Cobden Drinking Water System

Waterworks # 220001218
System Category – Large Municipal Residential

Annual Water Report

Prepared For: The Township of Whitewater Region

Reporting Period of January 1th – December 31st 2021
March 17th, 2022

Revision: 1

Operating Authority:

OCWA
ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

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

The annual report will be available to residents at the Township of Whitewater Region's Municipal Office and copies provided free of charge if requested. The Township of Whitewater Region's Municipal Office is located at, 44 Main Street, Cobden, Ontario.

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

Compliance Report Card

Compliance Event	# of Events
Ministry of Environment Inspections	1 MECP Inspection on August 17th 2021 100% Rating
Ministry of Labour Inspections	0
QEMS External Audit	1 Audit completed on February 17th 2021 by SAI Global. No major or minor non-conformances were identified.
AWQI's/BWA	2/0
Non-Compliance	2
Community Complaints	27
Spills	0
Watermain Breaks	1

System Process Description

Raw Source

The Cobden water treatment plant receives raw water from Muskrat Lake and is considered a conventional surface water treatment plant. The intake for the water treatment plant consists of a 300 mm diameter pipe located approximately 12.2 m below the water surface, and is equipped with polyethylene lines for zebra mussel control and raw water sampling. Water flows by gravity from the intake structure and enters two interconnected intake wet wells with a total volume of 70 m^3. Two vertical turbine low lift pumps, each rated at 16.6 L/s at a total dynamic head (TDH) of 10 m, convey water into the treatment system. A flow meter is installed on the low lift discharge header to allow accurate monitoring of water takings.

Treatment

The Cobden water treatment plant consists of an Ecodyne Package Plant and Corix Treatment Unit, which both consist of a rapid mix zone, flocculation zone, sedimentation zone, and two-cell dual media filters.

Raw water is injected with the coagulant and coagulant aid, PAS-8 and polymer, and then mixed via an inline static mixer. Potassium permanganate is added seasonally at the raw water intake crib and/or at the raw water discharge header for zebra mussel and manganese control. Water then enters the one of two of the treatment tanks, travelling through a solids contact unit with a mixer for coagulation and flocculation. The solids are settled via tube settlers as water levels rise in the clarifier. Clarified water is collected in troughs and distributed to the two-cell dual media (sand/anthracite) gravity filters. A common underdrain collects filter effluent from both cells, and a continuous online turbidimeter monitors the filters effluent turbidity.

Sodium hypochlorite is injected into the effluent piping that conveys filtered water into a dual-celled baffled clearwell with total volume of 187 m^3 that provides sufficient contact time to meet primary disinfection. Water flows from the clearwell to two interconnected high lift pump wells. Two high lift pumps, direct water from the clearwell into the distribution system. Sodium hypochlorite is injected at the high lift header before travelling to the distribution system to maintain secondary disinfection. Treated flow leaving the clearwell is measured using a flow meter.

Process wastewater is directed to a 100 m^3 wastewater tank with a settling/equalization chamber and a supernatant chamber. The settling chamber discharges to the sanitary sewer. The supernatant chamber which discharges to the lake is no longer in use. Waste from floor drains is directed to a sump that discharges to a sanitary manhole.

Distribution

The Cobden Distribution System is a Class 1 Distribution System that serves a population of approximately 1000. The distribution system includes 9.2 km of watermains, 64 fire hydrants, and a 900 m^3 elevated water storage tank located at 44 Gould Street. Four dry wells are available on Simmons Drive, Ross Street, Main Street, Morrison Drive to facilitate distribution sampling and provide adequate chlorine residuals in the distributed water.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
PAS-8	Coagulation & Flocculation	Kemira
Superfloc 492PWG	Coagulant Aid (Polymer)	Kemira
Sodium Hypochlorite (12%)	Disinfection	Brenntag
Potassium Permanganate (granular 97.5%)	Zebra Mussel and Manganese Control	Cariox via Brenntag

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Location	Problem	Details	Legislation	Corrective Action Taken
05/07/21	154525	Cobden Distribution System	THM Running Annual Average (RAA) Exceedance	RAA: 103.5 ug/L RAA Limit: 100 ug/L	O. Reg 170/03 Schedule 16	Flush system to remove THMs and re-sample
21/08/21	155187	Cobden Distribution System	Multiple coloured water consumer complaints due excess Potassium Permanganate found in Distribution System	Chlorine residuals taken did not indicate a bacteriological threat	O. Reg 170/03 Schedule 16	Flush system to remove colour, collect samples for potassium and manganese analysis as per RCDHU

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
SDWA section 31(1)	The required Form 2 and the Director Notification Form were not sent to the Director as required during a coagulant trial.	March 23rd 2021 and until June 1st 2021	When the operating authority became aware of this requirement, the forms were completed and submitted to the Director.	Complete
O.Reg 170/03 Sch. 6 & Sch. 7	The minimum, maximum and mean results of tests for free chlorine required to meet primary disinfection and filter turbidity were not recorded due to a communication outage	October 13th 2021 at 11:04:47 am until October 25th 2021 at 7:58:08 am	Repairs to monitoring equipment were completed. Staff received training on the continuous monitoring compliance analyzer SOP to ensure data was recorded at the appropriate intervals	Complete

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
None to report.				

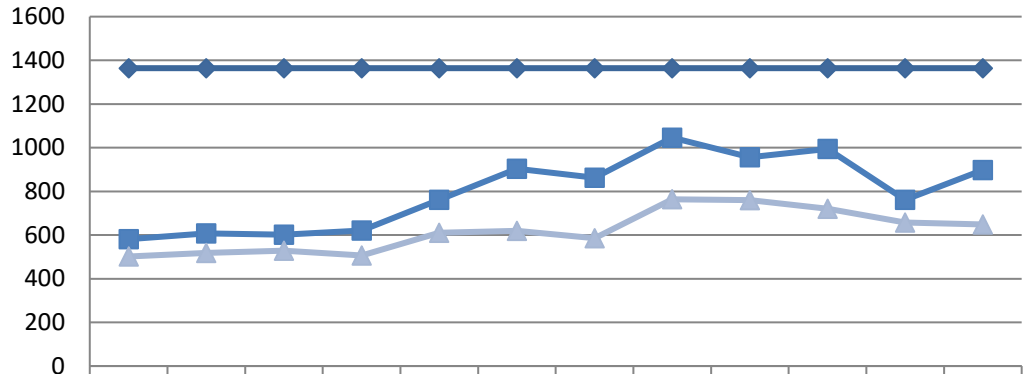
Flows

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 # 0782-8W3HY8. The confirmation and a copy of the data that was submitted are attached in Appendix A.

Total Monthly Flows

Max Allowable PTTW



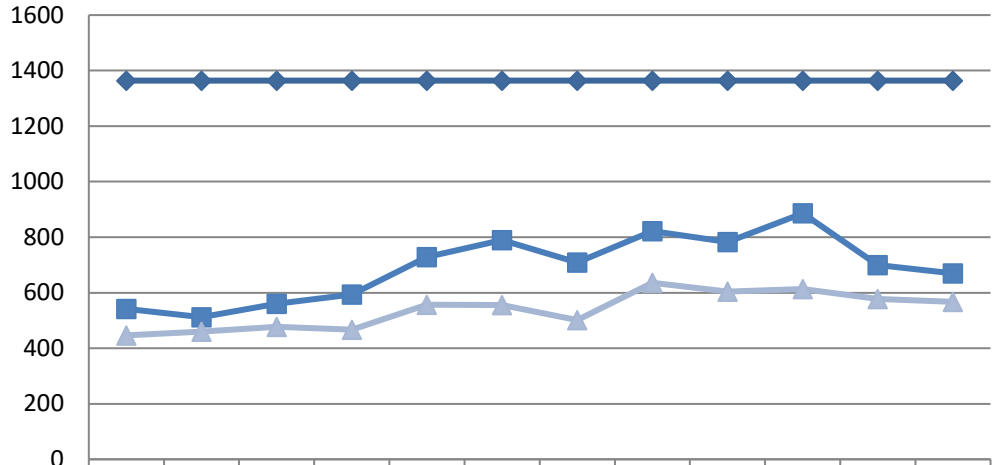
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable (m3/d)	1364	1364	1364	1364	1364	1364	1364	1364	1364	1364	1364	1364
Max Flow (m3/d)	581	607	602	621	762	903	862	1046	956	995	762	898
Avg (m3/d)	502	518	529	507	611	619	585	764	760	721	657	649

Treated Water Flows

The Treated Water flows are regulated under the Municipal Drinking Water Licence.

Monthly Rated Flows

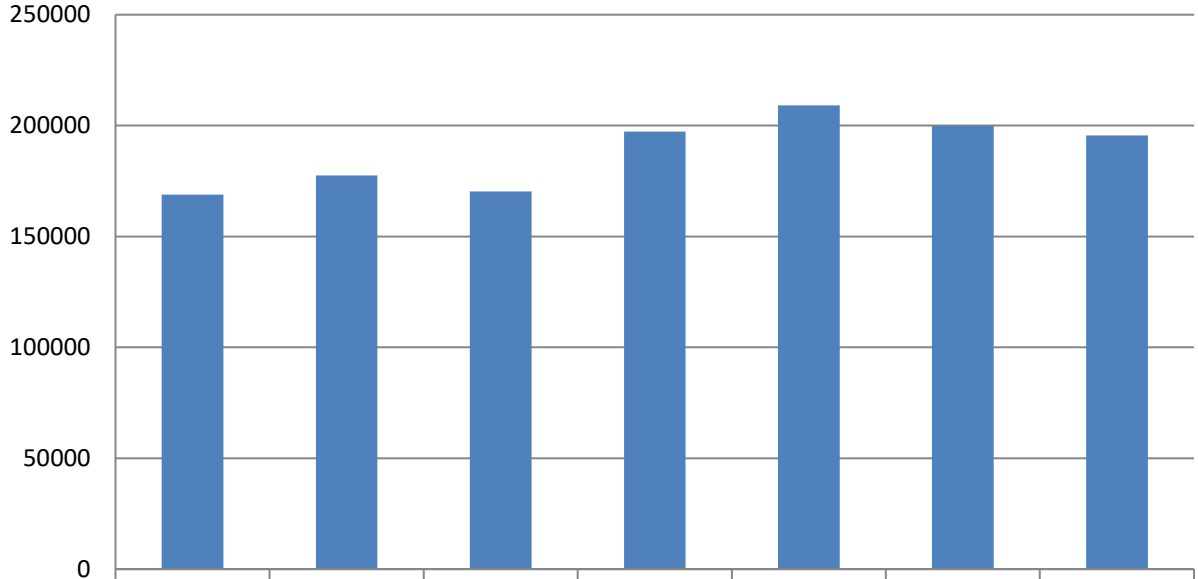
Rated Capacity - MDWL



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rated Capacity (m3/d)	1364	1364	1364	1364	1364	1364	1364	1364	1364	1364	1364	1364
Max Daily Flow (m3/d)	542	512	560	594	728	790	709	822	783	886	700	670
Avg (m3/d)	446	460	478	467	557	556	502	636	604	613	578	567

Annual Total Flow Comparison

Total Annual m3



	2015	2016	2017	2018	2019	2020	2021
WTP (m3)	168859	177503	170269	197238	209131	199899	195632

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	50*	0	7	0	300	N/A	N/A
Treated Water	52	0	0	0	0	0	1
Distribution Water	117	0	0	0	0	0	11

NOTE: 52 raw water samples were collected though the samples collected August 10th and September 14th in 2021 were NDOGT - No Data: Overgrown with Target Bacteria.

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, In-House (NTU) - RW	165	0.43	8.43
Turbidity, In-House (NTU) - TW	245	0.09	0.84
Turbidity, On-Line (NTU) - Filter 1	8760	0.00	0.90
Turbidity, On-Line (NTU) - Filter 2	8760	0.00	0.62
Highlift Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.70	2.65
Post Trim Free Chlorine Residual, On-Line (mg/L) - TW	258	1.47	2.98
Post Trim Free Chlorine Residual, In-House (mg/L) - TW	258	1.27	3.40
Free Chlorine Residual, In House (mg/L) - DW	368	0.06	2.09

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

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 annually 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 = Less than Method Detection Limit

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Treated Water					
Antimony: Sb (ug/L) - TW	2021/01/13	<MDL 0.9	6.0	No	No
Arsenic: As (ug/L) - TW	2021/01/13	<MDL 0.2	10.0	No	No
Barium: Ba (ug/L) - TW	2021/01/13	26.8	1000.0	No	No
Boron: B (ug/L) - TW	2021/01/13	11.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2021/01/13	<MDL 0.003	5.0	No	No
Chromium: Cr (ug/L) - TW	2021/01/13	0.89	50.0	No	No
Mercury: Hg (ug/L) - TW	2021/01/13	<MDL 0.01	1.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Selenium: Se (ug/L) - TW	2021/01/13	0.06	50.0	No	No
Uranium: U (ug/L) - TW	2021/01/13	0.256	20.0	No	No
Additional Inorganics					
Nitrite (mg/L) - TW	2021/01/13	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/04/22	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/07/22	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/10/28	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2021/01/13	0.341	10.0	No	No
Nitrate (mg/L) - TW	2021/04/22	0.337	10.0	No	No
Nitrate (mg/L) - TW	2021/07/22	0.291	10.0	No	No
Nitrate (mg/L) - TW	2021/10/28	0.095	10.0	No	No
Fluoride (mg/L) - TW	2019/01/03	0.13	1.5	No	No
Sodium: Na (mg/L) - TW	2019/01/03	16.0	20*	No	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.

Schedule 15 Sampling:

The Schedule 15 Sampling is required under O.Reg 170/03. This system is under reduced sampling. 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)	2	4	97	109	N/A	N/A
pH	2	4	7.3	7.4	N/A	N/A
Lead (ug/L)	2	4	0.04	0.06	10	0

Organic Parameters

These parameters are tested annually 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 = Less than Method Detection Limit

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Treated Water					
Alachlor (ug/L) - TW	2021/01/13	<MDL 0.02	5.0	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2021/01/13	<MDL 0.01	5.0	No	No
Azinphos-methyl (ug/L) - TW	2021/01/13	<MDL 0.05	20.0	No	No
Benzene (ug/L) - TW	2021/01/13	<MDL 0.32	1.0	No	No
Benzo(a)pyrene (ug/L) - TW	2021/01/13	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2021/01/13	<MDL 0.33	5.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Carbaryl (ug/L) - TW	2021/01/13	<MDL 0.05	90.0	No	No
Carbofuran (ug/L) - TW	2021/01/13	<MDL 0.01	90.0	No	No
Carbon Tetrachloride (ug/L) - TW	2021/01/13	<MDL 0.17	2.0	No	No
Chlorpyrifos (ug/L) - TW	2021/01/13	<MDL 0.02	90.0	No	No
Diazinon (ug/L) - TW	2021/01/13	<MDL 0.02	20.0	No	No
Dicamba (ug/L) - TW	2021/01/13	<MDL 0.2	120.0	No	No
1,2-Dichlorobenzene (ug/L) - TW	2021/01/13	<MDL 0.41	200.0	No	No
1,4-Dichlorobenzene (ug/L) - TW	2021/01/13	<MDL 0.36	5.0	No	No
1,2-Dichloroethane (ug/L) - TW	2021/01/13	<MDL 0.35	5.0	No	No
1,1-Dichloroethylene (ug/L) - TW	2021/01/13	<MDL 0.33	14.0	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2021/01/13	<MDL 0.35	50.0	No	No
2,4-Dichlorophenol (ug/L) - TW	2021/01/13	<MDL 0.15	900.0	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2021/01/13	<MDL 0.19	100.0	No	No
Diclofop-methyl (ug/L) - TW	2021/01/13	<MDL 0.4	9.0	No	No
Dimethoate (ug/L) - TW	2021/01/13	<MDL 0.06	20.0	No	No
Diquat (ug/L) - TW	2021/01/13	<MDL 1.0	70.0	No	No
Diuron (ug/L) - TW	2021/01/13	<MDL 0.03	150.0	No	No
Glyphosate (ug/L) - TW	2021/01/13	<MDL 1.0	280.0	No	No
Malathion (ug/L) - TW	2021/01/13	<MDL 0.02	190.0	No	No
Metolachlor (ug/L) - TW	2021/01/13	<MDL 0.01	50.0	No	No
Metribuzin (ug/L) - TW	2021/01/13	<MDL 0.02	80.0	No	No
MCPA (ug/L) - TW	2021/01/13	<0.12	100.0	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2021/01/13	<MDL 0.3	80.0	No	No
Paraquat (ug/L) - TW	2021/01/13	<MDL 1.0	10.0	No	No
PCB (ug/L) - TW	2021/01/13	<MDL 0.04	3.0	No	No
Pentachlorophenol (ug/L) - TW	2021/01/13	<MDL 0.15	60.0	No	No
Phorate (ug/L) - TW	2021/01/13	<MDL 0.01	2.0	No	No
Picloram (ug/L) - TW	2021/01/13	<MDL 1.0	190.0	No	No
Prometryne (ug/L) - TW	2021/01/13	<MDL 0.03	1.0	No	No
Simazine (ug/L) - TW	2021/01/13	<MDL 0.01	10.0	No	No
Terbufos (ug/L) - TW	2021/01/13	<MDL 0.01	1.0	No	No
Tetrachloroethylene (ug/L) - TW	2021/01/13	<MDL 0.35	10.0	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2021/01/13	<MDL 0.2	100.0	No	No
Triallate (ug/L) - TW	2021/01/13	<MDL 0.01	230.0	No	No
Trichloroethylene (ug/L) - TW	2021/01/13	<MDL 0.44	5.0	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2021/01/13	<MDL 0.25	5.0	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW	2021/01/13	<MDL 0.12	100.0	No	No
Trifluralin (ug/L) - TW	2021/01/13	<MDL 0.02	45.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Vinyl Chloride (ug/L) - TW	2021/01/13	<MDL 0.17	1.0	No	No

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

	Sample Year	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Distribution Water					
Trihalomethane (THM): Total (ug/L) Annual Average - DW	2021	99.0	100.0	No	Yes
Haloacetic Acid (HAA): Total (ug/L) Annual Average - DW	2021	75.7	80.0	No	Yes

Additional Legislated Samples

Schedule C: System-Specific Conditions of Municipal Drinking Water License #203-202 requires the Cobden Drinking Water System to have a Harmful Algal Bloom (HAB) plan. The HAB plan is implemented when a potential harmful algal bloom is suspected or present in the source water. The raw water source for the Cobden DWS, Muskrat Lake, has a known history of Blue-Green Algae blooms. To ensure the drinking water remains unaffected, the Raw and Treated water is sampled on a weekly basis for Microsystin during the Harmful Algal Bloom season, which occurs from June to October.

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Microcystin (ug/L) - RW	22	<MDL 0.1	<MDL 0.1
Microcystin (ug/L) - TW	22	<MDL 0.1	<MDL 0.1

<MDL = Less than Method Detection Limit

Schedule C: System-Specific Conditions of Municipal Drinking Water License #203-202 requires the Cobden Drinking Water System to monitor the effluent discharged to the natural environment. It should be noted that the backwash effluent directly discharges to the sanitary sewer to be processed at the Cobden Wastewater Treatment Plant, and as such the effluent was not sampled on a quarterly basis in 2021. An amendment to Schedule C of the MDWL is being processed to remove this condition.

Legal Document	Date of Issuance	Parameter	Limit (mg/L)	Result (mg/L)
MDWL #203-202	24-Sept-2020	Backwash Effluent Suspended Solids	Annual Average < 25 mg/L	17.25
MDWL #203-202	24-Sept-2020	Backwash Effluent Total Chlorine Residual	Annual Average < 0.02 mg/L	0.14

Major Maintenance Summary

WO #	Description
2094172	Repair natural gas heating units throughout facility
2174650	Installed pressure regulator on highlift chlorine analyzer
2316222	Cobden Water Tower and Clearwell ROV Inspection by Dundee Marine
2091016	Replaced Filter #2 effluent valve
2093767	Diesel Generator controller serviced by GAL Power
2173485	Replaced highlift chlorine analyzer
2543464	Replace Filter #1, Filter #2, and Effluent turbidity analyzers
2582816	Water Tower Exterior Inspection
2500606	PAS-8 bulk tank cleaned out and fittings repaired

Distribution Maintenance

Date	Location Reference	Category	Details	Corrective Repair
April 20, 2021	Dead Ends	N/A	Spring flushing program	N/A
July 28, 2021	42 Gould Street	1	Emergency repair of a watermain break	Replace six feet of 6” blue brute pipe and install two new Hi-max couplers
October 13, 2021	Entire System	N/A	Fall flushing program	N/A

Appendix A

WTRS Data and Submission Confirmation

Ontario

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: 0782-8W3HY8
Permit Holder: THE CORPORATION OF THE TOWNSHIP OF WHITEWATER REGION.
Received on:Feb 11, 2022 3:12 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.

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KAYLEE SAAR | 2022/02/11
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