

Moose Creek Drinking Water System

Waterworks # 220008033
System Category – Large Municipal Residential

Annual Report

Township of North Stormont

Reporting Period of January 1st – December 31st 2018

Issued: February 20, 2019

Revision: 0

Operating Authority:



This report has been prepared to satisfy the annual reporting requirements in O. Reg. 170/03 Section 11 and Schedule 22

Table of Contents

Report Availability	1
Compliance Report Card	1
System Process Description	1
Raw Source	1
Treatment	1
Distribution	2
Summary of Non-Compliance	2
Adverse Water Quality Incidents	2
Non-Compliance	2
Non-Compliance Identified in a Ministry Inspection	2
Flows	3
Raw Water Flows	3
Treated Water Flows	6
Regulatory Sample Results Summary	7
Microbiological Testing	7
Operational Testing	7
Inorganic Parameters	7
Organic Parameters	8
Additional Legislated Samples	10
Major Maintenance Summary	10
WTRS Submission Confirmation	A

Report Availability

As Moose Creek's drinking water system is considered a large municipal residential system under O. Reg. 170/03, this report must be made available to the public. It can be found at the Township of North Stormont's municipal office located at 15 Union Street, Berwick, Ontario and on the Township website (www.northstormont.ca).

Compliance Report Card

Compliance Event	# of Events
Ministry of Environment Inspections	1
Ministry of Labour Inspections	0
QEMS External Audit	1
AWQI's/BWA	1/0
Non-Compliance	2
Spills	0
Watermain Breaks	0

System Process Description

Raw Source

Moose Creek's drinking water system draws water from three wells completed in overburden sediments. Well #1R is a 200 mm diameter 15.2 m deep drilled groundwater production well equipped with a submersible well pump rated at 7.43 L/s at 14.3 m total dynamic head (TDH). Well #2 is a 200 mm diameter 30.8 m deep drilled groundwater production well equipped with a submersible well pump rated at 3.5 L/s at 40 m total dynamic head (TDH). Well #3 is a 200 mm diameter 32 m deep drilled groundwater production well equipped with a submersible well pump rated at 3.5 L/s at 42 m total dynamic head (TDH). Water from the three wells is conveyed in separate 50 mm diameter pipes to the pump house for treatment.

Treatment

Sodium hypochlorite is used for both primary and secondary disinfection. It is injected prior to discharge into a mixing chamber. After passing through the mixing chamber, the chlorinated water enters two clearwells. Two high lift pumps, each rated at 10.4 L/s at 58 m TDH, convey water from the clearwells to the distribution system. Water leaving the treatment plant is continuously monitored for flow and free chlorine residual.

Distribution

The distribution system consists of an elevated tank and approximately 7 km of PVC distribution piping installed in 1993 and 1994. The elevated storage tank is fabricated of steel and mounted on a concrete pedestal. It is located along County Road 15, west of the Village of Moose Creek and has a storage capacity of 622 m³. The storage tank provides for peak hour demands and fire flows.

Treatment Chemicals used during the reporting year

Chemical Name	Use	Supplier
Sodium Hypochlorite	Disinfection	Brenntag/Jutzi

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Location	Problem	Details	Legislation	Corrective Action Taken
04/16/2018	139141	WTP	No trending available for treated flow and free chlorine residual during plant runs on April 16 th and 17 th . Communication failure during power outage.	Facility was powered using a mobile generator during a widespread power outage. Low chlorine dialer alarm was operational and did not ring out.	O. Reg. 170	No further action required by MOH or MOE at the time.

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
None to report.				

Non-Compliance Identified in a Ministry Inspection

Legislation	requirement(s) system failed to meet	Corrective Action	Status
SDWA	Measures were not in place to protect the groundwater and/or GUDI source in accordance with the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.	Well inspections have been scheduled for all three of Moose Creek's wells.	Ongoing
O. Reg. 170/03	Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format.	A data logger has been installed onsite at the WTP.	Complete

Flows

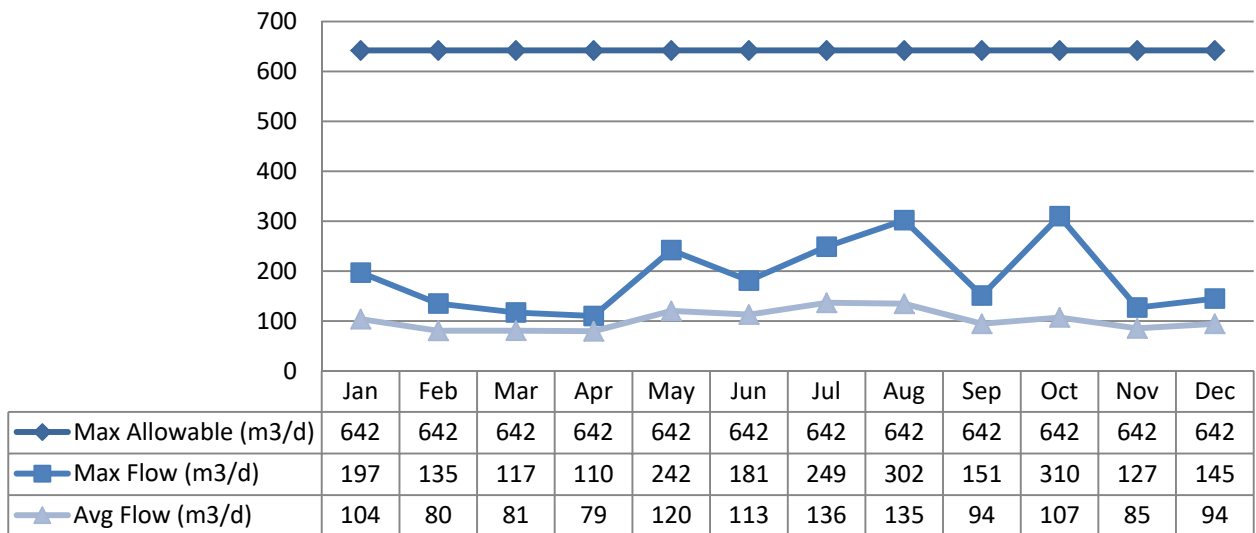
Moose Creek’s drinking water system is operating on average under half the rated capacity.

Raw Water Flows

Raw water flows are regulated under the Permit to Take Water (PTTW). Raw flow data for 2018 was submitted to the Ministry electronically under Permit #4000-9YGLJP. The submission confirmation can be found attached in Appendix A.

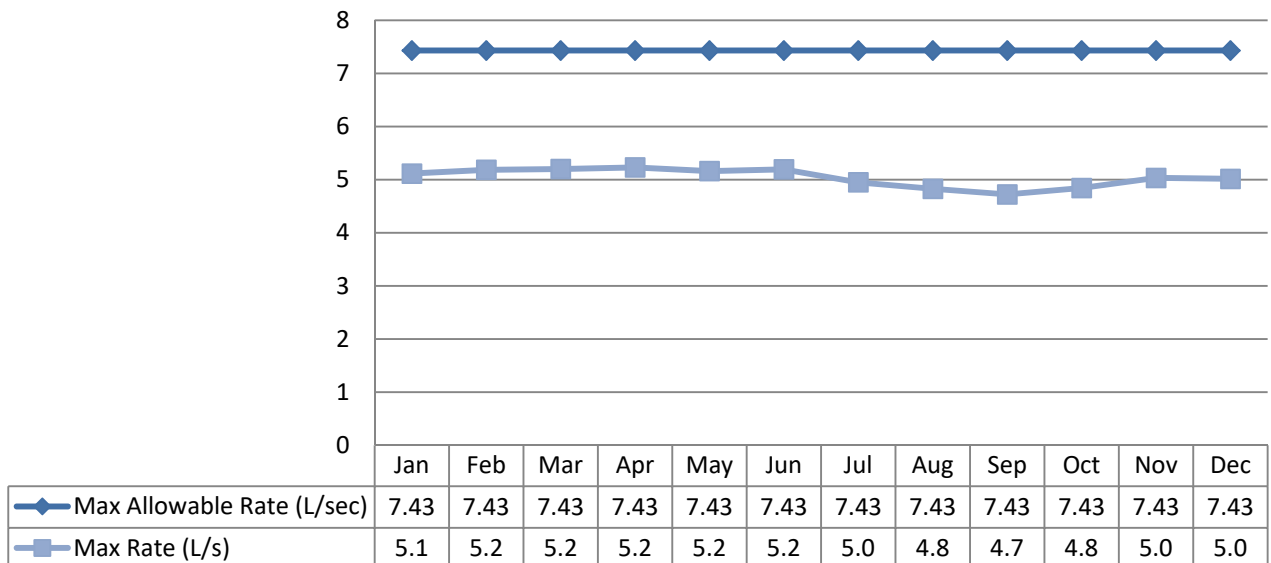
Well #1 - Flows

Max. Allowable Flow - PTTW



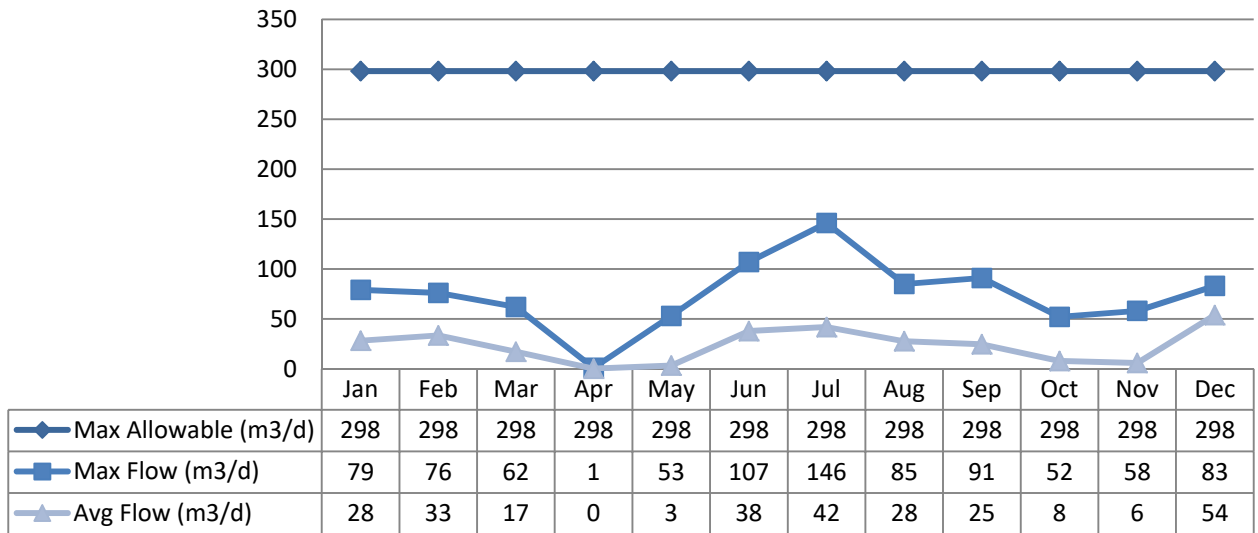
Well #1 - Maximum Flow Rates

Max. Allowable Rate - PTTW



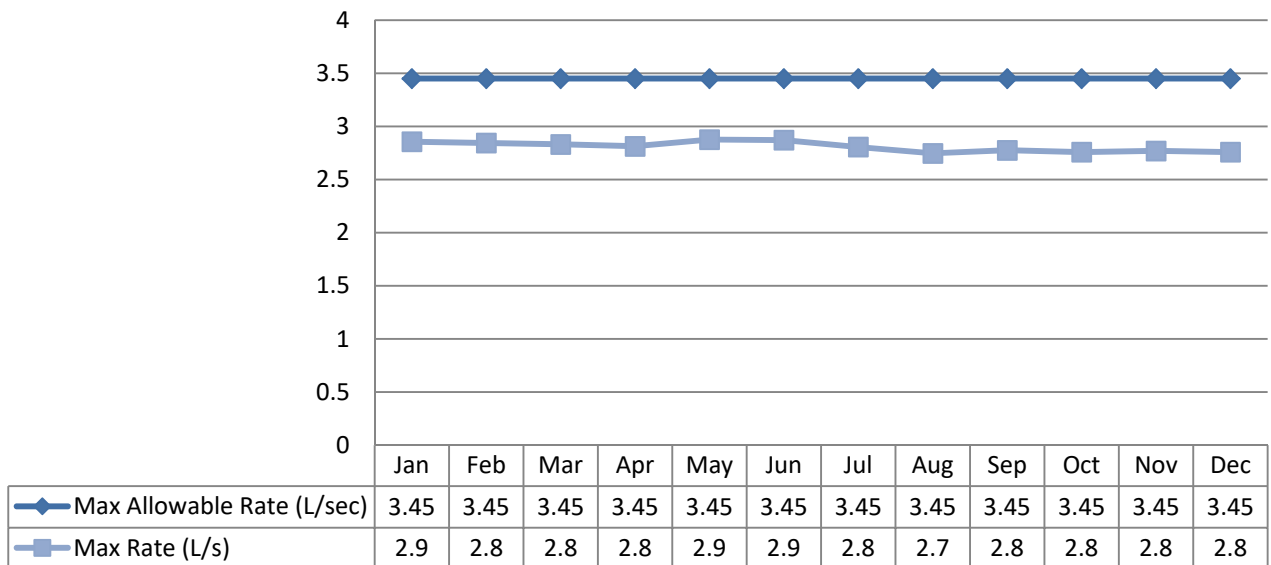
Well #2 - Flows

Max. Allowable Flow - PTTW



Well #2 - Maximum Flow Rates

Max. Allowable Rate - PTTW

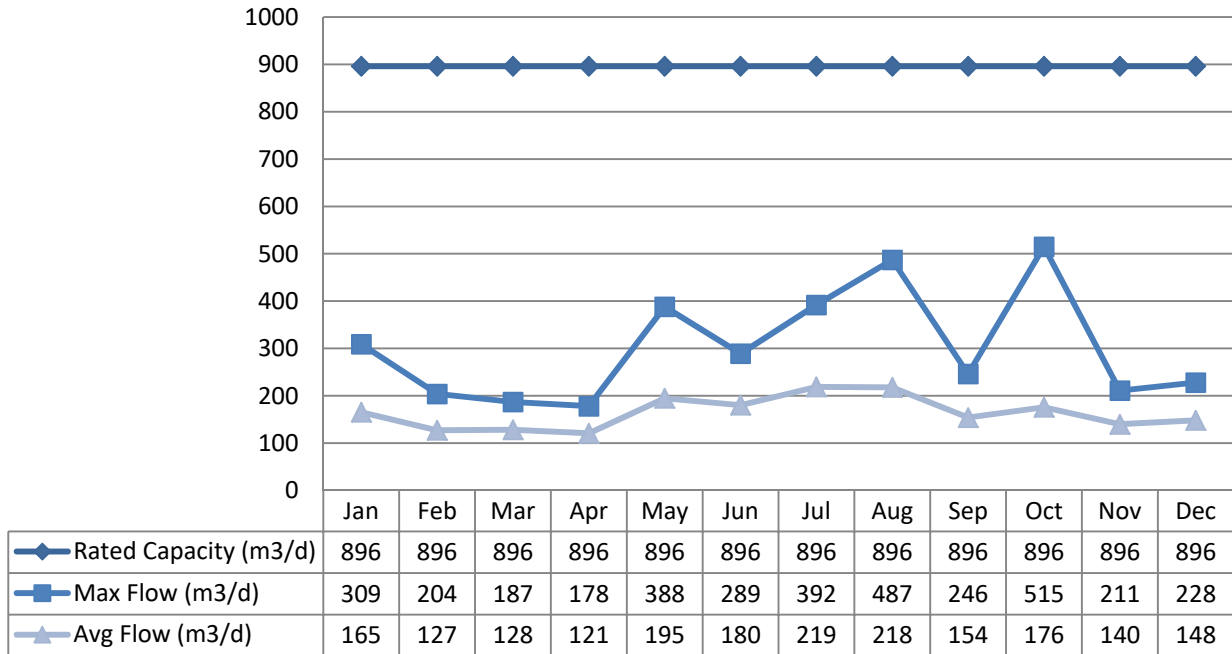


Treated Water Flows

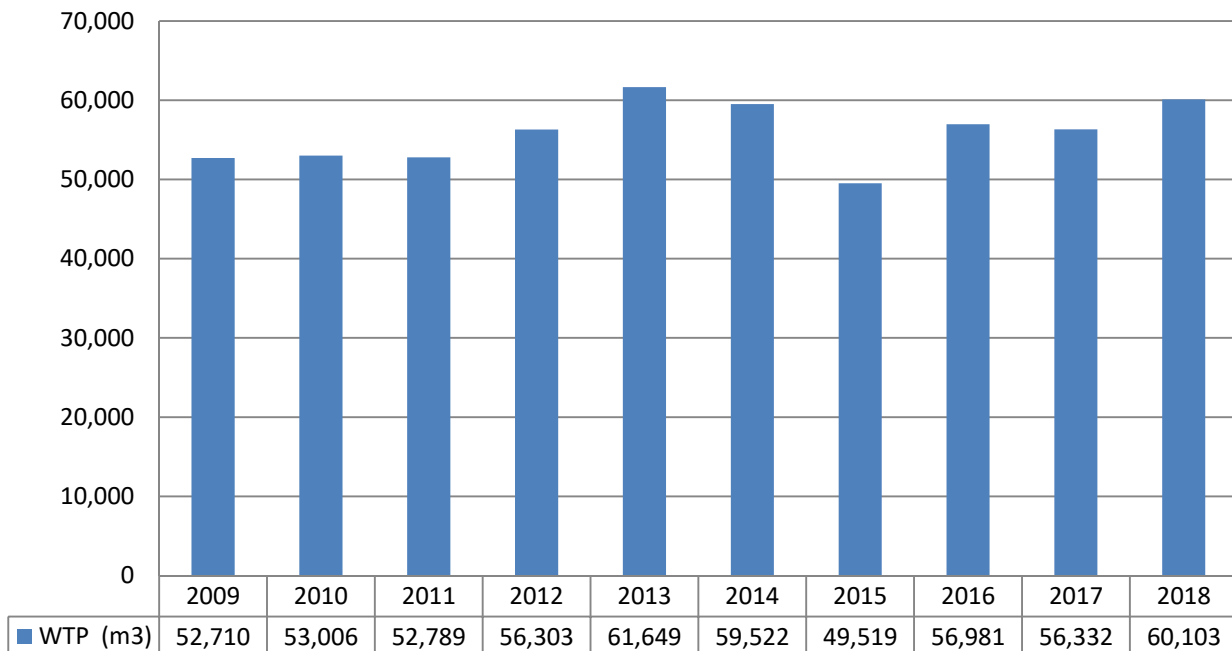
Treated water flows are regulated under the Municipal Drinking Water Licence (MDWL).

Treated Flows

Rated Capacity - MDWL



Annual Total Flow Comparison



Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E.Coli Results		Range of Total Coliform Results		Range of HPC Results	
		Min	Max	Min	Max	Min	Max
Raw Water	156	0	0	0	4	n/a	n/a
Treated Water	52	0	0	0	0	0	1520
Distribution Water	104	0	0	0	0	0	2520

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, In-House (NTU) - RW1	12	0.32	0.37
Turbidity, In-House (NTU) - RW2	12	0.30	0.36
Turbidity, In-House (NTU) - RW3	12	0.32	0.36
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.87	4.51
Free Chlorine Residual, On-Line (mg/L) - DW	8760	0.42	2.74
Free Chlorine Residual, DW Field (mg/L) - DW	104	0.50	2.20

NOTE: Spikes recorded by on-line instrumentation may result from air bubbles and various maintenance/calibration activities. All spikes are reviewed for compliance with O. Reg. 170/03

Inorganic Parameters

These parameters are tested as a requirement under O. Reg. 170/03. Sodium and Fluoride are required to be tested every 60 months. Nitrate and Nitrite are tested quarterly and metals are tested every 36 months as required under O. Reg. 170/03. In the event any parameter exceeds half the maximum allowable concentration the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O. Reg. 169/03
- MDL = Below the laboratory detection level

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Treated Water					
Antimony: Sb (ug/L) - TW	2018/01/22	<MDL 0.02	6.0	No	No
Arsenic: As (ug/L) - TW	2018/01/22	<MDL 0.2	10.0	No	No
Barium: Ba (ug/L) - TW	2018/01/22	157.0	1000.0	No	No
Boron: B (ug/L) - TW	2018/01/22	49.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2018/01/22	<MDL 0.003	5.0	No	No
Chromium: Cr (ug/L) - TW	2018/01/22	0.06	50.0	No	No
Mercury: Hg (ug/L) - TW	2018/01/22	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2018/01/22	<MDL 0.04	50.0	No	No
Uranium: U (ug/L) - TW	2018/01/22	0.298	20.0	No	No

Additional Inorganics					
Fluoride (mg/L) - TW	2017/01/09	0.24	1.5	No	No
Nitrite (mg/L) - TW	2018/01/22	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2018/06/25	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2018/07/16	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2018/10/15	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2018/01/22	0.013	10.0	No	No
Nitrate (mg/L) - TW	2018/06/25	0.012	10.0	No	No
Nitrate (mg/L) - TW	2018/07/16	0.011	10.0	No	No
Nitrate (mg/L) - TW	2018/10/15	0.01	10.0	No	No
Sodium: Na (mg/L) - TW	2017/01/16	32.3	20*	n/a	n/a

*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

Schedule 15 Sampling:

The Schedule 15 Sampling is required under O. Reg. 170/03. This system is under a reduced sampling schedule. No plumbing samples were collected.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	3	3	206	214	n/a	-
pH	3	3	8.0	8.6	n/a	-
Lead (ug/l)	-	-	-	-	10	0

Organic Parameters

These parameters are tested every 36 months as a requirement under O. Reg. 170/03. In the event any parameter exceeds half the maximum allowable concentration the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O. Reg. 169/03
- MDL = Below the laboratory detection level

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Treated Water					
Alachlor (ug/L) - TW	2018/01/22	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2018/01/22	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW	2018/01/22	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2018/01/22	<MDL 0.32	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2018/01/22	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2018/01/22	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2018/01/22	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW	2018/01/22	<MDL 0.01	90.00	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Carbon Tetrachloride (ug/L) - TW	2018/01/22	<MDL 0.16	2.00	No	No
Chlorpyrifos (ug/L) - TW	2018/01/22	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2018/01/22	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2018/01/22	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2018/01/22	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2018/01/22	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2018/01/22	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2018/01/22	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2018/01/22	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2018/01/22	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2018/01/22	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2018/01/22	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2018/01/22	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW	2018/01/22	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2018/01/22	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2018/01/22	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2018/01/22	<MDL 0.02	190.00	No	No
2-Methyl-4-Chlorophenoxyacetic Acid (MCPA) (ug/L) - TW	2018/01/15	<MDL 0.12	100.00	No	No
Metolachlor (ug/L) - TW	2018/01/22	<MDL 0.01	50.00	No	No
Metribuzin (ug/L) - TW	2018/01/22	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2018/01/22	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW	2018/01/22	<MDL 2.0	10.00	No	No
PCB (ug/L) - TW	2018/01/22	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW	2018/01/22	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW	2018/01/22	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW	2018/01/22	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW	2018/01/22	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW	2018/01/22	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2018/01/22	<MDL 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2018/01/22	<MDL 0.35	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2018/01/22	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2018/01/22	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2018/01/22	<MDL 0.44	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2018/01/22	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW	2018/01/22	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2018/01/22	<MDL 0.17	1.00	No	No

Distribution samples are tested quarterly for THM's and HAA's in accordance with O. Reg. 170/03.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Distribution Water					
Trihalomethane (THM): Total (ug/L) Annual Average - DW	2018/01/01	79.2	100	No	Yes
Haloacetic Acid (HAA): Total (ug/L) Annual Average - DW	2018/01/01	55.7	n/a	n/a	n/a

Additional Legislated Samples

No additional sampling required.

Major Maintenance Summary

Description
<ul style="list-style-type: none"> - Rebuilt 2 hydrants - Replaced chlorine analyzer at WTP - Replaced switches on well pumps - Cleaned and inspected water tower - Replaced well level transmitters - Replaced unit heaters at WTP - Replaced hour meters on two well pumps - Installed new data logger at WTP - Purchased spare parts kit for chlorine analyzer

Appendix A

WTRS Submission Confirmation



Location: WTRS / WT DATA / Input WT Record

WTRS-WT-008

Water Taking Data submitted successfully.

Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 4000-9YGLJP
Permit Holder: THE CORPORATION OF THE TOWNSHIP OF NORTH STORMONT.
Received on: Jan 22, 2019 2:50 PM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.

[Return to Main Page](#)

NORTH2 DUNDAS2 | 2019/01/22
version: v4.5.0.21 (build#: 22)
Last modified: 2018/09/18



This site maintained by
the Government of Ontario

©2019 [Queen's Printer for Ontario](#)

Moose Creek
4000-9YGLJP
2018