

Madoc Drinking Water System Annual Water Report

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

Prepared For: Corporation of the Municipality of
Centre Hastings

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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Compliance Report Card

Drinking Water System Number:	220001575
System Owner:	Corporation of the Municipality of Centre Hastings
Operating Authority:	Ontario Clean Water Agency
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2017 – December 31, 2017

Report Availability

Population Served:	< 10,000
Website where the annual report can be viewed by the public:	www.centrehastings.com
Alternate location where annual report will be available for inspection and is free of charge:	Municipal Office
How are system users notified that the annual report is available and is free of charge?	Public access/notice via Municipal Website
Number of Designated Facilities served:	None
Has a copy of this report been provided to all Designated Facilities?	N/A
Number of Interested Parties reported to:	N/A
Has a copy of this report been provided to all Interested Parties?	N/A
The following Drinking-Water Systems receive drinking water from this system:	N/A
Has a copy of this report been provided to connected owners?	N/A

Event Summary	# of Events	Date	Details
Ministry of Environment Inspections	2	Feb 8, 2017 &	Unannounced – Routine Drinking Water Inspection – Final Inspection Rating of 100%
		Dec 6, 2017	Announced-Detailed Drinking Water Inspection – Final Inspection Rating of 100%
Ministry of Labour Inspections	0		
DWQMS Audits	1	Jun 08, 2017	12 Month Surveillance Audit performed by SAI Global
AWQI's	0		
Non-Compliance	1	Mar 22, 2017	A monthly report had not been prepared solely for UV equipment alarms as per Schedule C, Section 1.6.4 of MDWL # 153-101, Issue #3.
Community Complaints	0		
Spills	0		

Quality Control Measures

Corporation of the Municipality of Centre Hastings facilities are part of OCWA's operational Trent Valley Hub. The facilities are supported by hub, regional and corporate resources. Operational Services are delivered by OCWA staff that live and work in the surrounding area. OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.

OCWA has additional "Value Added" and operational support services that Corporation of the Municipality of Centre Hastings benefits from including:

- Access to a network of operational compliance and support experts at the regional and corporate level, as well as affiliated programs that include the following:
 - Quality & Environmental Management System, Occupational Health & Safety System and an internal compliance audit system.
 - Process Data Collection (PDC) and PDM (WISKI) facility operating information repository, which consolidates field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.
 - Work Management System (WMS) tracks and reports maintenance activities, and creates predictive and preventative reports.
 - Outpost 5 wide-area SCADA system allows for process optimization and data logging, process trending, remote alarming and optimization of staff time.
- Client reporting which includes operational data, equipment inventory, financial statements, maintenance work orders, and capital status reports
- Site-Specific Contingency Plans and Standard Operating Procedures
- Use of accredited laboratories
- Access to a network of operational compliance and support experts at the hub, region and corporate level
- Additional support in response to unusual circumstances, and extra support in an emergency.
- Use of sampling schedules for external laboratory sampling

System Process Description

Raw Source

Raw water source for the Madoc Drinking Water System are two groundwater wells. The Rollins Well (Well 3) is considered the main water supply well, while the Whytock Well (Well 2) is proposed as a secondary standby well.

Treatment

A two well supply system, Well # 3– Rollins Street and Well #2 – Whytock Street. Both wells are considered to be groundwater under the direct influence of surface water (GUDI). Well #3 treatment system consists of a dual train cartridge filtration system. The Well #2 treatment system consists of a single train cartridge filtration system. Well #2 went offline on May 31, 2010 and is now a stand-by well. Both wells utilize filtration and ultraviolet light application for primary disinfection and sodium hypochlorite for secondary disinfection and are equipped with on-line alarmed continuous analyzers for treated water free chlorine residual and turbidity. Distribution free chlorine residual is continuously monitored with an on-line alarmed chlorine analyzer. The facility also contains a well pump lock out system in the case disinfection failure.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Sodium Hypochlorite	Disinfection	Brenntag

Summary of Non-Compliance

Non-Compliance Identified in a Ministry Inspection:

Ministry of Environment Inspection Rating: 100%

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
Schedule C, Section 1.6.4 of MDWL #153-101, Issue #3	<p>At the time of inspection, the Operating Authority had not prepared a monthly report solely for UV equipment alarms as per Schedule C, Section 1.6.4 of MDWL #153-101, Issue #3. Call-in records for the inspection period were provided that summarize the date /time and actions taken by operators responding to call-in alarms.</p> <p>Section 1.6.4 of Schedule C, MDWL #153-101, Issue #3. A monthly summary report shall be prepared at the end of each calendar month which sets out the time, date and duration of each UV equipment alarm, the volume of water treated during each alarm period and the actions taken by the operating authority to correct the alarm situation.</p>		<p>The Operating Authority for the Madoc Drinking Water System shall prepare a tracking tool to record the appropriate information for any UV equipment alarm as per Section 1.6.4 of Schedule C, MWDL #151-101 issue #3.</p> <p>Prior to the release of this report, the Operating Authority had submitted to the undersigned Provincial Officer the tracking form that will be used to track UV equipment alarms going forward.</p>	Complete

Adverse Water Quality Incidents

Date	AWQI #	Cause			Corrective Action Taken
		Parameter	Result	Exceedance of	
N/A					

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure	Corrective Action	Status

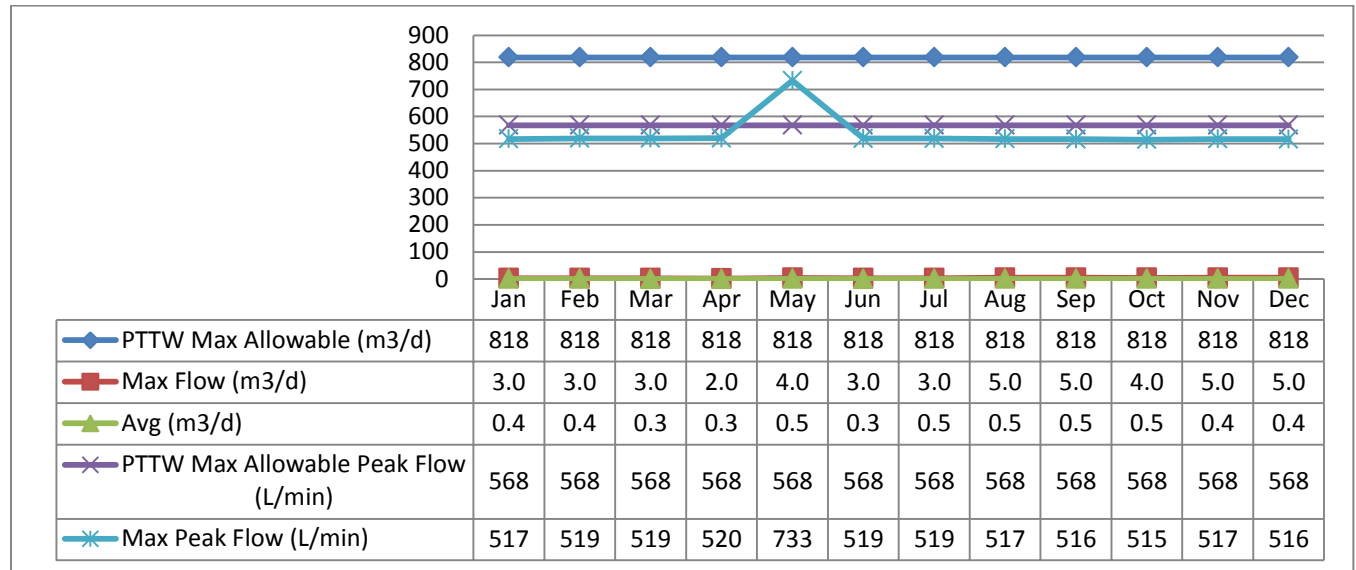
Flows

The Madoc Drinking Water System has a rated capacity for Rollins Street Pump house - 1,469m³/day and Whytock Street Pump house - 527m³/day. Additional flow data can be found under the Water Taking and Transfer Data.

Raw Water Flows

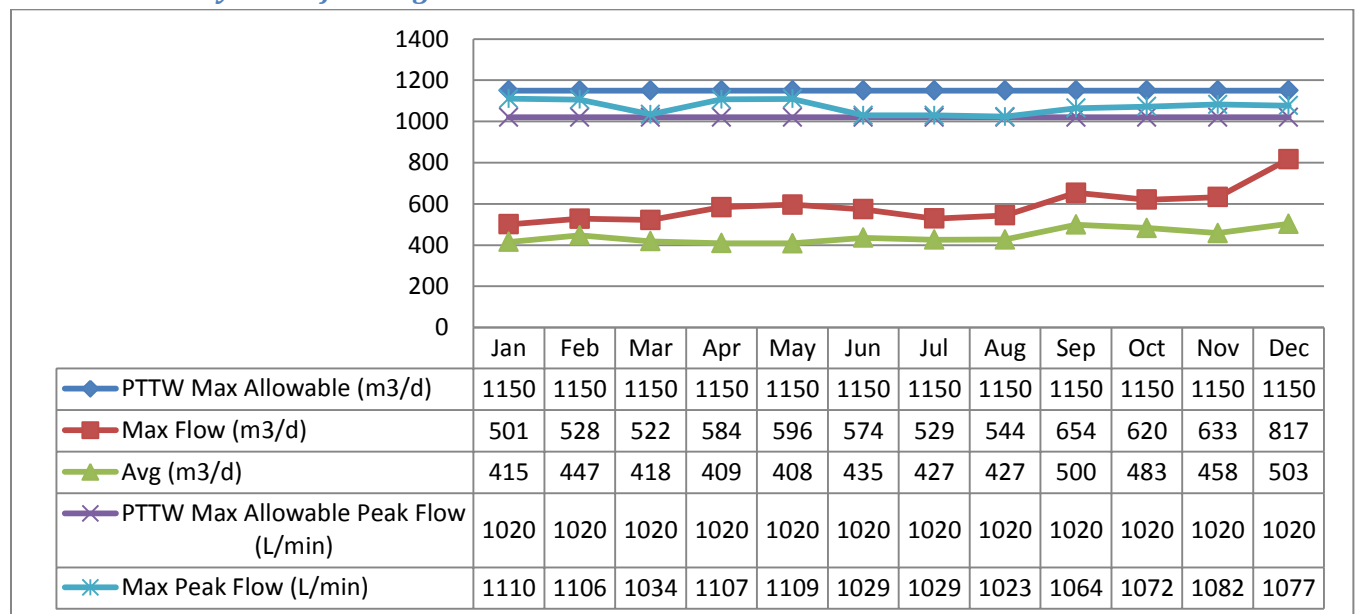
The Raw Water flows are regulated under the Permit to Take Water.

Raw Water Volume Taken: RW2



May 2016 - PTTW Max allowable peak flow was exceeded due to Annual Flow meter calibrations

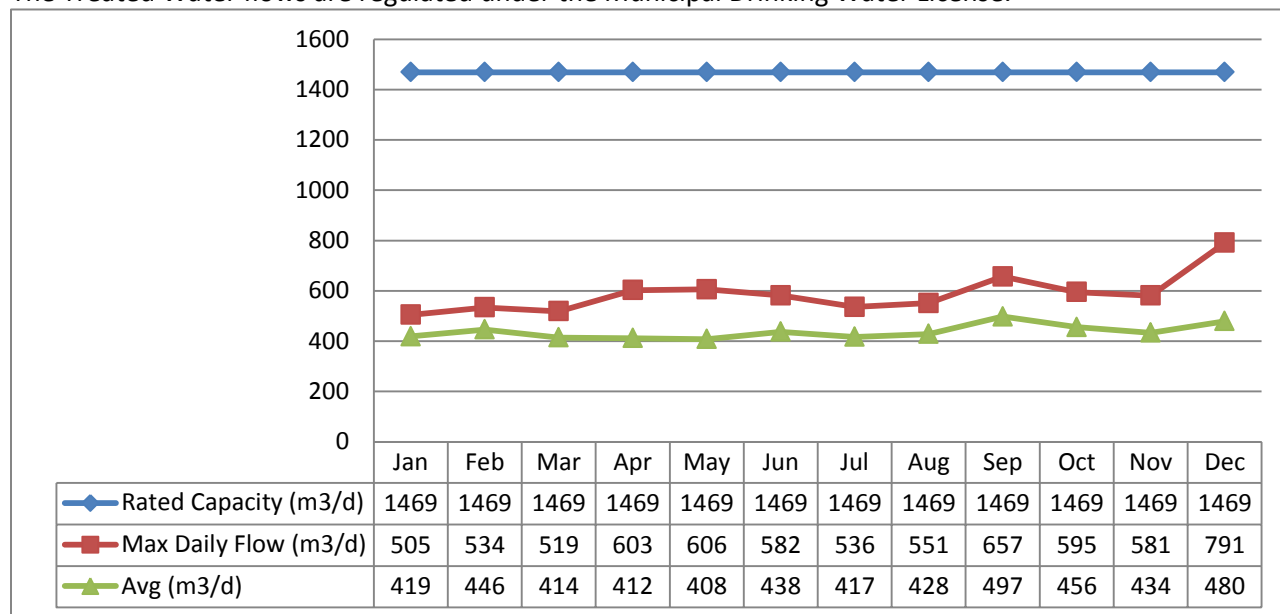
Raw Water Daily Rate of Taking: RW3



PTTW Max allowable peak flow was exceeded due to instantaneous exceedances in peak flow rate during start-up/pump to waste.

Treated Water Flows - TW3

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



Regulatory Sample Results Summary

- RW2 = Raw Water Well 2
- RW3 = Raw Water Well 3
- TW3 = Treated Water Well 3
- DW = Distribution Water

Microbiological Testing

Location	Number of Samples	E. Coli Results (min) - (max)	Total Coliform Results (min) - (max)	Number of HPC Samples	HPC Results (min) - (max)
Raw - RW2	52	0 - 0	0 - 1	~	~
Raw - RW3	52	0 - 8	0 - 124	~	~
Treated - TW3	53	0 - 0	0 - 0	53	0 - 1
Distribution - DW	125	0 - 0	0 - 0	123	0-1680

Operational Testing

On-Line

Parameter	Range of Results (min # - max #)
Turbidity, Well #3 Filter Effluent Train # 1 (NTU)	0.00 – 2.00 NTU*
Turbidity, Well #3 Filter Effluent Train # 2 (NTU)	0.00 – 2.00 NTU*
Chlorine, Well #3 Treated	0.00 – 4.91 mg/L*
Total Chlorine, Distribution	1.12 – 3.60 mg/L
Free Chlorine, Distribution	0.95 – 3.55 mg/L

* Instrument spikes and dips recorded by on-line instrumentation were a result of air bubbles and various maintenance and calibration activities. Power interruptions may also cause an instrument reading to drop to zero. All events are reviewed for compliance with O. Reg. 170/03 and if warranted, are reported to the Ministry of Environment as Adverse Water Quality Incidents.

In-House

Parameter	# of grab samples taken	Range of Results (min # - max #)
Raw Water Turbidity grabs - Well 2	12	0.28 – 3.61 NTU
Raw Water UVT grabs – Well 2	12	90.50 – 97.80 %
Raw Water Turbidity grabs - Well 3	12	0.12 – 0.89 NTU
Raw Water UVT grabs – Well 3	12	90.70 – 96.70 %
Well #3 Treated Water Free Chlorine	53	1.40 - 2.90 mg/L
Well #3 Treated Water Total Chlorine	53	1.62 – 3.30 mg/L
Distribution Free Chlorine	135	0.79 – 2.80 mg/L
Distribution Total Chlorine	135	0.96 – 3.20 mg/L

Additional Legislated Samples

Date of Legal Instrument issued	Parameter	Sample Location	# of grab samples taken	Range of Results (min # - max #)
MDWL : 153-101 Drinking Water Health Related Parameters	Antimony (ug/L)	RW 2	12	2.34 – 3.49
		RW 3	1	0.001
		TW 3	1	0.84
		DW	1	0.83
MDWL : 153-101 Drinking Water Non-Health Related Parameters	Organic Nitrogen (mg/L)	RW 2	4	<0.05 - 0.05
		RW 3	4	<0.05
	Dissolved Organic Carbon (mg/L)	RW 2	4	1.0 – 2.0
		RW 3	4	<1.00 – 6.00
	Ammonia (mg/L)	RW 2	Whytock did not operate in 2017	
Additional Samples	Total Kjeldahl Nitrogen (N) (mg/L)	RW 2	4	0.06-0.14
		RW 3	4	<0.05
	Total Ammonia Nitrogen (mg/L)	RW 2	4	0.06 – 0.15
		RW 3	4	<0.04 - <0.06
	Fluoride	TW	Fluoride is not used at this facility	

Lead Sampling

The Lead Sampling Program is required under O.Reg 170/03. This system qualified for the plumbing exemption.

Location	Date	Lead (ug/L)	pH	Alkalinity (mg/L) as CaCO ₃
Limits/Ranges				
		10.0	6.5-8.5	30-500
Hydrant #88	10-Apr-17	n/a	7.91	253
Hydrant #87	10-Apr-17	n/a	7.93	253
Hydrant #82	06-Oct-17	n/a	7.72	325
Hydrant #38	06-Oct-17	n/a	7.68	329

Inorganic Parameters

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level
- Fluoride and Sodium are only required to be tested every 60 months.

Parameter	Sample Date	Result Value	MAC	Exceedance	
				MAC	½ MAC
Antimony: Sb (ug/L) - TW3	2017/03/06	0.84	6.0	No	No
Arsenic: As (ug/L) - TW3	2017/03/06	2.3	25.0	No	No
Barium: Ba (ug/L) - TW3	2017/03/06	127.0	1000.0	No	No
Boron: B (ug/L) - TW3	2017/03/06	20.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW3	2017/03/06	0.091	5.0	No	No
Chromium: Cr (ug/L) - TW3	2017/03/06	0.56	50.0	No	No
Mercury: Hg (ug/L) - TW3	2017/03/06	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW3	2017/03/06	0.41	50.0	No	No
Uranium: U (ug/L) - TW3	2017/03/06	0.819	20.0	No	No
Additional Inorganics					
Nitrite (mg/L) - TW3	2017/01/09	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	2017/04/10	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	2017/07/10	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	2017/10/10	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW3	2017/01/09	3.16	10.0	No	No
Nitrate (mg/L) - TW3	2017/04/10	1.99	10.0	No	No
Nitrate (mg/L) - TW3	2017/07/10	2.06	10.0	No	No
Nitrate (mg/L) - TW3	2017/10/10	2.0	10.0	No	No

Organic Parameters

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

Parameter	Sample Date	Result Value	MAC	Exceedance	
				MAC	½ MAC
Alachlor (ug/L) - TW3	2017/03/06	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW3	2017/03/06	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW3	2017/03/06	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW3	2017/03/06	<MDL 0.32	1.00	No	No
Benzo(a)pyrene (ug/L) - TW3	2017/03/06	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW3	2017/03/06	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW3	2017/03/06	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW3	2017/03/06	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW3	2017/03/06	<MDL 0.16	2.00	No	No
Chlorpyrifos (ug/L) - TW3	2017/03/06	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW3	2017/03/06	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW3	2017/03/06	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW3	2017/03/06	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW3	2017/03/06	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW3	2017/03/06	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW3	2017/03/06	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW3	2017/03/06	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW3	2017/03/06	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW3	2017/03/06	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW3	2017/03/06	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW3	2017/03/06	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW3	2017/03/06	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW3	2017/03/06	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW3	2017/03/06	<MDL 0.02	190.00	No	No
Metolachlor (ug/L) - TW3	2017/03/06	<MDL 0.01	50.00	No	No
Metribuzin (ug/L) - TW3	2017/03/06	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW3	2017/03/06	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW3	2017/03/06	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW3	2017/03/06	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW3	2017/03/06	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW3	2017/03/06	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW3	2017/03/06	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW3	2017/03/06	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW3	2017/03/06	<MDL 0.01	1.00	No	No

Tetrachloroethylene (ug/L) - TW3	2017/03/06	<MDL 0.35	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW3	2017/03/06	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW3	2017/03/06	<MDL 0.44	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW3	2017/03/06	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW3	2017/03/06	<MDL 0.17	1.00	No	No
MCPA (mg/L) –TW3	2017/03/06	<MDL 0.12	100.00	No	No
DISTRIBUTION WATER					
Trihalomethane: Total (ug/L) Annual Average - DW	2017/01/01	19.25	100.00	No	No
HAA Total (ug/L) Annual Average - DW	2017/01/01	8.5		N/A	N/A

Maintenance Summary

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer’s and/or industry standards. Maintenance is completed using various tools and operational supports.

OCWA uses a Work Tracking Database (Maximo). Maximo is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is completed and added to the system.

Capital projects are listed and provided to the Corporation of the Municipality of Centre Hastings in the form of a “Capital Forecast”. This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

Preventative Maintenance Work Orders Completed	216
Operational Maintenance Work Orders Completed	14
Capital Maintenance Work Orders Completed	0
Weekly Maintenance Work Orders Completed	180

Maintenance Highlights: major expenses incurred to install, repair or replace required equipment

- Chlorine Preventative Maintenance Parts and Service
- Trojan UV Preventative Maintenance Parts and Service
- Annual flow meter calibrations

QEMS

A 12 month surveillance audit was conducted by QMI-SAI Canada Limited on Jun 08, 2017. The Corporation of the Municipality of Centre Hastings Quality Management System conforms to the Standard.

Water Taking and Transfer Data

Data for the reporting period of January 1, 2017 - December 31, 2017 was submitted electronically to the Ministry of the Environment and Climate Change on January 25, 2018 under Permit to Take Water #1383-AC9N3D.

The screenshot displays the WTRS web interface. At the top left is the Ontario logo. In the center is the 'environet WTRS' logo. At the top right is the text 'Ministry of the Environment and Climate Change'. Below the logos is a navigation menu with links: 'WT DATA', 'USER PROFILE', 'CONTACT US', 'HELP', 'HOME', and 'LOGOUT'. The breadcrumb trail shows 'Location: WTRS / WT DATA / Input WT Record' and the identifier 'WTRS-WT-04'. A green banner across the page reads 'Water Taking Data submitted successfully.'. Below this is a 'Confirmation:' section with the following text: 'Thank you for submitting your water taking data online.', 'Permit Number: 1383-AC9N3D', 'Permit Holder: THE CORPORATION OF THE MUNICIPALITY OF CENTRE HASTINGS.', and 'Received on: Jan 25, 2018 1:50 PM'. A final note states: '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.'