

Port Colborne Distribution System Annual Drinking Water Quality Report

Prepared on February 2, 2018
In Accordance with O.Reg. 170/03
January 1, 2017 to December 31, 2017

Prepared by:



Rocco Arillotta
Water/Wastewater Operator

Reviewed by:



Darlene Suddard
Environmental Compliance Supervisor

Approved by:



Doug Cressey
Utilities Supervisor

Approved by:



Chris Lee
Director of Engineering and Operations

Drinking Water System number: 260001643
Drinking Water System category: Large Municipal Residential
Owned and operated by: The Corporation of the City of Port Colborne

Port Colborne Distribution System Annual Drinking Water Quality Report

Introduction

The City of Port Colborne is required, under O.Reg.170/03 - *Drinking Water Systems*, to prepare an annual report detailing the operation of the Port Colborne Distribution System. The regulation specifies in Section 11 what the report must contain, and sets a February 28 deadline for having the report prepared and made available to the public.

Therefore, to ensure compliance with the regulation, this report is prepared in accordance with Section 11, and is available to the public on the City's website at www.portcolborne.ca, under the Water Quality link

Water Supply and Distribution

The Corporation of the City of Port Colborne (City) is the Owner and Operating Authority of the Port Colborne Distribution System (PCDS), which serves approximately 16,000 residents. The PCDS is a stand-alone, Class 1, distribution system, with no downstream connections, and obtains water from the Regional Municipality of Niagara's (RMON) Port Colborne Drinking Water System (water treatment plant - WTP). Treated water is purchased from RMON on a volume basis and distributed through the City owned distribution system via Region owned trunk mains. The WTP draws water from the Welland Canal, treats it at the WTP, and RMON is responsible for sampling, testing and monitoring water at and leaving the WTP.

The City of Port Colborne does not perform any secondary disinfection, as the WTP sufficiently chlorinates the water to meet the minimum requirement of >0.05 mg/L free chlorine residual. The only water treatment chemical used by the City is 12% sodium hypochlorite, and this is used solely when making repairs to or performing maintenance on the distribution system to perform the required disinfection to protect the drinking water. The distribution system has an average pressure of 58 psi, with pressure maintained by the King Street Water Water Tower until October 2017, and then by the new Barrick Road Water Tower after October 2017 together with the Fielden Avenue Reservoir, which are owned, operated and maintained by RMON.

The Regional Municipality of Niagara prepares an annual report for the Port Colborne Drinking Water System, providing information on the treatment methodology, the type of chemicals used, water quality reports and any significant maintenance, repair or upgrades

to the WTP. RMON is also required to make their reports available on the internet. Contact information is provided under the section entitled “Where to Obtain Additional Information”.

Water Quality Monitoring

The City of Port Colborne is required to supply safe drinking water that meets the requirements of the Safe Drinking Water Act and associated regulations. To ensure the City meet these requirements, the City has assigned the following individuals as responsible persons for the distribution system:

Table 1: Port Colborne Distribution System Responsible Persons

Position	Name	Phone number
Director of Engineering and Operations	Chris Lee	905-835-2900 ext. 223
Utilities Supervisor (Overall Responsible Operator)	Doug Cressey	905-835-2900 ext. 255
Environmental Compliance Supervisor	Darlene Suddard	905-835-2900 ext. 256

The City has identified the Engineering and Operations Department as the Operating Authority for the Port Colborne Distribution System (PCDS). The Public Works, Water Department operates under the Engineering and Operations Department, and is specifically responsible for the daily operation of the distribution system. As such, the Water Department is responsible for assigning Certified Water Operators to conduct both the routine, weekly water quality sampling and testing and to conduct non-routine sampling (i.e., during and after watermain breaks). These activities ensure the water quality meets the Ontario Drinking Water Quality Standards (O.Reg. 169/03) at all times and under all conditions. The Water Department also ensures that the Operational Checks, Sampling and Testing requirements specified in the Drinking Water Systems Regulation (O.Reg. 170/03) are conducted and recorded. If it is determined that the water quality or an operational parameter does not meet the regulated requirements or exceeds the regulated limits, Certified Operators immediately implement corrective action to ensure the continued supply of safe drinking water. The operational checks, sampling and testing requirements, which the City must conduct, are outlined in Table 4.

The Region operates the Port Colborne Water Treatment Plant, the Fielden Avenue Reservoir and the King Street and Barrick Road Water Towers, and as such, is required to conduct operational checks, sampling, and testing activities. Details regarding the Region’s requirements are summarized in their Annual Report; information on how to obtain a copy of their report is provided under the section entitled “Where to Obtain Additional Information”.

Water Quality Test Results

As per the sampling and testing requirements detailed in Table 4, the City conducted the following sampling in the period of January 1, 2017 to December 31, 2017:

Microbiological Analysis

In accordance with the requirements of Schedule 10, section 10-2 (1) of O.Reg.170/03, samples are collected and submitted for analysis on a weekly basis. Additionally, samples are also collected and submitted for analysis after watermain breaks, during hydrant flushing activities and in response to some water quality complaints etc.

In 2017, a total of 673 samples were collected and analyzed for the presence of *E.coli* and Total Coliforms. (623 routine samples, 50 non-routine samples) Laboratory results indicated that *E.coli* was non-detectable throughout the entire year and Total Coliforms were detected on four (4) occasions (*Table 5*). Details about the adverse results are discussed below.

To monitor the potential deterioration of the water quality, 311 samples were collected and analyzed for Heterotrophic Plate Count (HPC). Laboratory results indicated that HPC was detected at very low levels, between 0-35 colonies/mL in 2016 (*Table 5*).

Operational Parameters

The City monitors the operational parameters, chlorine and turbidity, on a twice weekly basis, and on an as-required basis in response to watermain breaks, hydrant flushing, and complaints etc. In 2017, this resulted in the collection and analysis of 1,248 routine chlorine samples and turbidity samples and the collection and analysis of 602 non-routine chlorine samples and 492 turbidity samples. Turbidity levels ranged from 0.07 to 2.28 NTU, while free chlorine levels ranged from 0.07 to 1.37 mg/L. There were no instances in 2017 where free chlorine levels were below the minimum level of 0.05 mg/L required under O.Reg. 170/03 (*Table 5*).

Lead Testing (Schedule 15.1) Results

The City is no longer required to collect samples from plumbing systems and is only required to collect samples from the distribution system. Under O.Reg. 170/03 distribution system samples are required to be collected twice annually, with one set collected during the winter sampling cycle (December 15 to April 15) and another set during the summer sampling cycle (June 15 to October 15). The collected samples are tested for alkalinity and pH in year one and two, with lead

sampled in year three. 2016 was year one; therefore, samples were collected from four locations in the distribution system and analyzed for alkalinity and pH. In total, eight samples were collected. Alkalinity values ranged from 77 to 94 mg/L, while pH values ranged from 6.45 to 8.24. Both parameters were well within the recommended guidelines (*Table 5*).

The City is not required under the Regulation to collect plumbing samples to be analyzed for lead concentrations, unless requested by a homeowner; the City did not receive a request from any homeowners to have the water tested for lead in 2017.

Organic Parameters

Up until January 1, 2017, the only organic parameter the City was required to monitor in the distribution system was trihalomethanes, or THMs. New regulatory requirements came into effect in 2017, and the City was required to begin sampling for Haloacetic Acids (HAAs).

THM results from 2017 continue to indicate that THMs are not a concern in the distribution system, as the average concentration was 0.0214 mg/L, much less than the 0.10 mg/L regulated limit (*Table 5*). None of the individual samples exceeded half the standard prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

Although HAA results are not reportable until January 1, 2020, results from the 8 samples collected in 2017 indicate that HAAs are not a concern in the distribution system, as HAAs were less than the method detection limit of 5.3 µg/L

In 2017, there were four (4) reportable adverse water quality incidents. The adverse results were due to the presence of total coliforms. Details about the adverse samples are discussed below.

Regulatory Non-Compliances

There were four (4) reportable adverse water quality incidents in 2017.

Table 2 below summarizes the date the adverse occurred, the adverse parameter, the corrective action taken by the City and the date the corrective action was taken:

Table 2: Summary of Adverse Test Results - 2017

Sample Date	Date Adverse Reported to City	Parameter	Result	Corrective Action Date	Corrective Action
May 8, 2017	May 10, 2107	Total Coliforms	1 cfu/100mL	May 10, 2017	Immediately flush and resample (two consecutive sets 24 and 48 hours apart). Total coliforms were absent from the resamples and free chlorine residuals >0.20 mg/L were maintained at all points in the affected part of the distribution system.
May 8, 2017	May 10, 2017	Total Coliforms	1 cfu/100mL	May 10, 2017	
July 24, 2017	July 26, 2017	Total Coliforms	1 cfu/100mL	July 26, 2017	
November 23, 2017	November 25, 2017	Total Coliforms	1 cfu/100mL	November 25, 2017	

It is important to note that although four adverse microbiological results were observed in 2017, (representing less than 0.1% of the total samples collected) the immediate action by the City’s certified Operators ensured that the adverse incident was addressed in a timely manner. This timely response ensured that the safety of the drinking water was maintained, as indicated by the results of special follow up sampling and evaluation, which found the water to be microbiologically safe.

Our Commitment to Providing Safe Drinking Water

To ensure that residents, businesses and visitors to our community continue to receive the safest drinking water, the City has incorporated the following practices into the routine operations of the Distribution System:

- Exceed the minimum regulatory sampling requirements, by sampling additional sites for both operational and microbiological parameters
- Comprehensive flushing program targeting “dead ends”, where water use is not very high, to ensure chlorine levels are at least 0.10 mg/L
- Prompt response to watermain breaks and customer complaints
- Increase the number of samples collected following a main break or distribution system improvements

In addition, the City has the following plans for 2018:

- Decommissioning of Elm Street Bulk water station and construction of a new bulk water station on Stonebridge Drive at an estimated cost of \$300,000.
- Installation of a fire service water meter and chamber at two facilities, to ensure water usage of fire services is metered, at an estimated total cost of \$160,000.
- Watermain replacements on Carter Avenue and Janet Street, at an approximate cost of \$1,000,000. The City received federal funding for this project.

Major expenditures for 2017 included the following:

- Completed the Elm/Prosperity/Rosedale watermain replacement project, which started in 2016, at an estimated cost of \$1,800,000
- Completed lowering the water services that froze in the Service Pipe portion of the water service during the cold winter of 2015, at an estimated cost of \$199,286.77.
- Completed the final phase of the new watermain to loop the distribution system from Clarence Street, south along Cement Plant Road to connect to the western end of Lakeshore Road. This project, with an original estimated cost of \$2.6 million, received \$2 million in funding from the Small, Rural and Northern Municipal Infrastructure Fund (SRNMIF). The cost of the final phase in 2017 was approximately \$53,000.

What's New?

The City's Drinking Water Quality Management System was re-accredited by SAI Global, in May 2016. The City's Operational Plan is available on the City's website at: http://www.portcolborne.ca/page/drinking_water_quality_management_system

New requirements to sample for haloacetic acids (HAAs) came into effect under O. Reg. 170/03 on January 1, 2017. Similar to trihalomethanes (THMs), HAAs are a disinfectant by-product of drinking water chlorination, and form when chlorine reacts with suspended organics. Based on the first sets of HAAs sampling results collected in 2017, combined with the historically low levels of THMs detected in the distribution system samples, HAAs are not expected to be a concern in the drinking water.

The City's Engineering and Operations Department moved into the new Engineering and Operations Centre, located at 1 Killaly Street West. All reports are available at this new location.

Where to Obtain Additional Information

Copies of this annual report are available, free of charge, at the Engineering and Operations Centre, 1 Killaly Street West. It can also be downloaded from the internet at www.portcolborne.ca, under the “Water Quality” link. Copies may also be obtained by contacting the City numbers listed below.

Additionally, all laboratory test results are available at the Engineering and Operations Centre, 1 Killaly Street West. Copies may also be obtained by contacting the City numbers listed below.

The Regional Municipality of Niagara provides an annual report for the Port Colborne Water Treatment Plant, and it can be downloaded from the Region’s website: <https://www.niagararegion.ca/living/water/water-quality-reports/default.aspx> Copies may also be obtained by contacting any of the numbers listed below:

Table 3: Contact Information for the City and Region

Organization	Department	Phone Number
City of Port Colborne	Engineering and Operations Centre	905-835-5079
Regional Municipality of Niagara	Water and Wastewater Division	905-685-1571

Table 4: Distribution System Water Quality Sampling and Testing Requirements

Parameter	Sampling and Analysis	Distribution System Standards	Comments
Microbiological	Minimum of 48 samples per month collected and tested for total coliforms and/or <i>E.coli</i> . Minimum 25% of all samples collected weekly analyzed for heterotrophic plate count	<ul style="list-style-type: none"> • <i>E.coli</i> – NONE detected • Total Coliforms – NONE detected • Heterotrophic plate count - <500 cfu/mL 	<ul style="list-style-type: none"> • 12 samples collected each week • Samples sent to an accredited laboratory for analysis • Adverse results are immediately reported by the lab to the City
Free Chlorine Residual	Minimum of 70 samples per month collected and tested for free chlorine. Collected twice weekly (at least 48 hours apart) from representative areas of the distribution system	<ul style="list-style-type: none"> • Minimum residual chlorine 0.05 mg/L • City targets 0.20 mg/L • City's acceptable low limit is 0.10 mg/L 	<ul style="list-style-type: none"> • City flushes all hydrants annually and known dead ends on a regular basis to ensure at least 0.10 mg/L is maintained at all areas of the distribution system
Turbidity	Frequency of sampling not specified, however, City collects minimum of 70 samples per month and tests for turbidity. Collected twice weekly from representative areas of the distribution system	<ul style="list-style-type: none"> • 5.0 NTU maximum aesthetic objective 	<ul style="list-style-type: none"> • Turbidity generally not an issue in the distribution system, however City flushes on a regular basis to ensure turbidity levels remain low.
Trihalomethanes (THMs)	Required to collect at least one sample quarterly, however the City collects 2 samples per month and submits for analysis	<ul style="list-style-type: none"> • 0.10 mg/L maximum acceptable concentration 	<ul style="list-style-type: none"> • Based on a four-quarter progressive annual average of test results (average of all test results each quarter) at points that are likely to have an elevated potential for the formation of THMs

Table 4: Distribution System Water Quality Sampling and Testing Requirements (*continued*)

Parameter	Sampling and Analysis	Distribution System Standards	Comments
Haloacetic Acids (HAAs)	Sampled quarterly. Required to collect one (1) sample per quarter. City collects 2 samples per quarter.	<ul style="list-style-type: none"> • 0.08 mg/L maximum acceptable concentration (comes into effect January 1, 2020) 	<ul style="list-style-type: none"> • Based on a four-quarter progressive annual average of test results (average of all test results each quarter) at points that are likely to have an elevated potential for the formation of HAAs
Lead	<p>Regulatory amendments late in 2009 and the City's historical results from 2008/09 resulted in the City qualifying for exemption from having to collect samples from plumbing.</p> <p>Required to collect 4 samples twice annually (between Dec 15 and Apr 15 and between Jun 15 and Oct 15) from 4 locations in the distribution system and analyze the samples for pH and alkalinity for two years, and then in the third year, perform the pH and alkalinity analysis and lead analysis.</p>	<ul style="list-style-type: none"> • No standard for alkalinity or pH, these parameters are monitored so that, should they change, the potential for lead levels to increase is analyzed • Maximum acceptable concentration for lead is 0.010 mg/L 	<ul style="list-style-type: none"> • Distribution system samples are generally collected from water sampling stations and/or fire hydrants • If a lead exceedance occurs in future, the City would be required to resume standard sampling.

Table 5: Distribution System Water Quality Sampling and Testing Results – January 1 to December 31, 2017

Parameter	Requirement	Number of samples		Results			Comments
		Routine	Non-Routine	Range	Unit	# of Adverse	
Microbiological Analysis							
<i>E. coli</i>	ND	623*	50	ND	cfu/100 mL	0	Presence of <i>E.coli</i> indicates presence of fecal matter
Total Coliforms	ND	623*	50	ND-1	cfu/100 mL	4	Presence of Total Coliforms indicates possible presence of pathogenic bacteria
Heterotrophic Plate Count	<500	311*		0-35	colonies/mL	0	Presence of HPC indicates water quality deterioration
Operational Parameters							
Free Chlorine	Minimum 0.05	1248*	602	0.07 – 1.37	mg/L	0	Level of disinfectant present
Turbidity	5.0	1248*	492	0.07 – 2.28	NTU	N/A	Not a reportable parameter; 5.0 NTU is aesthetic guideline
Lead Testing Results							
Alkalinity	30 - 500	8		77 – 94	mg/L	N/A	Neither are reportable parameters; guidelines are the recommended operational level. Low alkalinity and/or low pH may accelerate corrosion, which may cause lead from soldering or lead lines to be released into drinking water.
pH	6.5 – 8.5	8		6.45 – 8.24		N/A	
Lead	Plumbing	0.010 mg/L	N/A		mg/L	N/A	Corrosion of lead or lead soldered plumbing/distribution systems may cause lead to be released into drinking water
	Distribution		N/A				
Organic Parameters							
Trihalomethanes	0.10	24		(Annual Average) 0.0214	mg/L	0	By-product of chlorination; forms when chlorine reacts with suspended organics.
Haloacetic Acids	0.08 (Jan 1, 2020)	8		(Annual Average) <0.053	mg/L	N/A	By-product of chlorination; forms when chlorine reacts with suspended organics.

*Note – operational checks are routine samples. Only routine microbiological samples, collected in accordance with Schedule 10, section 10-2 (1) of O.Reg. 170/03, are analyzed for Heterotrophic Plate Count (HPC) to meet the required 25%. Non-routine sampling includes sampling after watermain breaks, complaints, annual hydrant flushing and dead end flushing.

ND = non-detectable

NTU = nephelometric turbidity unit