

# Merrickville Drinking Water System

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Waterworks # 220001227  
System Category – Large Municipal Residential

## Annual Water Report

Prepared For: Village of Merrickville-Wolford

Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup> 2021

Issued: February 28<sup>th</sup>, 2022

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

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## Report Availability

This system does not serve more than 10,000 residence and the annual reports will be available to users at The Village of Merrickville-Wolford Office. Notification will be at the Municipal Office and copies provided free of charge if requested.

The Village of Merrickville-Wolford is located at: 317 Brock St. W. PO Box 340, Merrickville, Ontario K0G 1N0.

There are no additional drinking water systems that receive water from this facility.

## Compliance Report Card

Compliance Event	Details
Ministry of Environment Inspections	Inspection May 10, 2021 <ul style="list-style-type: none"> <li>Inspection Rating 100%</li> </ul>
Municipal Drinking Water Licence Drinking Water Works Permit	Renewal of Licences completed in 2021 New Expiry Date 2026-11-19
Ministry of Labour Inspections	No inspections during the reporting period.
QEMS External Audit	One (1) External On-Site Audit
AWQI's/BWA	1 - AWQI reported during the reporting period
Non-Compliance	No non-compliance reported during the reporting period
Spills	No reportable spills during the reporting period.
Watermain Breaks	1 – 300 Block of Drummond Street East

## System Process Description

### Raw Water

Well 1 is located on the north side of Main Street East approximately 60 metres east of St. Lawrence Street. Well 1 consists of a 35 meter deep drilled groundwater production well, equipped with a submersible deep well pump, with a discharge pipe connecting to a well pump header in the main pump house described below, including a vented watertight galvanized steel enclosure over the wellhead.

Well 2 is located on the north side of Main Street East approximately 60 metres east of St. Lawrence Street. Well 2 consists of a 49 meter deep drilled groundwater production well, equipped with a submersible deep well pump, with a discharge pipe connecting to the Clearwell in the main pump house described below, including a vented watertight galvanized steel enclosure over the wellhead.

Well 4 is located on the north side of Main Street East approximately 85 metres east of St. Lawrence Street. Well 4 consists of a 50 meter deep drilled groundwater production well, equipped with a submersible deep well pump, connecting to a pipe discharging to the Clearwell in the main pump house described below, including a vented watertight galvanized steel enclosure over the wellhead.

The Main Pump house is comprised of a building located at the site of Well 1, housing treatment, pumping and control equipment, including a pump header and appurtenances including a flow meter, discharging into a dual celled Clearwell described below; two centrifugal high lift pumps, one duty pump and one standby pump connected to the pumping station discharge main; and one centrifugal fire pump.

The Clearwell consists of two cells located below and extending behind the main pump house. Clearwell Cell Number 1 is unbaffled, and has a storage volume of 590 cubic meters (m<sup>3</sup>). Clearwell Cell 2 is baffled and has a storage volume of 141 m<sup>3</sup>.

### **Disinfection**

Disinfection is provided using sodium hypochlorite (a liquid form of chlorine) injected into the Clearwell reservoir. One sodium hypochlorite feed system injects sodium hypochlorite solution into the raw water discharge line of Well 1. The second chemical metering system is located in Well House 4 and injects sodium hypochlorite solution into the common raw water discharge line of Wells 2 and 4.

### **Back-up Power**

Emergency or standby power is provided to the Main Pump house using a stationary 120 kW diesel generator set.

#### **Treatment Chemicals used during the reporting year:**

Chemical Name	Use	Supplier
12 % Sodium Hypochlorite	Disinfection	Brenntag

### **Distribution**

The pressure for the distribution system is maintained by the high lift pumps at the main pump house. There is approximately 8 km of water distribution mains with water service connections, hydrants, valves and manual blow-offs.

## Summary of Non-Compliance

### Adverse Water Quality Incidents

Date	AWQI #	Location	Details	Legislation	Corrective Action Taken
2021-01-14	153398	Distribution System	Sodium exceedance	Reg. 170/03	Health Unit to notify local health clinics
2021-09-22	15598	Distribution System	Water main break	Reg. 170/03	Water main repaired and bacteriological testing completed

### Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
Reg. O 170/03	Trihalomethane (THM) Haloacetic Acid (HAA) Nitrite/Nitrate	Quarter 3 of 2021	The operating staff will review the sampling calendar and sampling standard operating procedure.	Closed

### Non-Compliance Identified in a Ministry Inspection

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There were no non-compliances identified in the Ministry Inspection.				

## Flows

The Merrickville Drinking Water System is operating on average under half the rated capacity.

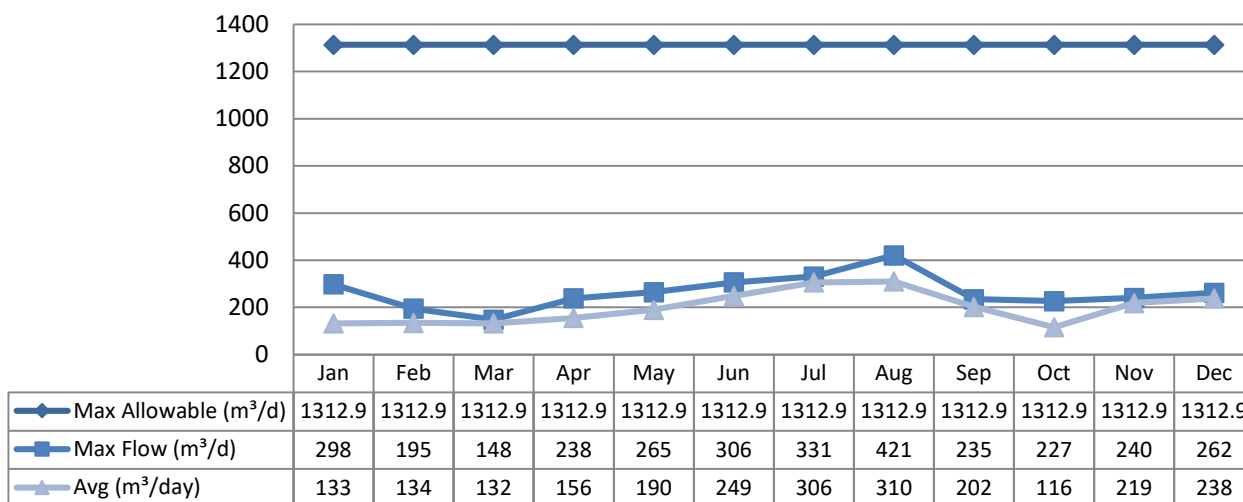
### Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water. 2021 Raw Flow Data was submitted to the Ministry electronically under permit #4573-73AR7F. The data was submitted on February 16<sup>th</sup>, 2022 and the confirmation is attached in Appendix A.

#### Well 1

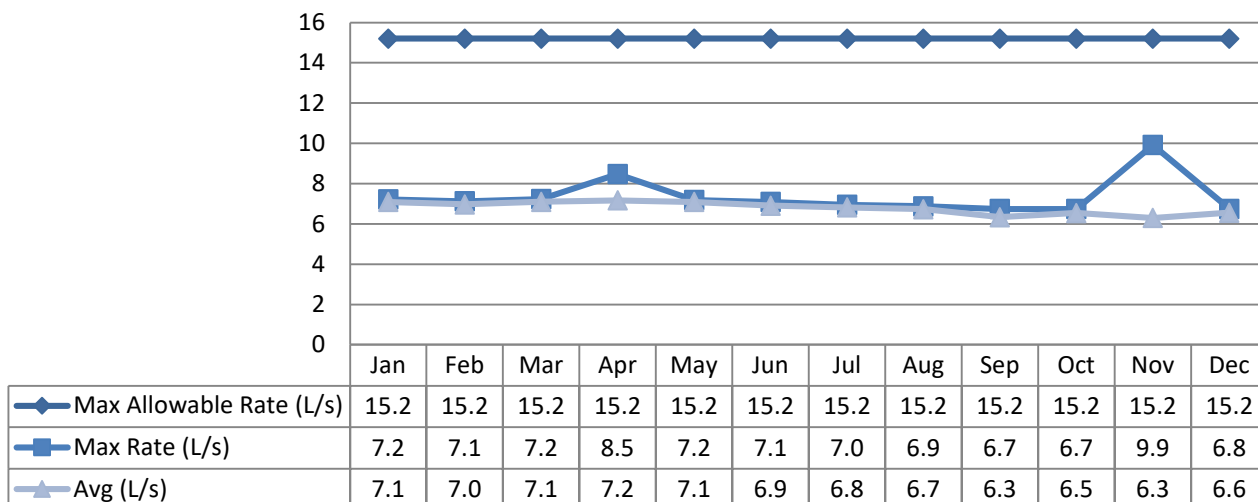
##### Total Monthly Flows (m<sup>3</sup>/d)

Max Allowable PTTW



##### Monthly Rated Flows (L/s)

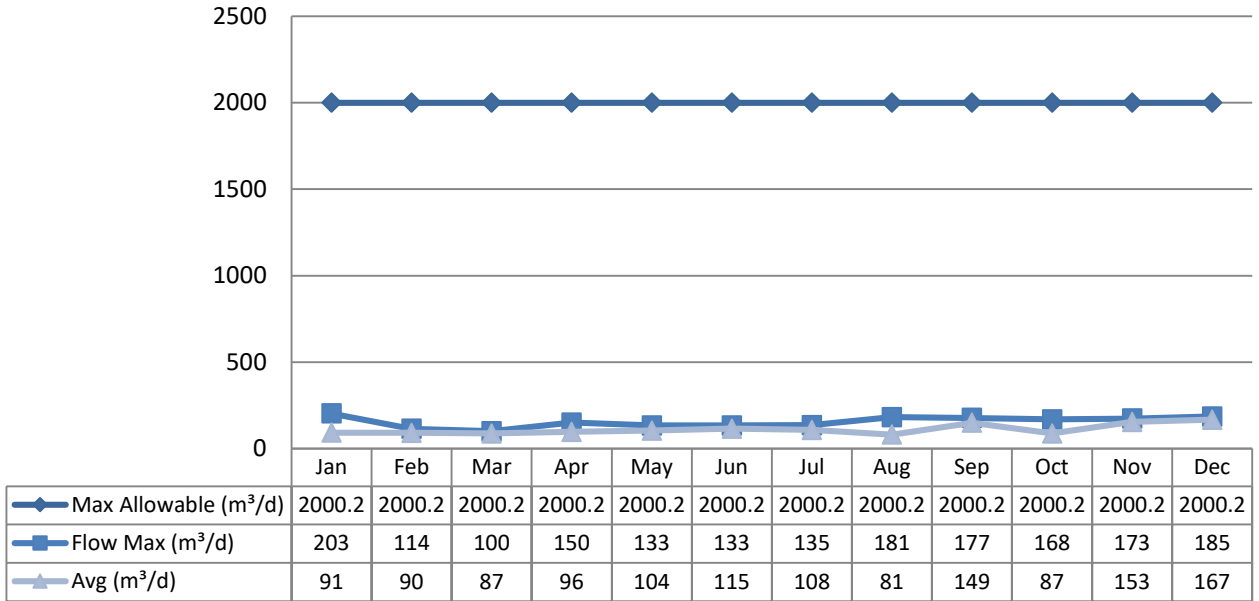
Max allowable rate - PTTW



**Well 2**

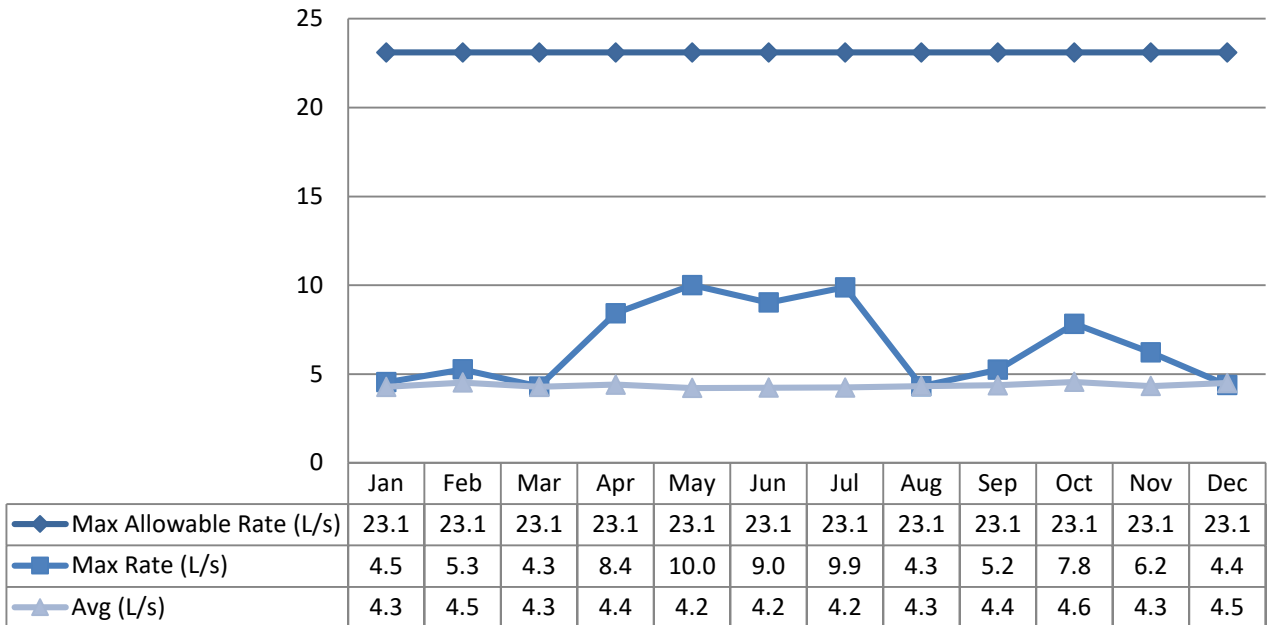
**Total Monthly Flows (m<sup>3</sup>/d)**

**Max Allowable PTTW**



**Monthly Rated Flows (L/s)**

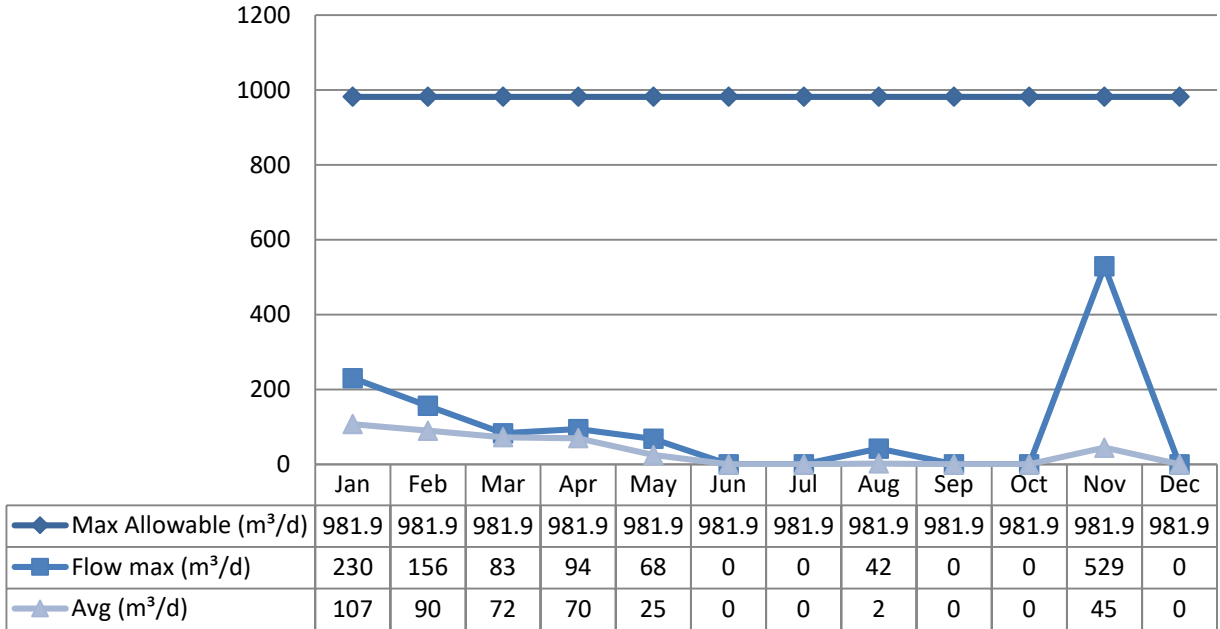
**Max allowable rate - PTTW**



**Well 4**

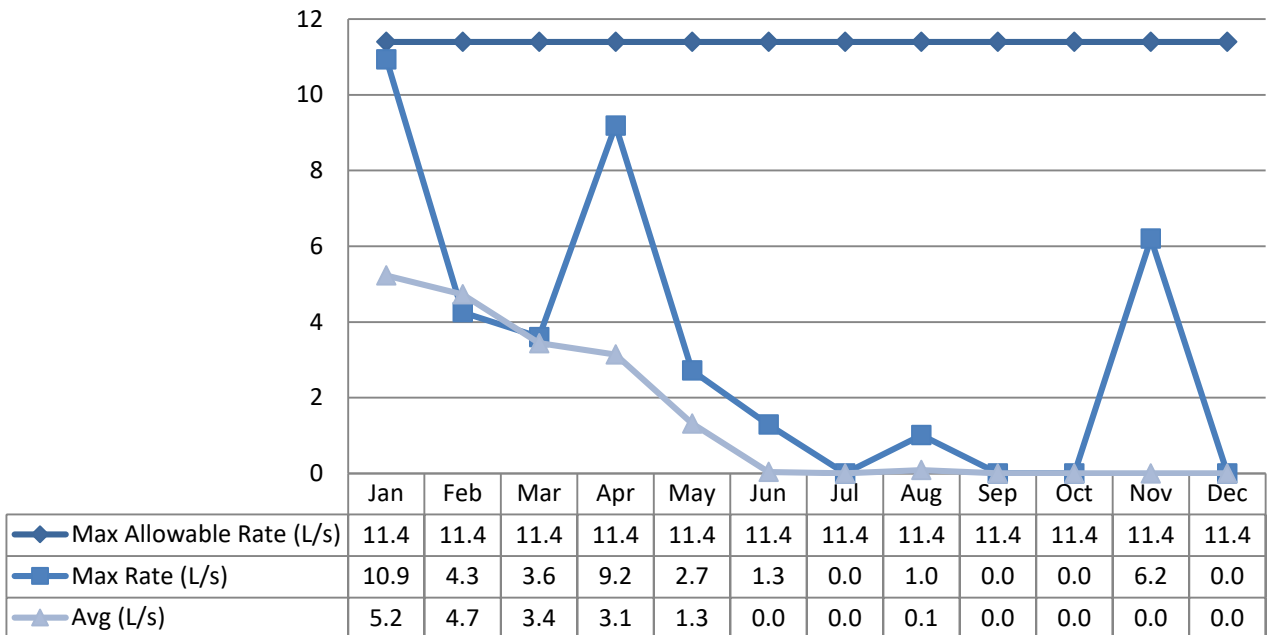
**Total Monthly Flows (m<sup>3</sup>/d)**

Max Allowable PTTW



**Monthly Rated Flows (L/s)**

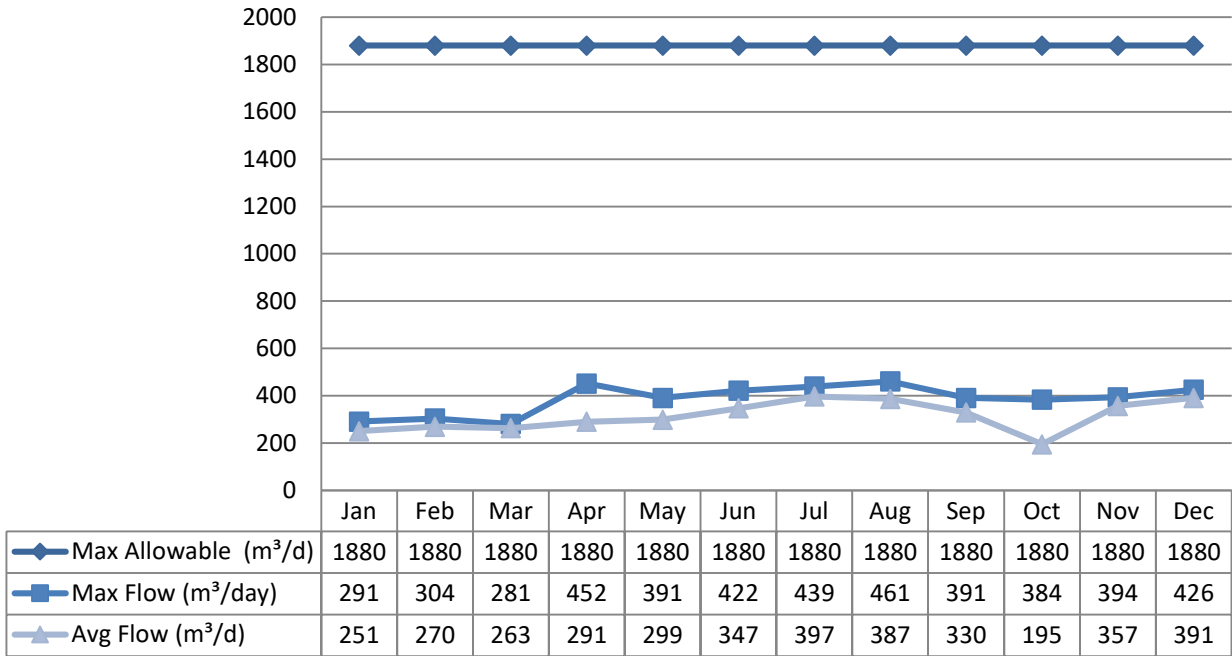
Max allowable rate - PTTW





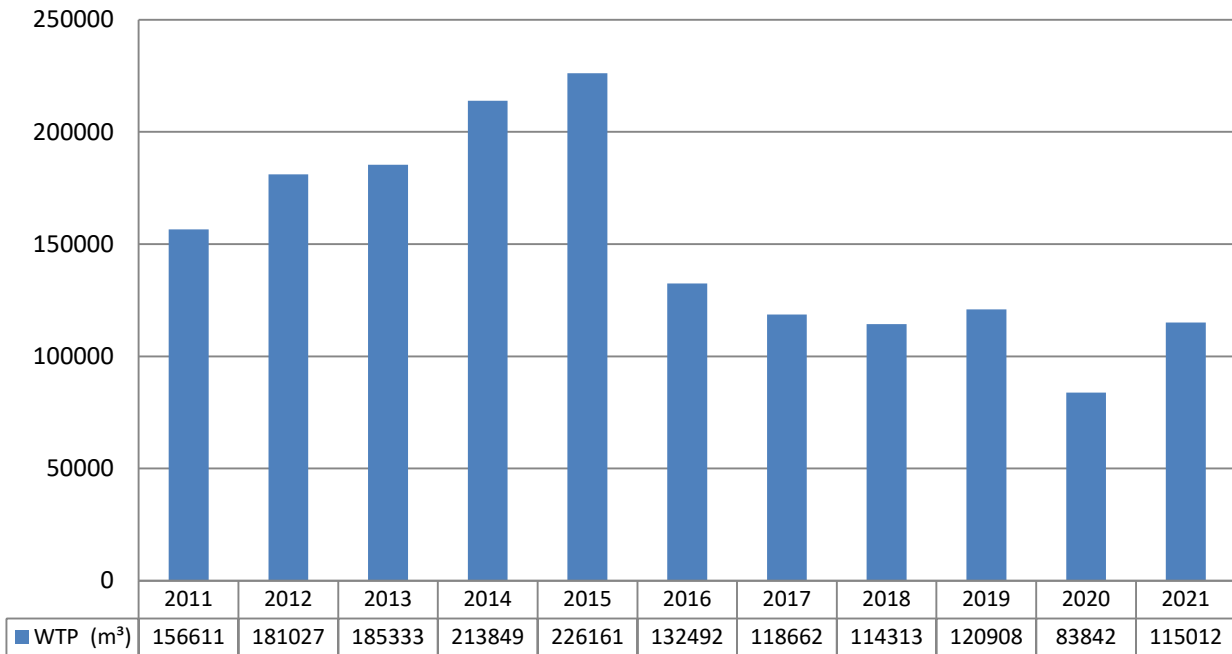
**System Water Flows**

The System Water flows are regulated under the Municipal Licence.



**Annual Total Flow Comparison**

Total Annual m³



## Regulatory Sample Results Summary

### Microbiological Testing

	No. of Samples	Range of E.coli Results		Range of Total Coliform Results		No. of HPC Samples	Range of HPC Results	
		Min	Max	Min	Max		Min	Max
RW Well 1	52	0	0	0	0	24	10	30
RW Well 2	53	0	0	0	0	19	2	40
RW Well 4	43	0	0	0	20	11	10	30
Treated Water	52	0	0	0	0	52	2	40
Distribution System	113	0	0	0	0	113	2	60

### Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, In-House (NTU) - RW1	12	0.43	0.83
pH, In-House (---) - RW1	1	7.12	7.61
Turbidity, In-House (NTU) - RW2	12	0.50	0.77
pH, In-House (---) – RW2	10	7.10	7.67
Turbidity, In-House (NTU) - RW4	12	0.30	0.99
pH, In-House (---) – RW4	10	7.06	7.58
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.04	1.98
Free Chlorine Residual, In-House (mg/L) - TW	96	0.00	1.36
Free Chlorine Residual, On-Line (mg/L) - DW	8760	0.30	2.00
Free Chlorine Residual, In-House (mg/L) - DW	95	0.33	1.11

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

### Physical Parameters

Parameter	Range of Results
Treated Water Alkalinity (mg/L)	235 – 282
Treated Water Colour (TCU)	2 – 2
Treated Water Conductivity (uS/cm)	653 - 693
Treated Water pH	7.93 – 8.05
Treated Water Hardness (as CaCO <sub>3</sub> ) (mg/L)	294 - 340

## Inorganic Parameters

These parameters are tested as a requirement under 170/03. Sodium and Fluoride are required to be tested every 5 years. Nitrate and Nitrite are tested quarterly and the metals are tested every 5 years as required under 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Antimony: Sb (ug/L) - TW	2021/01/11	< 0.1	6.0	No	No
Arsenic: As (ug/L) - TW	2021/01/11	< 0.1	10.0	No	No
Barium: Ba (ug/L) - TW	2021/01/11	106.0	1000.0	No	No
Boron: B (ug/L) - TW	2021/01/11	154.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2021/01/11	< 0.02	5.0	No	No
Chromium: Cr (ug/L) - TW	2021/01/11	< 2.0	50.0	No	No
Mercury: Hg (ug/L) - TW	2021/01/11	< 0.02	1.0	No	No
Selenium: Se (ug/L) - TW	2021/01/11	1.0	50	No	No
Uranium: U (ug/L) - TW	2021/01/11	0.88	20.0	No	No
<b>Additional Inorganics</b>					
Fluoride (mg/L) - TW	2019/01/07	<MDL 0.1	1.5	No	No
Nitrite (mg/L) - TW	2021/01/11	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2021/06/07	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2021/10/04	<MDL 0.1	1.0	No	No
Nitrate (mg/L) - TW	2021/01/11	<MDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2021/04/07	<MDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2021/10/04	<MDL 0.1	1.0	No	No
Sodium: Na (mg/L) - TW	2021/02/01	36.2	20*	Yes	Yes

\*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 mg/L 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.

MAC = Maximum Allowable Concentration as per O.Reg 169/03

BDL = Below the laboratory detection level

### Schedule 15 Sampling:

The Schedule 15 Sampling is required under O.Reg 170/03. This system is under the plumbing exemption. No plumbing samples were collected. Lead sampling will be required in July 2021.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (mg/L)	Number of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	6	6	235	283	N/A	N/A
pH	6	6	7.35	7.54	N/A	N/A
Lead (mg/L)	3	3	0.09	0.22	0.001	N/A

## Organic Parameters

These parameters are tested every 5 years as a requirement under O.Reg 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Alachlor (ug/L) - TW	2021/01/11	< 0.3	5.00	No	No
Azinphos-methyl (ug/L) - TW	2021/01/116	< 1.0	20.00	No	No
Benzene (ug/L) - TW	2021/01/116	< 0.5	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2021/01/116	< 0.005	0.01	No	No
Bromoxynil (ug/L) - TW	2021/01/116	< 0.5	5.00	No	No
Carbaryl (ug/L) - TW	2021/01/116	< 3.0	90.00	No	No
Carbofuran (ug/L) - TW	2021/01/116	< 1.0	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2021/01/116	< 0.2	2.00	No	No
Chlorpyrifos (ug/L) - TW	2021/01/116	< 0.5	90.00	No	No
Diazinon (ug/L) - TW	2021/01/116	< 1.0	20.00	No	No
Dicamba (ug/L) - TW	2021/01/116	< 10.0	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2021/01/116	< 0.5	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2021/01/116	< 0.5	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2021/01/116	< 0.5	5.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2021/01/116	< 5.0	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2021/01/116	< 0.1	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2021/01/116	< 10.0	100.00	No	No
Diclofop-methyl (ug/L) - TW	2021/01/116	< 0.9	9.00	No	No
Dimethoate (ug/L) - TW	2021/01/116	< 1.0	20.00	No	No
Diquat (ug/L) - TW	2021/01/116	< 5.0	70.00	No	No
Diuron (ug/L) - TW	2021/01/116	< 5.0	150.00	No	No
Glyphosate (ug/L) - TW	2021/01/116	< 25.0	280.00	No	No
Malathion (ug/L) - TW	2021/01/116	< 5.0	190.00	No	No
Methoxychlor (ug/L) - TW	2021/01/116	< 3.0	900.00	No	No
Metolachlor (ug/L) - TW	2021/01/116	< 3.0	50.00	No	No
Metribuzin (ug/L) - TW	2021/01/116	< 1.0	80.00	No	No
Paraquat (ug/L) - TW	2021/01/116	< 1.0	10.00	No	No
PCB (ug/L) - TW	2021/01/116	< 0.05	3.00	No	No
Pentachlorophenol (ug/L) - TW	2021/01/116	< 0.1	60.00	No	No
Phorate (ug/L) - TW	2021/01/116	< 0.3	2.00	No	No
Picloram (ug/L) - TW	2021/01/116	< 15.0	190.00	No	No
Prometryne (ug/L) - TW	2021/01/116	< 0.1	1.00	No	No
Simazine (ug/L) - TW	2021/01/116	< 0.5	10.00	No	No
Terbufos (ug/L) - TW	2021/01/116	< 0.5	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2021/01/116	< 0.5	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2021/01/116	< 0.1	100.00	No	No

	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Triallate (ug/L) - TW	2021/01/116	< 10.0	230.00	No	No
Trichloroethylene (ug/L) – TW	2021/01/116	< 0.5	5.00	No	No
2,4,6-Trichlorophenol (ug/L) – TW	2021/01/116	< 0.1	5.00	No	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW	2021/01/116	<10.0	100.0	No	No
Trifluralin (ug/L) - TW	2021/01/116	< 0.5	45.00	No	No
Vinyl Chloride (ug/L) - TW	2021/01/116	< 0.2	1.00	No	No
<b>Distribution</b>					
Trihalomethane: Total (ug/L) Annual Average - DW	2021	24.0	100.00	No	No
Haloaceticacid: Total (ug/L) Annual Average- DW	2021	5.3	80.00	No	No

MAC = Maximum Allowable Concentration as per O.Reg 169/03

BDL = Below the laboratory detection level

### Additional Legislated Samples

There was no additional sampling required.

## Major Maintenance Summary

WO#	Details
2093476	Capital SCADA/PLC services
2093481	Capital Chlorine feed system parts
2093482	Capital Well Inspection
2093483	Capital Leak Detection/Trace wire locator
2093484	Capital Bollards Installation Hydrant 1
2093485	Capital Auto flusher Hydrant 1
2093486	Capital Hydrant markers/parts
2093487	Capital Main PRV maintenance
2093488	Capital Fire pump control replacement
2093489	Capital Well 2 door contact and temp sensor alarm wire replace
2093490	Capital Distribution parts for hydrants and valve boxes
2093492	Capital Generator alarms expansion
2267106	Capital Meter and Supplies Drummond St W
2267685	Capital Flow Meter Annual calibration
2312528	Capital Distribution Trailer Annual Inspection
2364783	Capital Well Pumps 1-2-4 replacement
2403816	Capital New meter installation Broadway St E
2408278	Capital SAI Global DWQMS audit
2449249	Capital Annual UV Bulbs and Sleeves replacement EC and Library



2449578	Capital Service equipment Grenville Way
2452195	Capital Service equipment St Lawrence St
2452733	Capital Chemical pump parts inventory replace
2499175	Capital Outpost Repair
2501671	Capital Emergency repair Well Pump 2
2092532	Capital Pump Suction Repair Duty Pump 2
2092560	Capital Duty Pump 2 Doppler flow meter
2092879	Capital Sink bracket, shelving materials, JPB supplies
2134274	Capital Heater Fail Main Pump House
2176036	Capital Heater Fail Well 4
2176820	Capital Repair parts compliance equipment Metcon Hach
2224614	Capital Contractor Labor Meter Repair May-June 2021
2266296	Capital Generator Batteries replace

### **Distribution Maintenance Highlights**

<b>Date</b>	<b>Location Reference</b>	<b>Operator</b>	<b>Details</b>	<b>Corrective Repair</b>
September 22, 2021	300 Drummond St. E	J.M.	Water main Break	Repair clamp installed

# Appendix A

## WTRS Data and Submission Confirmation



Ministry of the Environment,  
Conservation and Parks

| [WT DATA](#) | [USER PROFILE](#) | [CONTACT US](#) | [HELP](#) | [HOME](#) | [LOGOUT](#) |

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: 2110-AP9LSG  
Permit Holder: THE CORPORATION OF THE VILLAGE OF MERRICKVILLE-WOLFORD.  
Received on: Feb 16, 2022 11:11 AM

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.

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MERRICKVILLE2 WOLFORD2 | 2022/02/16  
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