



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Lake Huron Plant
11/12/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.50	0.07	0.3/95% (1)		
Total Solids		mg/L	146	158		500	10
Total Dissolved Solids		mg/L	118	110		500	10
Aluminum	Al	mg/L	< 0.050	0.055		0.05-0.2	0.005
Iron	Fe	mg/L	0.140	0.201		0.3	0.005
Copper	Cu	mg/L	0.008	0.006	1.3		0.002
Magnesium	Mg	mg/L	9.72	9.62			0.5
Calcium	Ca	mg/L	25.7	24.5			0.1
Sodium	Na	mg/L	4.83	4.68		20 (2)	0.1
Potassium	K	mg/L	0.94	0.88			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	0.4	0.7			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.1	18.6			
Chloride	Cl ⁻	mg/L	7.0	8.5		250	5
Phosphorus	P	mg/L	< 0.05	0.37			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.9	4.9			
Total Hardness (3), (4), (5)		mg/L	96	102			
Total Alkalinity (3)		mg/L	82	80			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	80			
Non-Carbonate Hardness (3)		mg/L	14	22			
Chemical Oxygen Demand		mg/L	4.8	4.8			2
Dissolved Oxygen		mg/L	7.2	7.7			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.25	0.25	10	10	0.1
Fluoride	F ⁻	mg/L	0.08	0.59	4		0.5
pH			7.93	7.51	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	214	217			
Temperature		°C	16.7	14.4			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 5.92 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 Sr. Analytical Chemist Initial **B. B.** Date: 01/29/2015
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/29/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Southwest Plant
11/12/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	4.30	0.05	0.3/95% (1)		
Total Solids		mg/L	164	174		500	10
Total Dissolved Solids		mg/L	122	124		500	10
Aluminum	Al	mg/L	0.121	0.067		0.05-0.2	0.005
Iron	Fe	mg/L	0.067	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.020	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.77	10.71			0.5
Calcium	Ca	mg/L	24.9	28.7			0.1
Sodium	Na	mg/L	4.90	6.33		20 (2)	0.1
Potassium	K	mg/L	1.05	1.11			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	0.4	0.9			0.4
Sulfate	SO ₄ ²⁻	mg/L	17.0	23.5			
Chloride	Cl ⁻	mg/L	8.0	10.5		250	5
Phosphorus	P	mg/L	< 0.05	0.27			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.6	5.7			
Total Hardness (3), (4), (5)		mg/L	106	110			
Total Alkalinity (3)		mg/L	84	84			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	84	84			
Non-Carbonate Hardness (3)		mg/L	22	26			
Chemical Oxygen Demand		mg/L	14.0	9.2			2
Dissolved Oxygen		mg/L	8.2	8.0			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.30	0.36	10	10	0.1
Fluoride	F ⁻	mg/L	0.09	0.58	4		0.5
pH			8.02	7.47	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	233	250			
Temperature		°C	13.1	10.7			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
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 Sr. Analytical Chemist Initial **B. B.** Date: 01/29/2015
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/29/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Water Works Park Plant
11/12/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.40	0.07	0.3/95% (1)		
Total Solids		mg/L	157	168		500	10
Total Dissolved Solids		mg/L	124	125		500	10
Aluminum	Al	mg/L	0.067	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.191	0.175		0.3	0.005
Copper	Cu	mg/L	0.010	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.71	11.02			0.5
Calcium	Ca	mg/L	28.4	26.3			0.1
Sodium	Na	mg/L	5.12	5.06		20 (2)	0.1
Potassium	K	mg/L	0.95	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		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	AE	0.5			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.0	25.5			
Chloride	Cl ⁻	mg/L	7.0	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.31			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.4	7.4			
Total Hardness (3), (4), (5)		mg/L	100	106			
Total Alkalinity (3)		mg/L	82	72			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	72			
Non-Carbonate Hardness (3)		mg/L	18	34			
Chemical Oxygen Demand		mg/L	4.4	4.0			2
Dissolved Oxygen		mg/L	8.1	9.0			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.27	0.26	10	10	0.1
Fluoride	F ⁻	mg/L	0.09	0.57	4		0.5
pH			7.84	7.29	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	242	232			
Temperature		°C	14.9	14.4			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 6.15 GPG
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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 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/29/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Northeast Plant
11/12/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.40	0.08	0.3/95% (1)		
Total Solids		mg/L	157	164		500	10
Total Dissolved Solids		mg/L	124	127		500	10
Aluminum	Al	mg/L	0.067	0.206		0.05-0.2	0.005
Iron	Fe	mg/L	0.191	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.010	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.71	10.32			0.5
Calcium	Ca	mg/L	28.4	26.3			0.1
Sodium	Na	mg/L	5.12	5.08		20 (2)	0.1
Potassium	K	mg/L	0.95	0.97			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	AE	0.8			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.0	24.5			
Chloride	Cl ⁻	mg/L	7.0	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.35			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.4	9.2			
Total Hardness (3), (4), (5)		mg/L	100	116			
Total Alkalinity (3)		mg/L	82	106			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	106			
Non-Carbonate Hardness (3)		mg/L	18	10			
Chemical Oxygen Demand		mg/L	4.4	8.4			2
Dissolved Oxygen		mg/L	8.1	8.5			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.27	0.25	10	10	0.1
Fluoride	F ⁻	mg/L	0.09	0.44	4		0.5
pH			7.84	7.36	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	242	231			
Temperature		°C	14.9	12.8			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 6.73 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 Sr. Analytical Chemist Initial **B. B.** Date: 01/29/2015
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/29/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Springwells Plant
11/12/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.40	0.08	0.3/95% (1)		
Total Solids		mg/L	157	154		500	10
Total Dissolved Solids		mg/L	124	111		500	10
Aluminum	Al	mg/L	0.067	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.191	0.132		0.3	0.005
Copper	Cu	mg/L	0.010	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.71	9.79			0.5
Calcium	Ca	mg/L	28.4	26.4			0.1
Sodium	Na	mg/L	5.12	4.96		20 (2)	0.1
Potassium	K	mg/L	0.95	0.97			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	AE	0.7			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.0	30.0			
Chloride	Cl ⁻	mg/L	7.0	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.55			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.4	11.3			
Total Hardness (3), (4), (5)		mg/L	100	106			
Total Alkalinity (3)		mg/L	82	98			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	98			
Non-Carbonate Hardness (3)		mg/L	18	8			
Chemical Oxygen Demand		mg/L	4.4	10.8			2
Dissolved Oxygen		mg/L	8.1	8.1			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.27	0.24	10	10	0.1
Fluoride	F ⁻	mg/L	0.09	0.39	4		0.5
pH			7.84	7.24	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	242	232			
Temperature		°C	14.9	13.9			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 6.15 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 Sr. Analytical Chemist Initial **B. B.** Date: 01/29/2015
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/29/2015

Detroit Water & Sewerage Department



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

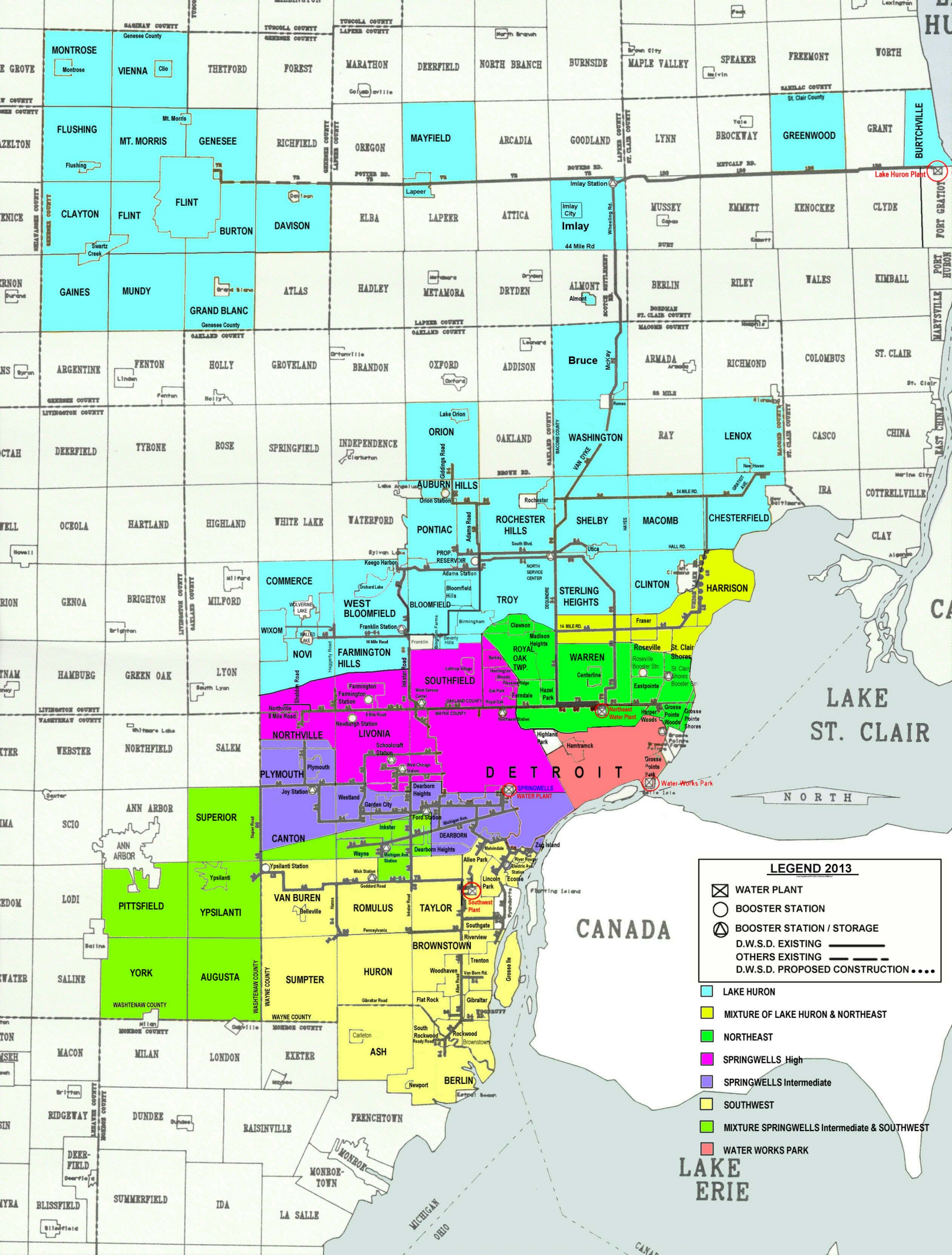
Date: 11/12/2014 11/12/2014 11/12/2014 11/12/2014 11/12/2014 11/12/2014 11/12/2014 11/12/2014

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	1.50	0.07	4.30	0.05	5.40	0.07	0.08	0.08	0.3 / 95% (1)		
Total Solids		mg/L	146	158	164	174	157	168	164	154		500	10
Total Dissolved Solids		mg/L	118	110	122	124	124	125	127	111		500	10
Aluminum	Al	mg/L	< 0.050	0.055	0.121	0.067	0.067	< 0.050	0.206	< 0.050		0.05 - 0.2	0.005
Iron	Fe	mg/L	0.140	0.201	0.067	< 0.050	0.191	0.175	< 0.050	0.132		0.3	0.005
Copper	Cu	mg/L	0.008	0.006	0.020	< 0.005	0.010	< 0.005	< 0.005	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	9.72	9.62	10.77	10.71	10.71	11.02	10.32	9.79			0.5
Calcium	Ca	mg/L	25.7	24.5	24.9	28.7	28.4	26.3	26.3	26.4			0.1
Sodium	Na	mg/L	4.83	4.68	4.90	6.33	5.12	5.06	5.08	4.96		20 (2)	0.1
Potassium	K	mg/L	0.94	0.88	1.05	1.11	0.95	0.93	0.97	0.97			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		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	0.4	0.7	0.4	0.9	AE	0.5	0.8	0.7			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.1	18.6	17.0	23.5	15.0	25.5	24.5	30.0			
Chloride	Cl ⁻	mg/L	7.0	8.5	8.0	10.5	7.0	9.0	9.5	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.37	< 0.05	0.27	< 0.05	0.31	0.35	0.55			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.9	4.9	1.6	5.7	2.4	7.4	9.2	11.3			
Total Hardness (3), (4), (5)		mg/L	96	102	106	110	100	106	116	106			
Total Alkalinity (3)		mg/L	82	80	84	84	82	72	106	98			
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	80	84	84	82	72	106	98			
Non-Carbonate Hardness (3)		mg/L	14	22	22	26	18	34	10	8			
Chemical Oxygen Demand		mg/L	4.8	4.8	14.0	9.2	4.4	4.0	8.4	10.8			2
Dissolved Oxygen		mg/L	7.2	7.7	8.2	8.0	8.1	9.0	8.5	8.1			
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	0.25	0.25	0.30	0.36	0.27	0.26	0.25	0.24	10	10	0.1
Fluoride	F ⁻	mg/L	0.08	0.59	0.09	0.58	0.09	0.57	0.44	0.39	4		0.5
pH			7.93	7.51	8.02	7.47	7.84	7.29	7.36	7.24	6.5 - 8.5	6.5 - 8.5	
Specific Conductance @ 25 °C.		micromhos	214	217	233	250	242	232	231	232			
Temperature		°C	16.7	14.4	13.1	10.7	14.9	14.4	12.8	13.9			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
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 Sr. Analytical Chemist Initial **B. B.** Date: 01/29/2015
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/29/2015

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**

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