.005		
Iron	Fe	mg/L	0.030	< 0.005	0.068	< 0.005	0.080	< 0.005	< 0.005	0.022				0.3	0.005		
Copper	Cu	mg/L	0.013	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3 (AL)		1.0	0.002			
Magnesium	Mg	mg/L	7.78	8.30	8.65	8.90	7.98	8.35	8.98	8.93					0.5		
Calcium	Ca	mg/L	25.9	26.4	26.7	27.8	26.9	27.2	27.8	27.5					0.1		
Sodium	Na	mg/L	4.69	4.93	5.21	5.40	5.55	5.13	5.68	5.70				20 (2)	0.1		
Potassium	K	mg/L	0.87	0.88	0.90	0.90	1.06	0.95	0.90	0.92					0.1		
Manganese	Mn	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002				0.05	0.002		
Lead	Pb	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)				0.001		
Zinc	Zn	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				5	0.1		
Silica	SiO <sub>2</sub>	mg/L	0.9	1.1	0.9	1.1	1.1	1.1	0.8	0.9					0.4		
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.8	21.5	17.8	25.5	17.2	22.7	24.0	24.9				250			
Chloride	Cl <sup>-</sup>	mg/L	7.9	8.9	7.9	9.4	8.4	9.9	9.9	9.9				250	5		
Phosphorus	P	mg/L	< 0.05	0.39	< 0.05	0.34	< 0.05	0.36	0.36	0.37					0.05		
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.0	5.7	1.6	7.8	1.4	7.6	6.9	7.0							
Total Hardness (3), (4), (5)		mg/L	96	104	106	104	102	106	106	102							
Total Alkalinity (3)		mg/L	82	72	86	74	86	74	76	80							
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0							
Bi-Carbonate Alkalinity (3)		mg/L	81	72	85	74	85	74	76	80							
Non-Carbonate Hardness (3)		mg/L	14	32	20	30	16	32	30	22							
Chemical Oxygen Demand		mg/L	2.9	< 2	2.9	2.9	3.3	3.3	2.5	2.5					2		
Dissolved Oxygen		mg/L	15.0	15.6	14.5	14.8	15.2	16.8	14.7	15.2							
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> - N	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1				0.1		
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> - N	mg/L	0.30	0.29	0.30	0.30	0.29	0.27	0.28	0.30	10				0.1		
Fluoride	F <sup>-</sup>	mg/L	0.08	0.75	0.08	0.61	0.07	0.60	0.39	0.35	4.0		2.0	0.5			
pH			8.20	7.40	8.04	7.28	8.08	7.29	7.34	7.36				6.5-8.5			
Specific Conductance @ 25 °C.		micromhos	218	228	231	240	230	237	239	239							
Temperature		°C	0.0	9.2	1.5	1.7	0.1	4.0	1.1	2.0							

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
mg/L: Milligram Per Liter	mg/L is equivalent to part per million (ppm)
AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Hardness in Grains per Gallon = 0.058 × (Hardness in mg/L)
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument detection limit.
IV: Invalid Sample	

Reporting Analyst: Korey Raupach      Chemist-I      Initials: **K.R.**      Date: 02/28/2018  
 Reviewed By: Patrick Williford      Management Professional - Ops.      Initials: **P.W.**      Date: 03/13/2018

Great Lakes Water Authority



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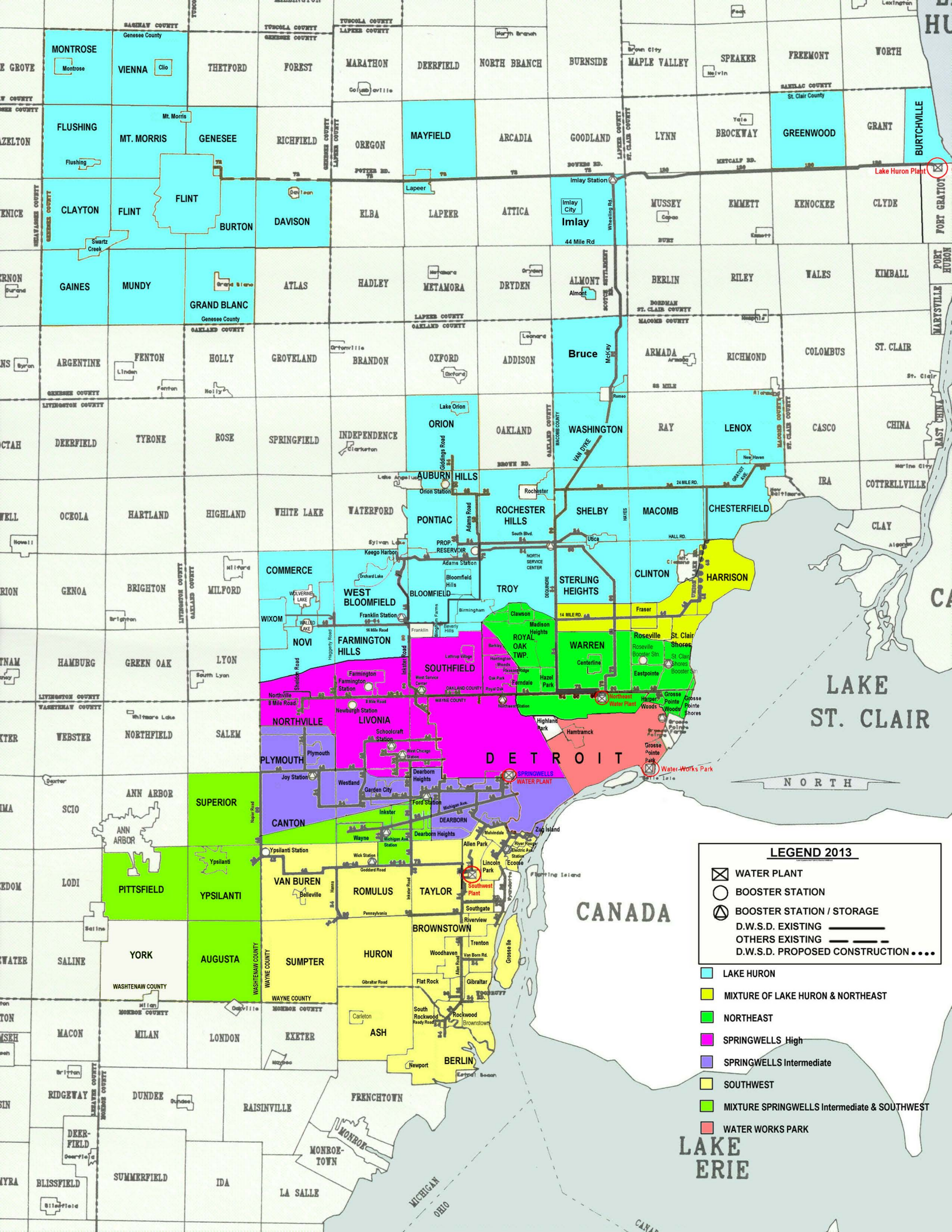
Sample Dates: 02/13/2018 02/13/2018 02/13/2018 02/13/2018 02/13/2018 02/13/2018 02/13/2018 02/13/2018

Parameter	Formula	Units	Lake Huron		Southwest		Belle Isle		Water Works Park		Northeast		Springwells		MCL	Sec.Std	MDL
			Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap			
Turbidity		NTU	0.52	0.06	2.40	0.04	3.70	0.06	0.07	0.09	0.3/95% (1)						
Total Solids		mg/L	127	135	155	161	131	140	141	139					500	10	
Total Dissolved Solids		mg/L	120	127	155	158	137	137	142	136					500	10	
Aluminum	Al	mg/L	0.080	0.105	0.172	0.103	0.190	0.093	0.103	0.079					0.05-0.2	0.005	
Iron	Fe	mg/L	0.010	< 0.005	0.061	< 0.005	0.055	< 0.005	0.005	0.014					0.3	0.005	
Copper	Cu	mg/L	0.007	< 0.005	0.008	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3 (AL)			1.0	0.002		
Magnesium	Mg	mg/L	7.75	7.90	8.15	8.35	8.10	7.88	7.88	7.90						0.5	
Calcium	Ca	mg/L	29.0	28.9	32.5	34.0	30.0	30.4	29.6	29.7						0.1	
Sodium	Na	mg/L	5.34	5.36	8.64	9.72	6.94	7.35	6.83	6.93				20 (2)	0.1		
Potassium	K	mg/L	0.96	0.95	1.27	1.31	1.22	1.01	0.98	0.99						0.1	
Manganese	Mn	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002				0.05	0.002		
Lead	Pb	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002				0.015 (AL)		0.001	
Zinc	Zn	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1					5	0.1	
Silica	SiO <sub>2</sub>	mg/L	2.5	2.8	2.7	2.9	2.4	2.6	2.6	2.6						0.4	
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.8	20.1	19.1	27.2	17.1	22.0	24.8	21.5				250			
Chloride	Cl <sup>-</sup>	mg/L	7.4	8.4	12.9	15.3	9.9	11.4	11.4	11.4				250	5		
Phosphorus	P	mg/L	< 0.05	0.40	< 0.05	0.33	< 0.05	0.40	0.35	0.37						0.05	
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.0	5.7	2.1	12.1	1.7	7.4	7.2	7.3							
Total Hardness (3), (4), (5)		mg/L	104	100	114	116	106	104	106	104							
Total Alkalinity (3)		mg/L	82	72	88	78	88	74	74	78							
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0							
Bi-Carbonate Alkalinity (3)		mg/L	81	72	87	78	87	74	74	78							
Non-Carbonate Hardness (3)		mg/L	22	28	26	38	18	30	32	26							
Chemical Oxygen Demand		mg/L	4.9	2.5	3.3	2.5	4.1	2.1	2.5	3.3						2	
Dissolved Oxygen		mg/L	13.0	13.5	12.9	13.1	13.0	14.0	13.5	13.4							
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> - N	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				1		0.1	
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> - N	mg/L	0.27	0.25	1.01	1.00	0.29	0.31	0.28	0.28				10		0.1	
Fluoride	F <sup>-</sup>	mg/L	0.08	0.77	0.09	0.73	0.08	0.63	0.58	0.61				4.0	2.0	0.5	
pH			8.20	7.40	7.91	7.11	8.00	7.30	7.31	7.33					6.5-8.5		
Specific Conductance @ 25 °C.		micromhos	190	196	134	242	207	209	212	212							
Temperature		°C	0.0	7.8	2.1	1.6	0.1	4.0	6.2	2.5							

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
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AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Hardness in Grains per Gallon = 0.058 x (Hardness in mg/L)
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

Reporting Analyst: Khan & Levoska      Chemist      Initials: **K.R.**      Date: 06/25/2018  
 Reviewed By: Patrick Williford      Management Professional - Ops.      Initials: **P.W.**      Date: 06/29/2018

Great Lakes Water Authority



**LEGEND 2013**

- ☒ WATER PLANT
- BOOSTER STATION
- ⊕ BOOSTER STATION / STORAGE
- D.W.S.D. EXISTING
- - - OTHERS EXISTING
- ⋯ D.W.S.D. PROPOSED CONSTRUCTION

- ☐ LAKE HURON
- ☐ MIXTURE OF LAKE HURON & NORTHEAST
- ☐ NORTHEAST
- ☐ SPRINGWELLS High
- ☐ SPRINGWELLS Intermediate
- ☐ SOUTHWEST
- ☐ MIXTURE SPRINGWELLS Intermediate & SOUTHWEST
- ☐ WATER WORKS PARK

**LAKE ERIE**

NORTH

CANADA

MICHIGAN OHIO