

City of Cambridge



2006 Summary/Annual Water Report

Submitted to Council March 19, 2007.

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Background

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.

Drinking Water System Description

The City of Cambridge maintains and operates 469 kilometers of watermains within the City's boundaries. The City owns a total of 411 km with the remaining 58 km being shared with the Region of Waterloo, with some dual use components. Within the network, there are nearly 37,200 service connections supplying water to approximately 122,000 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. To date, 23 of 28 recommendations made in Part One, and 60 of 93 in Part Two have been implemented, with the rest underway. It 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

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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.

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 Ridgeway 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

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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 August 1, 2008.

Non-Compliances with Legislation

Schedule 22 requires that all non-compliance with applicable legislation be discussed in the Summary Report. The following issues were noted and addressed during the Ministry of the Environment's annual system inspection.

Table 1: Non-Compliances

Requirement	Non-Compliance	City Action
Microbiological Water Quality Monitoring	All microbiological water quality monitoring required by the legislation was not being conducted.	In 1997/98 the Region of Waterloo's Best Management Practices (BMP) group submitted a proposal to the Ministry of Environment and Energy (MOE) 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. As requested by the MOE, the BMP group submitted an Interim Sampling Plan (attached) to address this situation and bring all members into compliance with present legislation.
	An appropriate written agreement was not in place between the donor (Region of Waterloo) and the receiver, and the receiver (City of Cambridge) had not monitored the treated water as required.	
Logbook Entries	The record system did not allow the reader to unambiguously identify the person who made the logbook entry.	On Sept 12, 2006, the City submitted an update version of 'Policy 6: Log Requirements' that addressed this issue. Training for field staff was carried out to ensure future compliance.

With the exception of the noted issues, the City of Cambridge is not aware of any additional non-compliances within the distribution system for 2006.

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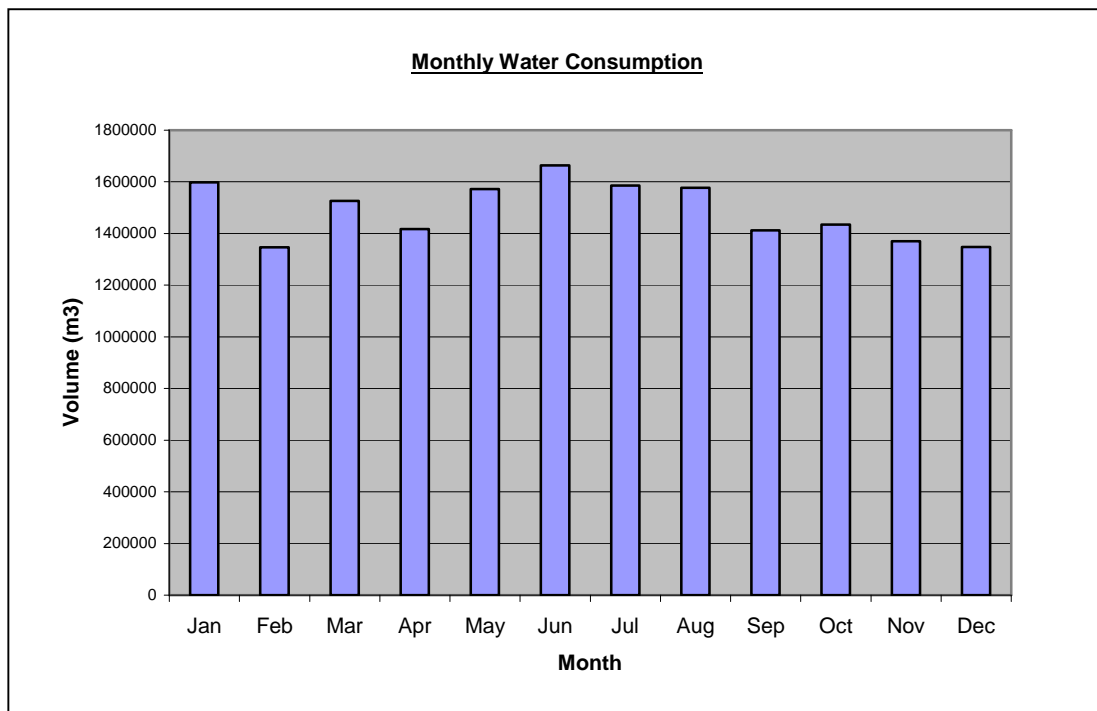
Water Usage

From January 1 to December 31, 2006, the City of Cambridge received a total of 17,850,804 cubic metres of water from the Region of Waterloo (supplier). This compares to 18,792,224 cubic metres from the previous year (a decrease of 5.0%).

Table 2: Monthly Water Consumption

Month	Consumption (m³)	Ave. Daily Consumption (m³)
January	1,598,337	51,559
February	1,346,583	48,092
March	1,525,790	49,219
April	1,417,579	47,253
May	1,572,077	50,712
June	1,663,815	55,461
July	1,585,240	51,137
August	1,576,613	50,858
September	1,412,367	47,079
October	1,434,983	46,290
November	1,370,168	45,672
December	1,347,252	43,460
2005 Total	17,850,804	48,906

Chart 1: Monthly Water Consumption



2006 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, 2006 to December 31, 2006.

Does your Drinking-Water System serve more than 10,000 people?
 Yes [X] No []

Is your annual report available to the public at no charge on a web site on the Internet?
 Yes [X] 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 [X] No []

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

- [X] Public access/notice via the web
- [X] Public access/notice via a newspaper
- [X] Public access/notice via Public Request
- [X] 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.
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Brief description and a breakdown of monetary expenses incurred for maintenance and repairs on equipment:

2006 valve replacement program (\$151,350)
2006 water main swabbing maintenance program (\$213,000)

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
10/23/2006	Testing not applicable – sheen observed while swabbing water main; reported under O. Reg. 170/03 section 16-4 (duty to report observations)	Not applicable (observation)	Not applicable	Swabbed and flushed mains and samples taken (bacteria and targeted organics; all results were non-detect)	10/23/2006

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	509	All absent	All absent	228	0 - 210

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)	1176	0.02 – 2.10 mg/L	No operational tests indicated adverse chlorine residuals were present in the distribution system
Chlorine (combined)	1176	0.00 – 1.14 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	04/21/2006	1.01	ug/L	No
	04/21/2006	1.05	ug/L	No
Benzene	10/31/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
Xylene (meta + para)	10/31/2006	<1.00	ug/L	No
	10/24/2006	<1.00	ug/L	No
	10/24/2006	<1.00	ug/L	No
	10/24/2006	<1.00	ug/L	No
Xylene (ortho)	10/31/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
Ethyl Benzene	10/31/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
Styrene	10/31/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
Toluene	10/31/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
	10/24/2006	<0.50	ug/L	No
THM (2006 running annual average)	10/11/2006	35.8	ug/L	No
	07/17/2006			No
	04/10/2006			No
	01/09/2006			No
Trichloroethylene	03/24/2006	0.5	ug/L	No
Petroleum Hydrocarbons	10/31/2006	<100	ug/L	No
	10/24/2006	<100	ug/L	No
	10/24/2006	<100	ug/L	No
	10/24/2006	<100	ug/L	No

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			

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The Corporation
of the City
of Cambridge

Cambridge Public Works
1310 Bishop St.
Cambridge, Ontario
N1R 6V5
(519) 621-0740 (office)
(519) 622-8032 (fax)

November 29, 2006

Attention: Mr. Don Hamilton, Supervisor, Drinking Water Inspections
Program, West Central Region
Ministry of the Environment
4th Floor, One Stone Road W.
Guelph, Ont.
N1G 4Y2

Dear Don,

The following report has been created by the members of the Best Management Practices Committee, composed of representatives from the cities of Cambridge, Waterloo, Kitchener, and the townships of North Dumfries, Wellesley, Wilmot, and Woolwich.

It is in response to the request from the Ministry of the Environment to address the need to increase the number of bacteria samples taken in some of the member distribution systems.

I request that you review this report and respond to me within one month stating the acceptability of the plan. If there are any immediate issues or concerns with this interim plan, please contact me at your soonest availability.

Thank you,

Jamie Austin
Manager – Operations Compliance/Metering
City of Cambridge, Public Works
1310 Bishop St.

cc: Bill Garibaldi – City of Waterloo
Barry Musselman – City of Kitchener
Rod Kruger – Woolwich Township
Gary Charbonneau – Wilmot Township
Olga Vrentzos – Region of Waterloo (North Dumfries and Wellesley Township)
Lenore Draushchak – Region of Waterloo, EELS

Background

In 1997/98 the Region of Waterloo's Best Management Practices (BMP) group submitted a proposal to the Ministry of Environment and Energy (MOE) 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 proposal suggested that sample taking be based on the Region's combined population at the time (370,000) and 137 samples were to be taken per month. A list of sampling locations was submitted and the MOE accepted the proposal in 1998.

In December 1998 a "Protocol and Procedures for Bacteriological Resampling and Corrective Action Plan" was prepared by the RMOW. The report provided the number of weekly distribution samples to be taken in each municipality.

In April 2003 the MOE prepared a follow-up response that stated that "...RMOW water supply is also considered one large distribution system. Therefore, the combined water distribution sampling must meet the combined total population sampling requirements set out in Schedule 2, O.Reg. 459..." The municipalities continued to sample, without incident, according to the combined total population and their percentage of the population.

The MOE inspected the Kitchener Distribution System in July 2006 and the Cambridge Distribution System in August 2006. The MOE determined that both Kitchener and Cambridge were in non-compliance since the number of microbiological samples did not meet the sampling requirements in Reg. 170/03. The term "non-compliance" is objectionable given the amount of correspondence that occurred between 1997 and 2003. The MOE indicated that they shared responsibility in the "non-compliance" since the municipalities were not informed that their agreement was no longer acceptable. Although we realize that the regulations changed after the last correspondence, the number of bacteriological samples required did not change. "Non-compliance" has a negative connotation that suggests that we knowingly disregarded the regulations and this is not the case.

Microbiological Sampling Meeting

A meeting was held on September 27, 2006 with representatives from the MOE, RMOW Environmental Enforcement and Laboratory Services (EELS), Cities of Kitchener, Waterloo and Cambridge and the Township of Woolwich.

The MOE discussed the fact that O.Reg. 170/03 was released in May 2003 (more extensive than Reg. 459), after the 2003 correspondence with the MOE regarding sampling requirements. The MOE indicated that the sampling agreement should have been reviewed after the release of the new regulation and that the current sampling program does not confirm to present day regulatory requirements. The MOE stated that they shared responsibility with the municipalities regarding the agreement. This will be noted as a non-compliance

item in future drinking water inspections. It should be noted that the number of microbiological samples did not change in the new regulation.

Population and Required Sampling

Kitchener

Kitchener's estimated population in July 2006 was 209,872 (source: F.P Markets 2006) that requires 120 samples per month.

Cambridge

Cambridge's estimated population for 2006 is estimated at 122,000, requiring 112 samples per month.

Waterloo

Waterloo's estimated population for 2006 is 110,800 (113,059 including seasonal university students). Technically, this requires 111 samples per month.

Wilmot Twosp., Woolwich Twosp., Region of Waterloo

No changes to bacti-sampling program.

Laboratory Agreement

Each municipality will have an up-to date written agreement with the laboratory/service provider (Region of Waterloo Environmental Enforcement Laboratory Services) that should include:

- Reference to current regulations
- Mechanism to have population/number of samples updated on an annual basis
- Reference a current sampling protocol
- Detail the Legislative requirement of owner that will be delegated (i.e. re-sampling)
- Ensure that all samplers are properly certified
- Ensure that the lab is properly accredited and if accreditation is lost that the owner of the drinking water system is notified
- Sample locations should be agreed to by the owner of the drinking water system
- Drinking water system owner should review prior to month's end that the required number of samples will be achieved.

Current Sampling Program

Kitchener

The City of Kitchener currently tests between 68 to 80 samples for any given calendar month at several sites across the City. Some locations are only sampled once every four weeks, however other locations are sampled bi-weekly.

Cambridge

The City of Cambridge currently tests approximately 55 samples for any given calendar month at several sites across the City. Some locations are only sampled once every four weeks, however other locations are sampled bi-weekly.

Waterloo

The City of Waterloo currently has 23 sample sites across the City that are sampled weekly.

Wilmot Twosp., Woolwich Twosp., Region of Waterloo

No changes to bacti-sampling program.

Revised Sampling Program

It is the owner's responsibility to ensure that all legislative requirements are met. To meet the required monthly samples, the sampling frequency has been increased at the majority of sampling locations:

Kitchener

Kitchener has decided to take 123 samples per month (a 2.5% increase to allow for un-accessible locations, and any population differences between the estimate and actual census values).

Cambridge

Cambridge has decided to take 115 samples per month (2.8%% increase to allow for un-accessible locations, and any population differences between the estimate and actual census values).

Waterloo

Waterloo has decided to take approximately 120 samples per calendar month (8.1% increase) to allow for enough tests to cover months with a lesser amount of calendar weeks. This increase also covers any population differences between the estimate and actual census values.

Wilmot Twosp., Woolwich Twosp., Region of Waterloo

No changes to bacti-sampling program.

Implementation

It is anticipated that the new sampling program will be implemented no later than March 31, 2007. The implementation time frame is due to several factors including new staffing requirement and budget considerations.

Item	Anticipated Completion Date
Interim Sampling Plan Submission	November 30, 2006
Laboratory Agreement	Mid December, 2006
Hiring process for additional staff at	March 1, 2007

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EELS/Staff training Implementation of New Sampling Program	No later than March 31, 2007
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We intend to comply with regulations, however we may investigate the potential of an exemption in the future.

Continuing Monitoring of Number of Samples

Weekly Check

As of October 6, 2006 the EELS began sending weekly sampling summaries for each distribution system. Each City and Township will review the summaries provided each Friday and contact EELS immediately if there are any deficiencies or inadequacies in the sampling program based on legislated requirements.

Year End Check

The number of sampling locations based on population and geographic coverage will be assessed at the end of the calendar year, annually. The distribution sample numbers will also be reviewed upon the release/update of any related regulations.