Port Colborne Distribution System
Annual Drinking Water Quality Report

Prepared on February 24, 2012
in accordance with O.Reg. 170/03
January 1, 2011 to December 31, 2011

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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 19,000 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	905-835-2900 ext. 212

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 3.

The Region operates the Port Colborne Water Treatment Plant, the Fielden Avenue Reservoir and the King Street Water Tower, and as such, is also required to conduct operational checks and 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, 2011 to December 31, 2011:

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 routinely collected and submitted for analysis after watermain breaks.

In 2011, a total of 657 samples were collected and analyzed for the presence of *E.coli* and Total Coliforms. 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 two adverse samples are discussed below.

To monitor the potential deterioration of the water quality, 154 samples were collected and analyzed for Heterotrophic Plate Count (HPC). While there is no regulated limit for HPC, the general acceptable standard is <500 colonies/mL. Laboratory results indicated that HPC was detected at very low levels, between 0-51 colonies/mL in 2011 *(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, complaints etc. In 2011, this resulted in the collection and analysis of 816 samples. Turbidity levels ranged from 0.07 to 6.67 NTU, while free chlorine levels ranged from 0.03 to 1.38 mg/L. There were three (3) instances in 2011 where free chlorine levels were below the minimum level of 0.05 mg/L required under O.Reg. 170/03 *(Table 5).* Details about these instances are discussed below.

Lead Testing (Schedule 15.1) Results

Beginning with the winter sampling cycle in 2010 (Dec 15, 2009 to April 15, 2010), the City was exempted from collecting samples from plumbing systems, and was only required to collect 4 samples from the distribution system twice annually (winter sampling cycle and summer sampling cycle – June 15, 2010 to October 15, 2010). Additionally, the City was no longer required to test for lead every year; the distribution system samples were required to be tested for alkalinity and pH during the first two years, with lead sampled in year three.

2011 was the second year of the cycle; therefore, 8 samples were collected in total and analyzed for alkalinity and pH. Alkalinity values ranged from 79 to 108 mg/L, while pH values ranged from 7.34 to 7.91. Both parameters were well within the recommended guidelines (*Table 5).*

Organic Parameters

The only organic parameter the City is required to monitor in the distribution system is trihalomethanes, or THMs. Results from 2011 continue to indicate that THMs are not a concern in the distribution system, as the average concentration was 0.0075 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 2011, there were five (5) reportable adverse water quality incidents. Three (3) adverse samples were due to low free chlorine (<0.05 mg/L) and two (2) were due to the presence of total coliforms (1 and 5 cfu/100 mL). Details about the adverse samples are discussed below.

Regulatory Non-Compliances

There were five (5) reportable adverse water quality incidents in 2011.

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 - 2011

Sample Date	Date Adverse Reported to City*	Parameter	Result	Corrective Action Date	Corrective Action
Aug 9, 2011	N/A	Free Chlorine	0.04 mg/L	Aug 10, 2011	Immediately flush the watermains and restore secondary disinfection to ensure that a free chlorine residual of at least 0.05 mg/L was achieved at all points in the distribution system. NOTE: it is our practice to achieved 0.20 mg/L or greater when dealing with an adverse chlorine incident.
Sep 8, 2011	N/A	Free Chlorine	0.04 mg/L	Sep 8, 2011	
Oct 24, 2011	N/A	Free Chlorine	0.03 mg/L	Oct 24, 2011	

Nov 1, 2011	Nov 3, 2011	Total Coliforms	1 cfu/ 100 mL	Nov 3, 2011	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.
Dec 12, 2011	Dec 13, 2011	Total coliforms	5 cfu/ 100 mL	Dec 13, 2011	

*Note: Free chlorine adverse are not "reported" to the City as they are detected immediately by the City's licensed Operators

It's important to note that although adverse water quality samples were measured in 2011, the immediate reaction by the City's licensed Operators ensured that the adverse was addressed in a timely manner, and that the safety of the drinking water was maintained.

In the areas of the system where the low free chlorine levels were observed, which indicated that the disinfectant was being affected due to low flows and high residence times, the City increased routine flushing activities to not only ensure free chlorine levels were higher than the minimum required, but also to provide more frequent monitoring of these areas.

Although there were two microbiological adverse results observed in 2011, representing less than 0.3% of the total samples collected, it is important to know that special follow up sampling and evaluation found the water to be microbiologically safe in each case.

Our Commitment to Providing Safe Drinking Water

To ensure that residents, businesses and visitors to our community continue to receive safe 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

In addition, the City has the following plans for 2012:

- A consultant has been selected to conduct an Infrastructure Needs Study (INS) for the distribution system. The current INS, which is the foundation for distribution system capital projects, was prepared in 1996. Recognizing that this information is dated and likely not a good reflection of the current status of the

distribution system infrastructure, an INS has been budgeted for completion in 2012, and every 5-6 years in future.

- Enhancement of current flow monitoring activities to allow real-time monitoring of flows within the distribution system and aid City staff in locating leaks and episodes of "unauthorized" water use.

Watermain replacement costs for 2011 were committed to the Elizabeth Street bulk water station project, which was started late in 2011 and will be completed and expensed early in 2012.

Major equipment expenditures for 2011 totalled $347,419 and were for the following items:

• Lease for water department backhoe	$22,234
• Purchase of single axle dump truck	$148,496
• Pick up truck for ORO	$24,532
• District Metered Area flow monitoring stations – 5 permanent, 3 portable (including panels, radio transmitters, antennas, insertion flow meters, pressure sensors and associated materials)	$152,157

What's New?

The City submitted their documentation for full scope accreditation of the City's Quality Management System in accordance with the Drinking Water Quality Management Standard in September 2011 and is currently waiting to be contacted by the Canadian General Standards Board to conduct the on-site audit. The Operational Plan is available on the City's website at:
http://www.portcolborne.ca/page/drinking_water_quality_management_system

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: http://www.niagararegion.ca/living/water/ptcolborne.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 *E.coli.* Minimum 25% of all samples collected weekly analyzed for heterotrophic plate count	• *E.coli* – NONE detected • Total Coliforms – NONE detected • Heterotrophic plate count - <500 colonies per mL sample	• 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 64 samples per month collected and tested for free chlorine. Collected twice weekly (at least 48 hours apart) from representative areas of the distribution system	• Minimum residual chlorine 0.05 mg/L • City targets 0.20 mg/L • City's acceptable low limit is 0.10 mg/L	• City flushes 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 64 samples per month and tests for turbidity. Collected twice weekly from representative areas of the distribution system	• 5.0 NTU maximum aesthetic objective	• 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	• 0.10 mg/L maximum acceptable concentration	• 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	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. 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 plus lead analysis. 2011 was the second year in the three year cycle, therefore lead analysis was not performed in 2011	• 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	• 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, 2011

Parameter	Requirement	Number of samples	Results			Comments
			Range	Unit	# of Adverse	
Microbiological Analysis						
E. coli	ND	657*	ND	cfu/ 100 mL	0	Presence of *E.coli* indicates presence of fecal matter
Total Coliforms	ND	657*	ND-5	cfu/ 100 mL	2	Presence of Total Coliforms indicates possible presence of pathogenic bacteria
Heterotrophic Plate Count	<500	154*	0-51	colonies/ mL	0	Presence of HPC indicates water quality deterioration
Operational Parameters						
Free Chlorine	Minimum 0.05	816	0.03 – 1.38	mg/L	3	Level of disinfectant present
Turbidity	5.0	816	0.07 – 0.92	NTU	N/A	Not a reportable parameter; 5.0 NTU is aesthetic guideline
Lead Testing Results						
Alkalinity	30 - 500	8	79 – 108	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	7.34 – 7.91		N/A	
Organic Parameters						
Trihalomethanes	0.10	8	(Annual Average) 0.0075	mg/L	0	By-product of chlorination; forms when chlorine reacts with suspended organics.

**Note – the total number of samples includes those collected after watermain break repairs. 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%. In 2011, 612 samples were collected and analyzed for presence of E.coli/Total coliforms, and 154 were analyzed for HPC.*

ND = non-detectable *NTU = nephelometric turbidity unit*