Mohawks of the Bay of Quinte

Annual Water Report

Reporting period of January 1, 2017 – December 31, 2017

Prepared For: Mohawks of the Bay of Quinte

Prepared By: Ontario Clean Water Agency
Agence Ontarienne Des Eaux

This report has been prepared to satisfy the annual reporting requirements of the Provincial Regulations and Guidelines established by the Ministry of the Environment in the Province of Ontario including the section 11 and Schedule 22 reports identified in O.Reg 170/03, Drinking Water Systems Regulation and the Permit to Take Water Reports identified in O.Reg 387/04, Water Taking and Transfer Regulation.

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Mohawks of the Bay of Quinte Water Treatment Facility

Facility Description & Treatment Process

The Mohawks of the Bay of Quinte Water Treatment Facility is a surface water membrane filtration plant with a submerged low-pressure ultrafiltration membrane system. The *Low Lift System* transfers raw water from the Bay of Quinte to feed the water treatment plant; it will be controlled according to the level in the Pretreatment System. Treatment consists of Pre-Treatment Clarifiers, Dissolved Air Flotation (DAF) and membrane filtration system, followed by granular activated carbon filter,followed by an ultraviolet disinfection system, with chemical disinfection and pumping system. This facility is Federally funded and operated, therefore it does not fall under Provincial legislation. However, OCWA does provide oversight of the system as if it is regulated under Ontario Regulation 170/03. The Mohawks of the Bay of Quinte Water Treatment Facility would be considered a Large Municipal Residential system under this legislation; therefore this system is classified as a Large Municipal Residential system.

Treatment Chemicals used during the reporting period:

Chemical Name
• **Citric Acid**
• **Phosphoric Acid**
• **Calcium Thiosulphate**
• **Sodium Hypochlorite – 12%**
• **Carbon Dioxide**
• **Kemira XL-54 PAC**
• **Ammonium Sulphate**

Operational & Maintenance Summary

- Routine operations, sampling, testing and required system maintenance completed.
- All samples were collected as per Ontario Regulation 170/03.
- All alarms tested and signals confirmed with applicable alarm monitoring.

During the reporting period, process deficiencies were identified in the water treatment process. All deficiencies have been recorded and brought to the attention of the contractor(s) and are being systemically addressed.

Performance Data

All samples collected at the Mohawks of the Bay of Quinte Water Treatment Facility during the reporting period were submitted to Eurofins laboratory for analysis, with the exception of in-house free chlorine residuals, pH and turbidity. Eurofins has been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. The free chlorine residuals, pH and turbidity parameters were analyzed in the field at the time of sample collection by certified and trained operators, to ensure accuracy and precision of the results obtained. Sampling was conducted in accordance with Ontario Regulation 170/03.

Ontario Regulation 170/03 requires the following microbiological sampling:

- Weekly sample for raw water source to be tested for Total Coliform and E. Coli;
- Nine distribution samples to be tested monthly for Total Coliforms, E. Coli and HPC.

Tabulated below is a summary of all microbiological testing completed during the reporting period.

Mohawks of the Bay of Quinte Water Treatment Facility - Microbiological Test Results

Sample Location	# Total Coliform and E. Coli Samples	Total Coliform (CFU/100 mL) – Range of Results (min#) – (max#)	E. Coli (CFU/100 mL)– Range of Results (min#) – (max#)	Exceedance	# HPC Samples	HPC (CFU/1 mL) – Range of Results (min#) – (max#)	Exceedance
Raw Water	52	0-412	0-9	Not Applicable	52	0->500	Not Applicable
Treated Water	52	0-0	0-0	NO	52	0-1	Not Applicable
Distribution Water – (Various Locations)	180	0-12	0-0	NO	180	0-96	Not Applicable

Tabulated below is a summary of the Performance Criterion for filtered water turbidity in percent of the measurements each month during the reporting period. The Mohawks of the Bay of Quinte WTF uses membrane filtration and therefore, must remain under 0.10 NTU 99% of the time.

Mohawks of the Bay of Quinte WTF – Filter Turbidity

Sample Parameter & Location	Filter #1	Filter #2
2017 Average	<.10 NTU at %100	<.10 NTU at %100

Tabulated below is a summary of Raw Water flows from the Bay of Quinte for the reporting period.

Mohawks of the Bay of Quinte WTF – Raw Water Flow				
Month	Total Flow m3	Minimum m3/day	Maximum m3/day	Average m3/day
January	8,182	173	370	264
February	10,048	273	579	359
March	10,757	280	532	359
April	12,745	118	679	399
May	11,499	209	547	371
June	8,724	133	563	291
July	8,163	156	829	389
August	9,008	162	933	392
September	8,977	164	1075	449
October	8,577	151	1116	408
November	9,543	130	1377	454
December	9,139	206	1542	508
Total	117,395			
Minimum		118		
Maximum			1542	
Average				384

Tabulated below is a summary of Treated Water Flows for the reporting period.

Mohawks of the Bay of Quinte WTF – Treated Water Flow				
	Total Flow m3	Minimum m3/day	Maximum m3/day	Average m3/day
January	3,448	42	176	111
February	5,623	98	398	201
March	5,617	130	238	187
April	7,548	131	454	236
May	7,832	161	370	253
June	5,607	140	297	187
July	8,163	156	829	389
August	9,008	162	933	392
September	8,977	164	1075	449
October	5,328	173	507	254
November	5,670	87	579	247
December	5,331	128	744	267
Total	78,152			
Minimum		42		
Maximum			1075	
Average				264

*The raw water flows are occasionally higher than the treated water flows due the water used to perform backwashes on the DAF and Ultrafiltration system.

Tabulated below is a summary of in-house analytical testing performed during sampling in the Mohawks of the Bay of Quinte Drinking Water System for the reporting period.

Mohawks of the Bay of Quinte WTF – - In-House Test Results		
Sample Parameter & Location	# of Grab Samples	Range of Results (min#) – (max#)
Turbidity (NTU)- Raw Water	256	0.19-2.58
pH- Raw Water	256	5.19-8.43
Free Chlorine Residual (mg/L) – Treated Water	256	0.55-4.07
Turbidity (NTU)- Treated Water	256	0.05-1.32
pH-Treated Water	256	6.56-7.02
Free Chlorine Residual (mg/L) – Distribution Water – Various Locations	436	0.41-2.61

Ontario Regulation 170/03 requires the following chemical testing to be performed:

- One treated water sample every three months to be tested for nitrite and nitrate;
- One distribution sample every three months to be tested for THM and HAA
- One treated water sample every 12 months to be tested for every parameter listed in Schedules 23 and 24; and
- One treated water sample every 60 months to be tested for sodium and fluoride.

Tabulated below is a summary of all chemical sample results for the reporting period.

MBQ WTF –- Chemical Test Results				
Sample Parameter	# of Samples	Distribution Community Well-being Centre– 2017 Average Result	ODWS Objective (Type)	Exceedance
Nitrite (N) - mg/L	4	<0.10	1 (MAC)	No
Nitrate (N) – mg/L	4	0.22	10 (MAC)	No
Nitrite + Nitrate (N) – mg/L	4	0.22	10 (MAC)	No
THM's Total – ug/L	4	1.5	100 (MAC) *	No
(Mono) Bromoacetic Acid ug/L	2	<2.0	None	N/A
(Mono) Chloroacetic Acid ug/L	2	<2.0	None	N/A
Bromochloroacetic Acid ug/L	2	<2.0	None	N/A
Dibromoacetic Acid ug/L	2	<2.0	None	N/A
Dichloroacetic Acid ug/L	2	<2.0	None	N/A
Trichloroacetic Acid ug/L	2	<2.0	None	N/A
Total Haloacetic Acids ug/L	2	<2.0	80 (MAC) *	No
Bromodichloromethane ug/L	2	0.5	None	N/A
Bromoform ug/L	2	<0.4	None	N/A
Chloroform ug/L	2	0.7	None	N/A
Dibromochloromethane ug/L	2	0.3	None	N/A

MAC = Maximum Acceptable Concentration, *expressed as a running annual average

Schedule 23 & 24 - Organic and Inorganic Parameter Results

Tabulated below is a summary of all Schedule 23 & 24 sample results for the reporting period.

MBQ WTF –-Test Results					
Parameter	**Units**	**Sample Date**	**Result Value**	**Objective**	**Exceedance (Yes/No)**
Hardness as CaCO3	mg/L	2017-03-28	120	80-100-OG	No
Langelier Index		2017-03-28	0.00		
Cyanide (Total)	mg/L	2017-03-28	<0.005		
Alkalinity as CaCO3	mg/L	2017-03-28	105	30-500	No
Chloride	mg/L	2017-03-28	29	250	No
Colour	TCU	2017-03-28	<2	5	No
Conductivity	uS/cm	2017-03-28	289		
Fluoride	mg/L	2017-03-28	<0.10	1.5	No
Nitrite	mg/L	2017-03-28	<0.10	1.0	No
Nitrate	mg/L	2017-03-28	<0.10	10.0	No
pH		2017-03-28	7.58	6.5-8.5	No
Sulphate	mg/L	2017-03-28	13	500	No
Turbidity	NTU	2017-03-28	1.4		
Total Dissolved Solids	mg/L	2017-03-28	160	500	No
Total Suspended Solids	mg/L	2017-03-28	<2		
(DDT) + Metabolites	ug/L	2017-03-28	<0.024	30	No
2,3,4,6-tetrachlorophenol	ug/L	2017-03-28	<0.5	100	No
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	ug/L	2017-03-28	<1.0	280	No
2,4,6-trichlorophenol	ug/L	2017-03-28	<0.5	5	No
2,4-dichlorophenol	ug/L	2017-03-28	<0.5	900	No
2,4-dichlorophenoxyacetic acid (2,4-D)	ug/L	2017-03-28	<1.0	100	No
a-chlordane	ug/L	2017-03-28	<0.006		
Alachlor	ug/L	2017-03-28	<0.5	5	No
Aldicarb	ug/L	2017-03-28	<9	9	No
Aldrin	ug/L	2017-03-28	<0.006		
Aldrin + Dieldrin	ug/L	2017-03-28	<0.012	0.07	No
Atrazine	ug/L	2017-03-28	<1.0		
Atrazine + N-dealkylated metabolites	ug/L	2017-03-28	<0.2	5	No
Azinphos-methyl	ug/L	2017-03-28	<2.0	20	No
Bendiocarb	ug/L	2017-03-28	<2.0	40	No
Benzo(a)pyrene	ug/L	2017-03-28	<0.01	0.01	No

Bromoxynil	ug/L	2017-03-28	<0.5	5	No
Carbaryl	ug/L	2017-03-28	<5.0	90	No
Carbofuran	ug/L	2017-03-28	<5.0	90	No
Chlordane (Total)	ug/L	2017-03-28	<0.018	7	No
Chlorpyrifos	ug/L	2017-03-28	<1.0	90	No
Cyanazine	ug/L	2017-03-28	<1.0	10	No
De-ethylated atrazine	ug/L	2017-03-28	<1.0		
Diazinon	ug/L	2017-03-28	<1.0	20	No
Dicamba	ug/L	2017-03-28	<1.0	120	No
Diclofop-methyl	ug/L	2017-03-28	<0.9	9	No
Dieldrin	ug/L	2017-03-28	<0.006		
Dimethoate	ug/L	2017-03-28	<2.5	20	No
Dinoseb	ug/L	2017-03-28	<1.0	10	No
Diquat	ug/L	2017-03-28	<5	70	No
Diuron	ug/L	2017-03-28	<10	150	No
Gamma-BHC (Lindane)	ug/L	2017-03-28	<0.006		
g-chlodane	ug/L	2017-03-28	<0.006		
Glyphosate	ug/L	2017-03-28	<10	280	No
Heptachlor + Heptachlor Epoxide	ug/L	2017-03-28	<0.012		
Heptachlor Epoxide	ug/L	2017-03-28	<0.006	3	No
Malathion	ug/L	2017-03-28	<5.0		
Methoxychlor	ug/L	2017-03-28	<0.006	190	No
Metolachlor	ug/L	2017-03-28	<1.0	900	No
Metribuzin	ug/L	2017-03-28	<5.0	50	No
Op-DDT	ug/L	2017-03-28	<0.006	80	No
Oxychlordane	ug/L	2017-03-28	<0.006		
Paraquat	ug/L	2017-03-28	<1		
Parathion	ug/L	2017-03-28	<1.0	10	No
Pentachlorophenol	ug/L	2017-03-28	<0.5	50	No
Phorate	ug/L	2017-03-28	<0.5	60	No
Picloram	ug/L	2017-03-28	<5.0	2	No
pp-DDD	ug/L	2017-03-28	<0.006	190	No
pp-DDE	ug/L	2017-03-28	<0.006		
pp-DDT	ug/L	2017-03-28	<0.006		
Prometryne	ug/L	2017-03-28	<0.25	1	No
Simazine	ug/L	2017-03-28	<1.0	10	No
Temephos	ug/L	2017-03-28	<10	280	No
Terbufos	ug/L	2017-03-28	<0.4	1	No
Triallate	ug/L	2017-03-28	<1	230	No
Trifluralin	ug/L	2017-03-28	<1.0	45	No
Mercury	mg/L	2017-03-28	<0.0001	0.001	No
Aluminum	mg/L	2017-03-28	0.01	00.1	No
Antimony	mg/L	2017-03-28	<0.0005	0.006	No

Arsenic	mg/L	2017-03-28	<0.001	0.025	No
Barium	mg/L	2017-03-28	0.03	1	No
Boron	mg/L	2017-03-28	<0.01	5	No
Calcium	mg/L	2017-03-28	40		
Cadmium	mg/L	2017-03-28	<0.0001	0.005	No
Chromium	mg/L	2017-03-28	<0.001	0.05	No
Copper	mg/L	2017-03-28	0.056	1	No
Iron	mg/L	2017-03-28	<0.03	0.3	No
Lead	mg/L	2017-03-28	<0.001	0.01	No
Magnesium	mg/L	2017-03-28	5		
Manganese	mg/L	2017-03-28	<0.01	0.05	No
Selenium	mg/L	2017-03-28	<0.001	0.01	No
Silver	mg/L	2017-03-28	<0.0001		
Sodium	mg/L	2017-03-28	13	200	No
Uranium	mg/L	2017-03-28	<0.001	0.02	No
Zinc	mg/L	2017-03-28	0.03	5	No
Polychlorinated Biphenyls (PCB's)	ug/L	2017-03-28	<0.1	3	No
Dissolved Organic Carbon	mg/L	2017-03-28	<0.5	5	No
Ammonia	mg/L	2017-03-28	0.03		
Bromodichloromethane	ug/L	2017-03-28	<0.3		
Bromoform	ug/L	2017-03-28	<0.4		
Chloroform	ug/L	2017-03-28	<0.5		
Dibromochloromethane	ug/L	2017-03-28	<0.3		
Trihalomethanes (total)	ug/L	2017-03-28	<1.5	100	No
Benzene	ug/L	2017-03-28	<0.5	5	No
1,1 – dichloroethylene	ug/L	2017-03-28	<0.5	14	No
1,2 – dichlorobenzene	ug/L	2017-03-28	<0.4	200	No
1,2 – dichloroethane	ug/L	2017-03-28	<0.2	5	No
1,4 – dichlorobenzene	ug/L	2017-03-28	<0.4	5	No
Carbon Tetrachloride	ug/L	2017-03-28	<0.2	5	No
Dichloromethane	ug/L	2017-03-28	<4.0	50	No
Monochlorobenzene	ug/L	2017-03-28	<0.2	80	No
Tetrachloroethylene	ug/L	2017-03-28	<0.3	30	No
Trichloroethylene	ug/L	2017-03-28	<0.3	5	No
Vinyl Chloride	ug/L	2017-03-28	<0.2	2	No

Ontario Regulation 170/03 – Specifies requirements for sampling and testing for lead as follows:

- 10 Plumbing Samples must be collected twice per year(Summer and Winter)

Tabulated below is a summary of the lead sampling results obtained during the reporting period.

Quinte Mohawks School –Plumbing Lead Sample Results –
April 28 & 29, 2017

Location	Sample Parameter- Lead – ug/L	ODWS Objective (Type)	Exceedance
Adult Language School S	1.00 ug/L	10 ug/L (MAC)	No
Adult Language School F	<1.00 ug/L	10 ug/L (MAC)	No
1658A York Rd. S	2.00 ug/L	10 ug/L (MAC)	No
1658A York Rd. F	<1.00 ug/L	10 ug/L (MAC)	No
1068 Ridge Road - Standing	1.00 ug/L	10 ug/L (MAC)	No
1068 Ridge Road - Flushed	<1.00 ug/L	10 ug/L (MAC)	No
1208 Ridge Road - Standing	1.00 ug/L	10 ug/L (MAC)	No
1208 Ridge Road - Flushed	<1.00 ug/L	10 ug/L (MAC)	No
936 Ridge Road - Standing	2.00 ug/L	10 ug/L (MAC)	No
936 Ridge Road - Flushed	<1.00 ug/L	10 ug/L (MAC)	No
Adult Language School -Standing	5.00 ug/L	10 ug/L (MAC)	No
Adult Language School -Flushed	<1.00 ug/L	10 ug/L (MAC)	No

There were no lead samples collected during this reporting period. Results of lead sampling will be included in the quarterly report for the quarter in which samples are collected.

Compliance Summary

From the results tabulated in the previous section, sample results obtained during the reporting period were within the Ontario Drinking Water Quality Objective. No samples taken exceeded the Maximum Acceptable Concentration (MAC) and therefore deemed to be in compliance with O.Reg 170/03.

Alarm Response & Overtime Summary

- Operations staff on-site as the low lift station had lost power due to an issue with the power source.
- Operations staff performed weekend checks to receive diesel fuel for the portable generator and maintain the low lift pumping station operation.
- Low chlorine alarm on SCADA. Pump #7 lock out in chlorine room. ORO onsite to assist in resetting alarm. Flush water through truck, fill and check P.W residual. All okay.
- Water production not ready and GAC disabled, Pre-treatment clarifier waste valve stuck open, reset with operator assistance
- Evoqua low, reset and adjustments made to pneumatic valves

Capital Expenditures Summary

- Corix Water Products - Compliance – Diffuser, Hose, & Dechlor Pucks for Hydrant Flushing
- Metcon Sales & Engineering - Online Analyzer for Distribution System
- Flowmetrix – Annual flow meter calibration
- D&M Plumbing – Back flow preventer maintenance
- TTC Transportation – Annual diesel generator maintenance
- Rental of portable generator to supply power to low lift station during repairs
- Variable Speed Drives (VFD's) set up to restart during a power interruption
- Bardon Supplies – Parts to install air bleed line on CL2 intake line
- Franklin Empire – Replace failed pressure transmitter

~~~Prepared for the Mohawks of the Bay of Quinte by the Ontario Clean Water Agency~~~
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