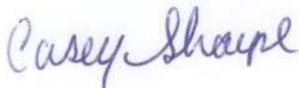


Port Colborne Distribution System Annual Drinking Water Quality Report

Prepared on February 27, 2017
In Accordance with O.Reg. 170/03
January 1, 2016 to December 31, 2016

Prepared by:



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Approved by:



Ron Hanson
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 Tower and the Fielden Avenue Reservoir, both of 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	Ron Hanson	905-835-2900 ext. 222
Utilities Supervisor (Overall Responsible Operator)	Doug Cressey	905-835-5079
Environmental Compliance Supervisor	Darlene Suddard	905-835-5079

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 Water Tower, 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, 2016 to December 31, 2016:

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 2016, a total of 712 samples were collected and analyzed for the presence of *E.coli* and Total Coliforms. (625 routine samples, 87 non-routine sample Laboratory results indicated that *E.coli* was non-detectable throughout the entire year and Total Coliforms were detected on two occasions (*Table 5*). Details about the adverse results are discussed below.

To monitor the potential deterioration of the water quality, 308 samples were collected and analyzed for Heterotrophic Plate Count (HPC). Laboratory results indicated that HPC was detected at very low levels, between 0-27 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 2016, this resulted in the collection and analysis of 1,248 routine chlorine samples and turbidity samples and the collection and analysis of 877 non-routine chlorine samples and turbidity samples. Turbidity levels ranged from 0.07 to 0.97 NTU, while free chlorine levels ranged from 0.05 to 1.29 mg/L. There were no instances in 2016 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 80 to 87 mg/L, while pH values ranged from 6.99 to 7.58. 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 2016.

Organic Parameters

The only organic parameter the City is required to monitor in the distribution system is trihalomethanes, or THMs. Results from 2016 continue to indicate that THMs are not a concern in the distribution system, as the average concentration was 0.026083 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.

In 2016, there were two (2) 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 two (2) reportable adverse water quality incidents in 2016.

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 - 2016

Sample Date	Date Adverse Reported to City	Parameter	Result	Corrective Action Date	Corrective Action
Jan 27, 2016	Jan 28, 2016	Total Coliforms	5 cfu/100 mL	Jan 29, 2016	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.
June 20, 2016	June 22, 2016	Total Coliforms	1 cfu/100 mL	June 24, 2016	

It is important to note that although two adverse microbiological results were observed in 2016, (representing less than 0.1% of the total samples collected) the immediate action by the City's licensed 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 2017:

- Complete the lowering of the remaining 31 water services that froze in the Service Pipe portion of the water service during the cold winter of 2015, at an estimated cost of approximately \$256,000.
- Completion of the final phase of the Lakeshore Road watermain extension project, which started in 2015, at an estimated cost of \$210,000.
- Completion of the Elm/Prosperity/Rosedale watermain replacement project, which started in 2016, at an estimated cost of \$1,800,000
- Installation of a fire service water meter and chamber at three facilities, to ensure water usage of fire services is metered, at an estimated total cost of \$350,000.
- Watermain replacements on Carter Avenue and Janet Street, at an approximate cost of \$750,000. The City received federal funding for this project.

Major expenditures for 2016 included the following:

- Began 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 \$976,000

- Complete retrofit of approximately 5,300 water meters with RF technology, at an approximate cost of \$2 million. These meters provide the capability to datalog and provide historical data to customers in the event of a high bill complaint.
- Completed Phase 3 and 4 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, and which received \$2 million in funding from the Small, Rural and Northern Municipal Infrastructure Fund (SRNMIF) is ongoing, with the final Phase to be completed early in 2017. In 2016 approximately \$543,000 was spent on this project.
- In partnership with Niagara Region, began construction of 1,080 m total of replacement watermain on Elm Street, between Rosedale Ave and Barrick Road, and on Prosperity Ave and Rosedale Ave from Elm St to each dead end. Approximately \$8,000 of the \$1,800,000 project was completed in 2016.

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 Region's previous HAAs sampling results at the water treatment plant, combined with the historically low levels of THMs detected in the distribution system samples collected by the City, HAAs are not expected to be a concern in the drinking water.

The City's Engineering and Operations Department is moving in 2017 to a new Operations Centre, located at 1 Killaly Street West. All reports will be available at the new location after the move.

Where to Obtain Additional Information

Copies of this annual report are available, free of charge, at the Engineering and Operations Department, 2nd Floor, City Hall - 66 Charlotte Street. 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 either at the Engineering and Operations Department or at the Public Works office at 11 King Street. 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 Department	905-835-2900
	Public Works	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)	Sampled quarterly. Quantity of samples not specified in regulations. City collects 2 samples per quarter 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 (highest value per sampling event) 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
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, 2013

Parameter	Requirement	Number of samples		Results			Comments
		Routine	Non-Routine	Range	Unit	# of Adverse	
Microbiological Analysis							
<i>E. coli</i>	ND	625*	87*	ND	cfu/100 mL	0	Presence of <i>E. coli</i> indicates presence of fecal matter
Total Coliforms	ND	625*	87*	ND-5	cfu/100 mL	2	Presence of Total Coliforms indicates possible presence of pathogenic bacteria
Heterotrophic Plate Count	<500	308*		0-27	colonies/mL	0	Presence of HPC indicates water quality deterioration
Operational Parameters							
Free Chlorine	Minimum 0.05	1248*	920*	0.05 – 1.29	mg/L	0	Level of disinfectant present
Turbidity	5.0	1248*	920*	0.05 – 0.97	NTU	N/A	Not a reportable parameter; 5.0 NTU is aesthetic guideline
Lead Testing Results							
Alkalinity	30 - 500	8		84 – 89	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		6.71 – 8.41		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	8		(Annual Average) 0.0246	mg/L	0	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.