

O. Reg. 170/03 Section 11 ANNUAL REPORT

Drinking-Water System Number:	220003118
Drinking-Water System Name:	Woodward Sub-System of Hamilton Drinking Water System
Drinking-Water System Owner:	City of Hamilton
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2017 to December 31, 2017

<u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u>	<u>Complete for all other Categories</u>
<p>Does your Drinking-Water System serve more than 10,000 people? Yes [X] No []</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [] www.hamilton.ca/water</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <p>700 Woodward Administration Building and Compliance Support Group</p>	<p>Number of Designated Facilities served:</p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to:</p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
Caledonia/Cayuga/York Water Distribution System	260004566
North Aldershot Water Distribution System	260086762
Snake Road Water Distribution System	260086775
Bridgeview Community Water Distribution System	260068419

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [X] No [] Not applicable []

Indicate how you notified system users that your annual report is available, and is free of charge.

System users are notified that the annual report is available and free of charge via the Web and Local Newspaper.

Describe your Drinking-Water System

The Woodward Treatment Facility supplies a significant portion of Hamilton's population with drinking water including Stoney Creek, Dundas, Ancaster, Waterdown, Flamborough and Glanbrook. The population served is estimated at 537,000. In addition, the treatment system provides treated water to parts of the Haldimand County (Caledonia, York and Cayuga) and parts of Halton Region.

The intake is comprised of three intake pipes: 1.22m, 1.52m and 2.44m in diameter that extend into Lake Ontario 640m, 915m and 945m respectively. The 2.44m and 1.52m diameter intakes are currently in use. The water treatment process consists of pre-chlorination of raw water, screening, and water clarification by coagulation, sedimentation and filtration. Chlorine for disinfection can be added at three places: raw water intake, the pretreatment stage, and after the filters. Polyaluminum chloride is added to coagulate suspended solids that settle down in sedimentation tanks. The settled water is filtered using dual media filters of Sand/Granular Activated Carbon (GAC). GAC is used to reduce the presence of taste/odour causing compounds such as Geosmin/MIB in the raw water. Taste and odour episodes may occur in late summer, due to the abundance of algae. Ammonia is added before the treated water is sent to distribution to convert chlorine to mono-chloramine to help maintain stable chlorine residuals in the distribution system. Fluoride is added to the drinking water to promote dental health. Water is then pumped from a high lift pumping station through the distribution system comprised of 21 pumping stations; 12 reservoirs, 3 elevated storage tanks and one standpipe. Continuous monitoring equipment such as chlorine analyzers, turbidity meters, etc., ensures the maintenance of high quality water.

List all water treatment chemicals used over this reporting period.

Polyaluminum Chloride
Liquid chlorine
Aqueous ammonia
Hydrofluorosilicic acid

Were any significant expenses incurred to?

- Install required equipment
- Repair required equipment
- Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred.

Projects completed 2017 – Woodward Water Treatment System and Water Outstations:

- Ben Nevis Reservoir (HDR1C) Upgrades (Construction)
- Hillcrest Water Reservoir (HDR02) Upgrades (Construction)
- Kelly Street Standpipe (HDT01) Restraint (Construction)
- Osler Pumping Station (HD011) Process Upgrades (Construction)

The above water treatment and water station upgrades and modifications were completed at a cost of approximately \$11.7 million.

Projects initiated 2017 - Woodward Water Treatment System and Water Outstations:

- Ben Nevis & Dewitt Pumping Station (HD08A) Upgrades (Design)
- Greenhill & Summercrest Pumping Station (HD04B & HD05A) Upgrades, Capacity Expansion and Standby Power (Consulting Services)
- High Lift Pumping Station Improvements (Investigation)
- Highland Gardens Park Pumping Station Site (HGPPS) Security Gate (Design)
- Lee Smith Reservoir (HDR00) New Valve (Construction)
- Osler Drive Pumping Station (HD011) Upgrades (Design)
- Security System Upgrades - High Priority Water Outstations
- Water Distribution System Control Valves (Construction)

- Woodward Water Treatment Facility - Condition Upgrades (Design)
- Woodward Water Treatment Facility - Corrosion Control Building (Construction)

The above water treatment and water station upgrades and modifications are being undertaken at a cost of approximately \$12.2 million.

Distribution System Pipes:

As part of the City's Linear Asset Management Program, the following water upgrades and rehabilitations were completed in 2017:

Approximately 7.3 km of watermain was replaced as a stand-alone project and/or in coordination with roadwork at a cost of \$6.5 million.

Approximately 6.6 km of watermain was rehabilitated using structural and/or cement mortar lining at a cost of \$8.7 million.

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre.

Notification Date	Location of Adverse	AWQI	Resolution
2014-04-05	Fire Station Fleet Maintenance, 177 Bay St. N.	Total Coliforms = 6 CFU/100mL	Resampled adverse location, one upstream and one downstream hydrant. All results passed. The adverse was not confirmed.
2017-07-26	Ancaster Sampling Station A	Total Coliforms = 3 CFU/100mL	Resampled adverse location, one upstream and one downstream hydrant. Result failed at upstream hydrant which resulted in another AWQI July 27 th . The adverse was confirmed
2017-07-27	Hydrant AN15H006, Jerseyville Rd.	Total Coliforms = 2 CFU/100mL	Flushing was done to get the chlorine residual to 1.0 mg/L or higher. Two consecutive sets of samples were taken 24 to 48 hours apart at the original adverse location, the adverse hydrant, one upstream and one downstream hydrant. Results for the both sets of samples passed.

Microbiological testing done under Schedule 10, 11, 12 and 17, 18 of Regulation 170/03, during this reporting period.

Sample Type	Number of Samples	Range of E.Coli Results (min #)-(max #) CFU/100mL	Range of Total Coliform results (min #)-(max #) CFU/100mL	Number of HPC Samples	Range of HPC Results (min #)-(max #) CFU/1mL
Raw	52	0 to 35	1 to 120	N/A	N/A
Treated	2856	0	0	2856	0 to 187
Distribution	1867	0	0 to 6	1856	0 to 343

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

NOTE: For continuous monitors use 8760 as the number of samples.

Parameter - Sample Type	Number of Grab Samples	Range of Results (min #)-(max #)	Unit of Measure
Turbidity - Treated- Filter 1	8760	0.02 - 0.10	NTU
Turbidity - Treated- Filter 2	8760	0.02 - 0.12	NTU
Turbidity - Treated- Filter 3	8760	0.02 - 0.09	NTU
Turbidity - Treated- Filter 4	8760	0.02 - 0.14	NTU
Turbidity - Treated- Filter 5	8760	0.02 - 0.13	NTU
Turbidity - Treated- Filter 6	8760	0.02 - 0.19	NTU
Turbidity - Treated- Filter 7	8760	**O/S**	NTU
Turbidity - Treated- Filter 8	8760	0.02 - 0.19	NTU
Turbidity - Treated- Filter 9	8760	0.02 - 0.30	NTU
Turbidity - Treated- Filter 10	8760	0.02 - 0.27	NTU
Turbidity - Treated- Filter 11	8760	0.02 - 0.18	NTU
Turbidity - Treated- Filter 12	8760	0.02 - 0.23	NTU
Turbidity - Treated- Filter 13	8760	0.02 - 0.16	NTU
Turbidity - Treated- Filter 14	8760	0.02 - 0.20	NTU
Turbidity - Treated- Filter 15	8760	0.02 - 0.15	NTU
Turbidity - Treated- Filter 16	8760	0.02 - 0.14	NTU
Turbidity - Treated- Filter 17	8760	0.02 - 0.11	NTU
Turbidity - Treated- Filter 18	8760	0.02 - 0.09	NTU
Turbidity - Treated- Filter 19	8760	0.02 - 0.25	NTU
Turbidity - Treated- Filter 20	8760	0.03 - 0.22	NTU
Turbidity - Treated- Filter 21	8760	0.02 - 0.11	NTU
Turbidity - Treated- Filter 22	8760	0.02 - 0.10	NTU
Turbidity - Treated- Filter 23	8760	0.02 - 0.11	NTU
Turbidity - Treated- Filter 24	8760	0.02 - 0.09	NTU
Combined Chlorine - Treated	8760	1.80 - 2.65	mg/L
Free Chlorine - Distribution	1867	<0.02 to 0.21	mg/L
Combined Chlorine - Distribution	1867	0.64 to 2.83	mg/L
Fluoride - Treated (If the DWS provides fluoridation)	8760	0.40 - 0.80	mg/L

O/S - Out of Service

*NOTE: Record the unit of measure if it is **not** milligrams per litre (mg/L).*

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Parameter	Sample Date	Result Value	Unit of Measure
N/A			

Summary of Schedule 23 Inorganic parameters tested during this reporting period.

Parameter	Sample Date	Result Value	Unit of Measure	AWQI
Treated				
Antimony	2017-01-17 to 2017-11-13	<0.0006	mg/L	0
Arsenic	2017-01-17 to 2017-11-13	<0.001	mg/L	0

Barium	2017-01-17 to 2017-11-13	0.0208 to 0.0240	mg/L	0
Boron	2017-01-17 to 2017-11-13	0.022 to 0.030	mg/L	0
Cadmium	2017-01-17 to 2017-11-13	<0.0001	mg/L	0
Chromium	2017-01-17 to 2017-11-13	<0.001	mg/L	0
Fluoride	2017-01-17 to 2017-11-13	0.57 to 0.67	mg/L	0
Mercury	2017-01-17 to 2017-11-13	<0.05	mg/L	0
Nitrate as N	2017-01-17 to 2017-11-13	0.40 to 0.52	mg/L	0
Nitrite as N	2017-01-17 to 2017-11-13	<0.01	mg/L	0
Selenium	2017-01-17 to 2017-11-13	<0.002	mg/L	0
Sodium	2017-01-17 to 2017-11-13	14.8 to 17.4	mg/L	1
Uranium	2017-05-11	0.000295	mg/L	0

Summary of lead testing under Schedule 15.1 during this reporting period.

(Applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems).

Location Type	Number of Samples Required	Number of Samples Taken	Range of pH Results (min #) – (max #) pH Units	Range of Alkalinity Results (min #) – (max #) mg/L	Range of Lead Results (min #) – (max #) mg/L	Number of Lead AWQIs	Number of Lead Exceedances
Plumbing-NR	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Plumbing-R	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distribution	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NR- Non-Residential

R – Residential

N/A: Woodward DWSS has been granted relief in Schedule D of Permit 005-101 from the standard sampling table for lead (15.1-4 of O. Reg 170/03) and as such this relief extends to section 15.1-7 as well. Therefore lead, pH or alkalinity sampling is not required between April 16, 2014 and June 24, 2019.

Summary of Schedule 24 Organic parameters sampled during this reporting period.

Parameter	Sample Date	Result Value	Unit of Measure	AWQI
Treated				
1,1-Dichloroethylene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
1,2-Dichlorobenzene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
1,2-Dichloroethane	2017-01-17 to 2017-11-13	<0.2	ug/L	0
1,4-Dichlorobenzene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Benzene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Carbon Tetrachloride	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Chlorobenzene	2017-01-17 to 2017-11-13	<0.3	ug/L	0
Dichloromethane	2017-01-17 to 2017-11-13	<0.5	ug/L	0
Ethylbenzene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Tetrachloroethylene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Toluene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Trichloroethylene	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Vinyl Chloride	2017-01-17 to 2017-11-13	<0.2	ug/L	0
Xylene	2017-01-17 to 2017-11-13	<0.3	ug/L	0
2,3,4,6-Tetrachlorophenol	2017-05-11	<0.2	ug/L	0
2,4,6-Trichlorophenol	2017-05-11	<0.25	ug/L	0

2,4-D	2017-05-11	<0.19	ug/L	0
2,4-Dichlorophenol	2017-05-11	<0.15	ug/L	0
Alachlor	2017-05-11	<0.02	ug/L	0
Atrazine + Desethyl-atrazine	2017-05-11	0.05	ug/L	0
Azinphos-methyl	2017-05-11	<0.05	ug/L	0
Benzo[a]pyrene	2017-05-11	<0.004	ug/L	0
Bromoxynil	2017-05-11	<0.33	ug/L	0
Carbaryl	2017-05-11	<0.05	ug/L	0
Carbofuran	2017-05-11	<0.01	ug/L	0
Chlorpyrifos (Dursban)	2017-05-11	<0.02	ug/L	0
Diazinon	2017-05-11	<0.02	ug/L	0
Dicamba	2017-05-11	<0.20	ug/L	0
Diclofop-methyl	2017-05-11	<0.40	ug/L	0
Dimethoate	2017-05-11	<0.03	ug/L	0
Diquat ug/L	2017-05-11	<1	ug/L	0
Diuron	2017-05-11	<0.03	ug/L	0
Glyphosate ug/L	2017-05-11	<1	ug/L	0
Malathion	2017-05-11	<0.02	ug/L	0
MCPA (2-methyl-4-chlorophenoxyacetic acid)	2017-05-11	<0.12	ug/L	0
Metolachlor	2017-05-11	<0.01	ug/L	0
Metribuzin (Sencor)	2017-05-11	<0.02	ug/L	0
Paraquat ug/L	2017-05-11	<1	ug/L	0
PCBsTotal ug/L	2017-05-11	<0.05	ug/L	0
Pentachlorophenol	2017-05-11	<0.15	ug/L	0
Phorate	2017-05-11	<0.01	ug/L	0
Picloram	2017-05-11	<1	ug/L	0
Prometryne	2017-05-11	<0.03	ug/L	0
Simazine	2017-05-11	<0.01	ug/L	0
Terbufos	2017-05-11	<0.01	ug/L	0
Triallate	2017-05-11	<0.01	ug/L	0
Trifluralin	2017-05-11	<0.02	ug/L	0
DISTRIBUTION				
Total Trihalomethanes - Distribution	Running annual average for the last four quarters.	21.2	ug/L	0
Haloacetic Acids	2017-01-17 to 2017-11-13	<5.3	ug/L	0

* The Maximum Acceptable Concentration for Trihalomethanes in the distribution is based on a running average of the results from all sampling events in the past four quarters. This running average can be found in the result value column.

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards (O.Reg. 169/03).

Parameter	Sample Date	Result Value	Unit of Measure
N/A			

(Only if DWS category is large municipal residential, small municipal residential, large municipal non residential, non municipal year round residential, large non municipal non residential)

Definitions:

AWQI: Adverse Water Quality Incident

CFU: Colony Forming Unit

HPC: Heterotrophic Plate Count

mg/L: milligrams per litre

mL: millilitre

N/A: Not Applicable