



The Corporation of the Municipality of Port Hope
Department of Public Works
Drinking Water Treatment Division
56 Queen Street,
Port Hope ON L1A 3Z9
Tel: 905-885-2209
Fax: 905-885-7509
Email: rtrumper@porthope.ca
Web: www.porthope.on.ca

January 28, 2014
Municipality of Port Hope
56 Queen Street
Port Hope, ON
L1A 3Z9

Attention: Mr. Peter Angelo, P. Eng., Director of Works and Engineering

**RE: 2013 Annual Report – Port Hope Water Treatment Plant
Drinking-Water System Number – 260058006**

Dear Mr. Angelo:

We are pleased to provide the *2013 Annual Report* for the Municipality of Port Hope's Drinking Water System as outlined in Ontario Regulation 170/03, Section 11 made under the Safe Drinking Water Act.

This report covers the time frame from January 1, 2013 to December 31, 2013 for the Drinking Water System.

Sincerely,

Rick Trumper
Water Treatment Supervisor
Municipality of Port Hope

The Corporation of the Municipality of Port Hope



Port Hope Drinking Water System

DWSN 260058006

2013 Annual Report



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	260058006
Drinking-Water System Name:	Port Hope Drinking Water System
Drinking-Water System Owner:	The Corporation of the Municipality of Port Hope
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2013 – December 31, 2013

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <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 []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Municipal Development Team Office, Municipal Libraries, Municipal Administrative Office, Water Treatment Plant.</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;">N/A</div> <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> <div style="border: 1px solid black; padding: 2px; width: fit-content;">N/A</div> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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
N/A	

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 [] No []

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

- Public access/notice via the web
 Public access/notice via Government Office
 Public access/notice via a newspaper
 Public access/notice via Public Request
 Public access/notice via a Public Library
 Public access/notice via other method _____

Describe your Drinking-Water System

System Information

Port Hope Drinking Water System is classified as Large Municipal Residential system and consists of the Water Treatment Plant (WTP) and Distribution System. The WTP provides ultrafiltration water treatment for the water system. The WTP is located at 35 Marsh St in the Municipality of Port Hope, County of Northumberland, Ontario. The Municipality is the Owner and Operator of the Port Hope Drinking Water System that serves the community of Port Hope with a population of 12,500.

Drinking Water Quality Management System

Port Hope Drinking Water System is operated in accordance with the Municipal Drinking Water License # 146-101, the Drinking Water Works Permit # 146-201 and the Municipality's Drinking Water Quality Management System Operational Plan # 146-401.

The following describes the components of the Port Hope Drinking Water System:

Raw Water Source

The water supply for Port Hope WTP is obtained from Lake Ontario. Lake Ontario water is of good quality and can be described as a large body of clear-coloured water of low turbidity. The Lake's water temperature ranges from 0°C (winter) to approximately 22°C (summer). The raw water source is classified as surface water, which means that it is considered to be an unprotected source. Raw water requires full treatment at Port Hope's Water Treatment Plant to make it drinkable or potable.

Intake Structure

Raw water is taken into a 750-mm diameter intake pipe through the intake structure. The existing intake structure and 750 mm intake piping was retrofitted to include a 900 mm on shore addition. This intake is utilized to draw water from Lake Ontario to the low lift pumping station. The low lift pumping station is where water undergoes coarse screening.

Raw Water pumping

The raw water pumping station consists of several raw water chambers, one (1) raw water travelling screen, two (2) manually cleaned screens (i.e., for standby purposes), and three (3) low lift pumps (with provision for a fourth). During the Zebra Mussel



season the raw water is dosed with chlorine for Zebra Mussel control prior to ultrafiltration process.

The raw water quality is monitored by Operations staff at the Water Treatment Plant.

Water Treatment

Raw water is treated by passing through the ultrafiltration system. The ultrafiltration process removes organics and solids as well as safeguards against *giardia* and *cryptosporidium* contamination. The water treatment facilities consist of a Zenon ZeeWeed 1000 membrane ultrafiltration system which includes four (4) membrane tanks (each tank contains two (2) filtration cassettes with a total capacity for four cassettes) and associated cleaning and backwashing equipment. Following ultrafiltration, filtered water is disinfected by using a chlorine gas system (primary disinfection). The post-chlorination (secondary chlorination) is used as required to maintain a fixed chlorine residual levels in the water leaving the plant. Following the disinfection process, the water is ready for consumption by consumers within the distribution system. Five (5) high lift pumps (with provision for a sixth) lift treated water to the distribution system. The Water Treatment Plant has a rated capacity of 20,000 M³/d. It is expected that this capacity will provide potable water to the Municipality of Port Hope for a period greater than the 20 year planning period.

Water Storage Facilities

At the WTP, potable water storage consists of twined reservoirs that have a total rated capacity of 5000 M³. Off site storage facilities in Zone 1 include a Standpipe that can hold up to 1,205 M³. Zone 2 has an underground reservoir that can hold up to 2273 M³ and an elevated tank that can hold up to 3000 M³.

Process Wastewater System

The WTP provides process residue management consisting of equalization storage and solids separation. Two (2) equalization tanks precede two (2) parallel tube settling units. Settled solids at the base of each wastewater clarifier are pumped via a sewage pumping station (located outside the WTP) to the sanitary sewer, while wastewater supernatant is analysed and dechlorinated prior to a discharge to Lake Ontario.

Water Distribution System

Due to Port Hope's hilly terrain, the community has been divided into two pressure zones. Zone 1 is located in the lower parts of the community while Zone 2 controls the higher area. A booster pumping station, an elevated tank and an in-ground reservoir/pumping station are located in Zone 2 to maintain adequate pressures and flows in Zone 2. Zone 1 pressures are maintained via the Pumping Station at the Water Treatment Plant and the Standpipe located at the highest point of Zone 1.

Supervisory Control and Data Acquisition (SCADA)

SCADA system consists of numerous computer systems that control and monitor the drinking water system and the water quality at all times. Operational staff monitors and control these systems to insure their proper operation and water quality. All



Operational Staff for Port Hope Drinking Water System are fully certified by the Ministry of the Environment.

List all water treatment chemicals used over this reporting period

Chlorine Gas

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

Budgeted equipment repairs and general maintenance for 2013 totaled \$150,000; some unexpected expenditures related to equipment failures totaled \$33,215.

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

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Mar. 13/13	Turbidity	No local reading	NTU	Instrument was found to be operating as designed; any readings below lowest value (0.00ntu) will result in a local dashed reading.	Mar. 13/13
June 10/ 13	Sodium	32.0	mg/l	Re-sampled at original location and two other locations, all samples returned within normal parameters.	June 17/13
Aug. 21/13	Chlorine residual/ Log removal	<0.5 mg/L or <1 log	mg/l and log	Primary disinfection had lowered below minimum operational value, filtration system was shut down and investigation started. Found	Aug. 22/13



				sodium bisulphite had entered the contact chamber via CIP process on Train 2. Pumped out effected water from contact chambers and restarted filtration process. Lost prime on sample pump for primary chlorine analyser, filtration system alarmed on low log removal and shut down.	
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Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03 during this reporting period.

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	55	0-20	0-1920	N/A	N/A
Treated	65	0	0	82	0-84
Distribution	375	0	0	375	0-37

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

	Number of Grab Samples	Range of Results (min #)-(max #)	Unit of Measure
Raw Turbidity	8760	0.00 - 99.99	NTU
Treated Turbidity	8760	0.00 – 2.00	NTU
Primary Chlorine	8760	0.02 – 1.85	mg/L
Secondary Chlorine	8760	0.17- 4.89	mg/L
Distribution Chlorine (Grab Samples)	1,738	0.07 – 1.90	mg/L
Distribution Chlorine (Reservoir)	8760	0.00 – 4.20	mg/L
Distribution Chlorine (Elevated Tank)	8760	0.00 – 5.00	mg/L

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



Fluoride (If the DWS provides fluoridation)	N/A	N/A	N/A
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Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
Sept. 16, 2010, Municipal Drinking Water License 146-101	Process waste water, Total Chlorine Residual	Continuously	0.00 – 5.01	mg/L
Sept. 16, 2010, Municipal Drinking Water License 146-101	Process waste water, Total suspended solids	Monthly	7.91 Annual Average	mg/L

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	Aug. 20/13	0.15	ug/L	No
Arsenic	Aug. 20/13	1.3	ug/L	No
Barium	Aug. 20/13	21.0	ug/L	No
Boron	Aug. 20/13	23	ug/L	No
Cadmium	Aug. 20/13	0.003	ug/L	No
Chromium	Aug. 20/13	0.7	ug/L	No
*Lead	N/A			
Mercury	Aug. 20/13	0.01 <MDL	ug/L	No
Selenium	Aug. 20/13	1.0 <MDL	ug/L	No
Sodium	Aug. 20/13	13.9	mg/L	No
Uranium	Aug. 20/13	0.393	ug/L	No
Fluoride	-	-	-	-
Nitrite	Dec. 3/13	0.003 <MDL	mg/L	No
Nitrate	Dec. 3/13	0.470	mg/L	No

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

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	Range of Lead Results (min#) – (max #)	Unit of Measure	Number of Exceedances
Plumbing	N/A			
Distribution	8	Not required – pH and Alkalinity only		



Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Aug. 20/13	0.02 <MDL	ug/L	No
Aldicarb	Aug. 20/13	0.01 <MDL	ug/L	No
Aldrin + Dieldrin	Aug. 20/13	0.01 <MDL	ug/L	No
Atrazine + N-dealkylated metabolites	Aug. 20/13	0.09	ug/L	No
Azinphos-methyl	Aug. 20/13	0.02 <MDL	ug/L	No
Bendiocarb	Aug. 20/13	0.01 <MDL	ug/L	No
Benzene	Aug. 20/13	0.32 <MDL	ug/L	No
Benzo(a)pyrene	Aug. 20/13	0.004 <MDL	ug/L	No
Bromoxynil	Aug. 20/13	0.33 <MDL	ug/L	No
Carbaryl	Aug. 20/13	0.01 <MDL	ug/L	No
Carbofuran	Aug. 20/13	0.01 <MDL	ug/L	No
Carbon Tetrachloride	Aug. 20/13	0.16 <MDL	ug/L	No
Chlordane (Total)	Aug. 20/13	0.01 <MDL	ug/L	No
Chlorpyrifos	Aug. 20/13	0.02 <MDL	ug/L	No
Cyanazine	Aug. 20/13	0.03 <MDL	ug/L	No
Diazinon	Aug. 20/13	0.02 <MDL	ug/L	No
Dicamba	Aug. 20/13	0.20 <MDL	ug/L	No
1,2-Dichlorobenzene	Aug. 20/13	0.41 <MDL	ug/L	No
1,4-Dichlorobenzene	Aug. 20/13	0.36 <MDL	ug/L	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	Aug. 20/13	0.01 <MDL	ug/L	No
1,2-Dichloroethane	Aug. 20/13	0.35 <MDL	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	Aug. 20/13	0.33 <MDL	ug/L	No
Dichloromethane	Aug. 20/13	0.35 <MDL	ug/L	No
2,4 Dichlorophenol	Aug. 20/13	0.15 <MDL	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Aug. 20/13	0.19 <MDL	ug/L	No
Diclofop-methyl	Aug. 20/13	0.40 <MDL	ug/L	No
Dimethoate	Aug. 20/13	0.03 <MDL	ug/L	No
Dinoseb	Aug. 20/13	0.36 <MDL	ug/L	No
Diquat	Aug. 20/13	1.0 <MDL	ug/L	No
Diuron	Aug. 20/13	0.03 <MDL	ug/L	No
Glyphosate	Aug. 20/13	1.0 <MDL	ug/L	No
Heptachlor + Heptachlor Epoxide	Aug. 20/13	0.01 <MDL	ug/L	No
Lindane (Total)	Aug. 20/13	0.01 <MDL	ug/L	No
Malathion	Aug. 20/13	0.02 <MDL	ug/L	No
Methoxychlor	Aug. 20/13	0.01 <MDL	ug/L	No
Metolachlor	Aug. 20/13	0.01 <MDL	ug/L	No
Metribuzin	Aug. 20/13	0.02 <MDL	ug/L	No
Monochlorobenzene	Aug. 20/13	0.30 <MDL	ug/L	No
Paraquat	Aug. 20/13	1.0 <MDL	ug/L	No
Parathion	Aug. 20/13	0.02 <MDL	ug/L	No
Pentachlorophenol	Aug. 20/13	0.15 <MDL	ug/L	No
Phorate	Aug. 20/13	0.01 <MDL	ug/L	No
Picloram	Aug. 20/13	1 <MDL	ug/L	No
Polychlorinated Biphenyls(PCB)	Aug. 20/13	0.04 <MDL	ug/L	No
Prometryne	Aug. 20/13	0.03 <MDL	ug/L	No



Simazine	Aug. 20/13	0.01 <MDL	ug/L	No
THM (NOTE: show latest annual average)	2013	42.4	ug/L	No
Temephos	Aug. 20/13	0.01 <MDL	ug/L	No
Terbufos	Aug. 20/13	0.01 <MDL	ug/L	No
Tetrachloroethylene	Aug. 20/13	0.35 <MDL	ug/L	No
2,3,4,6-Tetrachlorophenol	Aug. 20/13	0.14 <MDL	ug/L	No
Triallate	Aug. 20/13	0.01 <MDL	ug/L	No
Trichloroethylene	Aug. 20/13	0.44 <MDL	ug/L	No
2,4,6-Trichlorophenol	Aug. 20/13	0.25 <MDL	ug/L	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	Aug. 20/13	0.22 <MDL	ug/L	No
Trifluralin	Aug. 20/13	0.02 <MDL	ug/L	No
Vinyl Chloride	Aug. 20/13	0.17 <MDL	ug/L	No

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

Parameter	Result Value	Unit of Measure	Date of Sample
N/A			