Havelock Drinking Water System

Annual Water Report

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

Prepared For: The Township of Havelock-Belmont-Methuen

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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Report Availability

Population Served:	< 10,000
Website where the annual report can be viewed by the public:	www.hbmtwp.ca
Alternate location were 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 Township Website and Utility Bill
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

Compliance Report Card

Drinking Water System Number:	210000595
System Owner:	The Corporation of the Township of Havelock-Belmont-Methuen
Operating Authority:	Ontario Clean Water Agency
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2017 – December 31, 2017

Event Summary	# of Events	Date	Details
Ministry of Environment Inspections	0		
Ministry of Labour Inspections	0		
DWQMS Audits	1	May 2, 2017	S.2 Surveillance Audit
AWQI's	0		
Non-Compliance	1	Oct 16, 2017	Sample was not collected in accordance with O. Reg 170/03 15.1-5 (5)
Community Complaints	2		Visual
Spills	0		

Quality Control Measures

The Township of Havelock-Belmont-Methuen 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 who 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 the Township of Havelock-Belmont-Methuen 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) and Maximo track 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 Havelock Drinking Water System are from three groundwater wells; Well 1, Well 3 and Well 4.

Treatment

The Havelock Drinking Water System is operated with two treatment subsystems; Well #3 which is an independent subsystem and Wells 1&4 which are operated together. Well #3 is under the direct influence of surface water system. Treatment consists of chemically assisted duel media (GAC/sand) gravity filtration plus ultraviolet and sodium hypochlorite disinfection. Well #1 and Well #4 utilize ultraviolet disinfection and sodium hypochlorite for treatment. This water system has continuous, alarmed monitoring for treated water free chlorine residual, filter effluent turbidity and distribution free chlorine residual.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
SternPac	Primary Coagulation	Kemira
Magnafloc	Coagulant aid	BASF Canada
Granular Activated Carbon	Filter Media	Nichem
Sodium Hypochlorite – 12%	Disinfection	Brenntag

Summary of Non-Compliance

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 (i.e. date(s))	Corrective Action	Status
O.Reg 170/03 15.1-5 (5)	Collected the pH and alkalinity samples on Oct 16, 2017. Outside the required sampling period of June 15 to October 15	1 day	Implemented online advanced notification. Full review on Section 15.1 Lead of O. Reg 170/03.	Resolved

Non-Compliance Identified in a Ministry Inspection:

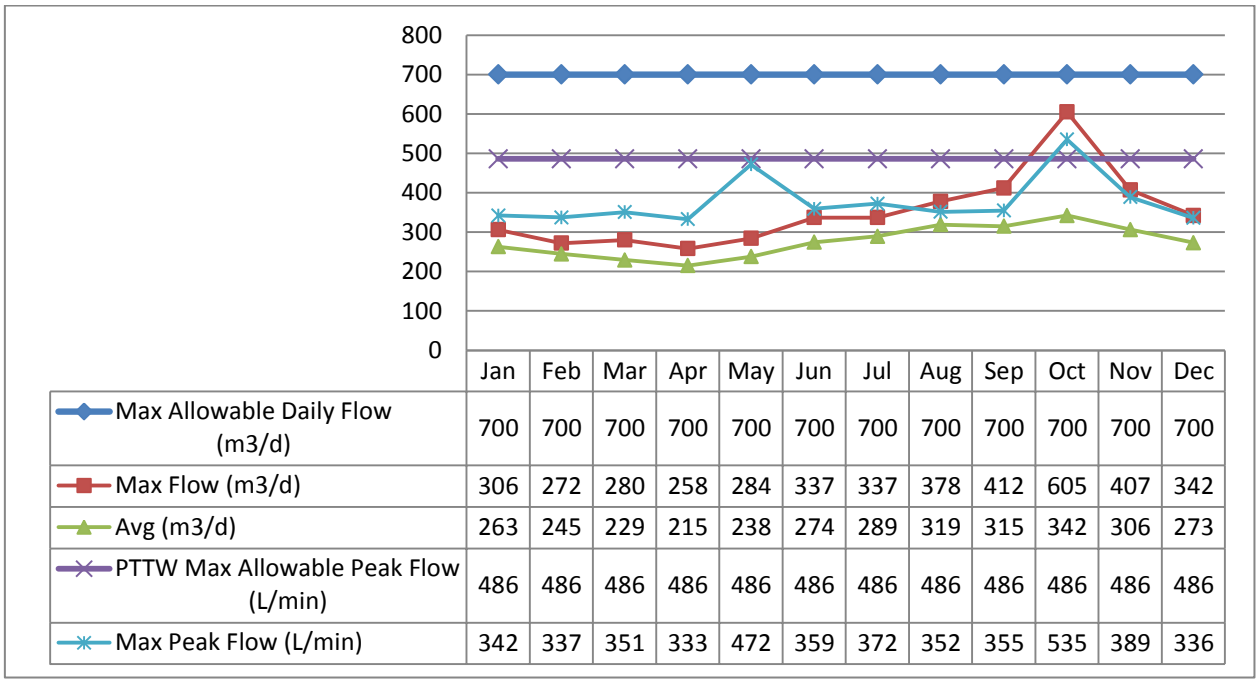
Ministry of Environment Inspection Rating: N/A

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

Raw Water Flows

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

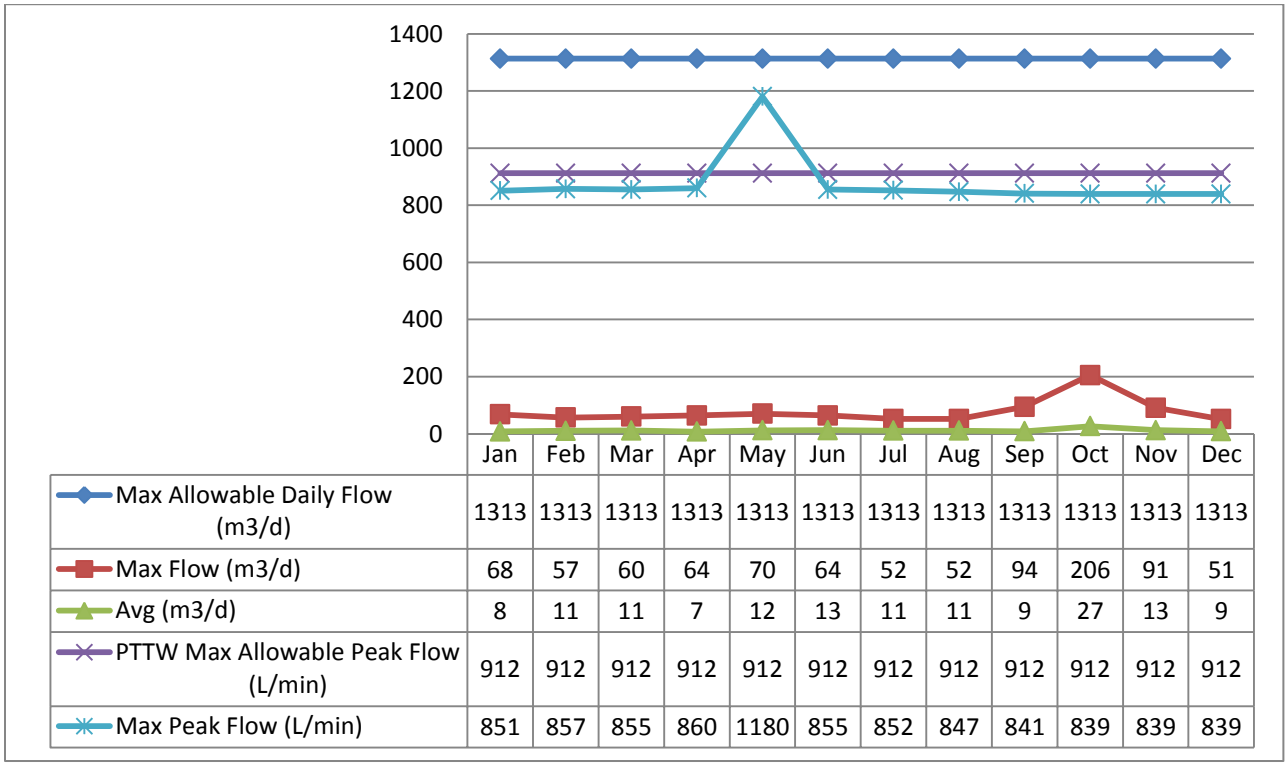
Raw Water Volume Taken- Raw Well 1:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable Daily Flow (m3/d)	700	700	700	700	700	700	700	700	700	700	700	700
Max Flow (m3/d)	306	272	280	258	284	337	337	378	412	605	407	342
Avg (m3/d)	263	245	229	215	238	274	289	319	315	342	306	273
PTTW Max Allowable Peak Flow (L/min)	486	486	486	486	486	486	486	486	486	486	486	486
Max Peak Flow (L/min)	342	337	351	333	472	359	372	352	355	535	389	336

The Peak flow rate was exceeded in October 2017 due to hydrant flushing maintenance.

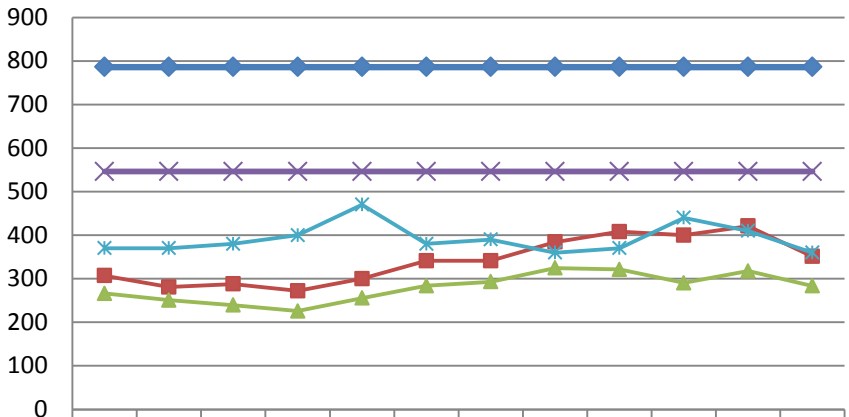
Raw Water Daily Rate of Taking Raw Well 3:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable Daily Flow (m3/d)	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313
Max Flow (m3/d)	68	57	60	64	70	64	52	52	94	206	91	51
Avg (m3/d)	8	11	11	7	12	13	11	11	9	27	13	9
PTTW Max Allowable Peak Flow (L/min)	912	912	912	912	912	912	912	912	912	912	912	912
Max Peak Flow (L/min)	851	857	855	860	1180	855	852	847	841	839	839	839

The Peak Flow rate was exceeded in May 2017 during scheduled flow meter calibrations.

Raw Water Daily Rate of Taking Raw Well 4:

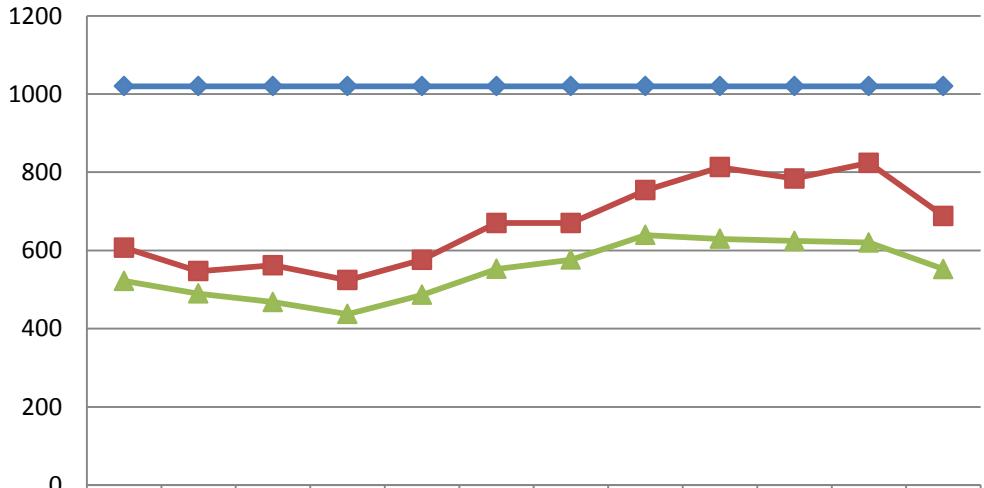


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable Daily Flow (m3/d)	786	786	786	786	786	786	786	786	786	786	786	786
Max Flow (m3/d)	307	281	288	272	300	341	341	384	408	400	421	351
Avg (m3/d)	266	251	239	226	255	284	293	325	321	291	318	283
PTTW Max Allowable Peak Flow (L/min)	546	546	546	546	546	546	546	546	546	546	546	546
Max Peak Flow (L/min)	370	370	380	400	470	380	390	360	370	440	410	360

Treated Water Flows

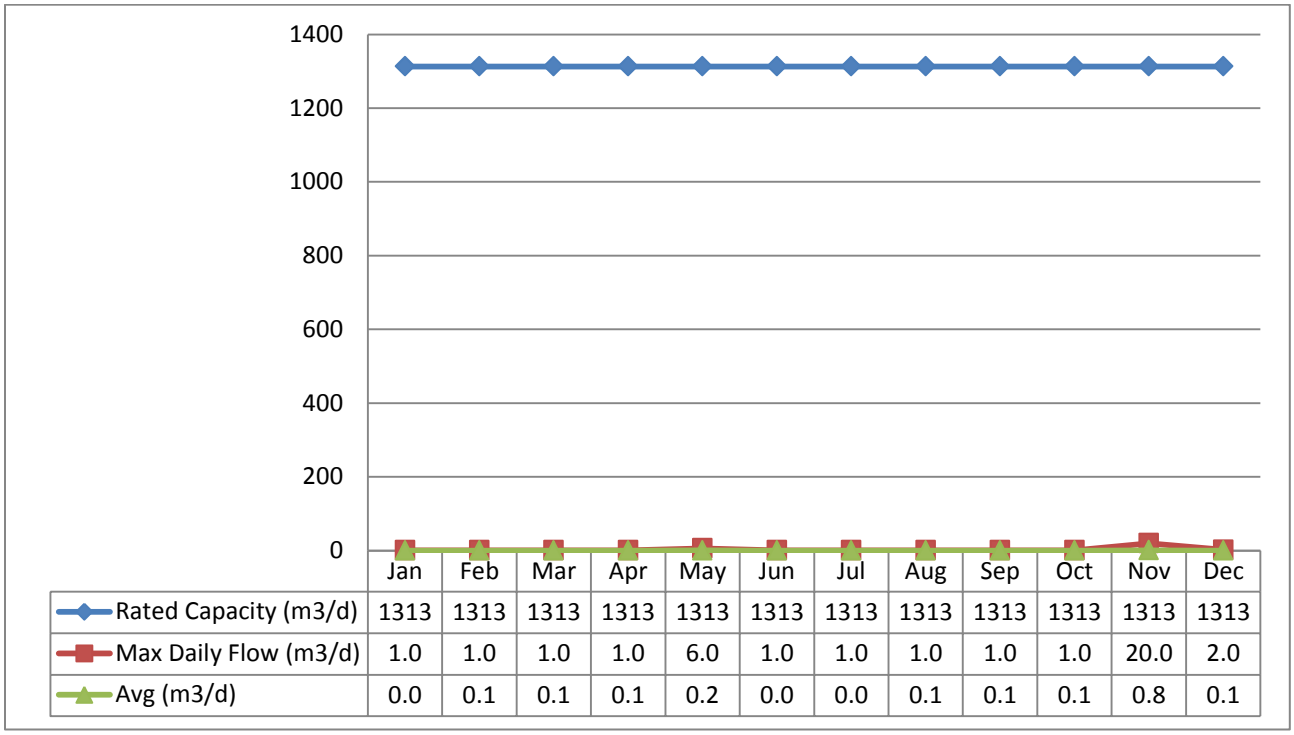
The Treated Water flows are regulated under the Municipal Drinking Water License. The Havelock Drinking Water System has a rated capacity of 1020m3/day for Well 1&4 and 1313m^3/day for Well 3. Additional flow data can be found under the Water Taking and Transfer Data section.

Treated Water Well 1 & 4:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rated Capacity (m3/d)	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020
Max Daily Flow (m3/d)	607	547	562	524	576	670	670	754	813	784	824	688
Avg (m3/d)	522	490	468	437	486	553	576	639	630	624	620	552

Treated Water Well 3:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rated Capacity (m3/d)	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313
Max Daily Flow (m3/d)	1.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	20.0	2.0
Avg (m3/d)	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.1	0.1	0.8	0.1

Regulatory Sample Results Summary

- RW1 = Raw Water Well 1
- RW3 = Raw Water Well 3
- RW4 = Raw Water Well 4
- TW3 = Treated Water Well 3
- TWc = Treated Water Well 1&4 Combined
- 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, Well 1	52	0 – 0	0 – 5	~	~
Raw, Well 3	52	0 - 20	0 – 100	~	~
Raw, Well 4	52	0 – 0	0 – 4	~	~
Treated, Well 3	53	0 – 0	0 - 0	53	0 – 29
Treated – Well 1 & 4 Combined	52	0 - 0	0 - 0	52	0 – 5
Distribution - DW	154	0 - 0	0 - 0	154	0 – 420

Operational Testing

On-Line

Parameter	Range of Results (min # - max #)
Filter #1 Effluent Turbidity, Well 3	0.00 - 4.57 NTU*
Filter #2 Effluent Turbidity, Well 3	0.00 – 3.63 NTU*
Treated Water Free Chlorine, Well 3	0.79 – 2.73 mg/L*
Turbidity, Well 1	0.00 – 5.00 NTU*
Turbidity, Well 4	0.00 – 5.00 NTU*
Treated Water Free Chlorine, TWc	1.22 – 3.03 mg/L
Distribution Free Chlorine	0.91 – 2.52 mg/L
Treated Water Fluoride	Fluoride is not added at this facility

***** 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, Well 1	12	0.00 – 4.42 NTU*
Raw Water Turbidity, Well 4	12	0.12 – 0.21 NTU
Treated Water Free Chlorine, Well 1&4	53	1.22 – 3.03 mg/L
Treated Water Free Chlorine, Well 3	53	0.79 – 2.73 mg/L*
Distribution Free Chlorine	167	0.91 – 2.52 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.

Laboratory

Parameter	# of grab samples taken	Range of Results (min # - max #)
Treated Water Fluoride	Fluoride is not used at this facility	
Raw Water Iron, Well 3	12	151.0 – 24,000.0 ug/L
Raw Water Manganese, Well 3	12	135.0 – 1,930.0 ug/L
Treated Water Iron, Well 3	12	21 – 113.0 ug/L
Treated Water Manganese, Well 3	12	5.0 – 39.0 ug/L

Additional Legislated Samples

Legal Document	Date of Issuance	Parameter	# of grab samples taken	Range of Results (min # - max #)
Municipal Licence	June 29, 2016	Suspended Solids	12	<2.0 – 2.0 mg/L

Inorganic Parameters

- MAC = Maximum Allowable Concentration as per O. Reg 169/03
- BDL = Below the laboratory detection level
- Note: 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) - TWc	2017/03/06	0.07	6.0	No	No
Antimony: Sb (ug/L) - TW3	2017/03/06	0.09	6.0	No	No
Arsenic: As (ug/L) - TWc	2017/03/06	<MDL 0.2	25.0	No	No
Arsenic: As (ug/L) - TW3	2017/03/06	0.2	25.0	No	No
Barium: Ba (ug/L) - TWc	2017/03/06	135.0	1000.0	No	No
Barium: Ba (ug/L) - TW3	2017/03/06	58.4	1000.0	No	No
Boron: B (ug/L) - TWc	2017/03/06	38.0	5000.0	No	No
Boron: B (ug/L) - TW3	2017/03/06	15.0	5000.0	No	No
Cadmium: Cd (ug/L) - TWc	2017/03/06	0.004	5.0	No	No
Cadmium: Cd (ug/L) - TW3	2017/03/06	<MDL 0.003	5.0	No	No
Chromium: Cr (ug/L) - TWc	2017/03/06	1.03	50.0	No	No
Chromium: Cr (ug/L) - TW3	2017/03/06	1.57	50.0	No	No
Mercury: Hg (ug/L) - TWc	2017/03/06	<MDL 0.01	1.0	No	No
Mercury: Hg (ug/L) - TW3	2017/03/06	0.02	1.0	No	No
Selenium: Se (ug/L) - TWc	2017/03/06	0.94	10.0	No	No
Selenium: Se (ug/L) - TW3	2017/03/06	0.16	10.0	No	No
Uranium: U (ug/L) - TWc	2017/03/06	0.187	20.0	No	No
Uranium: U (ug/L) - TW3	2017/03/06	0.035	20.0	No	No
Nitrite (mg/L) - TWc	2017/01/09	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TWc	2017/04/10	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TWc	2017/07/10	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TWc	2017/10/10	<MDL 0.003	1.0	No	No
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) - TWc	2017/01/09	1.96	10.0	No	No
Nitrate (mg/L) - TWc	2017/04/10	2.11	10.0	No	No
Nitrate (mg/L) - TWc	2017/07/10	2.69	10.0	No	No
Nitrate (mg/L) - TWc	2017/10/10	2.42	10.0	No	No
Nitrate (mg/L) - TW3	2017/01/09	0.139	10.0	No	No
Nitrate (mg/L) - TW3	2017/04/10	0.179	10.0	No	No
Nitrate (mg/L) - TW3	2017/07/10	0.338	10.0	No	No
Nitrate (mg/L) - TW3	2017/10/10	0.177	10.0	No	No

Organic Parameters

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

TREATED WATER	Sample Date	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TWc	2017/03/06	<MDL 0.02	5	No	No
Alachlor (ug/L) - TW3	2017/03/06	<MDL 0.02	5	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TWc	2017/03/06	<MDL 0.01	5	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW3	2017/03/06	<MDL 0.01	5	No	No
Azinphos-methyl (ug/L) - TWc	2017/03/06	<MDL 0.05	20	No	No
Azinphos-methyl (ug/L) - TW3	2017/03/06	<MDL 0.05	20	No	No
Benzene (ug/L) - TWc	2017/03/06	<MDL 0.32	5	No	No
Benzene (ug/L) - TW3	2017/03/06	<MDL 0.32	5	No	No
Benzo(a)pyrene (ug/L) - TWc	2017/03/06	<MDL 0.004	0.01	No	No
Benzo(a)pyrene (ug/L) - TW3	2017/03/06	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TWc	2017/03/06	<MDL 0.33	5	No	No
Bromoxynil (ug/L) - TW3	2017/03/06	<MDL 0.33	5	No	No
Carbaryl (ug/L) - TWc	2017/03/06	<MDL 0.05	90	No	No
Carbaryl (ug/L) - TW3	2017/03/06	<MDL 0.05	90	No	No
Carbofuran (ug/L) - TWc	2017/03/06	<MDL 0.01	90	No	No
Carbofuran (ug/L) - TW3	2017/03/06	<MDL 0.01	90	No	No
Carbon Tetrachloride (ug/L) - TWc	2017/03/06	<MDL 0.16	5	No	No
Carbon Tetrachloride (ug/L) - TW3	2017/03/06	<MDL 0.16	5	No	No
Chlorpyrifos (ug/L) - TWc	2017/03/06	<MDL 0.02	90	No	No
Chlorpyrifos (ug/L) - TW3	2017/03/06	<MDL 0.02	90	No	No
Diazinon (ug/L) - TWc	2017/03/06	<MDL 0.02	20	No	No
Diazinon (ug/L) - TW3	2017/03/06	<MDL 0.02	20	No	No
Dicamba (ug/L) - TWc	2017/03/06	<MDL 0.2	120	No	No
Dicamba (ug/L) - TW3	2017/03/06	<MDL 0.2	120	No	No
1,2-Dichlorobenzene (ug/L) - TWc	2017/03/06	<MDL 0.41	200	No	No
1,2-Dichlorobenzene (ug/L) - TW3	2017/03/06	<MDL 0.41	200	No	No
1,4-Dichlorobenzene (ug/L) - TWc	2017/03/06	<MDL 0.36	5	No	No
1,4-Dichlorobenzene (ug/L) - TW3	2017/03/06	<MDL 0.36	5	No	No
1,2-Dichloroethane (ug/L) - TWc	2017/03/06	<MDL 0.35	5	No	No
1,2-Dichloroethane (ug/L) - TW3	2017/03/06	<MDL 0.35	5	No	No
1,1-Dichloroethylene (ug/L) - TWc	2017/03/06	<MDL 0.33	14	No	No
1,1-Dichloroethylene (ug/L) - TW3	2017/03/06	<MDL 0.33	14	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TWc	2017/03/06	<MDL 0.35	50	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW3	2017/03/06	<MDL 0.35	50	No	No
2,4-Dichlorophenol (ug/L) - TWc	2017/03/06	<MDL 0.15	900	No	No
2,4-Dichlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.15	900	No	No

2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TWc	2017/03/06	<MDL 0.19	100	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW3	2017/03/06	<MDL 0.19	100	No	No
Diclofop-methyl (ug/L) - TWc	2017/03/06	<MDL 0.4	9	No	No
Diclofop-methyl (ug/L) - TW3	2017/03/06	<MDL 0.4	9	No	No
Dimethoate (ug/L) - TWc	2017/03/06	<MDL 0.03	20	No	No
Dimethoate (ug/L) - TW3	2017/03/06	<MDL 0.03	20	No	No
Diquat (ug/L) - TWc	2017/03/06	<MDL 1.0	70	No	No
Diquat (ug/L) - TW3	2017/03/06	<MDL 1.0	70	No	No
Diuron (ug/L) - TWc	2017/03/06	<MDL 0.03	150	No	No
Diuron (ug/L) - TW3	2017/03/06	<MDL 0.03	150	No	No
Glyphosate (ug/L) - TWc	2017/03/06	<MDL 1.0	280	No	No
Glyphosate (ug/L) - TW3	2017/03/06	<MDL 1.0	280	No	No
Malathion (ug/L) - TWc	2017/03/06	<MDL 0.02	190	No	No
Malathion (ug/L) - TW3	2017/03/06	<MDL 0.02	190	No	No
Metolachlor (ug/L) - TWc	2017/03/06	<MDL 0.01	50	No	No
Metolachlor (ug/L) - TW3	2017/03/06	<MDL 0.01	50	No	No
Metribuzin (ug/L) - TWc	2017/03/06	<MDL 0.02	80	No	No
Metribuzin (ug/L) - TW3	2017/03/06	<MDL 0.02	80	No	No
MCPA (mg/L) - TW3	2017/03/06	<MDL 0.00012	-	-	-
MCPA (mg/L) - TWc	2017/03/06	<MDL 0.00012	-	-	-
Monochlorobenzene (Chlorobenzene) (ug/L) - TWc	2017/03/06	<MDL 0.3	80	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW3	2017/03/06	<MDL 0.3	80	No	No
Paraquat (ug/L) - TWc	2017/03/06	<MDL 1.0	10	No	No
Paraquat (ug/L) - TW3	2017/03/06	<MDL 1.0	10	No	No
PCB (ug/L) - TWc	2017/03/06	<MDL 0.04	3	No	No
PCB (ug/L) - TW3	2017/03/06	<MDL 0.04	3	No	No
Pentachlorophenol (ug/L) - TWc	2017/03/06	<MDL 0.15	60	No	No
Pentachlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.15	60	No	No
Phorate (ug/L) - TWc	2017/03/06	<MDL 0.01	2	No	No
Picloram (ug/L) - TWc	2017/03/06	<MDL 1.0	190	No	No
Prometryne (ug/L) - TWc	2017/03/06	<MDL 0.03	1	No	No
Prometryne (ug/L) - TW3	2017/03/06	<MDL 0.03	1	No	No
Simazine (ug/L) - TWc	2017/03/06	<MDL 0.01	10	No	No
Simazine (ug/L) - TW3	2017/03/06	<MDL 0.01	10	No	No
Terbufos (ug/L) - TWc	2017/03/06	<MDL 0.01	1	No	No
Terbufos (ug/L) - TW3	2017/03/06	<MDL 0.01	1	No	No
Tetrachloroethylene (ug/L) - TWc	2017/03/06	<MDL 0.35	30	No	No
Tetrachloroethylene (ug/L) - TW3	2017/03/06	<MDL 0.35	30	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TWc	2017/03/06	<MDL 0.2	100	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.2	100	No	No
Triallate (ug/L) - TWc	2017/03/06	<MDL 0.01	230	No	No
Triallate (ug/L) - TW3	2017/03/06	<MDL 0.01	230	No	No

Trichloroethylene (ug/L) - TWc	2017/03/06	<MDL 0.44	50	No	No
Trichloroethylene (ug/L) - TW3	2017/03/06	<MDL 0.44	50	No	No
2,4,6-Trichlorophenol (ug/L) - TWc	2017/03/06	<MDL 0.25	5	No	No
2,4,6-Trichlorophenol (ug/L) - TW3	2017/03/06	<MDL 0.25	5	No	No
Trifluralin (ug/L) - TWc	2017/03/06	<MDL 0.02	45	No	No
Trifluralin (ug/L) - TW3	2017/03/06	<MDL 0.02	45	No	No
Vinyl Chloride (ug/L) - TWc	2017/03/06	<MDL 0.17	2	No	No
Vinyl Chloride (ug/L) - TW3	2017/03/06	<MDL 0.17	2	No	No
DISTRIBUTION WATER					
Trihalomethane: Total (ug/L) Annual Average - DW	2017	33.75	100	No	No
HAA: Total (ug/L) Annual Average – DW	2017	8.75	N/A	No	No

Lead Sampling

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

Location	Date	Lead (mg/L)	pH	Alkalinity (mg/L) as CACO3
Hydrant #47	05-Apr-17	n/a	8.06	265
Hydrant #68	05-Apr-17	n/a	8.06	274
Hydrant #47	16-Oct-17	n/a	7.85	284
Hydrant #68	16-Oct-17	n/a	7.52	280

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.

Preventative Maintenance Work Orders Completed	276
Operational Maintenance Work Orders Completed	3
Capital Maintenance Work Orders Completed	1
Weekly Maintenance Work Orders Completed	427

Capital projects are listed and provided to the The Township of Havelock-Belmont-Methuen in the form of a "Capital Forecast". This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

QEMS

A S2 Surveillance Audit was conducted by QMI-SAI Canada Limited on May 2, 2017. The Township of Havelock-Belmont-Methuen's Quality Management System conforms to the Standard.

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

Well 1 & 4:
• Chlorine system parts and probe
• Trojan UV Parts & Maintenance
Well 3:
• Hallet UV Parts
• Iron and Manganese Laboratory Analysis

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 on Jan 24, 2018 under Permit to Take Water PTTW 3448-9LMT5K