



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

### Lake Huron Water Treatment Plant Mineral Report

Sample Date: 10/11/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	0.30	0.06	0.3/95% (1)		
Total Solids		mg/L	94	91		500	10
Total Dissolved Solids		mg/L	81	51		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.006	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.59	9.82			0.5
Calcium	Ca	mg/L	14.0	14.5			0.1
Sodium	Na	mg/L	6.76	5.63		20 (2)	0.1
Potassium	K	mg/L	0.81	0.84			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.7	0.7			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	17.9	21.4		250	
Chloride	Cl <sup>-</sup>	mg/L	7.5	8.5		250	5
Phosphorus	P	mg/L	< 0.05	0.36			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.1	3.1			
Total Hardness (3), (4), (5)		mg/L	96	100			
Total Alkalinity (3)		mg/L	78	78			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	78	78			
Non-Carbonate Hardness (3)		mg/L	18	22			
Chemical Oxygen Demand		mg/L	6.0	6.4			2
Dissolved Oxygen		mg/L	9.4	10.0			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	AE	AE	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.56	0.07	4.0	2.0	0.5
pH			8.14	7.70	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	215	222			
Temperature		°C	15.4	15.4			

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) Tap Water Hardness in Grains per Gallon <b>5.80 GPG</b>
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

Analyst: Brian Brown      Chemist-I      Initial **B. B.**      Date: 03/06/2017  
 Reviewed By: Patrick Williford      Chemist-II      Initial **P. W.**      Date: 03/07/2017

Great Lakes Water Authority



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### Southwest Water Treatment Plant Mineral Report

Sample Date: 10/11/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	3.32	0.09	0.3/95% (1)		
Total Solids		mg/L	143	114		500	10
Total Dissolved Solids		mg/L	66	83		500	10
Aluminum	Al	mg/L	0.109	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.242	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.012	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	7.93	10.30			0.5
Calcium	Ca	mg/L	15.1	17.3			0.1
Sodium	Na	mg/L	5.24	5.61		20 (2)	0.1
Potassium	K	mg/L	0.94	0.87			0.1
Manganese	Mn	mg/L	0.011	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	0.7			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	18.9	24.4		250	
Chloride	Cl <sup>-</sup>	mg/L	8.0	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.34			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.2	2.3			
Total Hardness (3), (4), (5)		mg/L	94	104			
Total Alkalinity (3)		mg/L	86	70			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	86	70			
Non-Carbonate Hardness (3)		mg/L	8	34			
Chemical Oxygen Demand		mg/L	4.0	2.0			2
Dissolved Oxygen		mg/L	9.8	9.7			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	AE	AE	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.75	0.11	4.0	2.0	0.5
pH			8.14	7.79	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	222	189			
Temperature		°C	16.6	16.6			

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) Tap Water Hardness in Grains per Gallon <b>6.03 GPG</b>
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

Analyst: Brian Brown      Chemist-I      Initial **B. B.**      Date: 03/06/2017  
 Reviewed By: Patrick Williford      Chemist-II      Initial **P. W.**      Date: 03/07/2017

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### Water Works Park Water Treatment Plant Mineral Report

Sample Date: 10/11/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	4.30	0.08	0.3/95% (1)		
Total Solids		mg/L	115	124		500	10
Total Dissolved Solids		mg/L	53	62		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.292	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.57	10.61			0.5
Calcium	Ca	mg/L	21.1	14.5			0.1
Sodium	Na	mg/L	5.67	5.58		20 (2)	0.1
Potassium	K	mg/L	1.13	0.92			0.1
Manganese	Mn	mg/L	0.006	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	0.7			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	17.0	23.3		250	
Chloride	Cl <sup>-</sup>	mg/L	7.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.32			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.4	4.2			
Total Hardness (3), (4), (5)		mg/L	100	100			
Total Alkalinity (3)		mg/L	80	80			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	80			
Non-Carbonate Hardness (3)		mg/L	20	20			
Chemical Oxygen Demand		mg/L	7.2	4.4			2
Dissolved Oxygen		mg/L	9.3	10.7			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	AE	AE	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.00	0.06	4.0	2.0	0.5
pH			8.06	7.58	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	177	230			
Temperature		°C	19.1	18.0			

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) Tap Water Hardness in Grains per Gallon <b>5.80 GPG</b>
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

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### Northeast Water Treatment Plant Mineral Report

Sample Date: 10/11/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	4.30	0.06	0.3/95% (1)		
Total Solids		mg/L	115	108		500	10
Total Dissolved Solids		mg/L	53	45		500	10
Aluminum	Al	mg/L	< 0.050	0.109		0.05-0.2	0.005
Iron	Fe	mg/L	0.292	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.57	8.31			0.5
Calcium	Ca	mg/L	21.1	29.4			0.1
Sodium	Na	mg/L	5.67	6.18		20 (2)	0.1
Potassium	K	mg/L	1.13	0.90			0.1
Manganese	Mn	mg/L	0.006	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	0.6			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	17.0	24.5		250	
Chloride	Cl <sup>-</sup>	mg/L	7.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.26			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.4	3.2			
Total Hardness (3), (4), (5)		mg/L	100	102			
Total Alkalinity (3)		mg/L	80	72			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	72			
Non-Carbonate Hardness (3)		mg/L	20	30			
Chemical Oxygen Demand		mg/L	7.2	2.0			2
Dissolved Oxygen		mg/L	9.3	10.0			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	AE	AE	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.00	0.65	4.0	2.0	0.5
pH			8.06	7.65	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	177	230			
Temperature		°C	19.1	18.3			

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) Tap Water Hardness in Grains per Gallon <b>5.92 GPG</b>
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

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### Springwells Water Treatment Plant Mineral Report

Sample Date: 10/11/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	4.30	0.05	0.3/95% (1)		
Total Solids		mg/L	115	104		500	10
Total Dissolved Solids		mg/L	53	76		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.292	0.080		0.3	0.005
Copper	Cu	mg/L	< 0.005	0.006	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.57	10.82			0.5
Calcium	Ca	mg/L	21.1	72.6			0.1
Sodium	Na	mg/L	5.67	5.76		20 (2)	0.1
Potassium	K	mg/L	1.13	0.88			0.1
Manganese	Mn	mg/L	0.006	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	0.7			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	17.0	27.3		250	
Chloride	Cl <sup>-</sup>	mg/L	7.5	10.5		250	5
Phosphorus	P	mg/L	< 0.05	0.80			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.4	3.3			
Total Hardness (3), (4), (5)		mg/L	100	100			
Total Alkalinity (3)		mg/L	80	76			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	76			
Non-Carbonate Hardness (3)		mg/L	20	24			
Chemical Oxygen Demand		mg/L	7.2	2.4			2
Dissolved Oxygen		mg/L	9.3	12.2			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	AE	AE	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.00	0.53	4.0	2.0	0.5
pH			8.06	7.66	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	177	228			
Temperature		°C	19.1	16.0			

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) Tap Water Hardness in Grains per Gallon <b>5.80 GPG</b>
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
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Analyst: Brian Brown      Chemist-I      Initial **B. B.**      Date: 03/06/2017  
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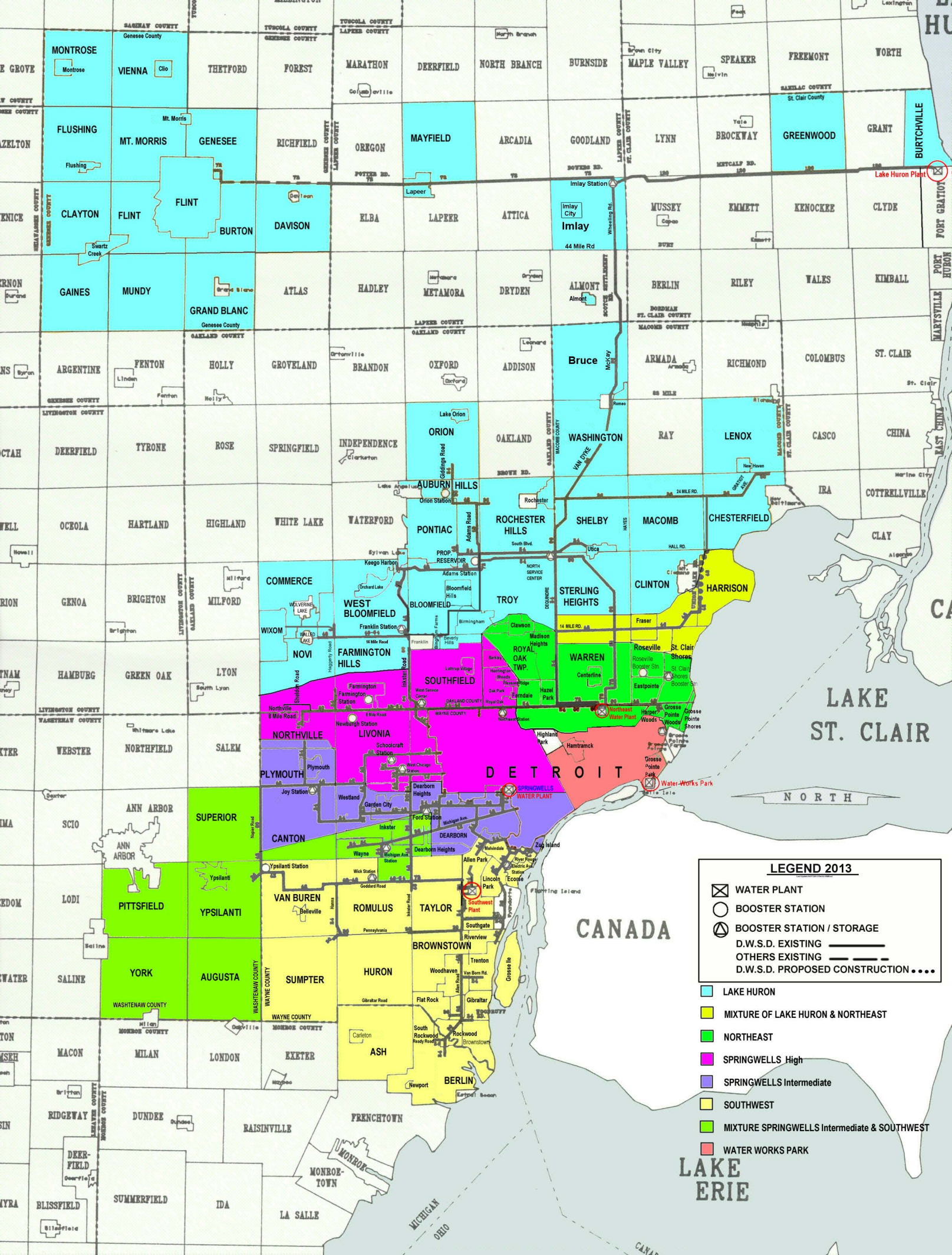
### All GLWA Water Treatment Plant Mineral Reports

Parameter	Formula	Units	10/11/2016		10/11/2016		10/11/2016		10/11/2016		10/11/2016		MCL	Sec.Std	MDL
			Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap					
Turbidity		NTU	0.30	0.06	3.32	0.09	4.30	0.08	0.06	0.05	0.3/95% (1)				
Total Solids		mg/L	94	91	143	114	115	124	108	104			500	10	
Total Dissolved Solids		mg/L	81	51	66	83	53	62	45	76			500	10	
Aluminum	Al	mg/L	< 0.050	< 0.050	0.109	< 0.050	< 0.050	< 0.050	0.109	< 0.050			0.05-0.2	0.005	
Iron	Fe	mg/L	< 0.050	< 0.050	0.242	< 0.050	0.292	< 0.050	< 0.050	0.080			0.3	0.005	
Copper	Cu	mg/L	0.006	< 0.005	0.012	< 0.005	< 0.005	< 0.005	< 0.005	0.006	1.3 (AL)		1.0	0.002	
Magnesium	Mg	mg/L	8.59	9.82	7.93	10.30	8.57	10.61	8.31	10.82				0.5	
Calcium	Ca	mg/L	14.0	14.5	15.1	17.3	21.1	14.5	29.4	72.6				0.1	
Sodium	Na	mg/L	6.76	5.63	5.24	5.61	5.67	5.58	6.18	5.76			20 (2)	0.1	
Potassium	K	mg/L	0.81	0.84	0.94	0.87	1.13	0.92	0.90	0.88				0.1	
Manganese	Mn	mg/L	< 0.002	< 0.002	0.011	< 0.002	0.006	< 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)			0.002	
Zinc	Zn	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010			5	0.1	
Silica	SiO <sub>2</sub>	mg/L	0.7	0.7	0.8	0.7	0.8	0.7	0.6	0.7				0.4	
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	17.9	21.4	18.9	24.4	17.0	23.3	24.5	27.3			250		
Chloride	Cl <sup>-</sup>	mg/L	7.5	8.5	8.0	9.0	7.5	9.5	9.5	10.5			250	5	
Phosphorus	P	mg/L	< 0.05	0.36	< 0.05	0.34	< 0.05	0.32	0.26	0.80				0.05	
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.1	3.1	1.2	2.3	1.4	4.2	3.2	3.3					
Total Hardness (3), (4), (5)		mg/L	96	100	94	104	100	100	102	100					
Total Alkalinity (3)		mg/L	78	78	86	70	80	80	72	76					
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0					
Bi-Carbonate Alkalinity (3)		mg/L	78	78	86	70	80	80	72	76					
Non-Carbonate Hardness (3)		mg/L	18	22	8	34	20	20	30	24					
Chemical Oxygen Demand		mg/L	6.0	6.4	4.0	2.0	7.2	4.4	2.0	2.4					2
Dissolved Oxygen		mg/L	9.4	10.0	9.8	9.7	9.3	10.7	10.0	12.2					
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	AE	AE	AE	AE	AE	AE	AE	AE			10	0.1	
Fluoride	F <sup>-</sup>	mg/L	0.56	0.07	0.75	0.11	0.00	0.06	0.65	0.53			4.0	2.0	0.5
pH			8.14	7.70	8.14	7.79	8.06	7.58	7.65	7.66			6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	215	222	222	189	177	230	230	228					
Temperature		°C	15.4	15.4	16.6	16.6	19.1	18.0	18.3	16.0					

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) Tap Water Hardness in Grains per Gallon multiply value by 0.058 (Grains/Gallon)/(mg/L)
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument detection limit.
IV: Invalid Sample	

Analyst: Brian Brown      Chemist-I      Initial      **B. B.**      Date: 03/06/2017  
 Reviewed By: Patrick Williford      Chemist-II      Initial      **P. W.**      Date: 03/07/2017

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