



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Lake Huron Plant
11/09/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	0.60	0.06	0.3/95% (1)		
Total Solids		mg/L	108	123		500	10
Total Dissolved Solids		mg/L	106	108		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	1.0	0.002
Magnesium	Mg	mg/L	7.46	7.75			0.5
Calcium	Ca	mg/L	24.5	25.9			0.1
Sodium	Na	mg/L	4.66	4.29		20 (2)	0.1
Potassium	K	mg/L	0.89	1.06			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 ₂	mg/L	0.9	1.1			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.1	14.5		250	
Chloride	Cl ⁻	mg/L	8.0	9.3		250	5
Phosphorus	P	mg/L	< 0.05	0.40			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.1	8.5			
Total Hardness (3), (4), (5)		mg/L	94	96			
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	14	24			
Chemical Oxygen Demand		mg/L	< 2.0	3.2			2
Dissolved Oxygen		mg/L	7.4	7.7			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.29	0.28	10		0.1
Fluoride	F ⁻	mg/L	0.10	0.86	4.0	2.0	0.5
pH			7.87	7.23	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	197	199			
Temperature		°C	17.8	16.5			

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 5.57 GPG
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: 01/14/2016
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 01/15/2016

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Southwest Plant
11/09/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	2.30	0.04	0.3/95% (1)		
Total Solids		mg/L	117	123		500	10
Total Dissolved Solids		mg/L	98	109		500	10
Aluminum	Al	mg/L	0.141	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.116	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.018	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.84	9.04			0.5
Calcium	Ca	mg/L	26.7	28.0			0.1
Sodium	Na	mg/L	4.30	4.68		20 (2)	0.1
Potassium	K	mg/L	0.94	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	< 0.010		5	0.1
Silica	SiO ₂	mg/L	0.9	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	18.3	21.1		250	
Chloride	Cl ⁻	mg/L	7.4	8.6		250	5
Phosphorus	P	mg/L	< 0.05	0.38			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.8	9.5			
Total Hardness (3), (4), (5)		mg/L	94	110			
Total Alkalinity (3)		mg/L	84	70			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	84	70			
Non-Carbonate Hardness (3)		mg/L	10	40			
Chemical Oxygen Demand		mg/L	6.8	9.2			2
Dissolved Oxygen		mg/L	7.7	7.9			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.26	0.25	10		0.1
Fluoride	F ⁻	mg/L	0.11	0.73	4.0	2.0	0.5
pH			7.96	7.17	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	202	206			
Temperature		°C	14.7	14.8			

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 6.38 GPG
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: 01/14/2016
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 01/15/2016

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Water Works Park Plant
11/09/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.30	0.08	0.3/95% (1)		
Total Solids		mg/L	126	124		500	10
Total Dissolved Solids		mg/L	102	130		500	10
Aluminum	Al	mg/L	0.176	0.058		0.05-0.2	0.005
Iron	Fe	mg/L	0.116	0.060		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.46	7.81			0.5
Calcium	Ca	mg/L	26.7	25.5			0.1
Sodium	Na	mg/L	4.67	5.23		20 (2)	0.1
Potassium	K	mg/L	0.97	0.91			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	0.07	< 0.010		5	0.1
Silica	SiO ₂	mg/L	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.5	20.1		250	
Chloride	Cl ⁻	mg/L	8.0	9.9		250	5
Phosphorus	P	mg/L	< 0.05	0.31			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.0	9.8			
Total Hardness (3), (4), (5)		mg/L	94	100			
Total Alkalinity (3)		mg/L	76	78			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	76	78			
Non-Carbonate Hardness (3)		mg/L	18	22			
Chemical Oxygen Demand		mg/L	5.2	3.2			2
Dissolved Oxygen		mg/L	8.0	8.4			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.28	0.27	10		0.1
Fluoride	F ⁻	mg/L	0.10	0.76	4.0	2.0	0.5
pH			8.19	7.20	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	200	205			
Temperature		°C	16.0	16.1			

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 5.80 GPG
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: 01/14/2016
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 01/15/2016

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Northeast Plant
11/09/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.30	0.06	0.3/95% (1)		
Total Solids		mg/L	126	120		500	10
Total Dissolved Solids		mg/L	102	106		500	10
Aluminum	Al	mg/L	0.176	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.116	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.46	7.46			0.5
Calcium	Ca	mg/L	26.7	28.5			0.1
Sodium	Na	mg/L	4.67	4.41		20 (2)	0.1
Potassium	K	mg/L	0.97	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	0.07	< 0.010		5	0.1
Silica	SiO ₂	mg/L	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.5	23.4		250	
Chloride	Cl ⁻	mg/L	8.0	9.9		250	5
Phosphorus	P	mg/L	< 0.05	0.36			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.0	10.0			
Total Hardness (3), (4), (5)		mg/L	94	88			
Total Alkalinity (3)		mg/L	76	74			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	76	74			
Non-Carbonate Hardness (3)		mg/L	18	14			
Chemical Oxygen Demand		mg/L	5.2	< 2.0			2
Dissolved Oxygen		mg/L	8.0	8.0			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.28	0.22	10		0.1
Fluoride	F ⁻	mg/L	0.10	0.69	4.0	2.0	0.5
pH			8.19	7.17	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	200	208			
Temperature		°C	16.0	15.0			

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
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: 01/14/2016
Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 01/15/2016

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Springwells Plant
11/09/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.30	0.10	0.3/95% (1)		
Total Solids		mg/L	126	115		500	10
Total Dissolved Solids		mg/L	102	113		500	10
Aluminum	Al	mg/L	0.176	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.116	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.46	7.75			0.5
Calcium	Ca	mg/L	26.7	29.0			0.1
Sodium	Na	mg/L	4.67	4.26		20 (2)	0.1
Potassium	K	mg/L	0.97	0.87			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	0.07	0.04		5	0.1
Silica	SiO ₂	mg/L	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.5	17.6		250	
Chloride	Cl ⁻	mg/L	8.0	9.3		250	5
Phosphorus	P	mg/L	< 0.05	0.37			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.0	10.4			
Total Hardness (3), (4), (5)		mg/L	94	92			
Total Alkalinity (3)		mg/L	76	72			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	76	72			
Non-Carbonate Hardness (3)		mg/L	18	20			
Chemical Oxygen Demand		mg/L	5.2	< 2.0			2
Dissolved Oxygen		mg/L	8.0	8.5			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.28	0.22	10		0.1
Fluoride	F ⁻	mg/L	0.10	0.72	4.0	2.0	0.5
pH			8.19	7.14	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	200	207			
Temperature		°C	16.0	14.4			

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 5.34 GPG
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: 01/14/2016
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 01/15/2016

Detroit Water & Sewerage Department



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

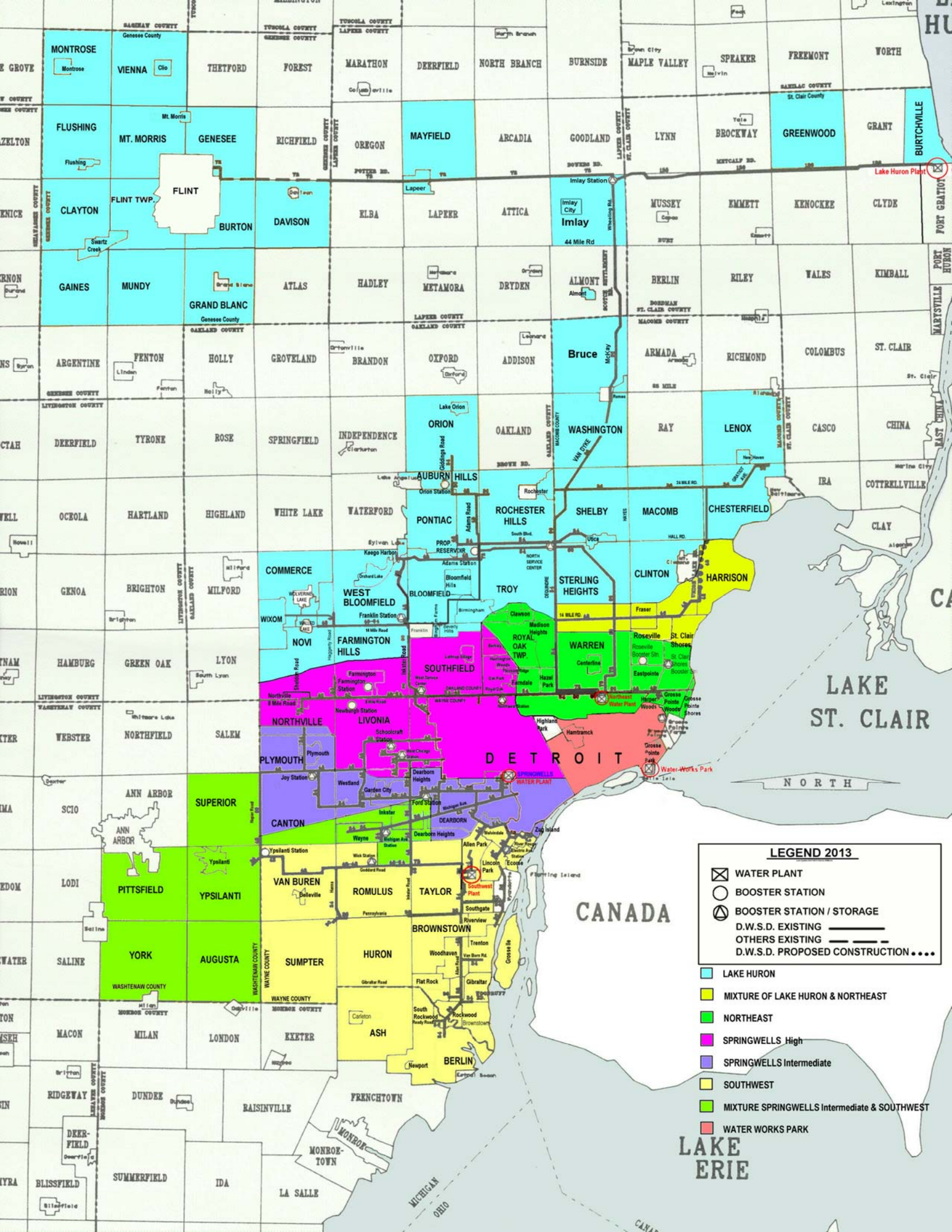
Date: 11/09/2016 11/09/2016 11/09/2015 11/09/2015 11/09/2015 11/09/2015 11/09/2015 11/09/2015

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	0.60	0.06	2.30	0.04	5.30	0.08	0.06	0.10	0.3/95% (1)		
Total Solids		mg/L	108	123	117	123	126	124	120	115		500	10
Total Dissolved Solids		mg/L	106	108	98	109	102	130	106	113		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050	0.141	< 0.050	0.176	0.058	< 0.050	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050	0.116	< 0.050	0.116	0.060	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.006	< 0.005	0.018	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.46	7.75	7.84	9.04	7.46	7.81	7.46	7.75			0.5
Calcium	Ca	mg/L	24.5	25.9	26.7	28.0	26.7	25.5	28.5	29.0			0.1
Sodium	Na	mg/L	4.66	4.29	4.30	4.68	4.67	5.23	4.41	4.26		20 (2)	0.1
Potassium	K	mg/L	0.89	1.06	0.94	0.96	0.97	0.91	0.84	0.87			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)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	0.07	< 0.010	< 0.010	0.04		5	0.1
Silica	SiO ₂	mg/L	0.9	1.1	0.9	1.0	1.0	1.0	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.1	14.5	18.3	21.1	15.5	20.1	23.4	17.6		250	
Chloride	Cl ⁻	mg/L	8.0	9.3	7.4	8.6	8.0	9.9	9.9	9.3		250	5
Phosphorus	P	mg/L	< 0.05	0.40	< 0.05	0.38	< 0.05	0.31	0.36	0.37			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.1	8.5	1.8	9.5	1.0	9.8	10.0	10.4			
Total Hardness (3), (4), (5)		mg/L	94	96	94	110	94	100	88	92			
Total Alkalinity (3)		mg/L	80	72	84	70	76	78	74	72			
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	72	84	70	76	78	74	72			
Non-Carbonate Hardness (3)		mg/L	14	24	10	40	18	22	14	20			
Chemical Oxygen Demand		mg/L	< 2.0	3.2	6.8	9.2	5.2	3.2	< 2.0	< 2.0			2
Dissolved Oxygen		mg/L	7.4	7.7	7.7	7.9	8.0	8.4	8.0	8.5			
Nitrite Nitrogen	NO ₂ ⁻ -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 ₃ ⁻ -N	mg/L	0.29	0.28	0.26	0.25	0.28	0.27	0.22	0.22	10		0.1
Fluoride	F ⁻	mg/L	0.10	0.86	0.11	0.73	0.10	0.76	0.69	0.72	4.0	2.0	0.5
pH			7.87	7.23	7.96	7.17	8.19	7.20	7.17	7.14	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	197	199	202	206	200	205	208	207			
Temperature		°C	17.8	16.5	14.7	14.8	16.0	16.1	15.0	14.4			

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 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: 01/14/2016
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 01/15/2016

Detroit Water & Sewerage Department

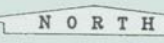


LEGEND 2013

- ☒ 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



CANADA

MICHIGAN OHIO

HU

PORT GRATION

PORT HURON

MARYSVILLE

EAST CHINA

CA

LAKE ST. CLAIR

NORTH

