
Madoc Drinking Water System Annual Water Report

Reporting period of January 1, 2016 – December 31, 2016

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.

Table of Contents

Compliance Report Card	2
Report Availability	2
Quality Control Measures	3
System Process Description	3
Raw Source	3
Treatment	3
Treatment Chemicals used during the reporting year:	4
Summary of Non-Compliance	4
Non-Compliance Identified in a Ministry Inspection:.....	4
Adverse Water Quality Incidents.....	4
Non-Compliance	4
Flows.....	5
Raw Water Flows	5
Regulatory Sample Results Summary	6
Microbiological Testing.....	6
Operational Testing	6
Additional Legislated Samples.....	7
Lead Sampling.....	7
Inorganic Parameters	8
Organic Parameters.....	9
Maintenance Summary	10
Maintenance Highlights: major expenses incurred to install, repair or replace required equipment	10
QEMS	10
Water Taking and Transfer Data	11

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, 2016 – December 31, 2016

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	1	Jan 23, 2016	Announced-Focused Drinking Water Inspection – Final Inspection Rating of 100%
Ministry of Labour Inspections	0		
DWQMS Audits	1	May 06, 2016	Re-Accreditation Audit performed by SAI Global
AWQI's	2	July & Sept 2016	AWQI #137107 AWQI #131333
Non-Compliance	0		
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
N/A				

Adverse Water Quality Incidents

Date	AWQI #	Cause			Corrective Action Taken
		Parameter	Result	Exceedance of	
July 6, 2016	137107	Total Coliform	2	0	Resample, Retest
September 26, 2016	131333	Total Coliform	1	0	Resample, Retest

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
N/A				

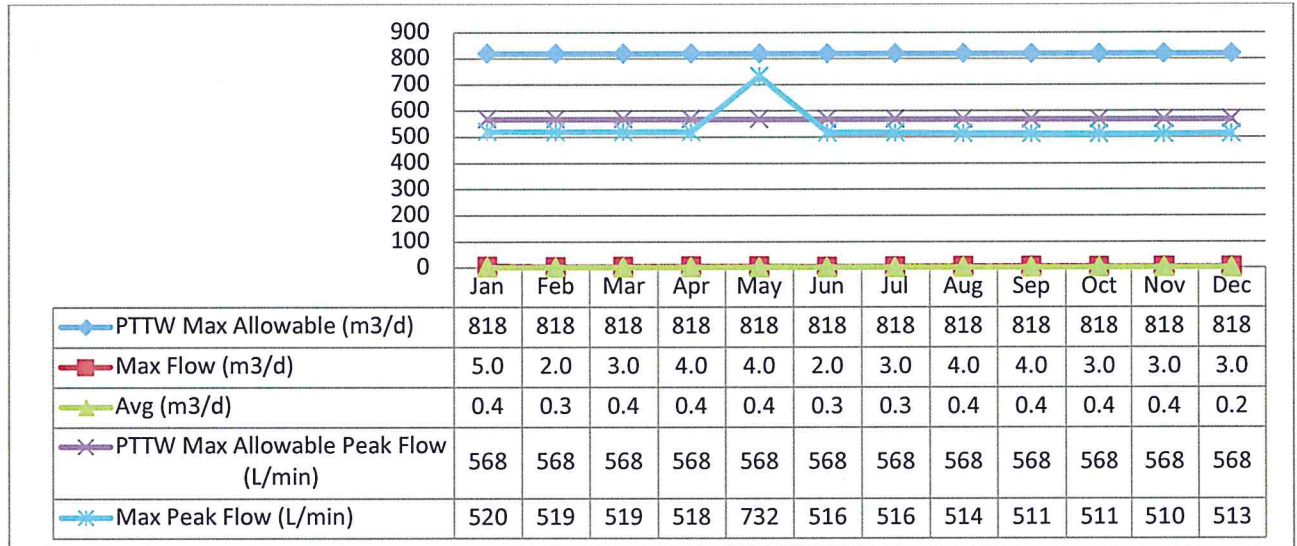
Flows

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

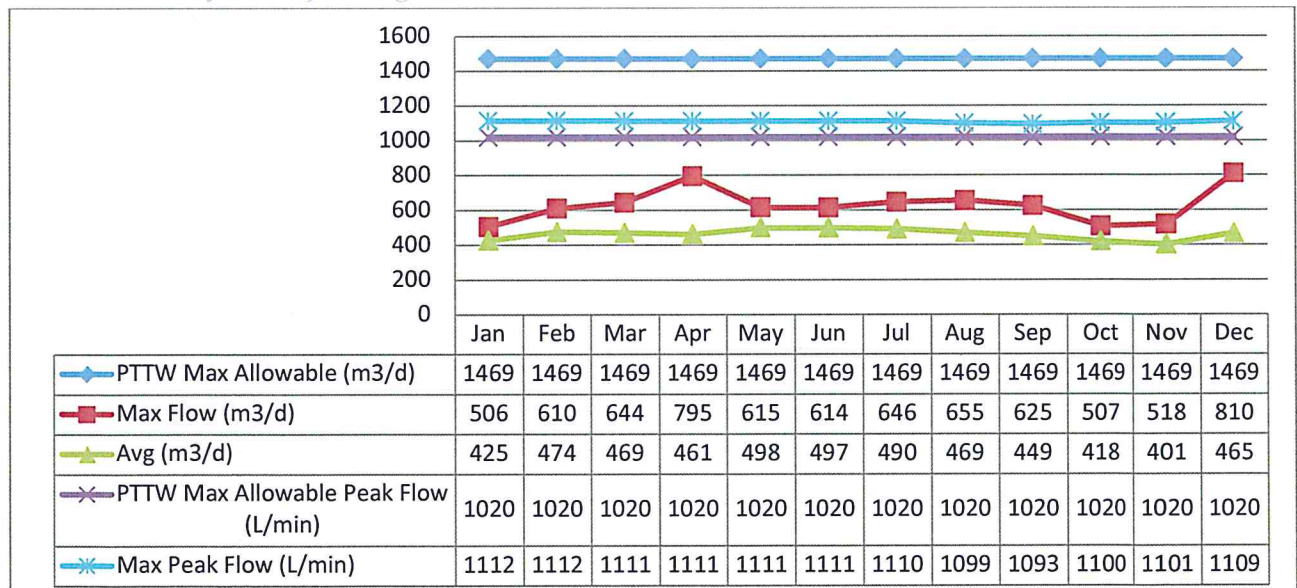
The Raw Water flows are regulated under the Permit to Take Water.

Raw Water Volume Taken: RW2



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

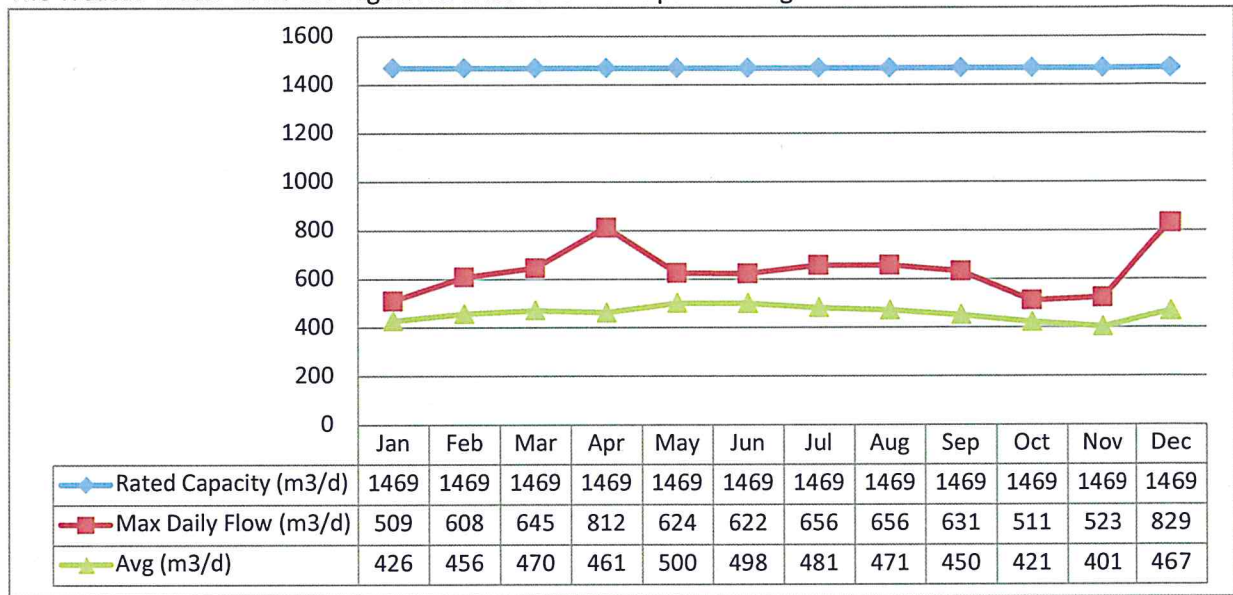
Raw Water Daily Rate of Taking: RW3



PTTW Max allowable peak flow was exceeded due to 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	53	0 - 0	0 - 17	~	~
Raw - RW3	53	0 - 3	0 - 71	~	~
Treated - TW3	55	0 - 0	0 - 1	54	0 - 2000
Distribution - DW	131	0 - 0	0 - 2	131	1 - 2000

Operational Testing

On-Line

Parameter	Range of Results (min # - max #)
Turbidity, Well #3 Filter Effluent Train # 1 (NTU)	0.00 - 1.99 NTU*
Turbidity, Well #3 Filter Effluent Train # 2 (NTU)	0.00 - 1.99 NTU*
Chlorine, Well #3 Treated	0.90 - 4.81 mg/L*
Total Chlorine, Distribution	1.02 - 2.95 mg/L
Free Chlorine, Distribution	0.96 - 2.01 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	0.42 – 2.83 NTU
Raw Water UVT grabs – Well 2	12	90.40 – 97.20 %
Raw Water Turbidity grabs - Well 3	12	0.16 – 0.88 NTU
Raw Water UVT grabs – Well 3	12	90.50 – 96.10 %
Well #3 Treated Water Free Chlorine	53	1.25 - 2.20 mg/L
Well #3 Treated Water Total Chlorine	53	1.51 - 2.40 mg/L
Distribution Free Chlorine	135	0.41 – 1.97 mg/L
Distribution Total Chlorine	135	0.70 – 2.30 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 <u>Health</u> Related Parameters	Antimony (ug/L)	RW 2	12	2.34 – 3.49
		RW 3	1	0.72
		TW 3	1	0.74
		DW	1	0.76
MDWL : 153-101 Drinking Water <u>Non-Health</u> Related Parameters	Organic Nitrogen (mg/L)	RW 2	4	<0.05 - 0.07
		RW 3	4	<0.05
	Dissolved Organic Carbon (mg/L)	RW 2	4	1.0 – 1.9
		RW 3	4	<1.00 - <2.00
	Ammonia (mg/L)	RW 2	Whytock did not operate in 2016	
Additional Samples	Total Kjeldahl Nitrogen (N) (mg/L)	RW 2	4	<0.05
		RW 3	4	<0.05
	Total Ammonia Nitrogen (mg/L)	RW 2	4	<0.04 - <0.09
		RW 3	4	<0.04 - <0.08
	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 CaCO3	
		Limits/Ranges	10.0	6.5-8.5	30-500
Hydrant #82	12-Apr-16	n/a	7.85	268	
Hydrant #87	12-Apr-16	n/a	7.60	281	
Hydrant #82	11-Oct-16	n/a	7.95	318	
Hydrant #87	11-Oct-16	n/a	7.77	312	

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	2016/03/14	0.74	6.0	No	No
Arsenic: As (ug/L) - TW3	2016/03/14	2.4	25.0	No	No
Barium: Ba (ug/L) - TW3	2016/03/14	131.0	1000.0	No	No
Boron: B (ug/L) - TW3	2016/03/14	23.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW3	2016/03/14	0.102	5.0	No	No
Chromium: Cr (ug/L) - TW3	2016/03/14	0.06	50.0	No	No
Mercury: Hg (ug/L) - TW3	2016/03/14	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW3	2016/03/14	0.36	10.0	No	No
Uranium: U (ug/L) - TW3	2016/03/14	0.855	10.0	No	No
Nitrite (mg/L) - TW3	2016/01/04	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	2016/04/11	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	2016/07/11	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	2016/10/11	<0.003	1.0	No	No
Nitrate (mg/L) - TW3	2016/01/04	2.63	10.0	No	No
Nitrate (mg/L) - TW3	2016/04/11	1.43	10.0	No	No
Nitrate (mg/L) - TW3	2016/07/11	2.29	10.0	No	No
Nitrate (mg/L) - TW3	2016/10/11	1.18	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	14/03/2016	<MDL 0.02	5	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW3	14/03/2016	<MDL 0.01	5	No	No
Azinphos-methyl (ug/L) - TW3	14/03/2016	<MDL 0.05	20	No	No
Benzene (ug/L) - TW3	14/03/2016	<MDL 0.32	5	No	No
Benzo(a)pyrene (ug/L) - TW3	14/03/2016	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW3	14/03/2016	<MDL 0.33	5	No	No
Carbaryl (ug/L) - TW3	14/03/2016	<MDL 0.05	90	No	No
Carbofuran (ug/L) - TW3	14/03/2016	<MDL 0.01	90	No	No
Carbon Tetrachloride (ug/L) - TW3	14/03/2016	<MDL 0.16	5	No	No
Chlorpyrifos (ug/L) - TW3	14/03/2016	<MDL 0.02	90	No	No
Diazinon (ug/L) - TW3	14/03/2016	<MDL 0.02	20	No	No
Dicamba (ug/L) - TW3	14/03/2016	<MDL 0.2	120	No	No
1,2-Dichlorobenzene (ug/L) - TW3	14/03/2016	<MDL 0.41	200	No	No
1,4-Dichlorobenzene (ug/L) - TW3	14/03/2016	<MDL 0.36	5	No	No
1,2-Dichloroethane (ug/L) - TW3	14/03/2016	<MDL 0.35	5	No	No
1,1-Dichloroethylene (ug/L) - TW3	14/03/2016	<MDL 0.33	14	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW3	14/03/2016	<MDL 0.35	50	No	No
2,4-Dichlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.15	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW3	14/03/2016	<MDL 0.19	100	No	No
Diclofop-methyl (ug/L) - TW3	14/03/2016	<MDL 0.4	9	No	No
Dimethoate (ug/L) - TW3	14/03/2016	<MDL 0.03	20	No	No
Diquat (ug/L) - TW3	14/03/2016	<MDL 1.0	70	No	No
Diuron (ug/L) - TW3	14/03/2016	<MDL 0.03	150	No	No
Glyphosate (ug/L) - TW3	14/03/2016	<MDL 1.0	280	No	No
Malathion (ug/L) - TW3	14/03/2016	<MDL 0.02	190	No	No
Metolachlor (ug/L) - TW3	14/03/2016	<MDL 0.01	50	No	No
Metribuzin (ug/L) - TW3	14/03/2016	<MDL 0.02	80	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW3	14/03/2016	<MDL 0.3	80	No	No
Paraquat (ug/L) - TW3	14/03/2016	<MDL 1.0	10	No	No
PCB (ug/L) - TW3	14/03/2016	<MDL 0.04	3	No	No
Pentachlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.15	60	No	No
Phorate (ug/L) - TW3	14/03/2016	<MDL 0.01	2	No	No
Picloram (ug/L) - TW3	14/03/2016	<MDL 1.0	190	No	No
Prometryne (ug/L) - TW3	14/03/2016	<MDL 0.03	1	No	No
Simazine (ug/L) - TW3	14/03/2016	<MDL 0.01	10	No	No
Terbufos (ug/L) - TW3	14/03/2016	<MDL 0.01	1	No	No
Tetrachloroethylene (ug/L) - TW3	14/03/2016	<MDL 0.35	30	No	No

2,3,4,6-Tetrachlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.2	100	No	No
Triallate (ug/L) - TW3	14/03/2016	<MDL 0.01	230	No	No
Trichloroethylene (ug/L) - TW3	14/03/2016	<MDL 0.44	50	No	No
2,4,6-Trichlorophenol (ug/L) - TW3	14/03/2016	<MDL 0.25	5	No	No
Trifluralin (ug/L) - TW3	14/03/2016	<MDL 0.02	45	No	No
Vinyl Chloride (ug/L) - TW3	14/03/2016	<MDL 0.17	2	No	No
MCPA (mg/L) –TW3	14/03/2016	<MDL 0.00012	-	-	-
DISTRIBUTION WATER					
Trihalomethane: Total (ug/L) Annual Average - DW	2016		19	100	No No

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 Workplace Maintenance System (WMS). WMS 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	215
Operational Maintenance Work Orders Completed	19
Capital Maintenance Work Orders Completed	1
Weekly Maintenance Work Orders Completed	432

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


- Filters
- Chlorine Preventative Maintenance Parts and Service
- Trojan UV Preventative Maintenance Parts and Service
- VFD Installation
- Annual flow meter calibrations.

QEMS

A Re-Accreditation Audit was conducted by QMI-SAI Canada Limited on May 6, 2016. 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, 2016 - December 31, 2016 was submitted electronically to the Ministry of the Environment and Climate Change on January 26, 2017 under Permit to Take Water #1601-6WDLG5 and #1383-AC9N3D.



Ministry of the Environment
and Climate Change

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Water Taking Data submitted successfully.

Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 1383-AC9N3D
Permit Holder: THE CORPORATION OF THE MUNICIPALITY OF CENTRE HASTINGS.
Received on: Jan 26, 2017 9:56 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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Water Taking Data submitted successfully.

Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 1601-6WDLG5
Permit Holder: THE CORPORATION OF THE MUNICIPALITY OF CENTRE HASTINGS.
Received on: Jan 26, 2017 10:23 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.