



The Corporation
of the City
of Cambridge

REPORT

To: Council

Date of Meeting: March 4, 2008

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Department: Transportation & Public Works

Date to Management Committee: February 20, 2008

Report No.: TPW-06/08

File No.:

Ward No.: All

Subject:

**2007 SUMMARY / ANNUAL WATER
REPORT**

Recommendations:

THAT Council receive report TPW-06/08.

Executive Summary:

The delivery of potable water in Ontario is regulated by the Ministry of Environment (MOE) under the Safe Drinking Water Act (formerly the Ontario Water Resources Act). On June 1, 2003 O. Reg. 170/03 came into affect. This regulation prescribes requirements for owners and operators of municipal drinking water systems.

Among the obligations, O. Reg. 170/03 prescribes the need for all owners of licensed water works to produce a Summary Report as indicated in Schedule 22. The Report is required to contain the following information:

- ❖ List of requirements of the Act, regulations, the system's approval and any order that the system failed to meet at any time during the period covered by the report and specify the duration of the failure and describe the measures taken to correct the situation.
- ❖ Summary of quantities of water used for the period covered by the report.
- ❖ The Summary Report must be presented and accepted by Council by March 31st of each year.

This Regulation also requires the owner to produce an Annual Report, as found in Section 11. This report must include the following:

- ❖ Description of the system
- ❖ Summary of any adverse water quality reports and corrective actions
- ❖ Summary of all required testing results
- ❖ Description of any major expenses incurred to install, repair or replace required equipment
- ❖ The Annual Report must be completed by February 28th of each year.

Prior to the amendments made to O.Reg. 170/03 in 2006, the Annual Report had to be submitted to the Ministry of the Environment; this is no longer a requirement. As a result, the Summary and Annual Reports have been combined by City Staff into one document, which is submitted to Council for acceptance.

Report Highlights

The Annual Report

System Description

- 536 kilometers of watermains operated and maintained (City owns 454, 54 km owned by Region of Waterloo, with 28 km of dual-use components).
- Nearly 36,500 service connections supplying water to approximately 126,000 residents and various business and industrial locations.
- City is divided into 5 pressure zones

Adverse Water Quality Incidents/Corrective Actions

- October 30, 2007
 - Total coliform detected in single bacteria sample
 - Local distribution system flushed and resampled (all test results met legislated requirements)
- No other Adverse Water Quality Incidents

Bacteriological and Chemical Testing (Jan to Dec 2007)

- 1199 e.coli samples (pass on all test results except one)
- 1199 total coliform samples (pass on all test results)
- 387 background bacteria samples
- 2181 chlorine residual tests (pass on all test results)
- 47 lead samples (all results below MOE max. limit is 10 ug/L)
- 33 alkalinity samples (range from 250 to 284 mg/L)
- 7 pH samples (range 7.09 to 7.20)
- 4 THM (trihalomethane) samples (running average of 41.1 parts/billion; MOE max limit is 100)

Significant Expenses Incurred

- 2007 Valve Replacement Program (\$176,858)
- 2007 Watermain Swabbing Program (\$180,105)
-

The Summary Report

Legislation

- Safe Drinking Water Act (2002)
- Drinking Water Systems Regulation (170/03)
 - New lead testing requirements
- Water Operator Licensing Regulation (128/04)
- Upcoming: Drinking Water Management Quality Standard

Non-Compliance Issues

- Microbiological water quality monitoring
 - Previous sampling agreement with MOE was deemed null with changes in water regulations and required additional sampling be carried out
 - As agreed to with MOE, bacteria sampling increased to a monthly minimum of 112 locations.

City of Cambridge Water Consumption

- 2006 Total – 17,850,084 cubic metres
- 2007 Total – 17,957,072 cubic metres
(0.6% increase)

City of Cambridge



2007 Summary/Annual Water Report

Presented to Council: March 4, 2008

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Background

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Drinking Water System Description

The City of Cambridge maintains and operates all 536 kilometers of watermains within the City's boundaries. The City owns 454 km while 54 km are under Region of Waterloo ownership, with 28 km of dual-use watermains. There are 3,100 public hydrants providing fire protection and 4,688 valves of various sizes for controlling water flow. Within the network, there are nearly 36,500 service connections supplying water to approximately 126,000 residents and various business and industrial locations.

The distribution system is divided into five individual pressure zones based on the water supply components and the varying elevations throughout the City.






Water is supplied to the City by the Region of Waterloo through a network of wells, treatment plants, pumping stations, control valves, and reservoirs. Treated water from this supply network is monitored on-line, 24 hours per day by operators through the Regional SCADA (System Control and Data Acquisition) system.

Legislation

Since the issuance of the Walkerton Reports I and II in 2002, many legislative and regulatory changes have occurred for those supplying drinking water in Ontario. The following are the primary pieces of legislation that have directly affected the operation of the City of Cambridge's water distribution system.

Safe Drinking Water Act

As recommended by Commissioner O'Connor, the government passed the Safe Drinking Water Act in 2002, which expands on existing policy and practice and introduces new features to protect drinking water in Ontario. The Act's purpose is to protect human health through the control and regulation of drinking-water systems and drinking-water testing. The Act has also provides legislative authority to implement the recommendations made in Commissioner O'Connor's Walkerton Part One and Two Reports. As of August 2007, all 28 recommendations made in Part One, and all 93 in Part Two have been implemented. The Act also has the benefit of gathering in one place all legislation and regulations relating to the treatment and distribution of drinking water. Parts of the Act address:

-  Accreditation of operating authorities
-  Municipal drinking water systems
-  Drinking water testing
-  Inspections
-  Compliance and Enforcement

Ontario Regulation 170/03: Drinking Water Systems Regulation

The Drinking Water Systems Regulation (O. Reg. 170/03) regulates municipal and private water systems that provide water to year-round residential developments. This regulation stipulates treatment equipment usage, operational checks and sampling, chemical and microbiological testing requirements, corrective actions, and reporting requirements.

Amendments to O. Reg. 170/03 came into effect on June 5, 2006. The amendments are risk-based and are designed to safeguard the quality of Ontario's drinking water, while making the regulation more workable and affordable for residential drinking water systems and systems serving designated facilities. They add clarity and flexibility to the testing and operational regimes set out in Reg. 170 and in some cases, has reduced the cost of regulatory compliance.

On July 26th, 2007, further amendments were made requiring additional lead sampling for water distribution systems. The purpose of the new lead testing requirements is to determine whether communities have a problem with lead in drinking water at the tap. Random testing throughout the City would provide the basis on which to initiate actions to reduce lead levels through control of lead corrosion and would provide evidence of any changes in lead levels over time.

Ontario Regulation 128/04: Certification of Drinking-Water Operators and Water Quality Analysts

The Water Operator Certification Program was initiated for drinking water operators in 1987 as a voluntary program. On May 14, 2004, O. Reg. 128/04 was issued, increasing the requirements for drinking water operators' certification. The regulation also establishes ongoing training requirements for these operators. Details note the different types of licenses, reissuance and transferability, overall and operator in charge responsibilities, record keeping, and operations/maintenance manuals.

Of special note, this regulation stipulates that all new water operators must complete an Entry-Level Course of Study within the first 16 months of obtaining their operator-in-training (OIT) certificate. As of August 1, 2005, these operators must complete a 40 hour at-home study manual and successfully pass a written test based on this manual. After this, they must attend a five day in-class training seminar and examination facilitated by Ridgetown College and the Walkerton Clean Water Centre. Once these requirements have been met, the new operator's license is valid for three years, allowing them time to meet the requirements needed for a Level One License.

Drinking Water Quality Management Standard (DWQMS)

On November 28, 2005, The Ontario Ministry of the Environment posted the Drinking Water Quality Management Standard (DWQMS) on the Environmental Registry for comment until January 27, 2006. On October 30, 2006, the finalized standard was issued on the Environmental Bill of Rights Registry. The purpose of this Standard is to assist owners and operating authorities in the effective management and operation of their municipal residential drinking water systems. This Standard outlines requirements for a Quality Management System (QMS) to ensure high quality drinking water. In the development of a QMS, the Operating Authority must create an Operational Plan; this document will define the QMS and will be subject to external audits for accreditation. As referenced in the Standard, the QMS must be embraced by all those with active rolls in the water system, from front line staff to the highest level of management.

City Staff are in the process of developing a QMS specific to the City of Cambridge with the assistance of consulting group who have experience with the implementation of this Standard in other municipalities. Staff are confident that a successful implementation of this Standard will be obtained by the imposed deadline of February 1, 2009.

Non-Compliances with Legislation

Schedule 22 requires that all non-compliance with applicable legislation be discussed in the Summary Report. The Ministry of the Environment carried out their annual system inspection on August 21, 2007, for the period of September 1 2006 to July 31st 2007; no non-compliance issues were noted during this inspection (see Appendix 1: MOE Inspection Summary Rating Record). The following item is a carry-over from the August 25th 2006 inspection that has since been corrected.

Table 1: Non-Compliances

Requirement	Non-Compliance	City Action
Microbiological Water Quality Monitoring	Microbiological water quality monitoring was not being conducted in accordance with O. Reg. 170/03, Schedule 10-2.	<p>In 1997/98 the Region of Waterloo's Best Management Practices (BMP) group submitted a proposal to the Ministry of Environment and Energy (MOEE) to treat the water system as one continuous interconnected system obtaining water from a single supplier, the Regional Municipality of Waterloo (RMOW) to enhance efficiencies in water sampling. The accepted proposal indicated that samples would be taken based on the Region's combined population at the time (370,000) and 137 samples were to be taken per month, divide amongst the Tri-Cities and Woolwich Township. During the 2006 MOE inspections, the BMP members were told this agreement was no longer valid based on legislative changes since 1997 and that each member would have to sample at the present prescribed level.</p> <p>As agreed to with the MOE, starting on April 1st, 2007, the City of Cambridge increased their bacteria testing to a minimum of 112 samples per month to meet the legislative requirement.</p>

With the exception of the noted issue, the City of Cambridge is not aware of any additional non-compliances within the distribution system for 2007.

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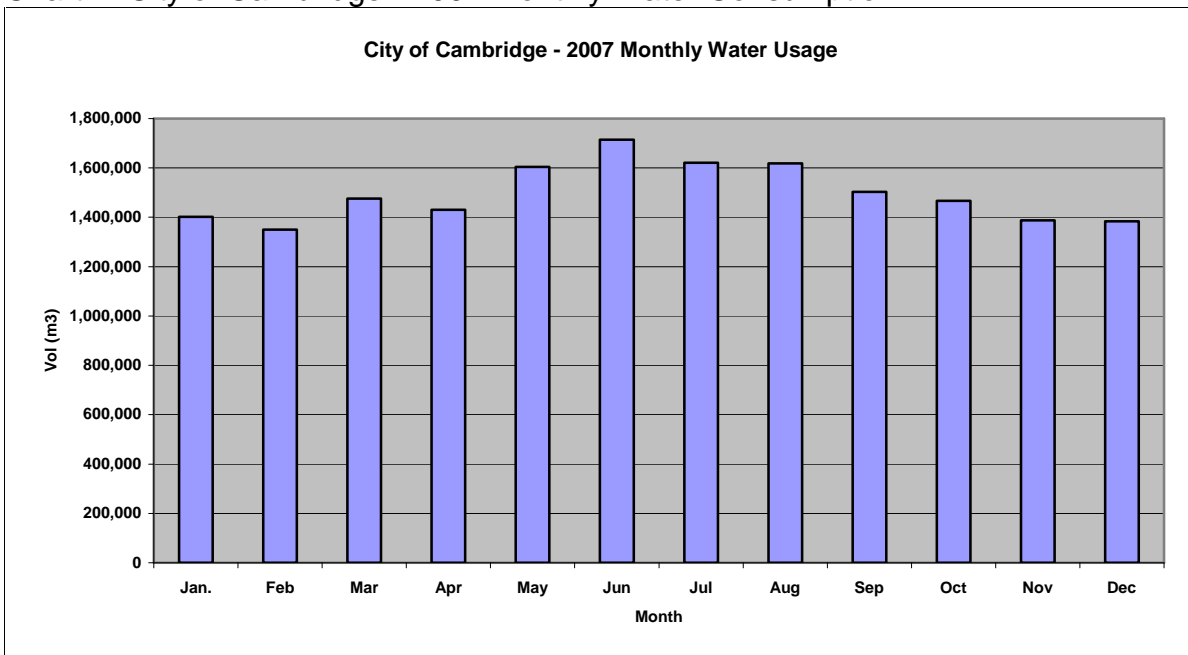
Water Usage

From January 1 to December 31, 2007, the City of Cambridge received a total of 17,957,072 cubic metres of water from the Region of Waterloo (supplier). This compares to 17,850,084 cubic metres from the previous year (an increase of 0.6%).

Table 2: City of Cambridge – 2007 Monthly Water Consumption

Month	Consumption (m ³)	Ave. Daily Consumption (m ³)
January	1,402,420	45,239
February	1,349,661	48,202
March	1,475,241	47,588
April	1,430,193	47,673
May	1,603,805	51,736
June	1,714,195	57,140
July	1,621,503	52,307
August	1,619,007	52,226
September	1,503,221	50,107
October	1,466,173	47,296
November	1,388,152	46,272
December	1,383,501	44,629
2007 Total	17,957,072	49,197

Chart 1: City of Cambridge - 2007 Monthly Water Consumption



2007 Summary/Annual Water Report

2007 Annual Report
System Information

Drinking-Water System Number:	260002460
Drinking-Water System Name:	Cambridge Distribution System
Drinking-Water System Owner:	The Corporation of the City of Cambridge
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2007 to December 31, 2007

Does your Drinking-Water System serve more than 10,000 people?

Yes [] No []

Is your annual report available to the public at no charge on a web site on the Internet?

Yes [] No []

Location where Summary Report will be available for inspection:

A copy may be obtained from City of Cambridge Clerks' Department (519)-623-1340

All Drinking-Water Systems, which receive all of their drinking water from the system:

Drinking Water System Name	Drinking Water System Number
Lloyd Brown Subdivision Distribution System	260002759

Were copies of the annual report given to these Drinking-Water System owners?

Yes [] No []

How were system users notified that the annual report is available, and that it is free of charge?

[] Public access/notice via the web

[] Public access/notice via a newspaper

[] Public access/notice via public request

[] Public access/notice via other method: Report presented to Cambridge City Council

List all water treatment chemicals used over this reporting period:

Water treatment is carried out the Region of Waterloo. New installation and repair work is disinfected using NSF 60 rated sodium and calcium hypochlorite.

Brief description and a breakdown of monetary expenses incurred for maintenance and repairs on equipment:

2007 valve replacement program: \$176,858

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2007 water main swabbing maintenance program: \$180,105

Testing Results

Summary of reports made to the Ministry under subsection 18(1) of the Safe Drinking-Water Act or Schedule 16-4 of O.Reg.170/03:

Incident Date	Parameter	Test Result	Unit of Measure	Corrective Action	Corrective Action Date
10/30/2007	Total Coliform	Present	Present / Absent	Flushed system at hydrant and confirmed chlorine residuals; resampled at location, plus additional upstream and downstream samples	10/31/2007 (date of lab notification of adverse)

Microbiological testing done under the Schedule 10 of Regulation 170/03, during this reporting period:

Water Type	Number of Samples	Range of E.Coli Results	Range of Total Coliform Results	Number of HPC Samples	Range of HPC Results (min #- max #)
Raw	Not applicable to Distribution System: see Region of Waterloo at www.region.waterloo.on.ca				
Treated					
Distribution	1199	All absent	1 "present" result	387	0 - >500

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

Testing	Number of Grab Samples	Range of Results (min #)-(max #)	Notes
Chlorine (free)	2181	0.00 – 2.06 mg/L	No operational tests indicated adverse chlorine residuals were present in the distribution system
Chlorine (combined)	2181	0.00 – 1.62 mg/L	
Fluoride	Not applicable: fluoride not added to water		

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
Not applicable; no additional testing/sampling required				

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Lead (internal plumbing)	32 Samples 01/01/2007 to 12/31/2007	<1.0 – 8.3	ug/L	No
Lead (Distribution System)	15 Samples 01/01/2007 to 12/31/2007	<1.0 - 1.3	ug/L	No
Alkalinity (Internal Plumbing)	20 Sample 01/01/2007 to 12/31/2007	250 - 284	mg/L	No
Alkalinity (Distribution System)	13 Samples 01/01/2007 to 12/31/2007	256 to 281	mg/L	No
pH (Internal Plumbing)	6 Samples 01/01/2007 to 12/31/2007	7.09 – 7.20	pH	No
pH (Distribution System)	1 Sample 12/17/2007	7.12	pH	No
THM (2007 running annual average)	10/10/2007	41.1	ug/L	No
	07/11/2007			
	04/10/2007			
	01/09/2007			

Note: for results on the supply source, see the Region of Waterloo at www.region.waterloo.on.ca.

List of 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
Not applicable; no Schedule 2 half standards exceeded			

Appendix 1: MOE Inspection Summary

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2007-2008)

DWS Name: CAMBRIDGE DISTRIBUTION SYSTEM
DWS Number: 2500024R0

DWS Owner: City of Cambridge
Municipal Location: City of Cambridge
O.Reg. 173/03 Category: Large municipal residential
Type of Inspection: Standalone
Inspection Date: August 27, 2007
Ministry Office: Guelph District

Maximum Question Rating: 123

Inspection Module	Non-Compliance Rating
Distribution System	0 / 0
Operations Manuals	0 / 5
Logbooks	0 / 26
Consumer Relations	0 / 5
Certification and Training	0 / 18
Water Quality Monitoring	0 / 38
Reporting & Corrective Actions	0 / 20
TOTAL	0 / 123

Yearly Comparison

FY 2005/06 Inspection Rating:	91.06%
FY 2006/07 Inspection Rating:	91.14%
FY 2007/08 Inspection Rating:	100.00%

Total Non-Compliance Rating: 0.00%

FINAL INSPECTION RATING: 100.00%