



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Lake Huron Plant**  
**10/13/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.70	0.10	0.3/95% (1)		
Total Solids		mg/L	125	120		500	10
Total Dissolved Solids		mg/L	117	121		500	10
Aluminum	Al	mg/L	0.089	0.092		0.05-0.2	0.005
Iron	Fe	mg/L	0.090	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.95	10.71			0.5
Calcium	Ca	mg/L	28.4	26.0			0.1
Sodium	Na	mg/L	5.00	4.50		20 (2)	0.1
Potassium	K	mg/L	0.86	0.85			0.1
Manganese	Mn	mg/L	0.005	< 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	1.0			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.5	19.3		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	2.0	3.5			
Total Hardness (3), (4), (5)		mg/L	96	100			
Total Alkalinity (3)		mg/L	84	76			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	84	76			
Non-Carbonate Hardness (3)		mg/L	12	24			
Chemical Oxygen Demand		mg/L	3.2	4.4			2
Dissolved Oxygen		mg/L	5.0	5.2			
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	0.29	0.25	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.08	0.67	4.0	2.0	0.5
pH			7.92	7.63	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	212	218			
Temperature		°C	19.3	19.3			

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>5.80 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      Initial **B. B.**      Date: 01/12/2016  
 Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 01/12/2016

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Southwest Plant**  
**10/13/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.70	0.04	0.3/95% (1)		
Total Solids		mg/L	113	112		500	10
Total Dissolved Solids		mg/L	107	110		500	10
Aluminum	Al	mg/L	0.093	0.078		0.05-0.2	0.005
Iron	Fe	mg/L	0.078	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.011	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	10.44	8.06			0.5
Calcium	Ca	mg/L	28.0	28.4			0.1
Sodium	Na	mg/L	4.96	4.90		20 (2)	0.1
Potassium	K	mg/L	0.91	0.94			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	0.8	0.9			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.3	23.0		250	
Chloride	Cl <sup>-</sup>	mg/L	7.5	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.22			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	2.4	3.9			
Total Hardness (3), (4), (5)		mg/L	100	102			
Total Alkalinity (3)		mg/L	96	80			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	96	80			
Non-Carbonate Hardness (3)		mg/L	4	22			
Chemical Oxygen Demand		mg/L	< 2.0	2.8			2
Dissolved Oxygen		mg/L	6.1	6.9			
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	0.22	0.25	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.09	0.63	4.0	2.0	0.5
pH			7.90	7.61	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	214	227			
Temperature		°C	16.0	17.2			

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.

Analyst: Brian Brown      Chemist      Initial **B. B.**      Date: 01/12/2016  
 Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 01/12/2016

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Water Works Park Plant**  
**10/13/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.20	0.06	0.3/95% (1)		
Total Solids		mg/L	102	126		500	10
Total Dissolved Solids		mg/L	111	126		500	10
Aluminum	Al	mg/L	0.437	0.225		0.05-0.2	0.005
Iron	Fe	mg/L	0.065	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.56	8.93			0.5
Calcium	Ca	mg/L	28.7	29.1			0.1
Sodium	Na	mg/L	4.97	5.43		20 (2)	0.1
Potassium	K	mg/L	0.91	0.92			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	0.8	0.8			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.6	21.6		250	
Chloride	Cl <sup>-</sup>	mg/L	11.5	10.5		250	5
Phosphorus	P	mg/L	< 0.05	0.30			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.0	3.5			
Total Hardness (3), (4), (5)		mg/L	100	106			
Total Alkalinity (3)		mg/L	72	78			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	72	78			
Non-Carbonate Hardness (3)		mg/L	28	28			
Chemical Oxygen Demand		mg/L	4.8	2.4			2
Dissolved Oxygen		mg/L	6.4	7.4			
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	0.28	0.27	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.08	0.56	4.0	2.0	0.5
pH			8.14	7.65	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	222	213			
Temperature		°C	20.9	20.7			

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>6.15 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      Initial **B. B.**      Date: 01/12/2016  
 Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 01/12/2016

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Northeast Plant**  
**10/13/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.20	0.10	0.3/95% (1)		
Total Solids		mg/L	102	113		500	10
Total Dissolved Solids		mg/L	111	115		500	10
Aluminum	Al	mg/L	0.437	0.062		0.05-0.2	0.005
Iron	Fe	mg/L	0.065	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.56	8.01			0.5
Calcium	Ca	mg/L	28.7	28.8			0.1
Sodium	Na	mg/L	4.97	5.20		20 (2)	0.1
Potassium	K	mg/L	0.91	0.93			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	0.8	0.9			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.6	22.9		250	
Chloride	Cl <sup>-</sup>	mg/L	11.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.32			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.0	3.7			
Total Hardness (3), (4), (5)		mg/L	100	100			
Total Alkalinity (3)		mg/L	72	78			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	72	78			
Non-Carbonate Hardness (3)		mg/L	28	22			
Chemical Oxygen Demand		mg/L	4.8	3.2			2
Dissolved Oxygen		mg/L	6.4	5.8			
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	0.28	0.28	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.08	0.59	4.0	2.0	0.5
pH			8.14	7.62	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	222	226			
Temperature		°C	20.9	18.9			

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      Initial **B. B.**      Date: 01/12/2016  
 Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 01/12/2016

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Springwells Plant**  
**10/13/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.20	0.05	0.3/95% (1)		
Total Solids		mg/L	102	124		500	10
Total Dissolved Solids		mg/L	111	125		500	10
Aluminum	Al	mg/L	0.437	0.065		0.05-0.2	0.005
Iron	Fe	mg/L	0.065	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.56	8.69			0.5
Calcium	Ca	mg/L	28.7	26.4			0.1
Sodium	Na	mg/L	4.97	4.83		20 (2)	0.1
Potassium	K	mg/L	0.91	0.96			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	0.04		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	1.0			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.6	23.7		250	
Chloride	Cl <sup>-</sup>	mg/L	11.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.78			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.0	4.9			
Total Hardness (3), (4), (5)		mg/L	100	98			
Total Alkalinity (3)		mg/L	72	78			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	72	78			
Non-Carbonate Hardness (3)		mg/L	28	20			
Chemical Oxygen Demand		mg/L	4.8	< 2.0			2
Dissolved Oxygen		mg/L	6.4	6.6			
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	0.28	0.22	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.08	0.61	4.0	2.0	0.5
pH			8.14	7.50	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	222	228			
Temperature		°C	20.9	18.5			

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
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>5.68 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      Initial **B. B.**      Date: 01/12/2016  
Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 01/12/2016

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department  
Water Quality Division  
Laboratory Analysis of Water Samples Collected at Each Plant**

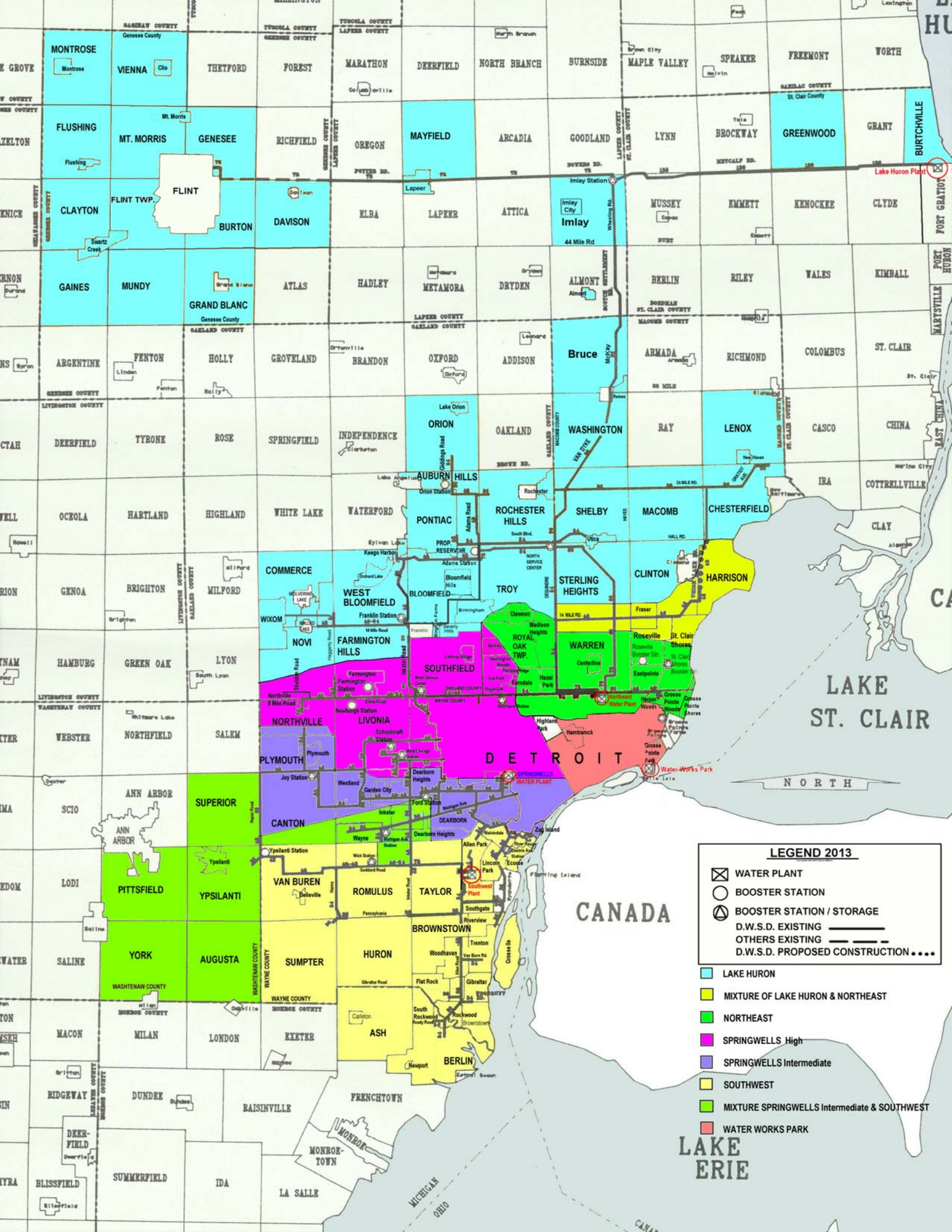
Date: 10/13/2015 10/13/2015 10/13/2015 10/13/2015 10/13/2015 10/13/2015 10/13/2015 10/13/2015

Parameter	Formula	Units	Lake Huron		Southwest		Belle Isle	Water Works Park	Northeast	Springwells	MCL	Sec.Std	MDL
			Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap			
Turbidity		NTU	1.70	0.10	1.70	0.04	5.20	0.06	0.10	0.05	0.3/95% (1)		
Total Solids		mg/L	125	120	113	112	102	126	113	124		500	10
Total Dissolved Solids		mg/L	117	121	107	110	111	126	115	125		500	10
Aluminum	Al	mg/L	0.089	0.092	0.093	0.078	0.437	0.225	0.062	0.065		0.05-0.2	0.005
Iron	Fe	mg/L	0.090	< 0.050	0.078	< 0.050	0.065	< 0.050	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.95	10.71	10.44	8.06	8.56	8.93	8.01	8.69			0.5
Calcium	Ca	mg/L	28.4	26.0	28.0	28.4	28.7	29.1	28.8	26.4			0.1
Sodium	Na	mg/L	5.00	4.50	4.96	4.90	4.97	5.43	5.20	4.83		20 (2)	0.1
Potassium	K	mg/L	0.86	0.85	0.91	0.94	0.91	0.92	0.93	0.96			0.1
Manganese	Mn	mg/L	0.005	< 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)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.04		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	1.0	0.8	0.9	0.8	0.8	0.9	1.0			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	16.5	19.3	16.3	23.0	16.6	21.6	22.9	23.7		250	
Chloride	Cl <sup>-</sup>	mg/L	8.0	9.0	7.5	9.0	11.5	10.5	9.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.34	< 0.05	0.22	< 0.05	0.30	0.32	0.78			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	2.0	3.5	2.4	3.9	1.0	3.5	3.7	4.9			
Total Hardness (3), (4), (5)		mg/L	96	100	100	102	100	106	100	98			
Total Alkalinity (3)		mg/L	84	76	96	80	72	78	78	78			
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	84	76	96	80	72	78	78	78			
Non-Carbonate Hardness (3)		mg/L	12	24	4	22	28	28	22	20			
Chemical Oxygen Demand		mg/L	3.2	4.4	< 2.0	2.8	4.8	2.4	3.2	< 2.0			2
Dissolved Oxygen		mg/L	5.0	5.2	6.1	6.9	6.4	7.4	5.8	6.6			
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	0.29	0.25	0.22	0.25	0.28	0.27	0.28	0.22	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.08	0.67	0.09	0.63	0.08	0.56	0.59	0.61	4.0	2.0	0.5
pH			7.92	7.63	7.90	7.61	8.14	7.65	7.62	7.50	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	212	218	214	227	222	213	226	228			
Temperature		°C	19.3	19.3	16.0	17.2	20.9	20.7	18.9	18.5			

<b>Legend</b>	<b>Notes:</b>
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
IV: Invalid Sample	detection limit.

Analyst: Brian Brown      Chemist      Initial      **B. B.**      Date: 01/12/2016  
 Reviewed By: Patrick Williford      Chemist      Initial      **P. W.**      Date: 01/12/2016

**Detroit Water & Sewerage Department**



**LEGEND 2013**

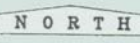
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- BOOSTER STATION
- ⊗ BOOSTER STATION / STORAGE
- D.W.S.D. EXISTING
- - - OTHERS EXISTING
- ..... D.W.S.D. PROPOSED CONSTRUCTION
- LAKE HURON
- MIXTURE OF LAKE HURON & NORTHEAST
- NORTHEAST
- SPRINGWELLS High
- SPRINGWELLS Intermediate
- SOUTHWEST
- MIXTURE SPRINGWELLS Intermediate & SOUTHWEST
- WATER WORKS PARK

**LAKE ERIE**

**LAKE ST. CLAIR**

**CANADA**

**DETROIT**



MICHIGAN OHIO