St. Clair Township Water Distribution System

Annual Summary Report – O.Reg. 170/03

2012

(Waterworks # 260006464)

Introduction

The Corporation of the Township of St. Clair owns and operates the St. Clair Township Water Distribution System and supplies potable water to residents and businesses throughout the Township. Potable water is purchased from the Lambton Area Water Supply System (LAWSS), which operates a Water Treatment Plant in Sarnia and a trunk distribution system, serving six Lambton County municipalities.

The Township of St. Clair and the LAWSS operate their facilities in accordance with the Provincial Drinking Water System Regulation 170/03, introduced in June 2003 under the Safe Drinking Water Act, 2002. The new regulation updated Ontario Regulation 459/00 which set standards for all publicly operated water systems in the Province. Among the requirements of the new regulation is the production of an Annual Report summarizing the results of water quality testing and an Annual Summary Report outlining the general operation of the water system.

The reports and detailed test results are available at the St. Clair Civic Centre, 1155 Emily Street, Mooretown, Ontario. The Annual Report may also be viewed on the Internet at www.twp.stclair.on.ca. Copies of LAWSS test results and reports, and the new regulations and standards are also available for review. If you have any questions concerning this report or the operation of the St. Clair Water System, please call the Director of Public Works, Larry Burnham, P. Eng., at 519-867-2125.

History

The current water supply system serving St. Clair Township has evolved significantly over the past 50 years. Initially, several of the urban areas developed their own independent water distribution systems. These systems obtained drinking water from communal wells or the St. Clair River. In the early 1950's, with the development of the Shell Canada Refinery, a piped water supply was obtained from the City of Sarnia to service the Shell Refinery and Corunna.

In the early 1970's, the Ontario Water Resources Commission and local municipalities developed an area water system, LAWSS. It supplied treated water to Point Edward, Sarnia, Moore, Sombra and part of Sarnia Township. This system was expanded in the late 1980's to service municipalities in the northeastern part of Lambton County. The LAWSS provided a safe treated water supply to the urban areas of Brigden, Corunna, Courtright, Mooretown, Port Lambton and Sombra Village in the mid 1970's. In the late 1980's expansion of the Township distribution system began, to service the rural areas of the Township. Today, over 95% of the population is serviced with a piped water supply.

The LAWSS is currently governed by the six member municipalities and operated under contract by the Ontario Clean Water Agency. The Council of the Township of St. Clair controls the St. Clair Township Water Distribution System.

Annual Highlights

Frequent watermain flushing and chlorine residual testing indicates that residuals are remaining at acceptable levels. Chlorine levels in the Froomfield area still require regular monitoring and testing to be maintained at acceptable levels. Monitoring is continuing across the entire Township to ensure that water quality is being maintained.

On September 14, 2012 the continuous chlorine analyzer at the Brigden Water Tower and six Pocket Colorimeters were calibrated by Hach Canada.

On November 18, 2012 the MOE conducted an inspection of the St. Clair Township Water Distribution System. The non compliance findings are listed below:

1. **The facility and equipment did not appear to be maintained or in a fit state of repair.**

   This drinking water system has continued to have ongoing problems with the RF link at the Brigden Water Tower, which provides communication to the SCADA monitoring system. Operators report frequent and repetitive problems with the communication link. Operators at times have changed the alarm to a Type B (event is captured by SCADA as an alarm event - RF Link Failure/ 0 mg/Lchlorine), however Type B alarms do not page an operator).

   Action(s) Required:
   1. No action required at this time as RF link failure has been corrected as of February 6, 2013.

2. **The owner did not have up-to-date documents describing the distribution components as required.**

   Drinking Water Works Permit No. 039-201, Condition 3.5 of Schedule B, requires the document/file (“St. Clair _Distribution System Maps.pdf”, dated Dec 2007) referenced in Schedule A, Condition 1.2.1 Column 1 of Table 1 of the DWWP, to be updated to include water main additions, modifications, replacements or extensions within 12 months of addition, modification, replacement or extension. The most recent version of “St. Clair _Distribution System Maps.pdf”,was dated Feb 2, 2009.

   Action(s) Required:
   1. No action required at this time as the owner has updated the distribution plans (electronic file document using the portable document format -.pdf) as required by condition 1.2, Column 1 of Table 1 of Schedule A of DWWP No. 039-201 to reflect all watermain additions, modifications, replacement or extensions made prior to 2012. "SCTRuralWaterCurrent.pdf" was provided as the electronic file document on February 19, 2013.

3. **All trihalomethanes water quality monitoring requirements prescribed by legislation were not conducted within the required frequency.**

   Schedule 13-6 (1) of O. Reg. 170/03 requires at least one distribution sample to be collected and tested for trihalomethane once every three months. Schedule 6-1.1 (4) of O. Reg. 170/03 defines "every three months", as at least 60 days and not more than 120 days after a sample was taken for that purpose in the previous three month period. The trihalomethane sample taken on March 15, 2012 was collected 140 days after the previous sample of October 26, 2011 and therefore did not comply with Schedule 13-6 (1). The intervals noted in O. Reg. 170/03 must be adhered to.

   Action(s) Required:
   1. The owner/operating authority shall ensure that the trihalomethane sampling schedule complies with Schedule 13-6 (1) of O. Reg. 170/03 and provide written confirmation of such.

Corrective Action Taken:

St. Clair Township requested OCWA's water sampling schedule for 2013 to ensure that the trihalomethane sampling schedule complies with Schedule 13-6(1) of O. Reg.170/03.

4. All required notifications of adverse water quality incidents were not immediately provided as per O. Reg. 170/03 16-6.

On December 20, 2011 (AWQI #104562): there was a large fire at the Port Lambton Marina, resulting in low chlorine due to surface water backflow entering the distribution system. While the County of Lambton Health Unit was notified, the Ministry of the Environment was not notified until December 21, 2011 at approximately noon.

Action(s) Required:

1. The owner shall review the reporting requirements of Schedule 16 of O. Reg. 170/03 and Section 18 of the Safe Drinking Water Act with the operators of the St. Clair Township Distribution System and confirm with the undersigned officer that this review has occurred.

Corrective Action Taken:

St. Clair Township held training for the Water ORO, Crew Leaders, Water Operators to review Schedule 16 and 18 of the O. Reg. 170/03 of the Safe Drinking Water Act.

5. Summary Reports for municipal council did not include the required content in accordance with the regulatory requirements.

Although the annual Summary Report- 2011, does refer to the Ministry's Inspection report, and lists the non-compliance items, the Summary Report does not provide the detail as to what measures were taken for each requirement that was not met in the Ministry's inspection report.

Action(s) Required:

1. The owner shall ensure that the annual Summary Report contains the information as prescribed by Schedule 22-2(2)(b) of O. Reg. 170/03.

Corrective Action Taken:

The Annual Summary Report for 2012 was updated after the findings from the Water Inspection were received to reflect the measures taken to comply with Schedule 22-2(2)(b) of O. Reg. 170/03.

Water Quality

Testing throughout the distribution system is conducted on a weekly basis for both chlorine residual and microbiological parameters. The maintenance of chlorine residual in the distribution system is one important step used to prevent microbiological contamination of the water supply. Chlorine is added at the treatment plant and at various locations throughout the distribution system to ensure adequate disinfection capabilities are maintained. The Township is careful to avoid possible contamination during the repair of water mains, the installation of new connections and services, and during routine maintenance.

Appendix 'A' summarizes the results of distribution system testing conducted from January through December 2012. Monitoring is required for parameters such as lead, quarterly for parameters such as trihalomethanes, weekly for parameters such as E-Coli and daily for parameters such as free chlorine residual all monitoring as per O'Reg 170/03. Appendix 'A' also summarizes the results from the continuous online chlorine analyzer at the Brigden Water Tower. These readings have been compared with the weekly and monthly testing in the area to confirm the accuracy and reliability of the equipment. An analysis of the data has confirmed that any low readings can be attributed to either a power outage or equipment malfunction. Appendix 'B' addresses the various parameters of water quality that are tested for.

The test results confirm that our water met all health-related Ontario Drinking Water Standards.

Compliance

Ontario Regulation 170/03 requires that the Annual Summary Report list any requirements of the Safe Drinking Water Act (SDWA), the regulations under the SDWA or the drinking-water system's approval that the system failed to meet at any time during the period covered by the report. Listed below are the requirements that the system failed to meet in 2012 along with the duration of the failure and the measures taken to correct the failure.

On October 22, 2012 a contractor hit the service line to the Riverview Public School while working on the storm sewer and a potential adverse water sample was called into SAC to take every precaution to ensure the safety of all staff and students. The Health Unit gave directions to post signs and communicated with the staff at Riverview Public not to drink the water until all sample results are obtained and communicated back to the staff at Riverview Public School. The water service line supplying the above mentioned address was repaired, flushing took place and microbiological samples were taken. All Microbiological test results were free of Total Coliform and E.coli.

System Capacity

Ontario Regulation 170/03 requires that the Annual Summary Report include a summary of the quantities and flow rates of the water supplied during the year such that the owner of the system will be able to assess the capability of the system to meet existing and planned uses of the system.

Appendix 'C' lists the volumes of water received from the LAWSS distribution system each month throughout the year along with a monthly comparison with the 2012 values and a yearly comparison with the values from the previous 7 years.

Table 1 lists the Average Daily flow for the maximum month for 2011 and 2012 along with the Average Daily flow for each year since 2005.

Table 1 – Average Daily Flows

2012 Average Daily Flow – Max. Month (August)	15,957 cu. m./day
2011 Average Daily Flow – Max. Month (July)	19,300 cu. m./day

2012 Average Daily Flow – Year	12,435 cu. m./day
2011 Average Daily Flow – Year	13,400 cu. m./day
2010 Average Daily Flow – Year	11,700 cu. m./day
2009 Average Daily Flow – Year	11,000 cu. m./day
2008 Average Daily Flow – Year	11,900 cu. m./day

2007 Average Daily Flow – Year	11,000 cu. m./day
2006 Average Daily Flow – Year	9,700 cu.m./day
2005 Average Daily Flow – Year	9,200 cu. m./day

The Lambton Area Water Treatment Plant has a rated maximum daily flow rate of 181,844 cu.m./day. St. Clair Township's proportion of the normal flow rate is approximately 25%. This would translate to a maximum daily flow rate of 45,461 cu.m./day, which is approximately three and a half times the 2012 Average Daily Flow-Maximum Month shown in Table 1.

In comparing the average monthly volumes, the value for 2012 is 7.23% less than the previous year.

Large industrial consumers accounted for approximately 71% of the total volume of water used in St. Clair Township in 2012. The largest single user in the water distribution system is the Nova – Moore Site, while the Suncor Ethanol Plant has become the second largest single user of the water system.

APPENDIX 'A'
2012 Water Quality Test Results
(Waterworks # 260006464)

	O.Reg. 170/03	Sampling Period	Number of Samples	Number of Detectable Results	Range	MAC or IMAC	Exceedence ?	Typical Source of Parameter
Microbiological Parameters								
Total Coliforms (membrane filter analysis) (counts / 100ml)	Schedule 10-2	Jan/01 - Dec/31 (sampled weekly)	520[1]	0	0-0	0*	No	Indicates possible presence of fecal matter.
Fecal Coliforms (membrane filter analysis) (counts / 100ml)	Schedule 10-2	Jan/01 - Dec/31 (sampled weekly)	520[1]	0	0-0	0*	No	Definite indicator of fecal contamination.
Background Count (membrane filter analysis) (counts / 100ml)	Schedule 10-2	Jan/01 - Dec/31 (sampled weekly)	520[1]	0	0-0	200	No	Indicates presence of aerobic bacteria and effectiveness of disinfection.
* indicator of adverse water quality if detected in treated water								
Parameters Related to Microbiological Quality								
Free Chlorine (Distribution System) (mg/l)	Schedule 6-3	Jan/01 - Dec/31 (sampled weekly)	520[1]	520	0.62 – 1.65	--	N/A	Recommended level of at least 0.2mg/l in system to maintain microbiological quality.
Free Chlorine (Froomfield)	♦	Jan/01 - Dec/31	15	--	0.45 – 1.64	--	N/A	Recommended level of at least 0.2mg/l in system to maintain microbiological quality.
Free Chlorine (Operational - Flushing)	♦	Jan/01 - Dec/31	748	--	0.05 – 1.69	--	N/A	
Free Chlorine (Daily)	Schedule 7-2(3)	Jan/01 - Dec/31	365	--	0.62 - 1.65	--	N/A	
Free Chlorine (SCADA)	♦ (C of A)	Jan/01 - Dec/31	105120	--	0.00 – 2.03[4]	--	N/A	
Volatile Organics								
Trihalomethanes (running annual average) (ug/l)	Schedule 13-6	Jan/01 – Dec/31 (sampled quarterly)	4	4	41.3	100	No	Byproduct of chlorine reacting with naturally occurring organics.
Inorganic Parameters								
Lead (ug/l)	O. Reg. 170/03	2012 Plumbing 2012 Distribution	4	4	0.02 – 0.18	10 10	No No	Results from corrosion of lead pipe or lead solder in plumbing.

[1] The number of samples significantly exceeds the required number (24 per month – 288 annually).
[2] Re-sampling and re-testing yielded acceptable results.
[3] A full year of data consists of 105,120 samples when taken at 5 minute intervals.
[4] High / Low chlorine levels were attributed to power outages and/or equipment malfunction.
♦ Indicates additional operational testing not required by O.Reg. 170/03.

APPENDIX 'B'
WATER QUALITY PARAMETERS

What parameters do we test for?

Some parameters may be present in source water before it is treated. Here is a description of the various groups of parameters. The presence of these substances in drinking water does not necessarily mean that the water poses a health risk.

Microbiological parameters such as bacteria may come from sewage plants, livestock operations, septic systems and wildlife. Microbiological quality is the most important aspect of drinking water quality because of its association with dangerous water-borne diseases, which can strike quickly.

Inorganic parameters such as salts and metals can be naturally occurring or a result of urban storm runoff, industrial or domestic wastewater discharge, mining or agriculture. Some may be a result of treatment and distribution of water (for example, lead from old solder in pipes).

Organic parameters can be naturally occurring, but most organics of concern are synthetic. They originate from industrial discharges, urban storm runoff and other sources. Included in this group are pesticides that originate from both rural and urban areas. Some may originate from treatment of drinking water (for example, chlorination byproducts such as trihalomethanes).

Definitions

Here are some terms you should know about before reading the information below.

MAC

Maximum Acceptable Concentration. This is a health-related Ontario drinking water standard established for contaminants that have known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter.

IMAC

Interim Maximum Acceptable Concentration. This is a health-related Ontario drinking water standard established for contaminants when there are insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not practical to establish a MAC at the desired level.

Parameter

This is a substance that we sample and analyze for in the water

mg/l

milligrams per litre. This is a measure of the concentration of a parameter in water, sometimes called parts per million (ppm).

APPENDIX 'C'
2012 FLOWS

Annual Summary Report Appendix C. Final xls.xls