

# **St. Clair Township Water Distribution System**

## **Annual Summary Report – O.Reg. 170/03**

**2014**

(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 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](http://www.twp.stclair.on.ca). Copies of LAWSS test results and reports, and the 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 Water/Wastewater Specialist, Nova VanderSlagt, or the Director of Public Works, Matt Deline, 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. Monitoring is continuing across the entire Township to ensure that water quality is being maintained.

1. On September 18, 2014 the continuous chlorine analyzer at the Brigden Water Tower and seven Pocket Colorimeters were calibrated by Hach Canada.
2. On December 3, 2014 the MOECC conducted an inspection of the St. Clair Township Distribution System. The inspection review period was from September 1, 2013 to November 30, 2014. The inspection report was received from the MOECC February 18, 2015.

### **Non-compliance with Regulatory Requirements and Actions Required are as follows:**

- a) On November 21, 2013 the Brigden Water Tower was taken out of service for inspection and cleaning. The operating authority placed the Brigden Water Tower back into service on November 22, 2013 however, bacteriological verification sampling and testing was not conducted. The owner/operating authority is required to review and provide training on the requirements of condition 2.3.2 of DWWP 039-201 and on AWWA C652-11 Standard for Disinfection of Water-Storage Facilities to the operators working in the distribution system by March 31, 2015.

### **Summary of Recommendations and Best Practice Issues are as follows:**

- a) The Township is encouraged to continue on the path forward with finalizing and implementing a backflow prevention protection (BFP) program including a By-Law to protect the Township's water distribution system and the public health of the system users.
- b) It is recommended that the repair/maintenance to the Brigden Water Tower be carried out and that the vent mesh size is verified at that time.
- c) The owner/operating authority is requested to ensure that the correct number of Schedule 10 (Microbiological) "distribution" samples be listed in future Annual Reports and Summary Reports.
- d) It is recommended the Township of St. Clair implement the draft SOP "Pocket Colorimeter Quality Control."
- e) It is recommended that by June 1, 2015, the DWS owner/operating authority ensure that the Operations Manual or Manuals (including SOPs) are updated and maintained as required by Condition 16.1 of Schedule B of the Municipal Drinking Water Licence (MDWL) No. 039-101.

### **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 2014. 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 non-regulatory 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. There were no non-compliances to report for 2014.

**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 2013 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 2013 and 2014 along with the Average Daily flow for each year since 2007.

**Table 1 – Average Daily Flows**

2014 Average Daily Flow – Max. Month (June )	14,331 cu. m./day
2013 Average Daily Flow – Max. Month (April)	22,186 cu. m./day
2014 Average Daily Flow - Year	12,251 cu. m./day
2013 Average Daily Flow – Year	13,289 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

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 26%. This would translate to a maximum daily flow rate of 47,279 cu.m./day, which is approximately three times the 2014 Average Daily Flow-Maximum Month shown in Table 1.

In comparing the average monthly volumes, the value for 2014 is 8.13 % less than the previous year.

Large industrial consumers accounted for approximately 70% of the total volume of water used in St. Clair Township in 2014. The largest single user in the water distribution system is the Nova-Moore Site, while Suncor Ethanol Plant has become the second largest single user of the water system.

**APPENDIX 'A'**  
**2014 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
<b>Microbiological Parameters</b>								
Total Coliforms (membrane filter analysis) (counts / 100ml)	Schedule 10-2	Jan/01 - Dec/31 (sampled weekly)	416 <sup>1</sup>	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)	416 <sup>1</sup>	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)	416 <sup>1</sup>	3	0-1	200	No	Indicates presence of aerobic bacteria and effectiveness of disinfection.
* indicator of adverse water quality if detected in treated water								
<b>Parameters Related to Microbiological Quality</b>								
Free Chlorine (Distribution System) (mg/l)	Schedule 6-3	Jan/01 - Dec/31 (sampled weekly)	416 <sup>1</sup>	416	0.25 – 1.92	--	N/A	Recommended level of at least 0.2mg/l in system to maintain microbiological quality.
Free Chlorine (Operational - Flushing)	◆	Jan/01 - Dec/31	621	--	0.08 – 1.84	--	N/A	Recommended level of at least 0.2mg/l in system to maintain microbiological quality.
Free Chlorine (Daily)	Schedule 7-2(3)	Jan/01 - Dec/31	365	--	0.62 - 1.68	--	N/A	
Free Chlorine (SCADA)	◆ (C of A)	Jan/01 - Dec/31	105120	--	0.00 – 1.97 <sup>4</sup>	--	N/A	
<b>Volatile Organics</b>								
Trihalomethanes (running annual average) (ug/l)	Schedule 13-6	Jan/01 – Dec/31 (sampled quarterly)	4	4	41.25	100	No	Byproduct of chlorine reacting with naturally occurring organics.
<b>Inorganic Parameters</b>								
Lead (ug/l)	O. Reg. 170/03 399/07	2014 Plumbing 2014 Distribution	8	8	0.02 – 0.35	10 10	No No	Results from corrosion of lead pipe or lead solder in plumbing.

<sup>1</sup> The number of samples significantly exceeds the required number (23 per month – 276 annually).

<sup>2</sup> Re-sampling and re-testing yielded acceptable results.

<sup>3</sup> A full year of data consists of 105,120 samples when taken at 5 minute intervals.

<sup>4</sup> 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"														
2014 FLOWS														
Unless otherwise specified, volumes are expressed in cubic metres.														
Meter Name	Meter No.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
West Lambton Flow meter	WL to S CL	363,016	344,462	315,000	367,243	361,175	428,471	433,521	395,777	379,245	353,016	307,368	385,264	
Lasalle Road	3001	3,000	0	0	8,118	2,506	3,373	3,402	2,844	2,581	2,315	2,108	2,592	32,839
Fire School	3002, 3003	25	21	49	1,237	2,978	1,029	73	371	726	2,035	1,086	70	9,700
Basell Polyolefins	3004	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
Nova St. Clair	3005, 3006	6,677	6,547	4,841	6,243	9,694	6,385	7,561	11,004	9,810	7,680	14,191	8,506	99,139
Connuma - removed	3007, 3008				0	0	0	0	0	0	0	0	0	0
Industrial Park		6,550	4,100	2,300	1,350	900	1,950	1,400	1,400	450	500	550	550	22,000
Rokeby	3009	61,117	57,432	60,643	62,483	71,398	82,752	80,765	73,279	62,004	73,307	61,654	68,664	815,498
Praxair	3010	0	0	0	0	0	0	0	0	0	0	0	0	0
Nova Moore	3011, 3012	83,029	88,670	72,816	80,584	88,223	66,173	81,086	99,524	105,240	96,063	85,366	92,191	1,038,965
Dow / Dobson		0	0	0	0	0	0	0	0	0	0	0	0	0
Moortown	3013, 3014	1,090	1,115	1,835	1,400	1,535	3,065	2,920	2,335	2,080	1,310	1,175	1,050	20,910
Moore / Brigden	3015	19,075	0	33,580	17,845	18,775	22,915	21,325	19,425	18,435	17,640	15,855	18,845	223,715
Courtright	3017	12,230	0	5,200	0	5,275	17,000	17,000	0	11,410	0	0	1,105	69,220
Oil Springs Line	3018	410	260	330	-525	-1,060	-320	-1,225	0	0	0	0	0	-2,130
Canadian Waste		0	0	0	0	0	0	0	0	0	0	0	0	0
GATX		55	45	30	45	55	50	25	55	55	50	105	55	625
Residential Homes		0	0	126	0	0	165	0	0	131	0	0	81	503
Nova (unmetered)		0	0	0	0	0	0	0	0	0	0	0	14,366	14,366
Sombra	4001	26,650	0	50,550	28,150	30,000	39,750	36,900	32,000	29,850	29,450	24,900	29,300	357,500
Greenfield Energy		28,720	34,127	25,557	31,022	19,803	17,873	23,470	20,541	14,232	607	6,788	17,392	240,132
Envirofresh Produce		30	52	21	23	22	23	16	19	18	22	90	191	527
Greenfield South Power		16	20	12	21	20	55	39	45	72	37	47	49	433
Plank Road		1,920	1,355	1,020	745	595	1,480	925	965	865	830	880	1,310	12,890
Back to Samia		-2	-1,832	0	-2	-34	-2	-164	-292	-2	-101	-31	-4	-2,466
St. Clair Township total consumption and metered consumption difference		109,935	147,071	77,608	124,242	106,045	161,218	155,747	127,896	117,145	116,975	88,446	124,962	1,457,290
2014 Actual Metered Volume		365,527	343,983	341,518	367,981	361,730	429,934	436,265	396,411	380,102	353,720	308,210	386,275	4,471,656
(x 1,000 cu.m)		366	344	342	368	362	430	436	396	380	354	308	386	
2014 Average Daily Volume		11,791	11,861	11,017	12,266	11,669	14,331	14,073	12,787	12,670	11,410	10,274	12,460	12,251
2014 Purchased Volume		380,148	357,742	355,179	382,700	376,199	447,131	453,716	412,267	395,306	367,869	320,538	401,726	4,650,521
2013 Actual Metered Volume		330,737	341,041	317,107	665,594	427,429	391,742	490,076	413,315	357,001	408,801	317,369	390,368	4,850,580
(x 1,000 cu.m)		331	341	317	666	427	392	490	413	357	409	317	390	
2013 Average Daily Volume		10,669	12,180	10,229	22,186	13,788	13,058	15,809	13,333	11,900	13,187	10,579	12,593	13,289