

**ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM**

**JOINT BOARD OF MANAGEMENT**

**Monday, March 26, 2015 at 2:30 p.m.**

**City Hall – Room 309**

**AGENDA**

Election and Appointment of the Chair person

**DISCLOSURES OF INTEREST**

Minutes

Review and approval of the minutes of November 3, 2014

Reports

1. Report ES15-15, 2014 Annual Reports and 2014 Summary Report for the St. Thomas ASWSS
2. Report ES23-15 Drinking Water Quality Management Operation Plans and Policy Endorsement for the St. Thomas ASWSS (EMPS and Transmission Main)
3. Report ES26-15 St. Thomas ASWSS Financial Plan Update
4. Report ES27-15 EMPS Building Ownership reconciliation
5. Report ES28-15 St. Thomas ASWSS – Statutory Standard of Care for Drinking Water Systems

Unfinished Business

New Business

Adjournment



Corporation of the  
**City of St. Thomas**

Report No.

ES15-15

File No.

06-084-02

**Directed to:** Chairperson and Members of the Board of Management of the St. Thomas ASWSS

**Meeting Date:** February 17, 2015  
**Date Authored:** February 4, 2014

**Department:** Environmental Services

**Attachments**

- #1 – 2014 Annual Report for the EMPS of the St. Thomas ASWSS
- #2 – 2014 Annual Summary Report for St. Thomas Area Secondary Water Supply System (EMPS)
- #3 – Annual Report for the St. Thomas ASWSS (transmission main and elevated storage reservoir)

**Prepared By:** Cyril McCready  
Water and Wastewater Supervisor

**Subject:** 2014 Annual Reports and 2014 Summary Report for the St. Thomas Area Secondary Water Supply System

**Recommendation:**

THAT: Report ES15-15, 2014 Annual Reports and 2014 Summary Report for the St. Thomas Area Secondary Water Supply System, be received for information.

**Origin:**

The Safe Drinking Water Act, Regulation 170/03, Section 11, requires that Owners and Operating Authorities of drinking water systems prepare Annual Reports by February 28<sup>th</sup> of each year. Under Schedule 22, the Regulation also requires the Owner of a drinking water system to prepare a Summary Report no later than March 31<sup>st</sup> of each year.

**Analysis:**

The City of St. Thomas administers the St. Thomas Area Secondary Water Supply System and this requires that an Annual Report be prepared for the water supply system. A Summary Report is also required for the EMPS.

The Annual Reports have been completed by the required date of February 28<sup>th</sup> 2015, on standard forms provided by the Ministry and have been filed as required. The Summary Report has been completed prior to the required submission date of March 31<sup>st</sup> 2015. The Annual and Summary Reports are attached.

As required by the Regulation, arrangements have been made to post the reports on the City's web site and copies will be sent to the Owners of the drinking water systems that receive water from the St. Thomas Water Distribution System (Municipality of Central Elgin and the Township of Southwold). Copies of the reports will also be made available to the Public upon request at the Environmental Services Department.

The St. Thomas Area Secondary Water Supply System, which includes a portion of the Elgin Middlesex Pumping Station, is administered by the City of St. Thomas on behalf of the Owner, the St. Thomas Area Secondary Water Supply System Board of Management. This system transmits water to Southwold, Central Elgin, Dutton Dunwich and St. Thomas. The Ontario Clean Water Agency (OCWA) operates the pumping station and the transmission main is operated by the City of St. Thomas. The system complies with the Ontario Safe Drinking Water Act, Regulation 170/03, and with the terms and conditions of the applicable Municipal Drinking Water Licences.

**Financial Considerations:**

There are no financial implications associated with this report.

Respectfully Submitted,



Cyril McCready  
Supervisor, Water and Wastewater

Mike Campbell, P. Eng.  
Manager of Operations and Compliance

---

Reviewed By:                                                                    
Treasury      Env. Services      Planning      City Clerk      HR      Other



Drinking-Water System Number:	260078897
Drinking-Water System Name:	Elgin Middlesex Pumping Station - St. Thomas Area Secondary Water Supply System
Drinking-Water System Owner:	St. Thomas Area Secondary Water Supply System Joint Board of Management
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2014 through December 31, 2014

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px;"> <p>City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, ON. N5P 3V7 <a href="http://www.city.st-thomas.on.ca">www.city.st-thomas.on.ca</a></p> <p>Elgin Area Water Treatment Plant 43665 Dexter Line, Union, ON</p> </div>	<p><b><u>Complete for all other Categories.</u></b></p> <p>Number of Designated Facilities served: <input type="text" value="N/A"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Number of Interested Authorities you report to: <input type="text" value="N/A"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes <input type="checkbox"/> No <input type="checkbox"/></p>
---	---

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Systems that receive their drinking water directly from the St. Thomas EMPS:

Drinking Water System Name	Drinking Water System Number
St. Thomas Area Secondary Water Supply System	260078897



**Systems that receive their drinking water indirectly from the St. Thomas EMPS:**

Drinking Water System Name	Drinking Water System Number
St. Thomas Distribution System	260002187
Dutton/Dunwich Distribution System	220002967
Municipality of Central Elgin	260004761
Southwold Distribution Supply	210001362

**Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?**

Yes  No

**Indicate how you notified system users that your annual report is available, and is free of charge.**

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method

**Describe your Drinking-Water System**

The Elgin Middlesex Pumping Station (EMPS) receives water from the Elgin Area Primary Water Supply System, which is located to the east of Port Stanley. Through various secondary water supply systems, the EMPS serves the Cities of London and St. Thomas, Town of Aylmer, and Municipalities of Central Elgin, Malahide, Dutton-Dunwich and Southwold.

The EMPS is a shared facility encompassing a twin celled reservoir with a total capacity of 54,600m<sup>3</sup>. Booster pumps are dedicated to directing water to the City of London, St. Thomas Secondary and/or Aylmer Secondary Water Supply Systems. A gas chlorine system is utilized to provide re-chlorination for water being directed to the St. Thomas and Aylmer Secondary Supply Systems. The facility also houses a 600kW standby diesel generator that provides emergency power to pump water into the St. Thomas and Aylmer systems during a power interruption.

Three pipelines exit the EMPS: one exits to the south of the EMPS property and extends west to service the St. Area Thomas Secondary System; the second services the City of London distribution system; the third pipeline services the municipalities on the Aylmer Area Secondary System.

**List all water treatment chemicals used over this reporting period**

Chlorine Gas

Were any significant expenses incurred to?

- Install required equipment  
 Repair required equipment  
 Replace required equipment

**Please provide a brief description and a breakdown of monetary expenses incurred**

- Concrete suction and discharger header inspection - \$15000.00
- Fuel system upgrade \$105000.00 in process
- Implementation of tower alarms to Elgin SCADA - \$1000.00
- Pump Guards - \$1500.00

**Notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre**

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
N/A	N/A	N/A	N/A	N/A	N/A

**Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.**

	Number of Samples	Range of E.Coli Results (CFU/100 mL) (min #)-(max #)	Range of Total Coliform Results (CFU/100 mL) (min #)-(max #)	Number of Heterotrophic Plate Count (HPC) Samples	Range of HPC Results (CFU/1 mL) (min #)-(max #)
Distribution	53	0 - 0	0 - 0	53	(0) - (30)

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

Analyte	Number of Grab Samples (Continuous Monitoring)	Min	Max	Avg
Free Chlorine Residual (mg/L)	8760	0.61	2.89	1.33

*Note: The free chlorine residual spiked on occasion during 2014. Each spike corresponded with a pump start-up. None of the spikes lasted longer than 5 minutes after pump start-up.*

**Summary of Organic parameters sampled during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (NOTE: result value is based on latest annual average)	January 7, 2014	12	µg/L	NO
	April 8, 2014	17	µg/L	
	July 8, 2014	20	µg/L	
	October 7, 2014	26	µg/L	

**APPENDIX E**  
**2014 EMPS Treatment**

<b>Month</b>	<b>Total Chlorine Gas Usage - Kg</b>
January	134.2
February	136.4
March	140.9
April	116.7
May	135.3
June	157.2
July	163.6
August	181.4
September	184.9
October	203.3
November	113.1
December	153.7
<b>Yearly Total</b>	<b>1820.7</b>

Please note: Aylmer and St.Thomas combined cl2 usage

**ELGIN-MIDDLESEX PUMPING STATION  
ST.THOMAS AREA SECONDARY WATER SUPPLY SYSTEM  
2014 COMPLIANCE REPORT  
(Schedule 22 Summary Report)**

**Facility Name:** Elgin-Middlesex Pumping Station -  
St.Thomas Area Secondary Water Supply System

**Mailing Address:** Elgin Area Primary Water Supply System  
P.O. Box 220  
Port Stanley, ON N5L 1J4



Average Daily Flow 6,250 m<sup>3</sup>/day  
Max. Daily Flow 12,789 m<sup>3</sup>/day  
Source Water Elgin Area Primary Water Supply System

**CONTACT INFO:**

Contract Administration:  
City of St.Thomas, City Hall  
Environmental Services  
545 Talbot Street, St.Thomas, ON N5P3V7  
Contact: John Dewancker

Operator:  
Ontario Clean Water Agency  
P.O. Box 220, Port Stanley, Ontario N5L 1J4  
Contact: Mr. Blair Tully - Senior Operations Manager (519) 782-3101

## **Table of Contents**

---

System Approval	1
Treated Water Requirements	1
Staff Complement and Training	2
History of Facility	2
Process Description	3
Post-Treatment	3
High Lift Pump Station	3
Maintenance	3
Sampling Procedures	4
Flow Measurement and Water Quality Monitoring	4
Statement of Comparison	4
Ministry of the Environment Inspections	5
Benefiting Municipalities	5
Appendix A: Water Quality Summary for 2014	
Appendix B: Total Daily Flow for 2014	
Appendix C: Daily Instantaneous Peak Flow for 2014	
Appendix D: 2014 Annual Report	
Appendix E: Chemical Consumption for 2014	

### ***System Approval:***

The St. Thomas Area Water Supply System is supplied water through the Elgin-Middlesex Pump Station, which receives water from the Elgin Area Primary Water Supply System on Dexter Line, east of Port Stanley, Ontario. During the reporting period, The St. Thomas Area Secondary Water Supply System was operated pursuant to the approvals, licenses and permits listed below.

The supply and distribution of water to the system was governed by the following Municipal Drinking Water Licenses (MDWL) and Drinking Water Works Permits (DWWP):

#### **St. Thomas Area Secondary Water Supply System**

- o MDWL No. 190-101, issued on July 30, 2012
- o DWWP No. 190-201, issued on August 31, 2011

The DWWP and MDWL were issued in accordance with the *Safe Drinking Water Act (SDWA)*, 2002.



### ***Treated Water Requirements:***

Effective as of June 1, 2003 the Ontario government enacted new drinking water regulations under the *Safe Drinking Water Act, 2002*. The Drinking Water Systems Regulation (O.Reg. 170/03) replaced the Drinking Water Protection Regulation for Larger Waterworks (O. Reg. 459/00) and the Drinking Water Protection Regulation for Smaller Waterworks Serving Designated Facilities (O. Reg. 505/01).

### ***Staff Complement and Training:***

In 2014, the St.Thomas facilities at the Elgin-Middlesex Pump Station (EMPS) was operated and maintained under the operating authority, Ontario Clean Water Agency. The operational and maintenance staff are based at the Elgin Area Primary Water Supply System (EAPWSS) located east of Port Stanley, Ontario, and share their time between the two facilities.

Employees responsible for the operations and maintenance of the facility included one (1) Senior Operations Manager, (1) Compliance Manager, two (2) Team Leads, five (5) full time equivalent operations staff, four (4) full time equivalent maintenance staff and one (1) administrative assistant.

The Compliance Manager shares their work hours between the Lake Huron Primary Water Supply System (LHPWSS) and the Elgin Area Primary Water Supply System (EAPWSS).

In 2014, all employees received Director Approved and practical on-the-job training which contributed to annual MOE training requirements.

### ***History of Facility:***

The EMPS is occupied by three booster stations that comprise an integrated booster station consisting of two in-ground storage reservoirs, each having a capacity of 27.3 million liters. The site upon which the three booster stations is situated is owned by the Elgin Area Primary Water Supply System and includes the original St.Thomas pump station, constructed in 1970 that services St.Thomas, and sections of the Municipalities of Central Elgin and Southwold. Two additional pump stations were completed in 1994 and service the City of London, as well as the Municipality of Malahide, Town of Aylmer, and the Municipality of Central Elgin.

The St.Thomas pump station is comprised of three high-lift pumps that deliver water through a transmission main that services the St.Thomas Area Secondary Water Supply System. A gas re-chlorination system provides re-chlorination for water being directed to the St.Thomas Area Secondary Water Supply System.



In the event of a power failure, an on-site generator can provide sufficient standby power to operate the facility and run the St.Thomas pumps.

Remote monitoring and control of all three pump stations is performed by staff at the Elgin Area Primary Water Supply System (EAPWSS) near Port Stanley, Ontario. Remote monitoring and control capabilities are made possible via the EAPWSS and the EMPS SCADA systems.

### ***Process Description:***



The Elgin-Middlesex Pump Station (EMPS) receives treated water from the Elgin Area Primary Water Supply System, which pumps water from a water treatment plant located on the shores of Lake Erie to the east of Port Stanley. Water from the plant is pumped into the EMPS site reservoirs where it is subsequently fed via a series of headers to each of the pumping stations serving the Aylmer Area Secondary Water Supply System, the City of London Distribution System, and the St. Thomas Area Secondary Water Supply System.

The St. Thomas pump station has two duty pumps and one standby pump, all three pumps being fixed speed, each being rated at 316 L/s.

### ***Post-Treatment:***

The St. Thomas Area and Aylmer Area Secondary Water Supply System pump stations both utilize a gas re-chlorination facility. The facility consists of two scaled 150 lb gas chlorine cylinders and three chlorinators equipped with booster pumps. The three chlorinators redundantly serve the Aylmer Area Secondary Water Supply System (AASWSS) and St. Thomas Area Secondary Water Supply System (STASWSS) and have a dosage capacity of 1kg/h.

### ***High Lift Pump Station:***

The three high lift pumps provide redundant pumping capacity into the St. Thomas Area Secondary Water Supply System. See Appendix B for 2014 Total Daily Flows and Appendix C for 2014 Daily Instantaneous Peak Flows.

### ***Maintenance:***

Site maintenance was carried out by Ontario Clean Water Agency field services staff based at the Elgin Area Primary Water Supply System located near Port Stanley. Specialty maintenance services are provided, on an as needed basis by external service providers. All maintenance scheduling is monitored through a computerized maintenance management system.

In addition to the routine preventative maintenance program, a number of maintenance projects were completed at the EMPS in 2014. A summary of non-routine maintenance is available in Appendix D, the 2014 Annual Report.

### ***Sampling Procedures:***

All samples collected by licensed OCWA personnel are submitted to CALA accredited laboratories for bacteriological and chemical analysis.

A distribution water sample is taken twice per week at the inlet to the reservoir and submitted for bacteriological analysis. The distribution water entering the St.Thomas Area Secondary Water Supply System is sampled weekly and submitted to an external laboratory for bacteriological analysis. Chlorine residual, for the water entering the St.Thomas Area Secondary Water Supply System, is monitored continuously from the Elgin Area Primary Water Supply System by means of the SCADA system.

On a quarterly basis the distribution water entering the reservoir, as well as the water entering the St.Thomas Area Secondary Water Supply System is sampled and submitted to an accredited laboratory for testing of Total Trihalomethanes (THMs), a disinfection by-product. Twice annually, the distribution water entering the reservoir is sampled and submitted to an accredited laboratory for testing of lead concentrations. All water quality sampling at the Elgin-Middlesex Pump Station is performed in accordance with Ontario Regulation 170/03.

### ***Flow Measurement and Water Quality Monitoring:***

Flow is measured in the process utilizing a flow measurement device. Chlorine residual levels are monitored by an on-line analyzer located at the point of entry into the St.Thomas Secondary Water Supply System. These devices were calibrated in 2014 by licensed OCWA staff and contractors. See Appendix A for a summary of 2014 water quality data.

### ***Statement of Comparison:***

The previous Certificate of Approval and new Municipal Drinking Water License for the St.Thomas Area Secondary Water Supply System does not identify a rated capacity for the system. The pumping station has an available capacity of 54,605 m<sup>3</sup>/day, whereby instantaneous peak flow is 632 L/s.

The maximum total daily flow witnessed by the system in 2014 was 12,789 m<sup>3</sup>/day, approximately 23% of the capacity. The average total daily flow witnessed by the system in 2014 was 6,250 m<sup>3</sup>/day, approximately 11% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2014 was 600 L/s, approximately 95% of the capacity. See Appendix B for 2014 total daily flow values and Appendix C for 2014 daily instantaneous peak flow rates.

### ***Ministry of the Environment Inspections:***

The Ontario Ministry of the Environment (MOE) conducts an inspection of the St.Thomas portion of the Elgin-Middlesex Pumping Station annually along with the St Thomas Area Secondary Water System operated by the City of St Thomas. A MOE inspection took place in June 2014. The final inspection report was issued on August 6, 2014. A total of three (3) non-compliances were identified in the inspection report. The three non-compliances did not pertain to the EMPS portion. The final inspection rating received for the 2014-2015 reporting year was 86.04%

### ***Benefiting Municipalities:***

Following the adoption of the Municipal Water and Sewer Transfer Act in 1997, the Ontario Ministry of the Environment transferred the ownership of the three booster stations from the Province of Ontario to the water systems' benefiting municipalities. As a result the Aylmer Area Secondary Water Supply System portion of the EMPS and associated equipment is owned by the Aylmer Area Secondary Water Supply System Joint Board of Management, the London portion of the EMPS is owned by the Corporation of the City of London, and the St.Thomas Area Secondary Water System portion of the EMPS and associated appurtenances are owned by the St.Thomas Area Secondary Water System Joint Board of Management. Jointly these water systems benefit, and are managed on behalf of, the communities of Aylmer, Central Elgin, London, Malahide, Southwold and St.Thomas. A list of municipalities that receive water directly and indirectly from the St.Thomas Area Secondary Water Supply System at the EMPS is provided in Appendix D. The Ontario Clean Water Agency currently operates and maintains the Elgin- Middlesex Pump Station, under contract to the Aylmer Area Secondary Water Supply System, The Corporation of the City of London and the St.Thomas Area Secondary Water Supply System, with these contracts being administered by the City of St.Thomas on behalf of the various water systems.

This report was prepared by Ontario Clean Water Agency, the Operating Authority for the St.Thomas portion of the EMPS, on behalf of the St.Thomas Area Secondary Water Supply System Joint Board of Management.

**APPENDIX A – 2014 WATER QUALITY SUMMARY**

MONTH	POST TREATMENT	
	Free Cl <sub>2</sub> mg/L	
<b>January</b>		
Minimum	0.83	
Maximum	2.31	
Average	1.33	
<b>February</b>		
Minimum	0.78	
Maximum	2.58	
Average	1.31	
<b>March</b>		
Minimum	0.86	
Maximum	1.83	
Average	1.33	
<b>April</b>		
Minimum	0.79	
Maximum	2.39	
Average	1.31	
<b>May</b>		
Minimum	0.79	
Maximum	1.81	
Average	1.30	
<b>June</b>		
Minimum	0.81	
Maximum	2.22	
Average	1.38	
<b>July</b>		
Minimum	0.80	
Maximum	1.90	
Average	1.49	
<b>August</b>		
Minimum	0.78	
Maximum	1.84	
Average	1.33	
<b>September</b>		
Minimum	0.74	
Maximum	1.97	
Average	1.36	
<b>October</b>		
Minimum	0.77	
Maximum	2.89	
Average	1.33	
<b>November</b>		
Minimum	0.61	
Maximum	2.40	
Average	1.27	
<b>December</b>		
Minimum	0.80	
Maximum	1.67	
Average	1.23	
Yearly Minimum	0.61	
Yearly Maximum	2.89	
Yearly Average	1.33	

Note: Chlorine residuals obtained from SCADA.

**APPENDIX B  
ST. THOMAS TOTAL DAILY FLOW - 2014**

Date	January m <sup>3</sup>	February m <sup>3</sup>	March m <sup>3</sup>	April m <sup>3</sup>	May m <sup>3</sup>	June m <sup>3</sup>	July m <sup>3</sup>	August m <sup>3</sup>	September m <sup>3</sup>	October m <sup>3</sup>	November m <sup>3</sup>	December m <sup>3</sup>	
1	5203	6750	7043	4782	4192	7677	5903	6104	8014	7653	5527	6106	
2	5011	6567	12789	4357	3958	4835	6028	5094	6169	7514	6044	5748	
3	5455	6264	9645	4992	4220	5462	5360	5125	6771	7403	5573	6275	
4	6538	5848	8993	4187	4856	4883	6410	5528	6797	7007	5301	6068	
5	7327	6056	7078	4888	4494	4639	6162	5001	6733	8575	5736	6056	
6	6499	6044	6588	5424	4179	5754	6783	6233	6067	8063	5620	6857	
7	5735	5897	8540	4203	4062	6522	5040	6431	7015	7951	5257	7076	
8	6568	6276	6430	4504	4471	4658	4955	6941	6679	7859	5540	6844	
9	6397	6740	5850	4601	4539	6376	5660	7195	7397	8130	6217	6531	
10	5872	6067	5543	4563	5062	6084	5890	7251	6871	8233	5325	6449	
11	6436	6043	5160	4463	5504	5711	5740	6450	5915	8223	5607	6437	
12	6975	5879	5159	4951	4130	5175	6770	5721	5718	8195	5662	6418	
13	6157	6072	4689	4784	4460	4687	7089	5371	5743	8472	5268	6930	
14	6691	5845	5014	4558	4251	5400	7944	5878	6426	8372	5535	7311	
15	6320	7540	5661	4156	3894	6141	6172	6369	6262	8505	5931	6551	
16	6511	7465	5782	4699	3952	6469	6221	5552	5926	8431	6646	8481	
17	6380	8156	5363	4353	4193	5759	6592	6765	6295	8440	5261	8965	
18	6770	7071	5449	5069	4419	5395	7128	6787	6639	8677	5346	9013	
19	7114	5683	4982	4531	5799	5706	5228	7291	6438	8715	5649	7291	
20	6344	5863	5402	5167	4342	6029	6577	6711	6908	8489	5530	7026	
21	6200	5538	5341	5054	3909	6956	6259	6675	7253	8653	5644	6923	
22	6632	6399	5552	4351	5861	9058	6541	7304	6811	8873	6159	6605	
23	7777	6446	5759	4356	3928	7510	4728	6608	7708	9320	6764	6559	
24	6272	6107	5343	4659	5572	7903	6240	7185	7906	8211	8451	6356	
25	5862	5832	5389	4144	6627	5145	5615	7044	7919	8967	8557	6086	
26	8370	5736	4788	4507	5529	5657	6268	7295	7947	8854	6030	6188	
27	6301	8460	4848	4661	5638	7426	5957	7020	8090	8878	6196	6241	
28	6246	6002	4620	6553	5888	7938	4927	6884	8945	8564	5430	6703	
29	6299		5007	4237	5202	6731	6693	6831	7753	8776	6433	6238	
30	5858		5124	4167	5232	7052	5635	7377	7764	8963	6801	6373	
31	6087		4462		6849		5910	7060		6763		6006	
<b>Total</b>	198,207	178,646	187,393	139,921	149,212	184,738	188,425	201,081	208,879	257,729	179,040	208,711	2,281,982
<b>Minimum</b>	5,011	5,538	4,462	4,144	3,894	4,639	4,728	5,001	5,718	6,763	5,257	5,748	3,894
<b>Maximum</b>	8,370	8,460	12,789	6,553	6,849	9,058	7,944	7,377	8,945	9,320	8,557	9,013	12,789
<b>Average</b>	6,394	6,380	6,045	4,664	4,813	6,158	6,078	6,486	6,963	8,314	5,968	6,733	6,250

**APPENDIX C**  
**ST. THOMAS DAILY INSTANTANEOUS PEAK FLOW - 2014**

Date	January L/s	February L/s	March L/s	April L/s	May L/s	June L/s	July L/s	August L/s	September L/s	October L/s	November L/s	December L/s	
1	270	268	274	268	267	276	279	272	267	278	273	266	
2	265	271	277	270	271	272	275	273	266	269	277	273	
3	270	273	279	272	271	270	273	272	271	267	275	274	
4	266	274	281	271	272	271	270	275	272	600	272	277	
5	271	276	276	271	273	271	273	272	277	276	275	274	
6	270	278	273	271	274	273	276	277	274	274	272	274	
7	265	281	274	271	273	275	279	275	276	276	276	276	
8	270	277	280	271	276	277	273	269	274	275	274	452	
9	274	281	276	274	274	272	269	264	274	268	373	275	
10	490	277	275	278	269	270	270	268	272	268	278	277	
11	272	276	277	271	272	271	266	268	276	269	272	277	
12	273	352	279	276	273	276	269	271	273	268	272	273	
13	272	277	270	276	275	273	271	273	272	271	277	281	
14	273	277	267	270	278	275	275	270	275	267	279	275	
15	275	277	270	274	271	277	268	275	274	271	280	275	
16	264	279	273	276	267	277	268	278	274	268	280	275	
17	263	276	270	267	272	276	266	274	276	270	273	268	
18	270	275	265	267	271	279	267	280	269	271	369	265	
19	266	281	272	268	274	276	264	275	267	271	276	271	
20	268	276	271	270	275	281	267	275	267	268	280	275	
21	268	267	272	265	278	273	269	364	273	270	275	272	
22	272	267	270	268	279	274	268	268	271	277	272	269	
23	278	267	272	275	278	273	264	270	269	273	274	271	
24	266	272	290	268	278	276	265	268	491	272	275	264	
25	270	269	271	268	278	261	265	271	277	274	278	265	
26	271	272	269	267	275	270	271	270	277	274	276	266	
27	272	277	268	269	277	266	275	268	279	279	276	267	
28	276	273	267	271	272	269	268	268	276	279	267	266	
29	280		271	269	279	477	264	268	277	273	285	269	
30	270		268	266	272	273	273	270	285	273	275	278	
31	268		271		275		275	270		278		273	
<b>Minimum</b>	263	267	265	265	267	261	264	264	266	267	267	264	261
<b>Maximum</b>	490	352	290	278	279	477	279	364	491	600	373	452	600
<b>Average</b>	277	277	273	271	274	280	270	275	281	283	282	278	277



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	260078897
Drinking-Water System Name:	St. Thomas Area Secondary Water Supply System
Drinking-Water System Owner:	Joint Board of Management of the St. Thomas Area Secondary Water Supply System
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2014 through December 31, 2014

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [X]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <table border="1" style="width: 100%;"> <tr> <td>                 City of St. Thomas, City Hall                  Environmental Services                  545 Talbot Street                  St Thomas, Ontario             </td> </tr> </table>	City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario	<p><b><u>Complete for all other Categories.</u></b></p> <p>Number of Designated Facilities served:  <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]</p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]</p>
City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario		

**Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report**

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
City of St. Thomas Water Distribution System	260002187
Municipality of Central Elgin	260004761
Township of Southwold	210001362
Dutton/Dunwich Distribution System	220002967

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?  
 Yes [X] No [ ]



Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web  
City of St. Thomas Website – www.city.st-thomas.on.ca
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method \_\_\_\_\_

**Describe your Drinking-Water System**

The St. Thomas Area Secondary Supply System was constructed to supply treated water to the City of St. Thomas, the Ford Motor Company Assembly Plant near Talbotville, and the Municipality of Central Elgin and Township of Southwold. The system consists of an Elevated Water Tower storage tank and trunk water mains to the Ford Plant. A 750 mm diameter watermain is connected to the Primary System at the Old St. Thomas water works site on South Edgeware Road. The pipeline then connects to the Elevated Storage Tank, a 0.76 ML (200,000 gallon) steel teardrop elevated tank that is located just off Water Tower Line Road near Waterworks Park in the City of St. Thomas. The pipeline then extends west for approximately 2.6 km along Edgeware Road to County Road 26 and then along Ford Road/Wonderland Road before turning northwesterly for approximately 3.6 km. to the Ford Chamber located at the northwest corner of Clinton Line (Concession Road 11) and Wonderland Road. At the intersection of Ford Road and Talbotville Road, the diameter of the pipeline is reduced to 500 mm.

**List all water treatment chemicals used over this reporting period**

12% Sodium Hypochlorite                      Chlorine Gas (EMPS)  
Sodium Metabisulphite

**Were any significant expenses incurred to?**

- Install required equipment
- Repair required equipment
- Replace required equipment

**Please provide a brief description and a breakdown of monetary expenses incurred**

SCADA System Upgrades \$5,000

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre



Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date

**Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.**

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw					
Treated					
Distribution	212	(0)-(0)	(0)-(0)	212	(<10)-(>2000)

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

	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity		
Chlorine	8760	(0.00)-(2.19)
Sample Collection Cl2	217	(0.80)-(1.73)
Grab Cl2	825	(0.16)-(1.85)
Fluoride (If the DWS provides fluoridation)	1	0.54

*NOTE: For continuous monitors use 8760 as the number of samples.*

*NOTE: Record the unit of measure if it is not milligrams per litre. The value of 0.0 was recorded in the continuous chlorine sampler as a result of equipment abnormality/SCADA issue/maintenance work or calibration.*

**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

**Summary of Inorganic parameters tested during this reporting period or the most recent sample results**



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	October 30 2014	<0.02 MDL	ug/l	No
Arsenic	October 30 2014	0.5	ug/l	No
Barium	October 30 2014	23.0	ug/l	No
Boron	October 30 2014	19.3	ug/l	No
Cadmium	October 30 2014	<0.003 MDL	ug/l	No
Chromium	October 30 2014	0.07	ug/l	No
*Lead	October 30 2014	0.24	ug/l	No
Mercury	October 30 2014	<0.01 MDL	ug/l	No
Selenium	October 30 2014	<1 MDL	ug/l	No
Sodium	October 30 2014	17.6	mg/l	No
Uranium	October 30 2014	0.042	ug/l	No
Fluoride	October 30 2014	0.54	mg/l	No
Nitrite				
Nitrate				

\*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

**Summary of lead testing under Schedule 15.1 during this reporting period**  
 (applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing			
Distribution			

**Summary of Organic parameters sampled during this reporting period or the most recent sample results**



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Oct. 30 2014	<0.02 MDL	ug/l	No
Aldicarb	Oct. 30 2014	<0.01 MDL	ug/l	No
Aldrin + Dieldrin	Oct. 30 2014	<0.01 MDL	ug/l	No
Atrazine + N-dealkylated metabolites	Oct. 30 2014	0.07	ug/l	No
Azinphos-methyl	Oct. 30 2014	<0.02 MDL	ug/l	No
Bendiocarb	Oct. 30 2014	<0.01 MDL	ug/l	No
Benzene	Oct. 30 2014	<0.32 MDL	ug/l	No
Benzo(a)pyrene	Oct. 30 2014	<0.004 MDL	ug/l	No
Bromoxynil	Oct. 30 2014	<0.33 MDL	ug/l	No
Carbaryl	Oct. 30 2014	<0.01 MDL	ug/l	No
Carbofuran	Oct. 30 2014	<0.01 MDL	ug/l	No
Carbon Tetrachloride	Oct. 30 2014	<0.16 MDL	ug/l	No
Chlordane (Total)	Oct. 30 2014	<0.01 MDL	ug/l	No
Chlorpyrifos	Oct. 30 2014	<0.02 MDL	ug/l	No
Cyanazine	Oct. 30 2014	<0.03 MDL	ug/l	No
Diazinon	Oct. 30 2014	<0.02 MDL	ug/l	No
Dicamba	Oct. 30 2014	<0.20 MDL	ug/l	No



1,2-Dichlorobenzene	Oct. 30 2014	<0.41 MDL	ug/l	No
1,4-Dichlorobenzene	Oct. 30 2014	<0.36 MDL	ug/l	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	Oct. 30 2014	<0.01 MDL	ug/l	No
1,2-Dichloroethane	Oct. 30 2014	<0.35 MDL	ug/l	No
1,1-Dichloroethylene (vinylidene chloride)	Oct. 30 2014	<0.33 MDL	ug/l	No
Dichloromethane	Oct. 30 2014	<0.35 MDL	ug/l	No
2-4 Dichlorophenol	Oct. 30 2014	<0.15 MDL	ug/l	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Oct. 30 2014	<0.19 MDL	ug/l	No
Diclofop-methyl	Oct. 30 2014	<0.40 MDL	ug/l	No
Dimethoate	Oct. 30 2014	<0.03 MDL	ug/l	No
Dinoseb	Oct. 30 2014	<0.36 MDL	ug/l	No
Diquat	Oct. 30 2014	<1 MDL	ug/l	No
Diuron	Oct. 30 2014	<0.03 MDL	ug/l	No
Glyphosate	Oct. 30 2014	<1 MDL	ug/l	No
Heptachlor + Heptachlor Epoxide	Oct. 30 2014	<0.01 MDL	ug/l	No
Lindane (Total)	Oct. 30 2014	<0.01 MDL	ug/l	No
Malathion	Oct. 30 2014	<0.02 MDL	ug/l	No
Methoxychlor	Oct. 30 2014	<0.01 MDL	ug/l	No
Metolachlor	Oct. 30 2014	0.01	ug/l	No
Metribuzin	Oct. 30 2014	<0.02 MDL	ug/l	No
Monochlorobenzene	Oct. 30 2014	<0.30 MDL	ug/l	No

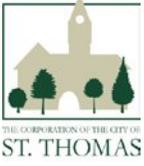


Paraquat	Oct. 30 2014	<1 MDL	ug/l	No
Parathion	Oct. 30 2014	<0.02 MDL	ug/l	No
Pentachlorophenol	Oct. 30 2014	<0.15 MDL	ug/l	No
Phorate	Oct. 30 2014	<0.01 MDL	ug/l	No
Picloram	Oct. 30 2014	<1 MDL	ug/l	No
Polychlorinated Biphenyls(PCB)	Oct. 30 2014	<0.04 MDL	ug/l	No
Prometryne	Oct. 30 2014	<0.03 MDL	ug/l	No
Simazine	Oct. 30 2014	<0.01 MDL	ug/l	No
THM (NOTE: show latest annual average)	Avg. 2014	30.75	ug/l	No
Temephos	Oct. 30 2014	<0.01 MDL	ug/l	No
Terbufos	Oct. 30 2014	<0.01 MDL	ug/l	No
Tetrachloroethylene	Oct. 30 2014	<0.35 MDL	ug/l	No
2,3,4,6-Tetrachlorophenol	Oct. 30 2014	<0.14 MDL	ug/l	No
Triallate	Oct. 30 2014	<0.01 MDL	ug/l	No
Trichloroethylene	Oct. 30 2014	<0.44 MDL	ug/l	No
2,4,6-Trichlorophenol	Oct. 30 2014	<0.25 MDL	ug/l	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	Oct. 30 2014	<0.22 MDL	ug/l	No
Trifluralin	Oct. 30 2014	<0.02 MDL	ug/l	No
Vinyl Chloride	Oct. 30 2014	<0.17 MDL	ug/l	No

List 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
-----------	--------------	-----------------	----------------



Corporation of the  
**City of St. Thomas**

**Report No.**

ES23-15

**File No.**

06-116-01a

06-116-01b

**Directed to:** Chairperson and Members of the Board of Management for the St. Thomas Area Secondary Water Supply System

**Meeting Date:** March 26, 2015

**Date Authored:** March 13, 2015

**Department:** Environmental Services

**Attachments**

**Prepared By:** John Dewancker

#1 – Elgin Middlesex Pumping Station (St. Thomas Component) Drinking Water Quality Management Operational Plan  
#2- St. Thomas Area Secondary Water Supply System (transmission main) Operational Plan

**Subject:** Drinking Water Quality Management Operational Plans and Policy Endorsement for the Elgin Middlesex Pumping Station and the Transmission Main for the St. Thomas Area Secondary Water Supply System

**Recommendation:**

THAT: Report ES23-15, Drinking Water Quality Management Plans and Policy Endorsement for the Elgin Middlesex Pumping Station and the Transmission Main for the St. Thomas Area Secondary Water System be received for information;

THAT: The Joint Board of Management approve the Drinking Water Quality Management Operational Plans and Policies.

**Origin:**

Ontario has established a strong regulatory framework for drinking water systems in the province. This framework under the *Safe Drinking Water Act, 2002* and related regulations focuses on compliance-based results which are verified through the Ministry of Environments' compliance and abatement programs. The regulations stipulate the detailed requirements for drinking water systems, testing services, quality standards, certification of drinking water system operators and drinking water quality analysts, as well as compliance and enforcement.

The Ontario Clean Water Agency (OCWA), the Operating Authority for the Elgin Middlesex Pumping Station (EMPS), has developed Drinking Water Quality Management Standards (DWQMS) to integrate quality management through a proactive and preventative approach to assuring drinking water quality. The SDWA requires each Owner of a municipal drinking water system to obtain a Drinking Water Licence for the operation of their waterworks. A prerequisite of the new municipal licensing program is to have the municipal drinking water system operated by an accredited Operating Authority. OCWA has obtained accreditation through SAI-Global, one of the external auditors, retained by the Ministry of the Environment to carry out audits for the DWQMS program.

The City of St. Thomas, the Operating Authority for the Transmission Main for the Secondary System, has developed Drinking Water Quality Management Standards (DWQMS) to integrate quality management through a proactive and preventative approach to ensure drinking water quality. The SDWA requires each Owner of a municipal drinking water system to obtain a Drinking Water Licence for the operation of their waterworks. A prerequisite of the new municipal licensing program is to have the municipal drinking water system operated by an accredited Operating Authority. The City of St. Thomas has obtained accreditation through SAI-Global, one of the external auditors, retained by the Ministry of the Environment to carry out audits for the DWQMS program.

Through the accreditation process, it was noted that the Joint Board of Management reaffirm their commitment to the Drinking Water Quality Management Plans for the EMPS developed by OCWA and the Transmission Main developed by the City of St. Thomas.

**Analysis:**

The Joint Board of Management is the Owner of the Water Supply System and provides governance for the St. Thomas Area Secondary Water Supply System.

OCWA is the operating authority that operates and maintains the EMPS and the City of St. Thomas is the operating authority for the transmission main of the Secondary System.

OCWA and the City of St. Thomas have developed DWQMS Operational Plans for the Secondary System consisting of the EMPS and the transmission main. The Plans commit the Joint of Management and both operating authorities to:

- Provide safe, cost-effective drinking water
- Be responsible for developing, implementing, maintaining and continually improving the Quality Management System with respect to the operation and maintenance of the EMPS
- Ensures compliance with applicable legislation and regulations

In addition, the Policy developed by the City of St. Thomas requires all suppliers and contractors to meet the required obligations and to promote conservation.

The Operational Plans are based on a number of guiding elements:

- Element 1 – *The Quality Management System*
- Element 2 – *The Quality Management System Policy*
- Element 3 – *Commitment and Endorsement*
- Element 4 – *QMS Representative*
- Element 5 – *Document and Records Control*
- Element 6 – *Drinking Water System*
- Element 7 and 8 – *Risk Assessment and Risk Assessment Outcomes*
- Element 9 – *Organizational Structure, Roles, Responsibilities and Authorities*
- Element 10 – *Competencies*
- Element 11 – *Personnel Coverage*
- Element 12 – *Communications*
- Element 13 – *Essential Supplies and Services*
- Element 14 – *Review and Provision of Infrastructure*
- Element 15 – *Infrastructure Maintenance, Rehabilitation and Renewal*
- Element 16 – *Sampling, Testing and Monitoring*
- Element 17 – *Measurement and Recording Equipment Calibration and Maintenance*
- Element 18 – *Emergency Management*
- Element 19 – *Internal Audits*
- Element 20 – *Management Review*
- Element 21 – *Continual Improvement*

Element 3 of the Operational Plans requires a written endorsement of its contents by the organization's top management and owner representative. A copy of the Drinking Water Quality Management Plans and Policies are provided (*Attachment #1*).

### ***Role and Responsibility of the Joint Board of Management***

The Owner of a public water system is responsible for meeting all of the public responsibilities that apply to the water supply. An Owner is a person, municipal council, or board of commissioners who owns a public water system. The owner may designate a manager, operator, or operators to conduct the day-to-day operations of a water supply, but the Owner is ultimately responsible for providing safe drinking water and meeting all regulatory requirements.

Section 19 of the *Safe Drinking Water Act, 2002* sets out the legal responsibilities and duties of persons who oversee municipal drinking water systems. This section requires that those who are in a position of oversight of municipal drinking water systems apply a statutory standard of care to their oversight activities. Anyone to whom the standard of care applies is expected to exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation.

The SDWA expressly extends regulatory responsibility to people with decision making authority over the drinking water system. Depending on specific circumstances and individual responsibilities, this responsibility may extend to individual board members and other municipal officials and employees.

To ensure that their responsibilities have been carried out diligently, the Joint Board of Management must:

- understand their obligations under the *Safe Drinking Water Act, 2002* and associated regulations;
- be aware of the conditions outlined in the system's Drinking Water Works Permit
- assign competent and certified management and operators
- allocate sufficient financial resources for the operation and maintenance of the system
- require and review periodic and annual reports from senior management on the operation of the municipal drinking water system
- be satisfied that appropriate steps are taken to address any issues

Therefore, it is recommended that the Joint Board of Management reaffirm their commitment to the obligations under the *Safe Drinking Water Act, 2002* through approval of the Drinking Water Quality Management Plans and Policies.

Respectfully Submitted,



John Dewancker, P. Eng.  
Director of Environmental Service & City Engineer

---

Reviewed By:                                                                                                                              

Treasury      Env Services      Planning      City Clerk      HR      Other



Corporation of the  
**City of St. Thomas**

**Report No.**

ES26-15

**File No.**

07-124

**Directed to:**

**Chairperson and the Members of the Board of Management for the St. Thomas Area Secondary Water Supply System**

**Meeting Date: March 26, 2015**

**Date Authored: March 13, 2015**

**Department:**

Environmental Services

**Attachments**

**Prepared By:**

John Dewancker

- Report ES69-14 (Award of proposal with Study outline)
- St. Thomas ASWSS Financial Plan Update-Report by Watson & Associates, Economists

**Subject:**

St. Thomas ASWSS Financial Plan Update per O.R. 453 of the Safe Drinking Water Act

**Recommendation:**

THAT: Report ES26-15, be received as information; and

THAT: The report of the St. Thomas ASWSS Financial Plan update, prepared by Watson & Associates, Economists Ltd. attached to report ES26-15 be approved; and

THAT: The Water Financial Plan and resolution, approving the plan, be submitted to the Ministry of the Environment in order to satisfy the requirements under the Safe Drinking Water Act; and

THAT: The Water Financial Plan resolution approving the plan and the STAWSS Water Rate Study (2015) be submitted to the Ministry of Municipal Affairs and Housing in order to satisfy the requirements under the Ontario Regulation 453/07, Section 3 (1) 6; and

THAT: A notice of the availability of the Financial Plan be published, as prescribed by Ontario Regulation 453/07, in the local press and on the City's website; and

THAT: The water rate schedule, included in the Financial Plan Update and referenced in Report ES26-15, be approved and that the new 2015 water rate be effective on July 1, 2015.

**Origin:**

The study project to undertake an update of the Financial Plan of the St. Thomas Area Secondary Water Supply System was approved by the Joint Board of Management in July, 2014 through Report ES69-14 (attached). The rate study component of the plan needs to identify the capital, operating and lifecycle expenditures forecasted over the 2015-2025 period for water services. A Full Cost Recovery Plan for the annual costs of service also need to be developed, including a long-term lifecycle plan consistent with the principles of O.Reg. 453/07 and the *Sustainable Water and Sewage Systems Act*.

**Analysis:**

Financial plan requirements regulated by the *Safe Drinking Water Act* Ontario Regulation 453/07 details the following requirements with regards to s.30 (1) part b of the *Safe Drinking Water Act* for existing water systems:

- Financial plans must be approved by Council resolution (or governing body)
- Financial plans must include a statement that the financial impacts have been considered and apply for a minimum six year period
- Financial plans must include detail regarding proposed or projected financial operations itemized by total revenues, total expenses, annual surplus/deficit and accumulated surplus/deficit (i.e. the components of a "Statement of Operations" as per the Public Sector Accounting Board) for each year in which the financial plans apply
- Financial plans are to be made available to the public upon request at no charge
- If a website is maintained, financial plans are to be made available to the Public through publication on the Internet at no charge, and
- Notice of the availability of the financial plans is to be given to the Public

New regulations have necessitated changes to financial reporting requirements. The new regulations require municipalities to report financial statements on a full accrual accounting basis. The accrual accounting method recognizes revenues and expenses in the same period as the activities that give rise to them, regardless of when they are actually paid. Historically, municipalities reported financial results on a modified cash basis of accounting whereby revenues and expenses are recognized when cash is paid or received. The difference has impacted the presentation of the statements in that various accounts have been added or deleted to properly report transactions.

The main differences in reporting include:

- Reporting tangible capital assets on the Statement of Financial Position
- Reporting accumulated surplus/deficit on the Statement of Financial Position
- Reporting amortization expense on the Statement of Operations
- Expensing any non-tangible capital assets on the Statement of Operations
- New report detailing the change in net financial assets/debt

Previously, capital assets were expensed; the new requirements stipulate that tangible capital assets must be capitalized and amortized as an expense over the estimated useful life of the asset.

The *Safe Drinking Water Act* requires a declaration of the financial plan's sustainability but it does not give a clear definition of what is considered sustainable. The Ministry of the Environment released a guideline ("Towards Financially Sustainable Drinking Water and Wastewater Systems") that provides possible approaches to achieving sustainability. Listed below are nine Principles of Financial Sustainability for Water and Wastewater Services developed by the Province:

1. Ongoing public engagement and transparency can build support for, and confidence in, financial plans and the system(s) to which they relate
2. An integrated approach to planning among water, wastewater, and storm water management is desirable given the inherent relationship among these services
3. Revenues collected for the provision of water and wastewater services should ultimately be used to meet the needs of those services
4. Life-cycle planning with mid-course corrections is preferable to planning over the short-term or not planning at all
5. An asset management plan is a key input to the development of a financial plan
6. A sustainable level of revenue allows for reliable service that meets or exceeds environmental protection standards, while providing sufficient resources for future rehabilitation and replacement needs
7. Ensuring users pay for the services they are provided leads to equitable outcomes and can improve conservation. In general, metering and the use of rates can help ensure users pay for services received.
8. Financial plans are "living" documents that require continuous improvement. Comparing the accuracy of financial projections with actual results can lead to improved planning in the future
9. Financial plans benefit from the close collaboration of various groups, including engineers, accountants, auditors, utility staff, and municipal council

#### *Water Rate Impact*

The Distribution Water Rate is impacted by the Primary System Water Rate and the Secondary System Water Rate.

The Primary System Water Rate is forecast to increase at an annual rate of 7%. The Secondary System Water Rate is forecast to increase as shown in the below noted table. The rate reflects the capital, operating and lifecycle expenditures forecasted over the 2015-2025 period for water services and the anticipated reduced water consumption for the system.

The existing water rate strategy is designed to ensure that the necessary funding is in place to meet operating costs and long-term rehabilitation and replacement needs. In this case, sufficient funds are being allocated to pay for a number of short term (Elevated Tower painting, EMPS pumping station modification to variable speed jockey pump, etc.) and more long term capital measures such as the eventual elimination of the Tower and the replacement of the booster pumping station system at the EMPS.

The STASWSS is currently operating at a deficit and the situation will require additional contributions to the reserve to remedy the deficit.

**Water Rate Forecast**

The following table summarizes the recommended water rates as per the report by Watson & Associates:

**St. Thomas and Suburban Service Area Blended Supply Rate  
Debt Use  
Residential Customer Water Rate Impact**

Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>St. Thomas and Suburban Service Area Blended Supply Rate</b>										
Primary Rate (\$/m <sup>3</sup> )	0.6761	0.7370	0.7739	0.8126	0.8532	0.8959	0.9407	0.9877	1.0371	1.0890
Secondary Rate (\$/m <sup>3</sup> )	0.6250	0.3578	0.3939	0.4336	0.4773	0.5255	0.5785	0.6368	0.7011	0.7718
Blended Supply Rate (70% Primary and 30% Secondary)	0.7736	0.8443	0.8921	0.9427	0.9964	1.0535	1.1142	1.1788	1.2474	1.3205
Annual Water Bill Impact (179 m <sup>3</sup> /year)	138.47	151.14	159.68	168.74	178.36	188.58	199.45	211.00	223.29	236.37
Total Annual Water Bill Increase	11.86	12.66	8.54	9.06	9.62	10.22	10.86	11.55	12.29	13.08
Annual Water Bill Increase (attributable to ASSWS)	1.87	1.76	1.94	2.13	2.35	2.59	2.85	3.13	3.46	3.80

**Financial Considerations**

There is no financial impact directly associated with this report. By approving the Financial Plan, the Joint Board of Management for the St. Thomas Area Secondary Water Supply System is committing to the financial sustainability of the drinking water system.

A representative of Watson & Associates Economists will be available at the meeting to present the study findings, conclusions and recommendations and to assist with the answers to the questions by the Members.

Respectfully Submitted,



John Dewancker, P. Eng.  
Director, Environmental Services & City Engineer

---

Reviewed By:                                                                                                                              

Treasury      Env Services      Planning      City Clerk      HR      Other



Corporation of the  
**City of St. Thomas**

Report No.

ES69-14

File No.

07-124

**Directed to:** Grant Jones, Acting Chair, and Members of the Board of Management of the St. Thomas Area Secondary Water Supply System

**Date**  
Meeting Date: July 17, 2014

Date Authored: July 4, 2014

**Department:** Environmental Services

**Attachment**

**Prepared by:** John Dewancker, Director

**Subject:** St. Thomas Area Secondary Water Supply System. Financial Plan Update – RFP 2014-046 – Award of proposal

**Recommendation:**

- That Report ES69-14 be received for information; and further
- That the proposal by Watson and Associates Economists Ltd. for the consulting services assignment for the St. Thomas Area Secondary Water Supply System – Financial Plan Update be approved; and further
- That the Board authorize staff to undertake the necessary actions in connection with this consulting services assignment.

**Origin:**

The approved 2014 budget includes the preparation of a financial plan update for the St. Thomas Area Water Supply System, which will provide the Management Board with a rate schedule and financial plan that is more accurate to identify the priorities of the system's needs with a rate projection up to 2019.

**Analysis:**

Following the April 7, 2014 pre-selection and pre-qualification of consulting firms to assist the City and the Board with professional consulting services for 13 projects, one of which is the St. Thomas Area Water Supply System – Financial Plan Update, the RFP for this study project was forwarded to the two consulting firms which were pre-qualified to submit a proposal for this project.

The following provides an outline of the key terms of reference for this project:

1. **INTENT**

The previous Water Financial Plan for the St. Thomas Area Secondary Water Supply System (ASWSS) was completed in 2011. The 2011 study met the requirements of the Financial Plan Regulation under the SDA, O. Reg. 453/07, it met the goals and objectives of the Sustainable Water and Sewage Systems Act (Bill 124) and also satisfied the requirements of the original MOE Transfer order. The completion of the 2011 Financial Plan was one of the basic requirements for the provision of a MOE Drinking Water License for the St. Thomas ASWSS to the City in its capacity of Administering Municipality, on behalf of the Board of Management (owner) of the Water Supply System.

The updated St. Thomas Area Secondary Water Supply System Rate Study assessed the existing and anticipated capital and operating needs of the system as well as anticipated changes to consumption projections. While the rate schedule also provided a rate projection up to 2019, the accuracy of resolution and priorities of the system's needs during the latter portion of the planning period usually diminishes, which results in the need for a 5-year periodic update of the system's needs as well as its rate schedule, a best practice and compliance which is also being required by the Province in conjunction with the issuance of the new MOE Drinking Water Licenses to Owners of Municipal Drinking Water Systems. Currently, provincial legislation (O. Reg. 453/07) requires the Water Financial Plan to cover a period of at least six years.

The updated St. Thomas Area Secondary Water Supply System Water Supply System Rate Study included all the activities required for preparation of a Financial Plan under the Safe Drinking Water Act, which can essentially be grouped in two categories:

- Needs assessment leading to the establishment of the full cost of all services to be provided by/for the system;
- Rate development to fund these costs, including a review of any required financial options;

The objectives of the 2011 update to the St. Thomas Area Secondary Water Supply System Water Supply System Rate Study were to:

- Forecast future water demands, incorporating the closure of the Ford Plant and extension of services within Dutton-Dunwich;
- Identify all present and future water system capital needs to assess the immediate and longer-term capital funding implications;
- Identify existing operating costs by component and estimate future operating costs over the next ten years. This assessment identified fixed and variable costs in order to project those costs sensitive to changes to the existing infrastructure inventory, as well as costs which may increase commensurate with growth; and
- Forecast Secondary System Water Rates for the period.

The Financial Plan Regulation (O. Reg. 453/07) also requires that the plan be established on a full-cost accrual basis instead of on a cash-basis which ensures that it is also PSAB 3150 (Public Sector Accounting Board) compliant.

## **2. BACKGROUND**

### **2.1 Secondary Water Consumption**

The St. Thomas Area Secondary Water System presently supplies water to three municipalities: St. Thomas, the Municipality of Central Elgin and the Township of Southwold. Historic water consumption information was provided by the City of St. Thomas for the period 2003-2010 for the updated St. Thomas Area Secondary Water Supply System Water Supply System Rate Study. Total water consumption for the Secondary System was anticipated to increase slightly in 2011 from 2.70 million m<sup>3</sup> to 2.77 million m<sup>3</sup>. Thereafter, it was anticipated at the time of the previous study completion to decrease sharply in 2012 to approximately 2.37 million m<sup>3</sup>, with minimal growth over the forecast period (2.39 million m<sup>3</sup> in 2019).

### **2.2 Full Cost of Services**

The updated St. Thomas Area Secondary Water Supply System Rate Study included a "Full Cost of Services" report that addressed the Sustainable Water and Sewage System Act requirements and supports the complementary "Cost Recovery Plan". The capital needs assessment summarized the following:

- Identified capital costs – including capital costs for the upgrade, repair and maintenance of the system as identified by the City of St. Thomas and the 2002 Due Diligence Report;
- Unidentified capital costs and lifecycle replacement costs – including items that are based on lifecycle needs - which could require replacement within the forecast period of 2011-2019 and beyond. The Cost Recovery Plan identifies the use of rate based funding for the capital needs in the forecast period, and the development of lifecycle reserve funds to address stable funding for works beyond the forecast period. The following items are included under the unidentified capital costs: Transmission Main Replacement; Ford Tower Replacement; replacement of the large chambers – East and West; New water meter installation, and the Elgin Middlesex Booster Station – STAWSS. This Financial Plan, while it lists the Ford elevated Tower as an asset, did not provide for the replacement of the elevated storage reservoir (Ford Tower) as part of the rate development, since its replacement, from an asset management point of view would normally not occur until 2068. At this time and in conjunction with the intent to proceed with the re-coating of this metal elevated storage reservoir, the Members of the Management Board have requested that a high level review be undertaken of the feasibility of implementing an alternative option that would provide for the removal of the elevated reservoir with the associated renewal/retrofitting of the EMPS or other existing works and to perform a cost benefit analysis of this alternative option.

### **2.3 Cost Recovery Plan**

Consistent with the requirements of the Sustainable Water and Sewage Systems Act, the Financial Plan must identify the strategy and sources of funding to pay for the costs of water services.

The predominate funding source for all of the Secondary System capital needs must be generated by direct recoveries through the water rate and indirectly through capital reserves which also are built by the system's water rate. The report summarizes the capital funding plan for the St. Thomas Area Secondary Water Supply System, with approximately \$ 2.3 million in contributions from the operating fund (that is, rate base) being required over the 2011-2019 forecast time-period.

**2.4 Water Rate Impact**

All water supplied to the St. Thomas ASWSS is generated by the Elgin Area Primary Water Supply System (EAPWSS) and the point of water transfer between the supply source, the EAPWSS and the St. Thomas ASWSS is the Elgin-Middlesex Pumping Station (EMPS).

The 2010 Updated St. Thomas Area Secondary Water Supply System Rate Study indicated that the Primary System Water Rate was forecast to increase at an annual rate of 7 %, annually. This rate increase has been 9 % during the last 3 years and this rate increase may need to be maintained over the next number of years (verification with the EAPWSS will be required in this regard). Consequently, the Secondary System Water Rate will need to be adjusted accordingly.

The current water rate and its projected schedule of rate adjustments is deemed to be inadequate as a result of a number of future increases in cost, including:

- Other recently identified system needs (EAPWSS) that will impact the financial sustainability of the reserve fund;
- Increased capital needs of the system;
- Reduced water consumptions.

**2.5 Financial Considerations**

The Updated St. Thomas Area Secondary Water Supply System – Water Financial Plan Study will identify the capital, operating and lifecycle expenditures, forecasted over the 2015-2025 period for the system's water services. The Full Cost Recovery Plan for the annual costs of service will be developed, including a long-term lifecycle plan consistent with the principles of O. Reg. 453/07 and the Sustainable Water and Sewage Systems Act.

The 2 firms who were invited to submit a proposal in response to the above RFP and terms of reference were:

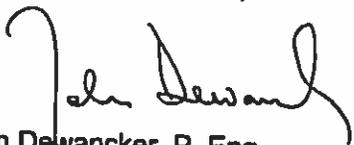
Watson & Associates Economists Ltd.  
Hemson Consulting

On June 26, 2014 , proposal/submission were opened in the presence of the City's Purchasing Agent. Only one firm submitted a proposal and upon review and evaluation, it is recommended the firm of Watson & Associates be retained to complete the project. This firm has a solid knowledge and expertise required to successfully complete this assignment and has successfully prepared a number of rate studies (Waste Financial Plans, Sewage Service Rate, Development Charges) for the City of St. Thomas in the past. The firm Blue Plan Engineering will assist in the development of the full Cost of Services Report

The Management Board's approved budget includes \$ 50,000 to complete this study project. The proposal cost, submitted is \$ 49,810 (excl. HST).

The implementation of the updated rates will essentially be for the re-establishment of a Plan to financially support the water supply system in a sustainable way and to establish a sustainable funding source for ongoing capital, operating and lifecycle replacement requirements all to be reflected, considered and analyzed by the Updated Financial Plan.

Respectfully Submitted,



John Dewancker, P. Eng,  
Director, Environmental Services

Reviewed By:

Treasury

Env. Services

Planning

City Clerk

HR

Other



Corporation of the  
**City of St. Thomas**

Report No.

ES27-15

File No.

06-117

**Directed to:** Chairperson and the Members of the Board of Management for the St. Thomas Area Secondary Water Supply System

**Meeting Date:** March 26, 2015  
**Date Authored:** March 13, 2015

**Department:** Environmental Services

**Prepared By:** John Dewancker

**Attachments**  
- EAPWSS report on EMPS ownership reconciliation

**Subject:** EMPS Building ownership reconciliation

**Recommendation:**

THAT: Report ES27-15, be received as information; and

THAT: The issue of the EMPS building ownership and associated responsibilities be addressed through a comprehensive evaluation and review between all involved parties (EAPWSS, City of London, St. Thomas ASWSS, Aylmer ASWSS).

**Origin:**

At the meeting of March 5, 2015 of the Elgin Area Primary Water Supply System Board of Management, the issue of ownership of the EMPS building (the 1967 original building + 1996 addition) was raised through the attached report (consent agenda item #6, pages 64-71). Also, Councillor Stevenson has asked that this matter be pursued in further detail before a final decision can be made in this regard.

**Analysis:**

The EAPWSS report recommends an endorsement of a suggested transfer of ownership of the building to a joint ownership that would involve the City of London, the Aylmer ASWSS and the St. Thomas ASWSS. In this regard the attached report (pg. 3 of 8) states that an agreement could not be reached between the involved municipalities. The issue, however, needs to be concluded between the parties that are accommodated by this building and these are the EAPWSS, City of London, the Aylmer ASWSS and the St. Thomas ASWSS.

The report, prepared by the Regional water staff of the EAPWSS recommends that the building ownership be transferred to the City of London, the Aylmer ASWSS and the St. Thomas ASWSS.

With ownership of an asset comes the need to take responsibility for the maintenance and capital renewal of the asset, as required.

In this regard, it would be important that a Building Condition and Needs Assessment be completed and be circulated to all involved parties. Also, the apportionment of the responsibilities (financial & otherwise), between the parties would need to be confirmed and documented in a joint agreement. Finally, all financial needs would need to be included in the respective Financial Plans of each water supply system.

Respectfully Submitted,

John Dewancker, P. Eng.  
Director, Environmental Services & City Engineer

Reviewed By:

Treasury

Env Services

Planning

City Clerk

HR

Other

To: Chair and Members  
Elgin Area Primary Water Supply System Board of Management

From: John Braam, P.Eng.  
Chief Administrative Officer

Meeting Date: March 5, 2015

Subject: Elgin-Middlesex Pumping Station Ownership Reconciliation

### RECOMMENDATION

That the Board of Management for the Elgin Area Primary Water Supply System take the following actions regarding the clarification of ownership at the Elgin-Middlesex Pumping Station site:

- a) The Board of Management for the Elgin Area Primary Water Supply System ACCEPT and ENDORSE the clarification of ownership of the reservoir cells, swab pond at the Elgin-Middlesex Pump Station and Reservoir site as being owned by the Elgin Area Primary Water Supply System, subject to the concurrence of the City of London; and,
- b) The Board of Management for the Elgin Area Primary Water Supply System ENDORSE the clarification of ownership of the common building, as being jointly owned by the City of London, the Aylmer Secondary Water System, and the St. Thomas Secondary Water System; it being noted that the common building includes the 1996 building addition, as well as the building services such as the HVAC, septic, and electrical systems.

### PREVIOUS AND RELATED REPORTS

June 7, 2012 Elgin-Middlesex Pumping Station Ownership Reconciliation

### BACKGROUND

The Board of Management for the Elgin Area Primary Water Supply System (EAPWSS) was established under a Transfer Order issued by the Minister of the Environment, pursuant to the *Municipal Water and Sewage Transfer Act, 1997*.

Under the Transfer Order, the EAPWSS works, properties, and assets acquired by the Province were transferred jointly to seven (7) municipalities on November 29, 2000, each having an undivided interest in the Primary Water Supply System and its assets, and established the Board of Management which represents that ownership and governs the system. Similarly:

- The pumps and associated equipment for the Elgin-Middlesex Secondary Water Supply System (City of London pump station) acquired by the Province were transferred to the City of London;
- The pumps and associated equipment for the St. Thomas Area Secondary Water Supply System acquired by the Province were transferred jointly to the three (3) benefiting municipalities, and established the St. Thomas Secondary Water Supply System Board of Management;

- The pumps and associated equipment for the Aylmer Area Secondary Water Supply System acquired by the Province were transferred jointly to three (3) benefiting municipalities, and established the Aylmer Secondary Water Supply System Board of Management.

The "Elgin-Middlesex Pumping Station" (EMPS) property, located at 490 South Edgeware Road in the Municipality of Central Elgin, contains three pumping station (London, St. Thomas Secondary, and Aylmer Secondary), reservoir comprised of two storage cells, a surge facility and various process equipment, all of which are owned by one or more of the four water systems noted above.

Since the Transfer Orders were issued in 2000 to the various municipalities and respective Boards of Management, there has been difficulty clearly delineating ownership at the EMPS site due to conflicting language in the various Transfer Orders, previous Certificates of Approval issued by the Province of Ontario, and the new Municipal Drinking Water Licences. The EAPWSS is proposing that some historical ownership issues be reconciled to clearly outline ownership, and apply more consistent ownership policies for assets that benefit multiple EAPWSS member municipalities.

The clarification of ownership is most significantly necessary to ensure responsibilities are clearly delineated for regulatory purposes and inspections by the Ministry of the Environment and Climate Change. At a meeting with the local Ministry of the Environment and Climate Change (MOECC) office on June 29, 2011, the MOECC agreed that if all parties affected by the proposed ownership reconciliation submitted signed documentation agreeing to the clarification, the MOECC will reconcile this on the various affected system's Municipal Drinking Water Licence (MDWL) and associated Drinking Water Works Permit (DWWP).

## DISCUSSION

Under the original Transfer Orders, a number of assets were transferred to the Elgin-Middlesex Secondary Water Supply System (City of London) that would have been more appropriately transferred to the EAPWSS. Generally speaking, assets that benefit multiple municipal water systems, and are of "primary treatment and supply" in nature, are typically owned by the primary system.

### Reservoir, Valvehouse, and overflow pond

At the July 7, 2012 meeting of the Board, it was agreed that the overflow settling pond, along with the second of the two reservoir cells be transferred from the City of London to the Elgin Area Primary Water Supply System, contingent on the concurrence of the City of London. The property, the first of the two reservoir cells, and the valvehouse are already listed as owned by the Elgin Area Primary Water Supply System and no further changes are required with regard to these assets.

### Backup Generator and Rechlorination System

With regard to the backup generator and the rechlorination system, municipal staff and Board staff have agreed that, although they were implemented to benefit more than one municipality (Aylmer Secondary Water System and St. Thomas Secondary Water System), these systems are more "distribution-related" and ownership of those two components should be between the two benefiting secondary water systems. The emergency backup generator is designed to supply electricity, other than instrumentation and general lighting, to only the pumps of the Aylmer Secondary and St. Thomas Secondary water systems and not the pumps owned by London. Similarly, the rechlorination system is distribution related ("tops up" and maintains chlorine levels in the water) and only benefits the Aylmer Secondary and St. Thomas Secondary water systems and not London.

**Common Pump Station Building (including 1996 addition)**

With regard to the reconciliation of the buildings themselves (physical/structural envelop), extensive discussions between the municipalities were undertaken, however an agreement could not be reached. Under the Transfer Orders issued, the newer portion of the building (1996 addition) was transferred to the City of London (occupied by the Aylmer Area Secondary System, St. Thomas Area Secondary System, and London) whereas the older original portion (occupied by the St. Thomas Area Secondary System) was transferred to the EAPWSS.

Initial discussions related to the common building were centred on the building and associated support systems (HVAC, electrical system, septic system, etc.) be transferred to the primary water system, acting as a "landlord", and the secondary systems (pumps and equipment) would act as a "tenant" in its occupancy within. Unfortunately, an agreement to this arrangement could not be reached.

As no agreement was reached with regard to the common building, it is recommended that the original portion of the building (constructed about 1967) currently listed as "owned" by the Elgin Area Primary Water System be transferred jointly to the City of London, the Aylmer Secondary Water Supply System, and the St. Thomas Secondary Water System. As the common building, including 1996 building addition, benefits all three of the secondary water systems, it is the recommendation of staff that the City of London, the Aylmer Secondary Water System, and the St. Thomas Secondary Water System enter into an agreement for the joint ownership, operation, maintenance and repair of the common building and associated assets (septic system, building environmental system, electrical system, etc.).

The 1996 building addition is currently listed as "owned" by the City of London, even though it additionally benefits the Aylmer Secondary Water System and the St. Thomas Secondary Water System.

The following table summarizes the current ownership of the assets and works at the EMPS, and the proposed changes.

Drinking Water System (Current Ownership)	Description of Works (Summary) as Identified by the Transfer Order	Recommended Clarification (Proposed Ownership)
Elgin-Middlesex Secondary Water Supply System  (City of London)	<p><b>Elgin-Middlesex pumping station</b> (the newer pumping station building addition built in 1996) including 3 pumps, overflow settling pond and re-chlorination facilities, excluding 2 pumps, associated piping and controls servicing the Aylmer Area Secondary Water Supply System</p> <p><i>NOTE: The re-chlorination facility was upgraded in 2010, and is no longer applicable to the City of London.</i></p>	<p>Transfer the overflow settling pond to the EAPWSS as it benefits only the primary system (eg. used for EAPWSS transmission main flushing).</p> <p>Jointly own the common buildings, including the original 1967 building and 1996 building addition, with the Aylmer and St. Thomas secondary systems.</p>
	<p><b>Elgin-Middlesex reservoir</b> (the newer reservoir cell built in 1996) including a 27,300 m<sup>3</sup> concrete in-ground reservoir (cell #2)</p>	<p>Transfer the reservoir cell to the EAPWSS, as it benefits several member municipalities. The original cell of the reservoir is already owned by the primary water system, and the two cells are operationally integrated.</p>
	<p><b>Elgin-Middlesex surge facility</b> consisting of a surge tank and associated controls</p>	<p>No change</p>
	<p><b>A transmission pipeline</b> from the Elgin-Middlesex Pump Station to the City of London.</p>	<p>No change</p>
	<p>Associated site works, piping, electrical, mechanical and instrumentation controls</p>	<p>No change</p>
Elgin Area Primary Water Supply System (EAPWSS)	<p><b>St. Thomas Reservoir</b> (the original reservoir cell built in the late 1960's) having a storage capacity of approx. 27,300 m<sup>3</sup> (cell #1)</p>	<p>No change</p>
	<p><b>St. Thomas Booster Pumping Station</b> (the original pumping station building built in the late 1960's) - building only</p>	<p>Transfer to the City of London, Aylmer Secondary Water System and St. Thomas Secondary Water System (to be owned jointly)</p>
	<p>Associated site works, piping, electrical, mechanical and instrumentation controls</p>	<p>No change</p>

Drinking Water System (Current Ownership)	Description of Works (Summary) as Identified by the Transfer Order	Recommended Clarification (Proposed Ownership)
St. Thomas Area Secondary Water Supply System	<b>Pumping facilities</b> including 3 pumps located at the St. Thomas Reservoir and Booster Pumping Station site	No change
	<b>A transmission pipeline</b> from the Elgin-Middlesex Pump Station to the Town of Aylmer.	No change
	<b>An elevated storage tank</b>	No change
	Associated site works, piping, electrical, mechanical and instrumentation controls	No change
Aylmer Area Secondary Water Supply System	<b>Pumping facilities</b> including 2 pumps located at the Elgin-Middlesex Pumping Station	No change
	<b>A transmission pipeline</b> from the Elgin-Middlesex Pump Station to the Municipality of Southwold.	No change
	Associated site works, piping, electrical, mechanical and instrumentation controls	No change
<i>Shared Assets</i>	An emergency backup generator having shared ownership between the Aylmer Secondary Water Supply System and the St. Thomas Secondary Water Supply System	No change  (the generator does not benefit the London pump station)
		The common buildings, including the original 1967 building and the 1996 building addition, jointly owned between the City of London, the Aylmer and St. Thomas secondary systems. This includes the associated building support system, such as the septic system, building environmental system (HVAC), and electrical system.
	A secondary chlorination system having shared ownership between the City of London, the St. Thomas Secondary Water System, and the Aylmer Secondary Water System	A secondary chlorination system having shared ownership between the St. Thomas Secondary Water System, and the Aylmer Secondary Water System

It is the opinion of Board staff that the proposed "changes" are a clarification and reconciliation of the Transfer Orders, previous Certificates of Approval, Municipal Drinking Water Licences and Drinking Water Works Permits issued by the Ministry of the Environment and Climate Change.

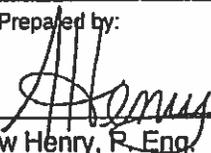
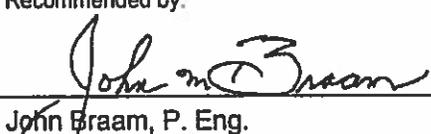
**CONCLUSION**

The reconciliation of the ownership of the reservoir cell #2, and overflow settling pond will result in more clear delineation of ownership at the EMPS site and address the confusion encountered during inspections by the Ministry of the Environment and Climate Change, and reconcile contract operations and operational accreditation issues.

The reconciliation of the building ownership is important for the purposes of delineating health and safety issues as well as general "housekeeping". As the assets after the terminal reservoir, physically, tends to relate entirely to the distribution systems of the secondary water systems and not the primary system treatment and transmission, it is recommended that these elements be jointly owned by the City of London, the Aylmer Secondary Water System, and the St. Thomas Secondary Water System.

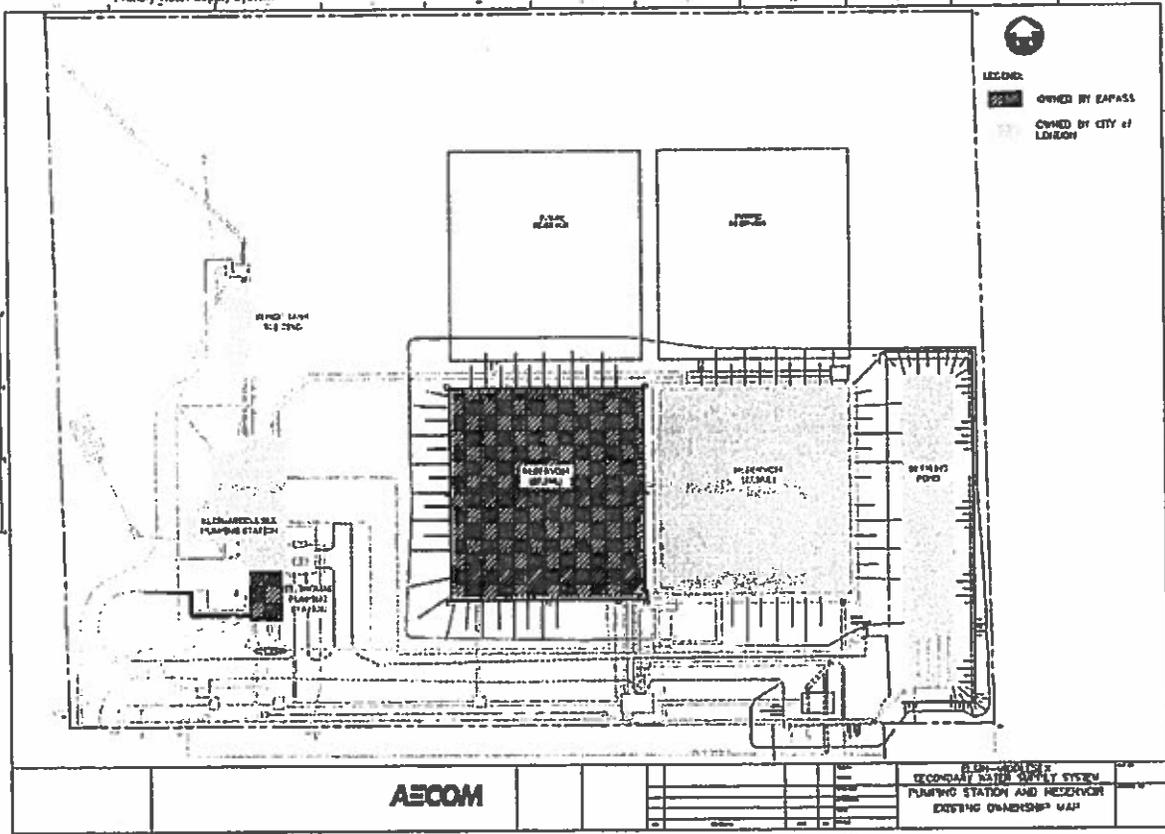
Should the Aylmer Secondary Water System and the St. Thomas Secondary Water System not agree with the joint ownership of the pump station building, it is recommended that the ownership of the original 1967 portion of the building (which is currently listed as "owned" by the primary water supply system) be transferred to the City of London as an interim measure. This will ensure that the entire building complex (1967 building, 1996 building expansion, and associated building services) are managed by one entity. London would then be responsible for apportioning the associated building costs as appropriate.

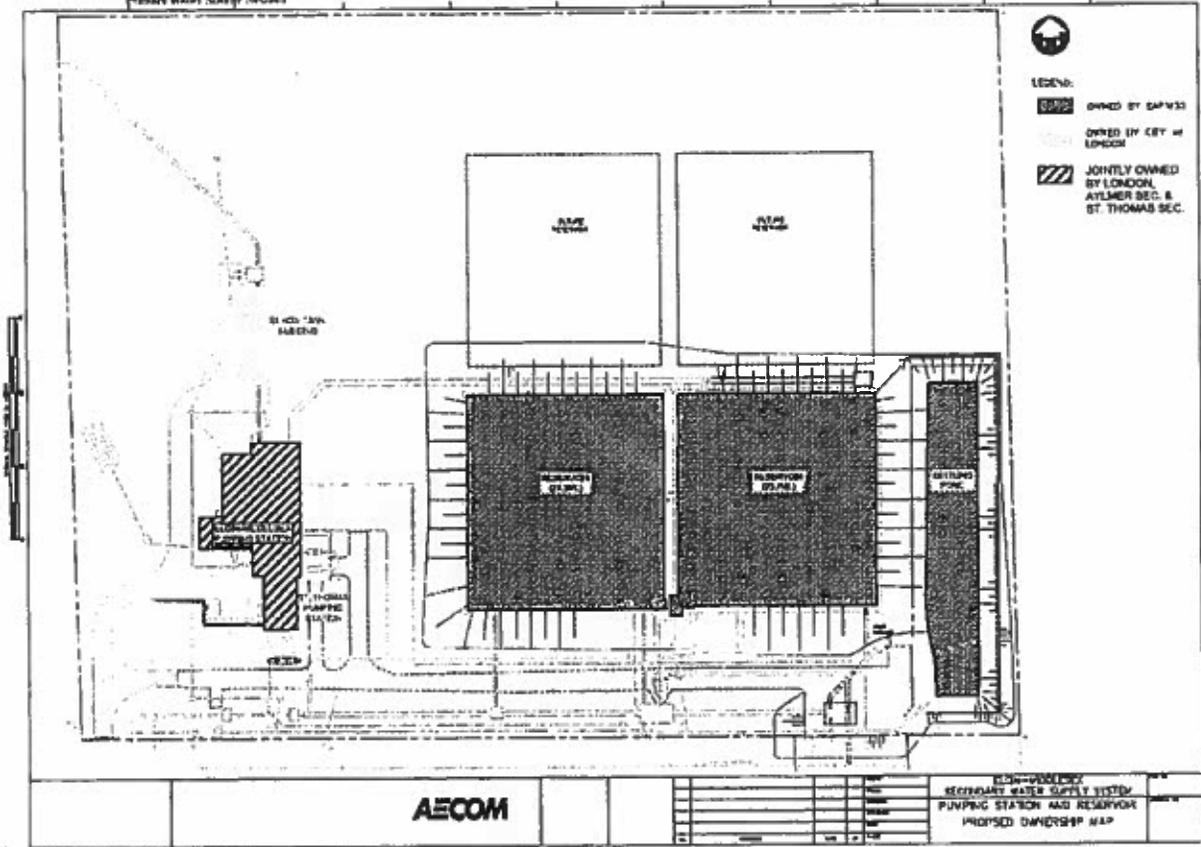
Information for this report was provided by Erin McLeod, Quality Assurance & Compliance Manager.

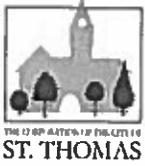
Report Prepared by:	Recommended by:
	
Andrew Henry, P. Eng. Division Manager, Regional Water Supply	John Braam, P. Eng. Chief Administrative Officer

**Attachments:**

Maps – Existing and Proposed Ownership







Corporation of the  
**City of St. Thomas**

**Report No.**  
ES28-15

**File No.**  
06-098

**Directed to:** Chairperson and Members of the Board of Management for the St. Thomas Area Secondary Water Supply System

**Date**  
Meeting Date: March 26, 2015  
Date Authored: March 14, 2015

**Department:** Environmental Services

**Prepared by:** John Dewancker, Director

**Attachment**

- St. Thomas ASWSS Water Quality Management Policy
- Standard of Care, A Guide for Members of Municipal Councils

**Subject:** St. Thomas Area Secondary Water Supply system - Statutory Standard of Care for Drinking Water System

**Recommendation:**

- That Report ES28-15 be received as information; and further
- That the MOE document, Taking Care of Your Drinking Water, A Guide for Members of Municipal Councils with Statutory Standard of Care responsibilities for public water supply under the Safe Drinking Water Act be received.

**Origin:**

Section 19 of the Safe Drinking Water Act sets out the legal responsibilities and duties of persons who oversee municipal drinking water systems. These persons have been defined in the Act, associated Regulations and the Drinking Water Quality Management System and include Municipal Officials and Corporate Officers, including all Members of the St. Thomas ASWSS Board of Management. In this regard, the attached information includes the City's Drinking Water Quality Management Policy as well as a Guide on the Duty of Care by the Members of Municipal Councils.

**Analysis:**

At the beginning of each term, Members of the Board, in its capacity of Owner of the St. Thomas ASWSS Drinking Water System, are informed on the Duty of Care aspects that are associated with the oversight responsibilities of the Water Supply System.

Also, a half day training session and workshop was organized by area municipalities in Port Stanley on December 3.

The attached guide provides a basic understanding of the technical aspects and administrative practices for Owners and Operators of public water supplies.

The Guide was prepared in compliance with Justice O'Connors' recommendations that led the Province to enact the Safe Drinking Water Act. In recommendation #45 of Part II of the Walkerton Inquiry, the Justice stated the following:

"Given that the safety of drinking water is essential for public health, those who discharge the oversight responsibilities of the municipality should be held to a statutory standard of care." Such standard of care is similar to the standard of care for directors of corporations under a number of corporations' statutes.

The responsibilities of the Board of Management, in its capacity of Owner of the St. Thomas Area Secondary Water Supply System, essentially entail the operation, maintenance and management of the water supply system. Also, in this regard, the Board Members' responsibilities in their Duty of Care may be reviewed in greater detail in the Guide's key sections of the Act for Municipal Councillors/Board Members as outlined on pages 6 – 12 of the attached document, which also is available for review at the following web address: <https://dr6j45jk9xcmk.cloudfront.net/documents/4224/standard-of-care-guide-2014-online.pdf>.

Finally, it is important to note that Regulatory requirements under the Act, ensure that the municipal drinking water system meets all requirements of the Act. These involve the following:

1. Each Owner of a water system has been required to obtain a municipal drinking water license. There are also ongoing audits (internal and external) to verify compliance. Prerequisites are:
  - a. Preparation of an operational plan
  - b. Operation of the system by an accredited operating authority.
  - c. A Financial Plan that addresses all system costs and revenue needs to meet all expenses (including life-cycle/depreciation costs).
  - d. Establishment of Management Procedures to oversee the Operating Authority.
  
2. Each Operating Authority needs to be accredited through an audit process of its quality assurance program. This involves the creation and adoption of a Drinking Water Quality Management Standard (DWQMS), by each Operating Authority. Also this provides its customers and any Regulatory Agency proof that it adheres to the Standard at all times. Such quality assurance program is very similar to an ISO accreditation process, which is based on the following 4 principles.
  - establish what you do
  - do what you say
  - verify that you do what you say
  - continuous improvement of operation

The above, is continually being implemented and satisfies the Owner's and Operator's due diligence responsibilities and standard of care, required in the regulatory environment of drinking water supply.

Staff will be pleased to answer any questions on the attached Guide at the Board's meeting of March 26, 2015.

Respectfully Submitted,



John Dewancker, P. Eng,  
Director, Environmental Services & City Engineer

Reviewed By: \_\_\_\_\_  
Treasury                      Env. Services                      Planning                      City Clerk                      HR                      Other



## **St. Thomas Area Secondary Water Supply System**

### **Drinking Water Quality Management Policy**

**EFFECTIVE DATE: June 12, 2014**

**REVISION: REVISION #9**

**TO BE REVIEWED: Annually or when a change occurs**

The Joint Board of Management is the owner and provides governance for the St. Thomas Area Secondary Water Supply System.

St. Thomas Area Secondary Water Supply System is comprised of the Elgin Middlesex Pumping Station (EMPS) located in Central Elgin, chambers, water tower, associated distribution water mains, hydrants, services and other appurtenances.

The City of St. Thomas provides management oversight for the Drinking Water Quality Management System (DWQMS), approves and monitors policy for continual improvement and also provides the necessary resource support for the successful implementation and ongoing viability of the DWQMS at all of its facilities.

The City of St. Thomas currently utilizes the services of its own Operations Division of the Environmental Services Department as its operating authority to operate and maintain the transmission mains for the St. Thomas Area Secondary Water Supply System on behalf of the Joint Board of Management. American Water is the operating authority for the EMPS contracted by the City of St. Thomas. Under the DWQMS, the Operations Division of the Environmental Services Department is responsible for implementing and maintaining the DWQMS in partnership with the Joint Board of Management.

City of St. Thomas is committed to:

- Managing and operating the St. Thomas Area Secondary Water Supply System in a responsible manner in accordance with documented quality management policies and procedures.
- Providing the customer with clean, safe drinking water.
- Being a quality leader in the business sector in which we participate.
- Promoting owner and consumer confidence in the safety of the drinking water supply by ensuring that the drinking water meets all MOE regulations, verified by the water analysis and reporting the results to the Public via the City's website and public notices.
- At a minimum, meeting all relevant legislative and other requirements and requiring our suppliers and contractors to similarly meet these obligations.
- Promoting resource stewardship, including conservation.

The City of St. Thomas will periodically undertake appropriate reviews, evaluations and performance measurements of its operations to ensure compliance with the Drinking Water Quality Management Policy.

The City of St. Thomas will periodically undertake reviews of the Quality Management System and undertake a full review of the Quality Management System within a 12 month time frame.

The City of St. Thomas strives to accomplish our goals through the dedication, support and participation of all employees and continual improvement of our Drinking Water Quality Management System.

Signed John Dewancker

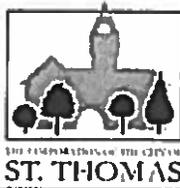
Owner Representative  
John Dewancker, P. Eng.  
Director, Environmental  
Services & City Engineer  
City of St. Thomas

Signed Michael Campbell

Operating Authority  
Michael Campbell, P. Eng.  
Manager of Operations &  
Compliance  
City of St. Thomas

Date June 12, 2014

Date 12 June 14



## ***St. Thomas Area Secondary Water Supply System***

### ***Drinking Water Quality Management Policy***

**EFFECTIVE DATE:** June 12, 2014

**REVISION:** REVISION #9

**TO BE REVIEWED:** Annually or when a change occurs

The Joint Board of Management is the owner and provides governance for the St. Thomas Area Secondary Water Supply System.

St. Thomas Area Secondary Water Supply System is comprised of the Elgin Middlesex Pumping Station (EMPS) located in Central Elgin, chambers, water tower, associated distribution water mains, hydrants, services and other appurtenances.

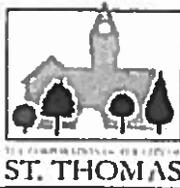
The City of St. Thomas provides management oversight for the Drinking Water Quality Management System (DWQMS), approves and monitors policy for continual improvement and also provides the necessary resource support for the successful implementation and ongoing viability of the DWQMS at all of its facilities.

The City of St. Thomas currently utilizes the services of its own Operations Division of the Environmental Services Department as its operating authority to operate and maintain the transmission mains for the St. Thomas Area Secondary Water Supply System on behalf of the Joint Board of Management. American Water is the operating authority for the EMPS contracted by the City of St. Thomas. Under the DWQMS, the Operations Division of the Environmental Services Department is responsible for implementing and maintaining the DWQMS in partnership with the Joint Board of Management.

City of St. Thomas is committed to:

- Managing and operating the St. Thomas Area Secondary Water Supply System in a responsible manner in accordance with documented quality management policies and procedures.
- Providing the customer with clean, safe drinking water.
- Being a quality leader in the business sector in which we participate.
- Promoting owner and consumer confidence in the safety of the drinking water supply by ensuring that the drinking water meets all MOE regulations, verified by the water analysis and reporting the results to the Public via the City's website and public notices.
- At a minimum, meeting all relevant legislative and other requirements and requiring our suppliers and contractors to similarly meet these obligations.
- Promoting resource stewardship, including conservation.

The City of St. Thomas will periodically undertake appropriate reviews, evaluations and performance measurements of its operations to ensure compliance with the Drinking Water Quality Management Policy.



**St. Thomas Area Secondary Water Supply System**

**Drinking Water Quality Management Policy**

**EFFECTIVE DATE: June 12, 2014**

**REVISION: REVISION #9**

**TO BE REVIEWED: Annually or when a change occurs**

The City of St. Thomas will periodically undertake reviews of the Quality Management System and undertake a full review of the Quality Management System within a 12 month time frame.

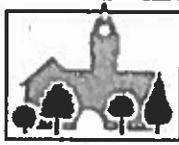
The City of St. Thomas strives to accomplish our goals through the dedication, support and participation of all employees and continual improvement of our Drinking Water Quality Management System.

Signed John Dewancker  
Owner Representative  
John Dewancker, P. Eng.  
Director, Environmental  
Services & City Engineer  
City of St. Thomas

Signed Michael Campbell  
Operating Authority  
Michael Campbell, P. Eng.  
Manager of Operations &  
Compliance  
City of St. Thomas

Date June 12, 2014

Date 12 June 14



THE CORPORATION OF THE CITY OF  
ST. THOMAS

## **St. Thomas Area Secondary Water Supply System**

### **Drinking Water Quality Management Policy**

**EFFECTIVE DATE:** June 12, 2014

**REVISION:** REVISION #9

**TO BE REVIEWED:** Annually or when a change occurs

#### **Table of Revisions**

<b>Date</b>	<b>Description of Revision</b>
April 1, 2009	Initial Issue of Document
June 15, 2009	Edward Soldo replaced Ivar Andersen as Manager of Operations and Compliance
June 15, 2010	Added City of St. Thomas to signee
October 14, 2010	Added that the City of St. Thomas will periodically undertake reviews of the Quality Management System and undertake a full review of the Quality Management System once per year
July 15, 2011	Changed the wording from encouraging suppliers and contractors to require suppliers and contractors to meet obligations and changed once a year to within a 12 month time frame
July 15, 2012	Completed annual review, no changes
January 28, 2013	Change in the Manager of Operations and Compliance position
June 14, 2013	Completed annual review of policy, no changes
June 12, 2014	Completed annual review of policy, no changes

# TAKING CARE OF YOUR DRINKING WATER

A GUIDE FOR MEMBERS OF MUNICIPAL COUNCILS



[www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)

## **Acknowledgements**

Ministry of the Environment and Climate Change would like to acknowledge the contributions of the following people and associations in the development of this guidance document, and thank them for sharing their time and expertise: former Councillor André Rivest, Councillor Brian Coleman, Craig Reid, former Mayor Delbert Shewfelt, Doug Parker, Councillor Jack Miller, former Councillor Ken Graham, former Mayor Michael Power, Councillor Paul Hubert, Councillor-at-Large Rebecca Johnson, Brian Jobb, Dr. Saad Jasim, Adam Sikora, Alexa Pagel, Ann Darby, Ann Marie Weselan, Barbara Stokes, Brenda Korbee, Brian Alton, Brian Gildner, Carol Salisbury, Cheryl Davis, Christine Campbell, Christine Mettler, Christopher Manning, Indra Prashad, Jakob Rehlinger, JillMarie Bourgeault, Krys Potapczyk, Laurence Borg, Matt Uza, Peter Feniak, Rhobi Chacha, Siobhan Corr, Terry Bulman, Stephen Hetherington, Valerie Capalbo, the Association of Municipalities of Ontario, the Ontario Water Works Association and the Ontario Municipal Water Association.

- For answers to general questions, contact the Ministry of the Environment and Climate Change at 1-800-565-4923
- Legal Disclaimer – This guide should not be viewed as legal or other expert advice. For specific questions regarding the legal application of the Safe Drinking Water Act (SDWA) and its regulations, please consult a lawyer and/or review the text of the Act at [www.e-laws.gov.on.ca](http://www.e-laws.gov.on.ca)

## **Sources**

Much of the material in this guide has been adapted from the Ontario Municipal Water Association's 2004 handbook "Ontario Drinking Water Stewardship Responsibilities" with their permission. Information was also obtained from the following sources:

- American Water Works Association, 2009, Water Basics for Decision Makers
- Office of the Fire Marshal and Emergency Management, 2010, Emergency Management Doctrine for Ontario
- Environment Canada, 2011, 2011 Municipal Water Use Report: 2009 Statistics
- Ontario Ministry of the Attorney General, 2002, Part Two Report of the Walkerton Inquiry
- Ontario Ministry of the Environment, 2006, The Clean Water Act: Promoting Municipal Awareness and Understanding
- Ontario Ministry of the Environment, 2007, "Drinking Water 101" course materials
- Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems
- Ontario Ministry of the Environment, 2007, Toward Financially Sustainable Drinking-Water and Wastewater Systems
- Ontario Ministry of the Environment, 2009, Annual Report 2007-2008 Chief Drinking Water Inspector
- Pollution Probe, 2006, The Source Water Protection Primer

# TABLE OF CONTENTS

## INTRODUCTION

A Message from the Chief Drinking Water Inspector of Ontario .....	4
A Message from Ontario's Chief Medical Officer of Health .....	4
What You Need to Know About Your Drinking Water Responsibilities .....	5

## UNDERSTANDING YOUR RESPONSIBILITIES FOR OVERSEEING DRINKING WATER

Protecting Ontario's Drinking Water .....	6
A Legislative and Regulatory Framework for Protecting Water .....	7
Key Sections of the SDWA for Municipal Councillors .....	8
What Should I be Asking? .....	13
Check Your Knowledge .....	14

## OVERVIEW OF DRINKING WATER MANAGEMENT TOPICS

Organizational and Governance Models .....	15
Municipal Licensing .....	16
The Operational Plan and You.....	16
Drinking Water System Reports and Inspections .....	18
Managing the Risks to Drinking Water .....	19
Infrastructure Planning .....	21
Sustainable Financial Planning for Drinking Water Systems .....	23
Communicating With Your Operating Authority .....	25
Emergency Planning for Drinking Water .....	25
Drinking Water System Operators .....	27
Water Conservation .....	29

## LEARN MORE ABOUT DRINKING WATER

Sources of Water.....	30
Drinking Water Treatment Processes .....	32
Water Distribution .....	34
For Further Information .....	35
Glossary.....	36

## A Message from the Chief Drinking Water Inspector of Ontario



Safeguarding drinking water, now and for our future generations, is a vitally important role. It requires leadership, vigilance and ongoing collaboration between the province and Ontario municipalities.

More than 80 per cent of Ontario's population receives their drinking water from

a municipal drinking water system. Drinking water quality and inspection results show that Ontario's municipalities are achieving strong and consistent performance levels. It is because of this dedication to excellence at the municipal level that Ontario's drinking water continues to be of the highest quality.

As good as current results are, constant attention is needed to keep our drinking water safe.

If you are a municipal councillor with decision-making responsibilities for a municipal drinking water system or have oversight of an accredited operating authority, you have a serious and unique role in protecting the people of your community. This guide will help you understand your responsibilities under the Safe Drinking Water Act, 2002 and provide you with information on how Ontario's drinking water is protected. It will help answer questions about your statutory standard of care responsibilities, and it provides some basic reference material on drinking water.

I look forward to continue working with municipalities to further improve how we protect and manage our water resources for the benefit of Ontarians.

*Susan Lo*  
Chief Drinking Water Inspector of Ontario

## A Message from Ontario's Chief Medical Officer of Health

Safe drinking water is one of the key pillars of public health in Ontario. Protection of our drinking water is a vital responsibility shared by many partners.

The Ministry of Health and Long-Term Care shares a strong commitment to excellence with the Ministry of the Environment and Climate Change by supporting Boards of Health and communities to provide safe drinking water in the province. Ontario's Boards of Health work together with municipalities in many ways to protect the public, including when your community's drinking water may not be safe for consumption.

As municipal councillors with oversight responsibilities for municipal drinking water systems, you are a critical partner in providing safe drinking water to the people of Ontario. I encourage you to use this resource guide, in your paramount role, to help protect Ontario's drinking water and keep your community healthy.

*Dr. David Mowat*  
Interim Chief Medical Officer of Health of Ontario



“Since Dr. John Snow's 1854 discovery in London, England, that drinking water could kill people by transmitting disease, the developed world has come a long way towards eliminating the transmission of water-borne disease. The Walkerton experience warns that we may have become victims of our own success, taking for granted our drinking water's safety. The keynote in the future should be vigilance. We should never be complacent about drinking water safety.”

— Justice Dennis O'Connor,  
2002, Report of the Walkerton Inquiry

# WHAT YOU NEED TO KNOW

*about your drinking water responsibilities*

Ontarians expect safe, high quality drinking water. It is a matter vital to public health. As a member of a municipal council, you have an important role to play to ensure that your community has access to safe, high quality drinking water — and you are legally obliged to do so.

## HERE ARE THREE THINGS TO REMEMBER AS A MUNICIPAL COUNCILLOR:

**It's Your Duty.** The Safe Drinking Water Act, 2002 includes a statutory standard of care for individuals who have decision-making authority over municipal drinking water systems or who oversee the operating authority of the system. This can extend to municipal councillors. There are legal consequences for not acting as required by the standard of care, including possible fines or imprisonment. (Read more on page 9 of this guide.)

**Be Informed.** Ask questions. Get answers. You don't have to be an expert in drinking water operations, but you do need to be informed about them. Your decisions can have an impact on public health. Seek advice from those with expertise and act prudently on that advice. (Check your knowledge on page 14.)

**Be Vigilant.** Complacency can pose one of the greatest risks to drinking water systems. It is critical that you never take drinking water safety for granted or assume all is well with the drinking water systems under your care and direction. The health of your community depends on your diligent and prudent oversight of its drinking water. (Read how the actions of one municipal council impacted their community on page 11.)



*“Water is unique as a local service. It is, of course, essential to human life and to the functioning of communities, (and) the consequences of a failure in the water system (are) most seriously felt by those who depend on it locally. Municipal ownership, and the ensuing responsibilities, should provide a high degree of public accountability in relation to the local water system.”*

— Justice Dennis O'Connor, 2002,  
Report of the Walkerton Inquiry

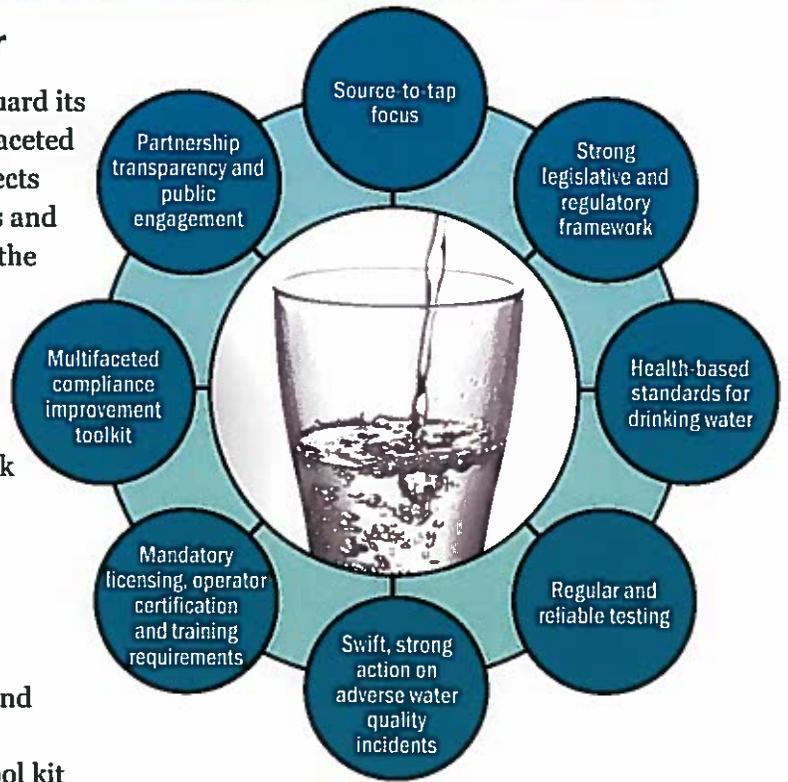
# UNDERSTANDING YOUR RESPONSIBILITIES FOR OVERSEEING DRINKING WATER

## Protecting Ontario's Drinking Water

Ontario has a comprehensive safety net to safeguard its drinking water from source to tap. It is a multi-faceted approach that helps prevent contamination, detects and solves water quality problems, enforces laws and regulations and increases people's awareness of the importance of safe, high quality drinking water.

Ontario's drinking water protection safety net has eight components:

- A source-to-tap focus
- A strong legislative and regulatory framework
- Regulated health-based standards for drinking water
- Regular and reliable testing
- Swift, strong action on adverse water quality incidents
- Mandatory licensing, operator certification and training requirements
- A multi-faceted, compliance improvement tool kit
- Partnership, transparency and public engagement



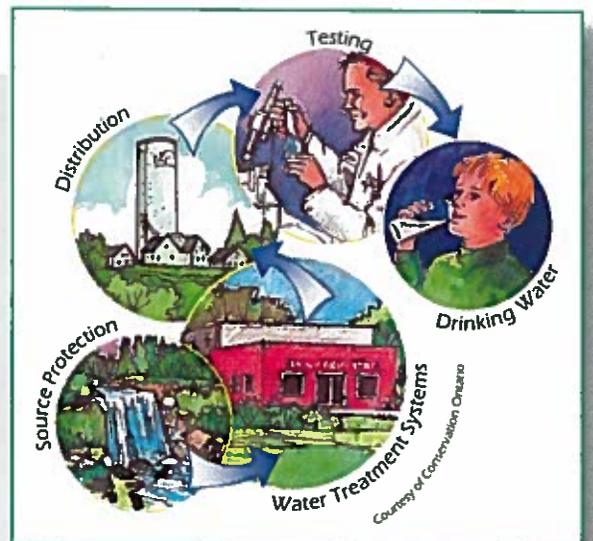
## What is our Multi-Faceted Approach?

Our multi-faceted approach is an integrated system of procedures, processes and tools that collectively prevent or reduce the contamination of drinking water from source to consumer in order to reduce risks to public health.

The multiple barriers include:

- **Source protection** to keep the raw water as clean as possible in order to lower the risk that hazards are present.
- **Treatment** to remove and/or neutralize hazards.
- Maintenance of the integrity of the **distribution system** to prevent recontamination after treatment.
- **Monitoring programs** to detect and act on system problems that could impair drinking water safety and to verify the performance of the system components and finished drinking water quality.
- Effective **management systems** including automatic control systems, well-developed responses and operating practices that are the ultimate means for protecting the safety of drinking water systems.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)



## A Legislative and Regulatory Framework for Protecting Water

Strong legislative and regulatory measures are key components of Ontario's drinking water safety net. This guide focuses on the Safe Drinking Water Act, 2002 (SDWA or the act), which provides a legislative framework for all municipal drinking water systems, as well as some non-municipal systems. The SDWA provides a consistent set of province-wide standards and rules to ensure access to safe, high quality, reliable drinking water.

### The Safe Drinking Water Act, 2002 – An Overview

The SDWA recognizes that the people of Ontario are entitled to expect their drinking water to be safe. It provides for the protection of human health and prevents drinking water health hazards through the control and regulation of drinking water systems and drinking water

#### Peer to Peer

*“As a Councillor, ensuring the best quality of drinking water for our community may be the most important thing we do.”*

— Councillor Jack Miller, City of Belleville

testing. In a municipal context, a drinking water system includes all collection, treatment and storage facilities and distribution pipes usually up to customer property lines but does not include plumbing.

The SDWA and its associated regulations specify the requirements for drinking water systems, testing services, certification of system operators and drinking water quality analysts. It also sets quality standards and mechanisms for compliance and enforcement.

### How the Pieces Fit Together

To learn more about how various acts and regulations create multiple safeguards to protect drinking water, download Conservation Ontario's brochure entitled "How Ontario's Drinking Water is Protected" from their website at: <http://goo.gl/wQtPW4>

### The Big Picture

There are approximately 660 municipal residential drinking water systems registered with the Ministry of the Environment and Climate Change (MOECC) that supply drinking water to more than 80 per cent of the homes in Ontario. In recent testing, approximately 530,000 drinking water test results were submitted to MOECC by laboratories licensed to perform these tests for municipal drinking water systems. Over 99 per cent of these drinking water tests met the province's rigorous, health-based drinking water quality standards.

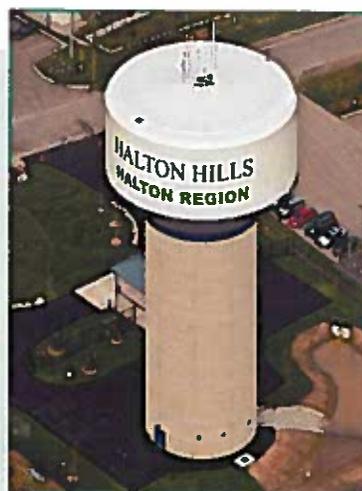


Photo courtesy of Halton Region

## Key Sections of the SDWA for Municipal Councillors



### Section 11: Duties of Owners and Operating Authorities

Section 11 of the SDWA describes the legal responsibilities of owners and operating authorities of regulated drinking water systems. It is important for you to understand the scope of your municipality or operating authority's day-to-day responsibilities.

Owners and operators are responsible for ensuring their drinking water systems:

- provide water that meets all prescribed drinking water quality standards
- operate in accordance with the act and its regulations, and are kept in a fit state of repair
- are appropriately staffed and supervised by qualified persons
- comply with all sampling, testing and monitoring requirements
- meet all reporting requirements

### Examples of actions required of owners and operators under Section 11:

- Sampling and testing of drinking water with a frequency appropriate to the type, size and users of the system in accordance with the act and corresponding regulations
- Using an accredited and licensed laboratory for drinking water testing services
- Reporting of adverse test results that exceed any of the standards in the Ontario Drinking Water Quality Standards Regulation, both verbally and in writing, to the local medical officer of health and MOECC
- Obtaining a drinking water licence for a municipal residential drinking water system from the MOECC, which includes a financial plan
- Ensuring the drinking water system is operated by an accredited operating authority
- Hiring certified operators or trained persons appropriate to the class of the system
- Preparing an annual report to inform the public on the state of the municipality's drinking water and the system providing it, and an annual summary report for the owners of the drinking water system

### *Who is the "owner" of a municipal drinking water system under the SDWA? Who is the "operator"?*

The "owner" of a municipal drinking water system is often the municipality as a corporate entity. Members of municipal councils and municipal officials who provide oversight to this corporate entity also provide oversight or exercise decision-making authority in respect of the drinking water systems it owns. They are responsible for having policies, management tools and processes in place so that the municipality meets all its legislative and regulatory requirements under the SDWA.

The "operator" or operating authority of a municipal drinking water system is the person or entity that is given responsibility by the owner for the day-to-day operations of the drinking water system, its management, maintenance or alteration. A municipality may take on this operational role through its own staff or it may choose to contract it out to a third party. (e.g. by hiring an accredited operating authority). The statutory standard of care continues to apply to municipalities that contract out this role to a third party.



## Section 19: Your Duty and Liability – Statutory Standard of Care

*“Given that the safety of drinking water is essential for public health, those who discharge the oversight responsibilities of the municipality should be held to a statutory standard of care.”* — Justice Dennis O’Connor, 2002, Report of the Walkerton Inquiry

This is one of the many important recommendations that came out of the Walkerton Inquiry reports in 2002. Section 19 of the SDWA responds directly to this recommendation.

Section 19 of the SDWA expressly extends legal responsibility to people with decision-making authority over municipal drinking water systems and those that oversee the accredited operating authority for the system. It requires that they exercise the level of care, diligence and skill with regard to a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation and that they exercise this due diligence honestly, competently and with integrity.

### Meeting your statutory standard of care responsibilities

Meeting the statutory standard of care is the responsibility of:

- the owner of the municipal drinking water system
- if the system is owned by a municipality, every person who oversees the accredited operating authority or exercises decision-making authority over the system – **potentially including but not limited to members of municipal councils**
- if the municipal drinking water system is owned by a corporation other than a municipality, every officer and director of the corporation

**It is important that members of municipal council and municipal officials with decision-making authority over the drinking water system and oversight responsibilities over the accredited operating authority understand that they are personally liable, even if the drinking water system is operated by a corporate entity other than the municipality.**

Section 14 (3) of the SDWA specifically notes that an owner is not relieved of their duty to comply with Section 19, even if there is an agreement to delegate the operations of the drinking water system to someone else.

The owner is still obligated to:

- ensure the operating authority is carrying out its responsibilities according to the act
- in cases where it is not, to take reasonable steps to ensure they do

### Examples of actions required of owners and operators under Section 14 (3):

- Being aware of the established procedure for communication with the operating authority, including how information is expected to be shared with municipal councillors, and assessing the effectiveness of this procedure
- Holding regular meetings with the operating authority, especially in cases where there may be reason to believe the operating authority is not carrying out its responsibilities

Since Ontario municipalities manage and govern municipal drinking water systems in a variety of ways, the people who are subject to the statutory standard of care within their corporation will also vary across the province, and would depend on specific facts related to individual situations.

### Peer to Peer

*“This guide makes it clear what our fiduciary and legal responsibilities are and provides the necessary questions to ask which allows us to become thoroughly knowledgeable on this aspect of our responsibilities. I encourage all elected and appointed officials to take the time to digest the information in this guide and put it to good use.”*

— Former Mayor Michael Power, Municipality of Greenstone and Past-President Association of Municipalities of Ontario

## Complete wording of Section 19, Safe Drinking Water Act, 2002

19. (1) Each of the persons listed in subsection (2) shall,  
 (a) exercise the level of care, diligence and skill in respect of a municipal drinking-water system that a reasonably prudent person would be expected to exercise in a similar situation; and  
 (b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. 2002, c. 32, s. 19 (1).

Same

(2) The following are the persons listed for the purposes of subsection (1):  
 1. The owner of the municipal drinking water system.  
 2. If the municipal drinking-water system is owned by a corporation other than a municipality, every officer and director of the corporation.  
 3. If the system is owned by a municipality, every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system. 2002, c. 32, s. 19 (2).

Offence

(3) Every person under a duty described in subsection (1) who fails to carry out that duty is guilty of an offence. 2002, c. 32, s. 19 (3).

Same

(4) A person may be convicted of an offence under this section in respect of a municipal drinking-water system whether or not the owner of the system is prosecuted or convicted. 2002, c. 32, s. 19 (4).

Reliance on experts

(5) A person shall not be considered to have failed to carry out a duty described in subsection (1) in any circumstance in which the person relies in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report. 2002, c. 32, s. 19 (5).

Note:

For a copy of the Safe Drinking Water Act, 2002 and its related regulations, go to the Ontario e-laws website at [www.e-laws.gov.on.ca](http://www.e-laws.gov.on.ca).



### Maintaining an Appropriate Level of Care

Standard of care is a well-known concept within Ontario legislation.

For example, the Business Corporations Act requires that every director and officer of a corporation act honestly and in good faith with a view to the best interests of the corporation and exercise the care, diligence and skill that a reasonably prudent person would in comparable circumstances.

Statutory standards of care address the need to provide diligent oversight. What is considered to be an appropriate level of care will vary from one situation to another. As a municipal councillor, it

is important to educate yourself on this statutory requirement and to gain an understanding of the operation of drinking water systems in your community to help you meet the standard of care requirements.

**You are not expected to be an expert in the areas of drinking water treatment and distribution.** Section 19 allows for a person to rely in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report.



## North Battleford: Council Decisions with Serious Consequences

In Spring 2001, nearly 6,000 residents of this Saskatchewan city of 13,000 fell victim to an outbreak of cryptosporidiosis, an illness caused by a parasite in human and animal waste, which entered the local drinking water supply. Symptoms included diarrhea, abdominal cramps, fever, nausea and headaches.

In an article on the subsequent Commission of Inquiry, the Canadian Environmental Law Association noted:

“... what became clear was that the people of North Battleford were let down. Their municipality, carrying a bulging contingency fund, refused to spend money on upgrading their decrepit water treatment plant. Their provincial government, although aware the plant was in poor condition, hadn't inspected it in the ten years prior to the outbreak... plant employees, who had been working without a supervisor for over four months, were unable to heed the warning signs of a potential drinking water problem.”

The City of North Battleford subsequently faced class-action lawsuits totaling millions of dollars. The first settlement was an out-of-court agreement awarding \$3.2 million to some 700 claimants.

(Source: [www.cela.ca](http://www.cela.ca) and [www.cbc.ca](http://www.cbc.ca))

### Enforcing the Statutory Standard of Care

As a municipal councillor, you need to be aware that not meeting your statutory standard of care responsibilities comes with serious consequences. Section 19 provides the province with an enforcement option when needed.

A provincial officer has the authority to lay a provincial offence charge against a person to whom the standard applies. The range of penalties includes maximum fines of up to \$4 million for a first offence and provision for imprisonment for up to five years. No minimum penalties are established. Actual penalties would be decided by the courts depending on the severity and consequences of the offence.

It is important to note the difference between the provision of the Municipal Act, 2001, that limits the personal liability of members of municipal councils and officials, and the

#### Peer to Peer

*“There is no greater responsibility imposed upon an elected municipal official than the diligent, conscientious oversight of a municipal water treatment or distribution system.”*

— Former Councillor Ken Graham, Town of Smiths Falls

standard of care imposed under the SDWA. Under sections 448-450 of the Municipal Act, 2001, municipal council members and officials have relief from personal civil liability when they have acted in good faith. However, despite that protection, municipal councillors and officials that are subject to the duty imposed by Section 19 of the SDWA could be penalized if a prosecution is commenced and a court determines they have failed to carry out the duty imposed under that section.

#### Peer to Peer

*“As mayor, it is vitally important that the standard of care is put in place and that municipal elected officials are aware of their responsibilities in ensuring that the public has safe and secure drinking water.”* — Former Mayor Delbert Shewfelt, Town of Goderich

## *Some Questions and Answers on the SDWA Statutory Standard of Care*



### **If drinking water operations are contracted out, am I still responsible for the statutory standard of care?**

If you oversee the accredited operating authority or exercise decision-making authority of the drinking water system, you remain responsible for meeting the standard of care even though your municipality has contracted out operations to an operating authority. (For more details see page 9 on Section 14 (3) of the SDWA.)

### **If something goes wrong, will I be held responsible?**

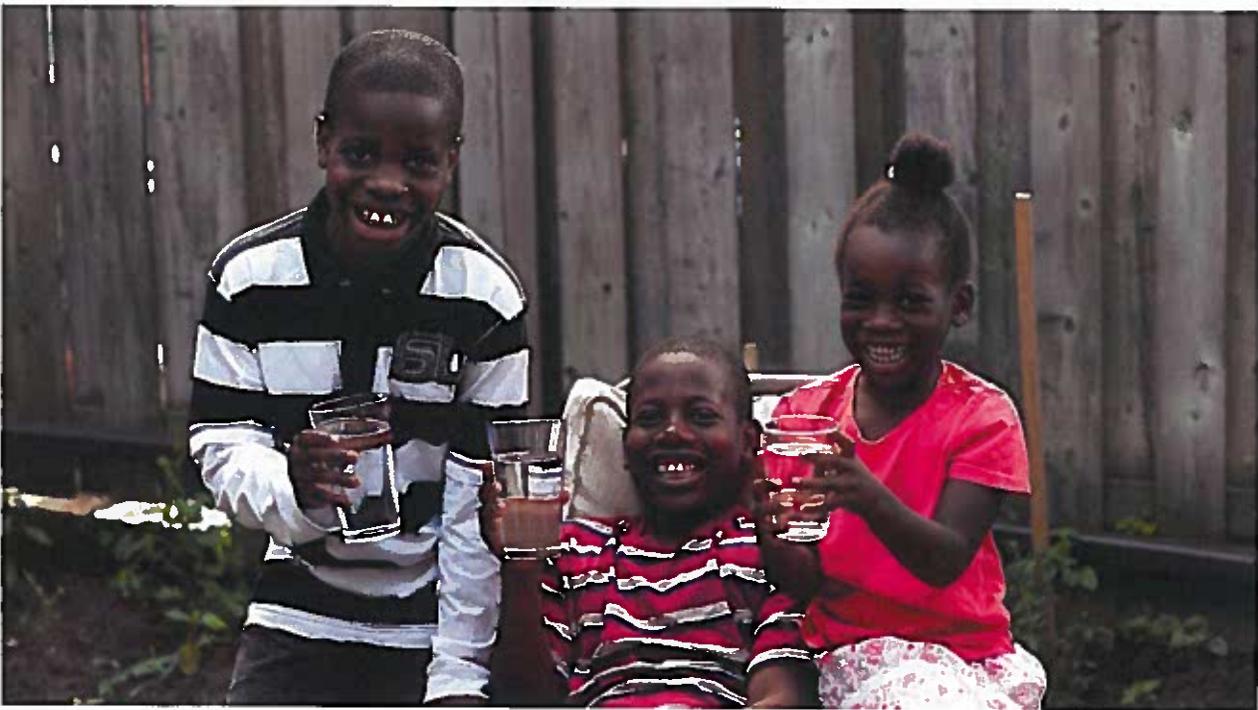
The standard of care related to drinking water is to ensure that decision-makers are doing their due diligence to protect public health when making decisions about drinking water systems and providing oversight of the accredited operating authority. The circumstances and your actions - what you did or didn't do, what questions you asked, what steps were taken to address identified risks or problems with your drinking water system - will all be important in determining whether you met your standard of care and if you should be held responsible.

### **What can happen to someone who breaches the standard of care?**

Justice O'Connor made it clear that the standard of care is all about ensuring responsible actions are taken to protect human health. Given the seriousness of this duty to your community, those whose actions fall below the standard of care, fail to protect the public and cause harm to human health could face significant penalties, including fines and imprisonment.

### **Who determines if the standard of care has been breached?**

When an incident occurs that may constitute a breach of the standard of care, the MOECC will initiate a response that may include an investigation and gathering of evidence to determine if charges should be laid. In a case where charges are laid, it is up to the courts to determine if an offence has been committed and if penalties or fines will be imposed. This procedure is followed in any potentially serious breach of MOECC statutes.



## ACTIONS YOU CAN TAKE

The following are some actions you can take to be better informed about your drinking water oversight responsibilities. Look for more of these suggested *Actions You Can Take* boxes throughout this guide.

- Consider taking the Standard of Care training offered by the Walkerton Clean Water Centre. Get course details and session offerings at [www.wcwc.ca](http://www.wcwc.ca) or by phoning toll free 1-866-515-0550.
- Learn about drinking water safety and its link to public health. Speak to water system and public health staff to learn more.
- Become familiar with your municipal drinking water system. Ask your water manager to give a presentation to council and/or arrange a tour of your drinking water facilities.
- Review the reports of the Walkerton Inquiry, specifically sections related to municipal government (Chapter 7 in Report I, Chapters 10 and 11 in Report II). The reports are available online at [www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/](http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/).
- Become further acquainted with drinking water legislation and regulations, available on the Ontario Government e-Laws website at [www.e-laws.gov.on.ca](http://www.e-laws.gov.on.ca). Search or browse current consolidated law to find what you are looking for. To search, enter the title, or any part of the title, of the law you wish to find (for example, "Safe Drinking Water Act", "Ontario Water Resources Act" or "Clean Water Act"). If you don't know any part of the title of the law, enter a word or phrase that you think might be in the text of the law.



## WHAT SHOULD I BE ASKING?

*When decisions come before your council relating to drinking water, you want to understand the impacts on your community and public health. While every situation will be different, the following are some preliminary questions you might want to ask:*

- What are the risks to public health?
- Are there any areas of risk that council needs to address?
- What checks and balances are in place to ensure the continued safety of our drinking water?
- Are we meeting our legislative and regulatory requirements?
- What is the public health impact or long-term cost of deferring this decision?
- Will this decision affect our drinking water sources or create new risks to drinking water sources?
- How will this decision impact our community's demand for water?
- How are we managing our drinking water infrastructure? Do we have an asset management plan for our water infrastructure?
- Are there any emerging issues related to our drinking water that council should be aware of?
- If there is a drinking water emergency, what is our emergency management plan? What is the role of council in a drinking water emergency?
- Have staff taken required training and upgrading?



## CHECK YOUR KNOWLEDGE

*Ask yourself these questions to check your current level of knowledge about your drinking water system and oversight responsibilities.*

- Have I had a tour of our drinking water facility?
- Am I familiar with our municipal drinking water systems including:
  - a. the water source?
  - b. the physical condition of major infrastructure?
  - c. the background and experience of senior staff?, and
  - d. the approvals that have been granted for ownership and operation of the facilities?
- Am I acquainted with the drinking water legislation and regulations?
- Do I know basic information about drinking water safety and the operation of water works facilities?
- Do I understand the requirements to meet minimum standards for drinking water?
- Do I know how to set the overall policy direction for the municipal drinking water system?
- Do I understand the different roles and responsibilities of those who have decision-making authority – municipal councillors, senior management, other municipal officials?
- Am I assured that competent senior management has been hired? Do they conduct regular performance appraisals of staff?
- Is there adequate staff in place to operate and maintain the system? How are new operators trained?
- Was our last inspection rating from the Ministry of the Environment and Climate Change 100 per cent? If no, why not?
- Am I aware of the risks currently facing our water sources, drinking water facilities and infrastructure? What are the plans to address these risks?
- If there is an emergency with the drinking water system, what procedures are followed? How will I be notified? How will the public be notified?
- Am I aware of my municipality's responsibilities in implementing our source protection plan?
- How and when do I ask for annual reports on the drinking water system from senior management?
- What should I look for in the annual report? What questions must it answer?
- What should I do if a report identifies declining water quality?
- Do I know that appropriate steps are being taken to resolve any issues? Do I know when outside expertise is needed?
- Are our drinking water systems periodically audited? How often? What should I do when I receive audit results for consideration?
- Do I know if our drinking water systems are financially sustainable for the future? Are there financial plans in place?
- Am I familiar with the requirements of keeping our municipal drinking water license valid, such as renewal timelines?

If there are any questions you can't answer, review them with municipal staff.

Training on the Safe Drinking Water Act: Standard of Care is available through the Walkerton Clean Water Centre. Visit the Centre's website at [www.wcwc.ca](http://www.wcwc.ca) to view its course catalogue.

# OVERVIEW OF DRINKING WATER MANAGEMENT TOPICS

## Organizational and Governance Models

Many different management and operating models are available for municipal consideration. Currently, most water services in Ontario are provided through municipal departments, with oversight provided directly by municipal councils.

Some municipalities hire external contractors to operate their drinking water system, whereas others own and operate their systems.

Regional municipalities have upper-tier and lower-tier governance structures, with the lower-tier municipality often owning and operating their own drinking water systems. There are also models for area water systems in Ontario in which systems cross municipal boundaries. These systems are governed by boards representing their municipal owners.

Municipalities may also create:

- Municipal Service Boards whose members are appointed by council and could include council members, private citizens or both
- Corporations for water utilities, similar to those for natural gas or electricity distribution

*“The purpose of the quality management approach in the context of drinking water is to protect public health by achieving consistent good practice in managing and operating a water system.”*

*“It is fundamental for municipalities to have a management and operating structure for their water system that enables them to provide safe water. I am making two important recommendations to assist in this regard. First, I recommend that municipalities be required to have an agency...to operate their systems. The agency should be accredited...The municipality must also submit an operational plan to the [Ministry of the Environment and Climate Change] for their water system(s). Second, I recommend that those responsible for exercising the municipality’s oversight responsibilities be held to a statutory standard duty of care. I note that, for municipalities, the first recommendation will be a significant step in satisfying the second.”*

— Justice Dennis O’Connor, 2002, Report of the Walkerton Inquiry

***My municipality is considering either a Municipal Service Board or a Municipal Services Corporation model to govern our drinking water functions. Would s. 19 of the SDWA still apply to these alternative ownership models?***

Yes. The standard of care provision in the Safe Drinking Water Act, 2002 would continue to apply in either the Municipal Service Board or the Municipal Services Corporation model since the standard applies to municipal drinking water systems owned by either a municipality or other corporation.



## Municipal Licensing: *Helping you protect your drinking water*

In Ontario, all municipal drinking water systems that provide water to residences in a community must have a licence from MOECC. The ministry's Municipal Drinking Water Licensing Program requires owners and operators of drinking water systems to incorporate the concepts of quality management into system operation and management.

As of September 2012, all municipal residential drinking water systems have received their

licenses as part of the Municipal Drinking Water Licensing Program.

For a drinking water system to receive or renew its licence, the owner and operator must have in place:

- a drinking water works permit
- an accepted operational plan (see next section for more details)
- an accredited operating authority
- a financial plan
- a permit to take water

### The Operational Plan and You – *Setting an Overall Policy*

The **operational plan** sets out a framework to develop a Quality Management System (QMS) that is specific and relevant to your drinking water system.

Part of your drinking water system's operational plan will document a QMS policy. This policy is the backbone of the quality management system. The policy must include commitments to:

- the maintenance and continual improvement of the QMS
- provide safe drinking water to the consumer
- comply with applicable legislation and regulations

Your operating authority must get the owner's written endorsement of the drinking water system's operational plan, including this policy. As a municipal councillor, your council may be asked to endorse the policy and its commitments. If your municipality has already completed this policy endorsement step, obtain a copy from your municipal staff.

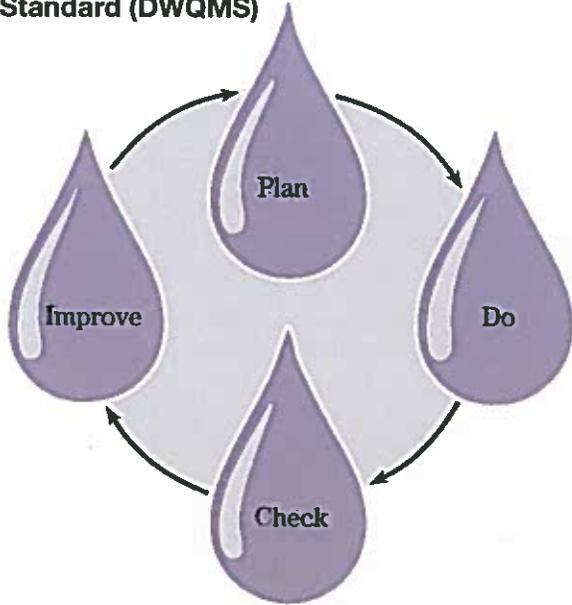
In addition to the QMS policy, the operational plan will also include:

- basic key information about every drinking water system your municipality owns
- a process for ongoing **risk assessment**
- a description of organizational structures (roles, responsibilities, authority)

- a procedure for an annual review of the adequacy of the **infrastructure** needed to operate and maintain the drinking water system, plus a commitment for the operating authority to **communicate review findings** to you
- a procedure for sharing sampling, testing and monitoring reports about the safety of your drinking water
- an outline of the system owner's responsibilities during **emergency situations**
- a commitment to **continual improvement** through **corrective action**
- a procedure for conducting a management review every 12 months which evaluates the suitability, adequacy and effectiveness of the QMS against the requirements of the Drinking Water Quality Management Standard (**DWQMS**) and how to report the results of this review, including identified deficiencies, and decision and action items

The DWQMS is the standard upon which drinking water system operational plans are developed and operating authorities are accredited. The requirements of the DWQMS, when implemented, will assist owners and operators of municipal drinking water systems to develop sound operational procedures and controls. Additional information on the **bolded** elements of the DWQMS listed above can be found further in this section of the guide.

**Drinking Water Quality Management Standard (DWQMS)**



The DWQMS is based on a PLAN, DO, CHECK and IMPROVE methodology which is similar to that found in some international standards. PLAN requirements of the standard typically specify policies and procedures that must be documented in the operational plans for the drinking water system, while DO requirements specify that the policies and procedures must be implemented. CHECK and IMPROVE requirements of the standard are reflected in the requirements to conduct internal audits and management reviews.

**Example of a QMS Policy**

**The following is an example of a QMS policy for the Westhill Water Supply and Distribution System:**

The Municipality of the Town of Westhill owns, maintains and operates the Westhill Water Supply and Distribution System.

The Town of Westhill is committed to:

1. ensuring a consistent supply of safe, high quality drinking water
2. maintaining and continuously improving its quality management system, and
3. meeting or surpassing applicable regulations and legislation

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

**DEFINITIONS**

**CONTINUAL IMPROVEMENT** is understanding what you already do well, and then finding ways to do it better.

**CORRECTIVE ACTION** is a method of improvement, and the solutions that are generated by those actions are also inputs to continual improvement.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

**ACTIONS YOU CAN TAKE**

- Ask your operating authority to speak to your municipal council about your operational plan.
- Consider and act on any advice (including deficiencies and action items) identified during the annual management review process.
- Review the QMS policy in your operational plan and its commitments.
- Ask your operating authority to show how it is meeting these commitments.

## Drinking Water System Reports and Inspections: *What they tell you about your drinking water system*

### Municipal Reports

An owner of a drinking water system is required to ensure that an annual summary report is presented to the members of council or local services board. Summary reports must be produced by March 31 of each year to cover the preceding calendar year.

The summary report must include:

- information about any requirements of the SDWA, the regulations, the system's approval, drinking water works permit, municipal drinking water licence and any order that the system failed to meet during the time period, plus the duration of the failure
- a description of the measures taken to correct each failure
- a comparison of the system's capability with the quantities and flow rates of the water supplied the preceding year to help assess existing and planned uses

Municipalities are also required to provide details about each residential drinking water system in an annual report to consumers. This annual report must be completed by February 28 each year and include:

- a brief description of the drinking water system including chemicals used
- a summary of the results of required testing, plus the approval, licence or provincial officer order issued to the system
- a summary of any adverse test results required to be reported to the Ministry of the Environment and Climate Change
- a description of any corrective actions taken
- a description of any major expenses incurred to install, repair or replace required equipment

### ACTIONS YOU CAN TAKE

- Obtain and thoroughly review copies of the most recent annual and summary reports.
- Ask for explanations of any information you don't understand.
- Consider, act on and correct any deficiencies noted in the reports.

### Ministry of the Environment and Climate Change Inspections

Every municipal residential drinking water system is inspected at least once a year by the Ministry of the Environment and Climate Change. An inspection includes the review of a system's source, treatment and distribution components, as well as water quality monitoring results and procedures to evaluate system management and operations.

MOECC prepares an inspection report that highlights any areas of non-compliance and what actions are required to correct them. The report also includes an inspection rating out of 100 per cent to help you compare your system's current and past performance, and identify areas for improvement. An inspection rating that is less than 100 per cent does not necessarily mean your municipality's drinking water is unsafe. It does mean that there may be opportunity for improvement in operational or administrative areas.





**What happens if the Ministry of the Environment and Climate Change identifies non-compliance issues as part of its annual inspection?**

Inspection ratings for municipalities in Ontario have been excellent and have remained consistent for many years. The ministry continues to work with owners and operators of systems with inspection ratings below 100 per cent to help them gain a better understanding of their obligations and responsibilities so they can improve the performance of their systems.

In a small number of cases each year, inspectors may issue a Provincial Officer's Order that requires the system owner or operator to take corrective action by a specific deadline or refer an incident to the ministry's Investigation and Enforcement Branch.

**ACTIONS YOU CAN TAKE**

- Review your annual inspection results and ask questions if there is any indication of declining quality.
- Clarify any technical terms.
- Ask how deficiencies are being addressed.
- Review your system's standing in the ratings reported in the Chief Drinking Water Inspector's Annual Report. If your rating is less than 100 per cent, ask why.
- Consider, act on and correct any deficiencies highlighted in the inspection.

**DEFINITIONS**

A **RISK ASSESSMENT** is an orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluating their significance.

**RISK** is the probability of identified hazards causing harm, including the magnitude of that harm or the consequences.

A **HAZARD** is a source of danger or a property that may cause drinking water to be unsafe for human consumption.

(Source: Ontario Ministry of the Environment, 2007, *Implementing Quality Management: A Guide for Ontario's Drinking Water Systems*)

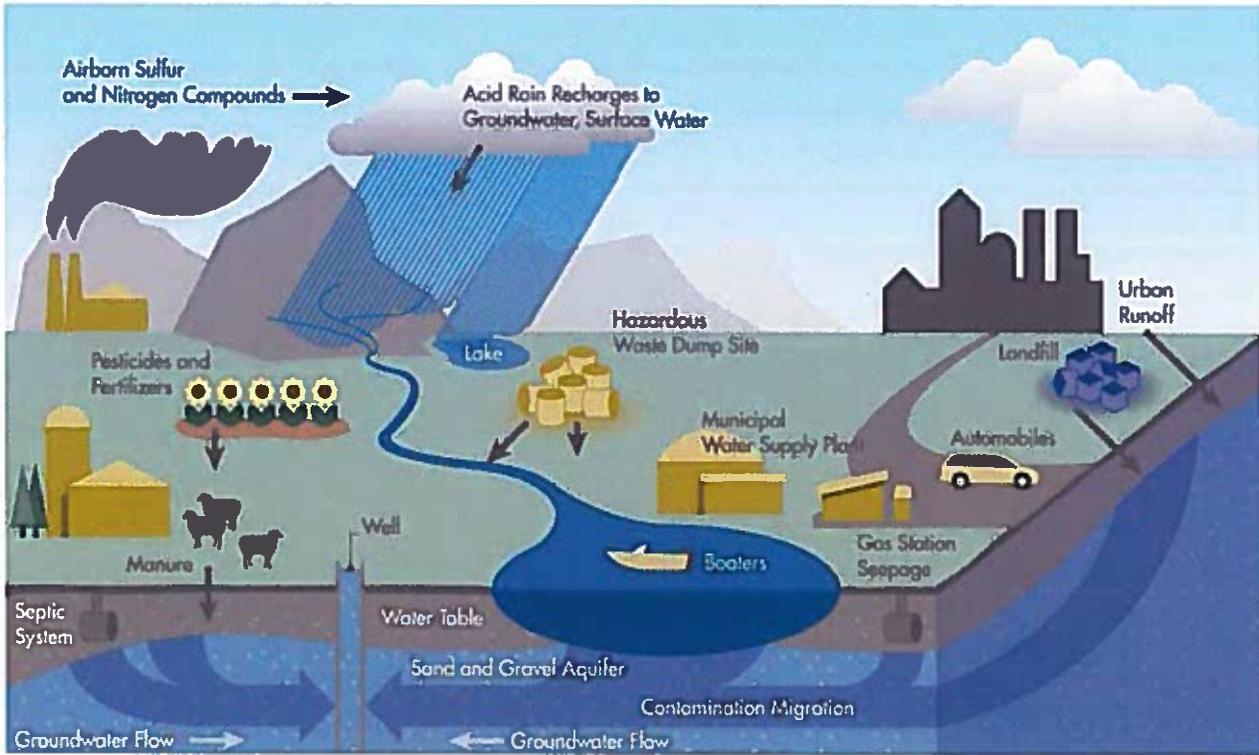
**Managing the Risks to Drinking Water**

Conducting a risk assessment is a key component of your drinking water system's operational plan. By performing a risk assessment, your operating authority will assess:

- existing or potential hazardous events facing your drinking water system, e.g. rail car derailment, algal blooms, water main breaks, etc.
- the impacts on drinking water if a hazardous event occurs, e.g. biological/chemical contamination of source water, possible biological/chemical contamination due to loss of supply/low pressure, etc.
- the necessary measures or response measures for each hazardous event (these measures may already be in place through such barriers as source protection or treatment processes)
- ranking of each event according to its likelihood of occurring and the consequences or severity of the results

In addition to the risks assessed by your operating authority, your local source protection authorities have performed detailed, science-based risk assessments of municipal drinking water sources within source protection areas. Learn more about the source protection program on **page 31**.

Human Activities Affecting Source Water



(Source: Pollution Probe, 2006, The Source Water Protection Primer)

In some cases, the operating authority may identify measures to address hazardous events which will call for improvements that require long-term planning. These types of decisions will often involve council approval. As a councillor, you should take time to understand the underlying risks associated with these decisions, their potential likelihood and impacts to public health.

In other cases, the operating authority may identify risks that are outside of their control. For these, it may be appropriate to develop contingency or emergency response procedures (see Emergency Planning for Drinking Water for more details on page 25).

Peer to Peer

*“Adequate municipal funding is a key component of risk management.”*

– Former Councillor Ken Graham, Town of Smiths Falls

Peer to Peer

*“Never take the quality of our drinking water for granted. There are too many factors that can turn good water into bad.”*

– Councillor Jack Miller, City of Belleville



## More on Hazardous Events and Hazards to Drinking Water

Hazardous events can be natural or technological in origin, or result from human activities. Natural events include floods, ice storms, drought and spring run-off. Technological events could include equipment failure or a power outage. Human activities that could lead to a drinking water risk include vandalism, terrorism, chemical spills and construction accidents.

The four different types of hazards that may affect drinking water are biological, chemical, physical and radiological:

### Biological Hazards:

- include bacterial, viral and parasitic organisms, such as E.coli, Giardia and Cryptosporidium
- are considered the most significant drinking water health risk because effects are acute; can cause illness within hours
- are commonly associated with fecal wastes from humans or animals, or occur naturally in the environment

### Chemical Hazards:

- include toxic spills, heavy metals, dissolved gases like radon, pesticides, nitrates, sodium, and lead
- can come from source water or occur in the treatment and distribution system

### Physical Hazards:

- include suspended particles and sediments that can carry microbiological hazards and interfere with disinfection process
- can result from contamination and/or poor procedures at different points in the delivery of water to the consumer

### Radiological Hazards:

- can be naturally occurring chemicals such as radon or uranium; most frequently occur in groundwater in low quantities
- may arise from man-made or natural sources

## Infrastructure Planning

Having a sustainable drinking water infrastructure is necessary to meet the demand for safe drinking water. Machinery, equipment and structures used to produce and provide safe drinking water must be in place, maintained and improved when necessary.

Your operating authority is required to:

- document a procedure for conducting an annual review of your drinking water system's infrastructure
- provide a summary of the programs in place to maintain, rehabilitate and review that infrastructure
- report their findings after the review to the owner
- monitor the effectiveness of its maintenance program

Depending on the structure of — and relationship between — the owner and operating authority, the results of the annual review can be communicated through such means as council, budget, planning or other management meetings.



Maintenance activities can be either planned or unplanned:

- Planned maintenance includes scheduled or proactive activities needed to maintain or improve infrastructure elements, e.g. equipment maintenance, main replacements, etc. They are done to reduce the risk of an unplanned failure.
- Unplanned maintenance includes reactive activities, e.g. to deal with main breaks, pump failures, etc. They can draw heavily on resources and adversely affect drinking water quality.

By establishing planned programs for maintenance, rehabilitation and renewal, the operating authority can save time and costs and increase public confidence in drinking water.

Some drinking water systems have five or 10-year rolling plans to address such considerations as main rehabilitation, upgrades and replacement, water treatment and storage due to increased projected demands. These

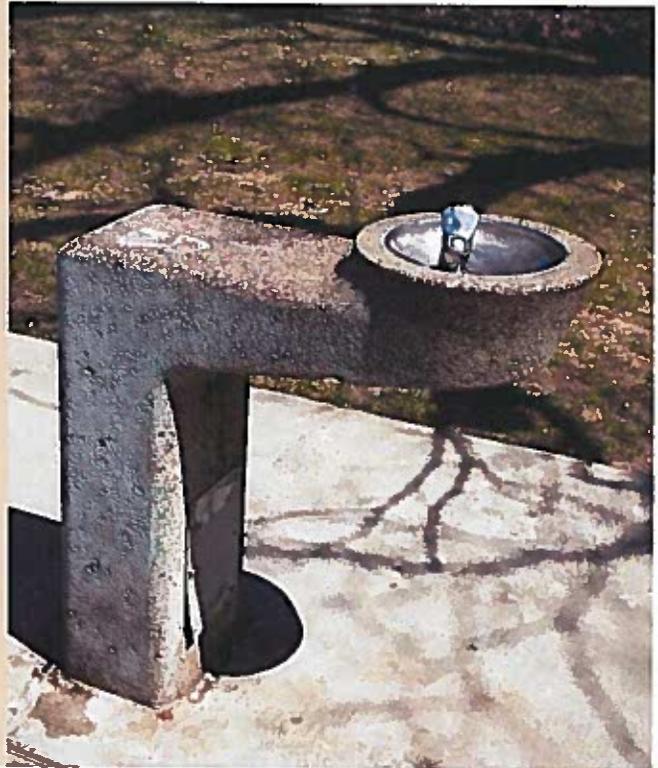
## DEFINITIONS

**INFRASTRUCTURE** – the set of interconnected structural elements that provide the framework for supporting the operation of the drinking water system, including buildings, workspaces, process equipment, hardware and software, and supporting services such as transport or communications.

**REHABILITATION** – the process of repairing or refurbishing an infrastructure element.

**RENEWAL** – the process of replacing the infrastructure element with new elements.

(Source: Ontario Ministry of the Environment, 2007, *Implementing Quality Management: A Guide for Ontario's Drinking Water Systems*)



## Peer to Peer

*“Aging infrastructure is the major challenge facing municipalities today, and a solid long-term plan to address this is a must.”*

– Councillor Paul Hubert, City of London

## ACTIONS YOU CAN TAKE

- Find out what maintenance, rehabilitation and renewal plans are in place for your drinking water system.
- Ask your operating authority to present the findings of its annual infrastructure review.

types of system maintenance requirements are usually tied to the capital budgets of the operating authority and/or the owner of the drinking water system.

## Sustainable Financial Planning for Drinking Water Systems

Achieving financial sustainability in Ontario's municipal water and wastewater is a long-term goal. Financial sustainability is needed to ensure that Ontarians continue to enjoy clean and safe drinking water, water and wastewater services are reliable and environmental protection is maintained.

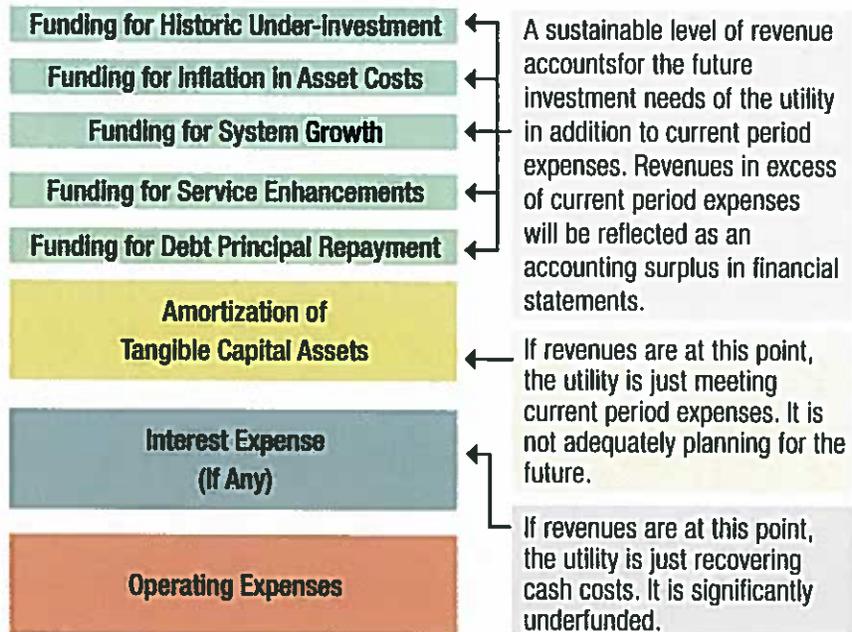
To receive or renew a municipal drinking water licence for your drinking water system, your municipality needs to prepare a financial plan.

You have an important role to play in ensuring that appropriate resources are made available to ensure that a financial plan can be prepared. Municipal councils have ultimate responsibility for approving financial plans that are prepared for a water utility.

The following are some key principles for developing a financial plan:

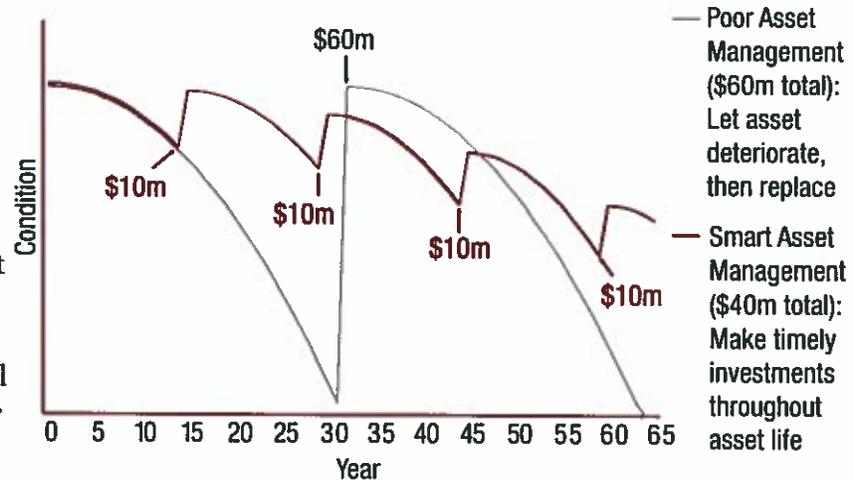
- Ongoing public engagement and transparency can build support for – and confidence in – the financial plan and the drinking water system.
- An integrated approach to planning among water, wastewater and storm water systems is desirable given the inherent relationship among these services.
- Revenues collected to provide water and wastewater services should ultimately be used to meet the needs of those services.
- Life-cycle planning with mid-course corrections is preferable to planning over the short-term or not planning at all.

### A Building-block Approach to Determining Utility Needs



(Source: Ontario Ministry of the Environment, 2007, Toward Financially Sustainable Drinking Water and Wastewater Systems)

### Timely Renewal Investments Save Money



(Source: Adapted from Ontario Ministry of Infrastructure, 2012, Building Together: Guide for Municipal Asset Management Planning)

- An asset management plan is a key input to the development of a financial plan.
- Financial plans benefit from the close collaboration of various groups including engineers, accountants, auditors, utility staff and municipal council.

*“Municipalities need to ensure that their water systems are adequately financed. Over the long term, safety depends on stable and adequate financing to maintain the water system’s infrastructure and its operational capacity to supply high-quality water consistently.”* – Justice Dennis O’Connor, 2002, Report of the Walkerton Inquiry



## Water Audits and Accounting for Water Losses

An important tool in understanding the condition of your drinking water system assets is a water audit. This is the process of estimating where all of the water entering the distribution system ends up. One of the things a water audit will reveal is how much water is being lost to leaks from water mains and service connections. Leaks are a concern as they can:

- signal deteriorating water main conditions and be a precursor to more breakages
- be a source of bacterial contamination
- result in additional costs for pumping and treating water that is not ultimately delivered to consumers
- damage other infrastructure such as roads and sewers

(Source: Ontario Ministry of the Environment, 2007, Towards Financially Sustainable Drinking Water and Wastewater Systems)

Financial plans for drinking water systems are required to forecast costs over a minimum period of six years, although municipalities are encouraged to adopt a life-cycle approach to managing their drinking water assets as a long-term goal. Financial plans are living documents and should be updated and reviewed as new information becomes available. As a best practice, they should be updated annually to foster continuous improvement and rolled into the annual municipal budget process.

There are many different costs, both capital and operating, associated with planning, building

and operating water systems. Some costs reflect outputs not attributable to the provision of water such as fire protection services, or the operation of storm and sanitary sewer systems.

A sustainable system is one that can adequately cover current operating costs, maintain and repair its existing asset base, replace assets when appropriate, fund future growth and enhancements to services, and account for inflation and changes in technology.

## The Big Picture

According to Environment Canada, 10.6 per cent of water produced at municipal water treatment facilities in Ontario is lost, mainly due to leaks in the distribution system infrastructure. Other sources estimate this figure is as high as 30 to 40 per cent.

(Sources: Environment Canada, 2011, 2011 Municipal Water Use Report: 2009 Statistics)

## Communicating With Your Operating Authority

Within the operational plan, your operating authority is required to have a procedure for communicating with the owner of the drinking water system, its personnel, suppliers and the public. You should be familiar with how communication about drinking water takes place. The procedure for communicating with the owner may be as simple as indicating the status of the implementation of the QMS and its effectiveness during scheduled meetings, such as council meetings. Communication with the public may include posting information on a publicly accessible website or through billing inserts.

As noted previously, your council may be asked to provide a written endorsement of the system's operational plan. Depending on the nature of your system's management structure, the operating authority may also involve the owner in other areas of the QMS such as risk assessment, management review or infrastructure.

### ACTIONS YOU CAN TAKE

- Determine when and how your operating authority will communicate to you as an owner.
- Find out what information is made available to the public and how.

## Emergency Planning for Drinking Water

Under the Emergency Management and Civil Protection Act, your municipality will already have an Emergency Response Plan for a wide range of potential scenarios. Some of these scenarios may involve drinking water and may link to planning done as part of the QMS to document procedures to maintain a state of emergency preparedness.

Emergency preparedness means identifying what could happen in your system to cause an emergency and having processes and procedures in place to prepare for and respond to those emergencies. Some elements of an emergency response plan include communications, training, testing, responsibilities and contact information.

### DEFINITIONS

A **DRINKING WATER EMERGENCY** is a potential situation or service interruption that may result in the loss of the ability to maintain a safe supply of drinking water to consumers.

(Source: Ontario Ministry of the Environment, 2007, *Implementing Quality Management: A Guide for Ontario's Drinking Water Systems*)



### Utilities Helping Utilities

A number of Ontario municipalities and utility sector associations joined together to establish the Ontario Water/Wastewater Agency Response Network, or OnWARN.

A province-wide network of "utilities helping utilities," OnWARN supports and promotes province-wide emergency preparedness, disaster response, and mutual aid and assistance for public and private water and wastewater utilities.

Learn how your municipality can become part of this growing network at [www.onwarn.org](http://www.onwarn.org)

In a drinking water context, emergencies can happen as the result of a variety of natural and human-caused events such as severe weather, major power outages, spills, pandemics and deliberate acts of vandalism or terrorism. Potential emergencies can be identified through risk assessments, MOECC inspections, corporate audits, insurance company reviews, and records of past emergencies.

An element of the QMS emergency procedures is to clearly document the roles and responsibilities of the owner and operating authority during each emergency. For example, in an emergency, your Clerk-Treasurer may be assigned the responsibility of seeking resource authorization from council and act as chief liaison with council and the mayor.

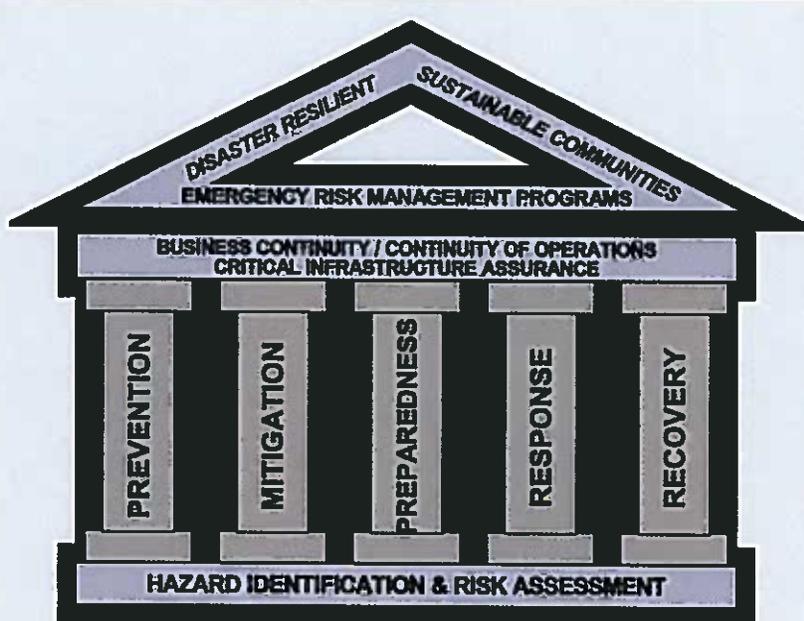
The QMS also requires that clear direction for communicating to the owner and others during an emergency be established. Planning beforehand how those in charge will talk to each other and the media can avoid complications during an emergency.

Preparing also means training and testing. The best emergency response procedures are ineffective if personnel are not properly trained on what to do and the procedures not tested. All personnel working within the drinking water system need to know what to do in an emergency, especially those with special response roles. Common forms of testing and training include orientation and education sessions, table-top exercises, walk-through drills, functional drills or full-scale exercises.

**Five pillars of emergency management**

Emergency management includes organized and comprehensive programs and activities taken to deal with actual or potential emergencies or disasters. It is based on a risk management approach and includes activities in five components: prevention, mitigation, preparedness, response, and recovery. These components are illustrated in the following figure:

(Source: Office of the Fire Marshall and Emergency Management, 2010, Emergency Management Doctrine for Ontario)



**ACTIONS YOU CAN TAKE**

- Ask your operating authority to review the drinking water emergency plan with council and to explain what responsibilities have been assigned to the owner.
- Know who will be the spokesperson during a drinking water emergency.
- Ensure critical staff have taken necessary training on emergency procedures and have participated in testing.

## Adverse Drinking Water Incident, Boil Water Advisory and Drinking Water Advisory - *How are they different?*

An adverse water quality incident (AWQI) indicates that a drinking water standard has been exceeded or a problem has arisen within a drinking water system. AWQIs are an important component of the drinking water safety net. The report of an AWQI does not in itself indicate that drinking water is unsafe or that the statutory standard of care has not been met, but rather that an incident has occurred and corrective actions must be taken to protect the public. In some cases, these corrective actions may include a boil water advisory (BWA) or a drinking water advisory (DWA).

The local Medical Officer of Health in each of Ontario's 36 public health units is responsible for issuing BWAs and DWAs when necessary.

A BWA is issued when a condition exists with a drinking water supply that may result in a health risk and the condition can be corrected

by boiling the water or by disinfection. An example is the presence of bacteria in the water supply such as *E. coli*.

A DWA is issued when a condition exists with a drinking water supply that cannot be corrected by boiling the water or by disinfection. An example is the presence of chemical contaminants.

In both cases, the local Medical Officer of Health will direct the system owner to inform users of the advisory, through means such as door-to-door notification, public posting of notices and local media outlets, to boil water and/or use an alternate water supply until further notice. An advisory will be lifted only after the local Medical Officer of Health is satisfied that corrective actions were taken and the situation is remedied.

## Drinking Water System Operators: *What do they do? What certification requirements must they meet? Why do you need to plan?*

Ontario has established requirements for the training and certification of drinking water (and wastewater) system operators. Municipal residential drinking water systems are required to use certified operators to perform all operational work.

Drinking water system operators play a vital operational role in providing safe drinking water to your community. The responsibilities of an operator may include:

- Checking, adjusting and operating equipment such as pumps, meters, filters, analyzers, and electrical systems, and having replacement parts on-site for critical repairs
- Determining chemical dosages and keeping chemical feed equipment appropriately filled with chemicals, adjusted and operating properly
- Maintaining operating records and submitting operating reports to the system's operating authority/owner and the province
- Ordering and maintaining a stock of parts, chemicals and supplies
- Collecting and submitting water samples as required by regulation (This usually involves taking samples from a number of key locations and transporting them to a licensed and accredited laboratory.)
- Explaining and recommending to the operating authority/owner any major repairs, replacements or improvements that should be made to the plant and/or distribution system

## Types of Drinking Water System Operators

**Overall Responsible Operator (ORO)** - designated by the owner or operating authority, the ORO has overall operational responsibility for the system and must have an operator's certificate that is the same classification as (or higher than) the system.

**Operator-in-Charge (OIC)** - designated by the owner or operating authority, the OIC can direct other operators, set operational parameters in the system and has the authority to make operational decisions.

**Operators** - a person who conducts operational checks; who adjusts, tests, evaluates a process or directs the flow, pressure or quality of the water within the system. Operators must hold a valid operator's certificate. Non-certified persons may work under the direct onsite supervision of a certified operator, who physically oversees all operational work.

**Operator-in-Training (OIT)** - new operators who can operate a drinking water system. They cannot be designated as an ORO or OIC.

**Water Quality Analyst** - a person who is trained and certified to take operational tests, such as chlorine residual or turbidity tests, within a drinking water system.

Drinking water operators in Ontario must be certified and trained according to the type and complexity (class) of the drinking water system they operate. Operators are required to go through rigorous training, write examinations, and meet mandatory continuing education requirements to renew and maintain their certification. A certificate is valid for three years. To renew their certificate, operators must complete 20 to 50 hours of mandatory training per year on subjects related to the duties of a water system operator. Continuing education helps operators steadily improve their knowledge and skills throughout their

### Peer to Peer

*“Competent, certified operators are a key element to due diligence. Municipalities have an obligation to facilitate ongoing training for water treatment operators.”*

– Former Councillor Ken Graham, Town of Smiths Falls

careers. Owners and operating authorities are responsible for ensuring drinking water systems are appropriately staffed and supervised by qualified persons.

### ACTIONS YOU CAN TAKE

- Ensure there are sufficient resources for required levels of training for municipal staff involved in operating a drinking water system.
- Confirm that an overall responsible operator (ORO) has been designated and that procedures are in place to ensure all required staff and contractors are certified.
- Check to see if drinking water operator succession planning is being done and that measures are taken to address any current or anticipated challenges to recruiting skilled employees.
- Ensure your municipality or operating authority has contingency plans in place for situations where your certified operators may not be available (e.g. labour disputes, illnesses, vacancies, etc.) and, if activated, confirm that these contingency plans have been, where required, approved by the Ministry of the Environment and Climate Change and are working.

## Water Conservation

Creating and implementing water conservation measures help to reduce water and energy consumption, lower long-term infrastructure costs, increase water sustainability and protect the environment.

It is estimated that every additional litre of water capacity costs roughly four dollars for expanded water and wastewater infrastructure. Many municipalities in Ontario are realizing significant savings from water conservation measures.

The cost of energy to pump, distribute and treat water and wastewater is a significant expense for most Ontario municipalities. Saving water

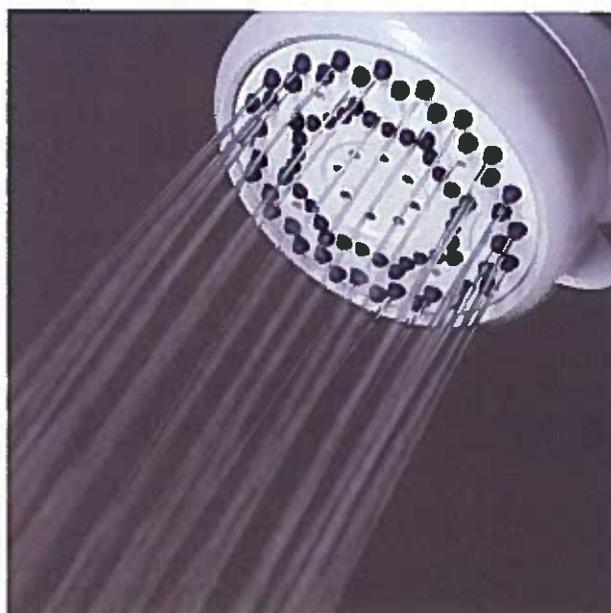
saves money, energy and reduces greenhouse gas emissions. Better water management has the potential to be one of the most cost-effective energy reduction strategies for Ontario's municipalities.

(Source: Ontario Ministry of the Environment and the Ontario Ministry of Natural Resources, 2009, Safeguarding and Sustaining Ontario's Water Resources for Future Generations)

### Peer to Peer

*"Water is our most valuable natural resource. How we as councillors protect that resource will become more and more important as we continue to require safe drinking water in the future."*

– Councillor-at-Large Rebecca Johnson,  
City of Thunder Bay



### Water Conservation Facts

- In Ontario, the average residential water use is about 225 litres of water per person per day, which is significantly more than countries with similar standards of living such as Germany, the United Kingdom and the Netherlands.
- Pumping and distributing water to homes and businesses, and treating water and wastewater makes up one-third to one-half of a municipal government's total electrical use, which is double that of other municipal costs such as street lighting.
- Canadian surveys have consistently shown that as the percentage of metered homes in a community increases, water use per capita decreases. In Canadian municipalities that use volume-based water charges (i.e. meters), the average daily consumption is 229 litres per person, while in municipalities that charge a flat or assessed rate, the corresponding figure is 65 per cent higher, or 376 litres per person.

(Source: Environment Canada, 2011, 2011 Municipal Water Use Report: 2009 Statistics)

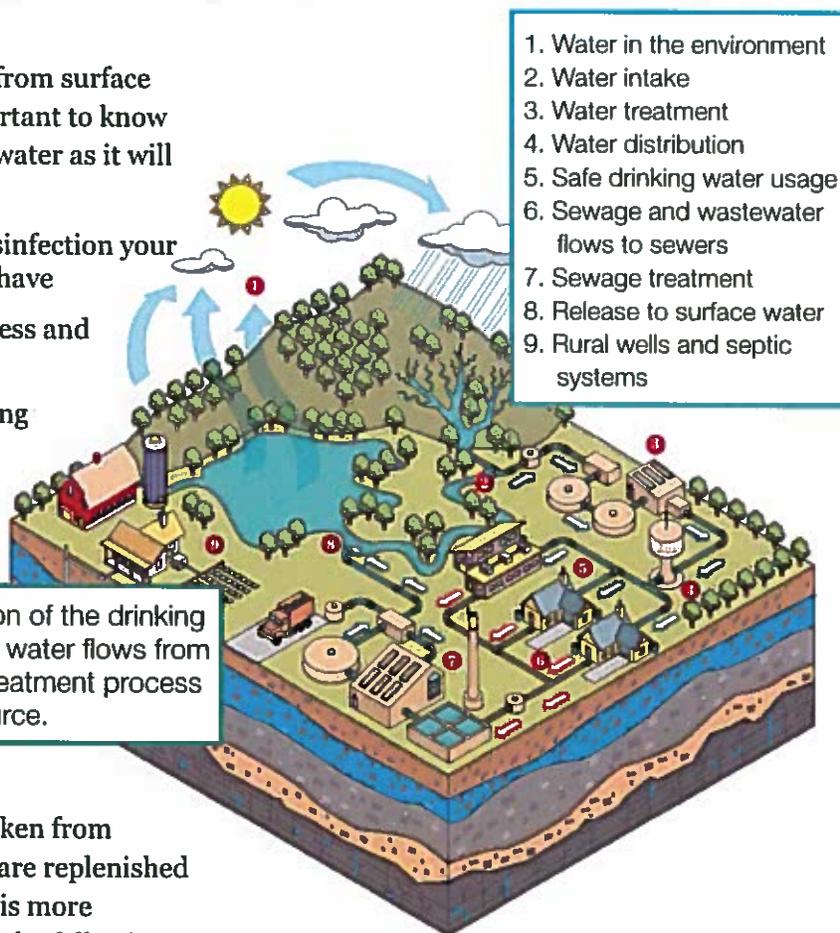
# LEARN MORE ABOUT DRINKING WATER

## Sources of Water

Ontario's drinking water comes from surface water or groundwater. It is important to know the source of your community's water as it will determine:

- the kind of treatment and disinfection your drinking water system must have
- the equipment needed to access and distribute your water
- the types of risks your drinking water may face, and
- planning for your water supplies for the future

**Right:** A graphical representation of the drinking water cycle demonstrating how water flows from the source through the water treatment process to your tap and back to the source.



1. Water in the environment
2. Water intake
3. Water treatment
4. Water distribution
5. Safe drinking water usage
6. Sewage and wastewater flows to sewers
7. Sewage treatment
8. Release to surface water
9. Rural wells and septic systems

## Surface water

Surface water for public use is taken from rivers, lakes or reservoirs which are replenished by rain and snow. Surface water is more susceptible to contamination for the following reasons:

- **Rivers** – may flow through farmland, industrial areas, sewage discharge zones and other areas which may cause harmful contamination and/or affect taste, odour, clarity and colour. River water quality will vary throughout the year.
- **Lakes and reservoirs** – usually have better water quality than rivers. Suspended contaminants will 'settle out' in lakes. However, lakes and reservoirs are subject to plant and algae growth, which can give lake water unpleasant taste or odour. Human activities (power boats, feed-lots, etc.) are also a threat. In addition, lakes are often fed by rivers which carry contaminants.

(Source: Ontario Ministry of the Environment, 2009, Annual Report 2007-2008 Chief Drinking Water Inspector)

## The Great Lakes and Drinking Water

Ontario borders on the Great Lakes, which store about 95 per cent of North America's supply of fresh water and about one-fifth of the world's supply of fresh surface water. Only one per cent of this water is renewed each year by rain and snowfall. More than 80 per cent of Ontarians get their drinking water from the Great Lakes.

## Groundwater

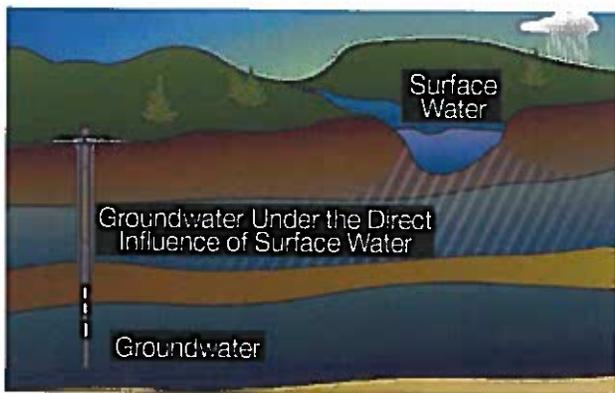
Groundwater (defined as 'water that occurs beneath the surface of the Earth') can be found in most parts of Ontario. It gathers in aquifers, the layers of sand, gravel and rock through which water seeps from the surface.

Sand and gravel aquifers are usually the most suitable for public water systems because water is more plentiful. Among rock aquifers, sandstone is often porous and can be a good source of groundwater. Limestone is not porous but may have cracks and cavities through which water can move and also provide a water supply.

## Groundwater Under Direct Influence - GUDI

In addition to groundwater and surface water, there is a third source of water known as GUDI which stands for Groundwater Under Direct Influence of Surface Water.

An aquifer supplied by GUDI is viewed in the same category as surface water and has the same treatment and disinfection requirements.



(Source: Ontario Ministry of the Environment, 2007, "Drinking Water 101" course materials)

## Source Protection in Ontario

Protecting our sources of drinking water is the purpose of the Clean Water Act, 2006 and the first component of Ontario's multi-faceted approach to providing safe, clean drinking water.

The source protection process in Ontario helps municipalities and others identify risks to sources of municipal drinking water so that better decisions can be made about addressing such risks through source protection plans. This science-based process has identified vulnerable areas to protect drinking water sources.

Municipalities have a significant role in implementing source protection plans: they are responsible for over half of the policies in the plans. Many of these policies are legally binding on municipalities. For example, municipalities may be required to appoint risk management officials and inspectors. These officials will negotiate risk management plans with landowners or businesses to address the risks their activities could pose to sources of municipal drinking water.

The Clean Water Act, 2006 also requires municipal official plans to conform with source protection policies to protect vulnerable areas. Municipalities may need to include policies in the official plan, as well as zoning by-laws to prevent future risks to these sources. Plans may require municipalities to take other specific actions to protect sources of drinking water.

To learn more about source protection planning for municipalities, please visit [www.conservation-ontario.on.ca/what-we-do/source-water-protection](http://www.conservation-ontario.on.ca/what-we-do/source-water-protection).

- Review the source protection plan for your area and find out what actions are being taken to protect vulnerable areas around your drinking water sources.
- Find out if your municipality has appointed risk management officials and inspectors to support source protection planning and whether you are sharing these duties with other municipalities or delegating to a local source protection authority.

### ACTIONS YOU CAN TAKE

## Drinking Water Treatment Processes

Treatment processes reduce or eliminate the potential for the presence of pathogens (organisms that can cause illness) in drinking water and are used to ensure your drinking water meets provincial standards. Different water sources necessitate different levels and methods of treatment to ensure safe, clean water is provided to consumers.

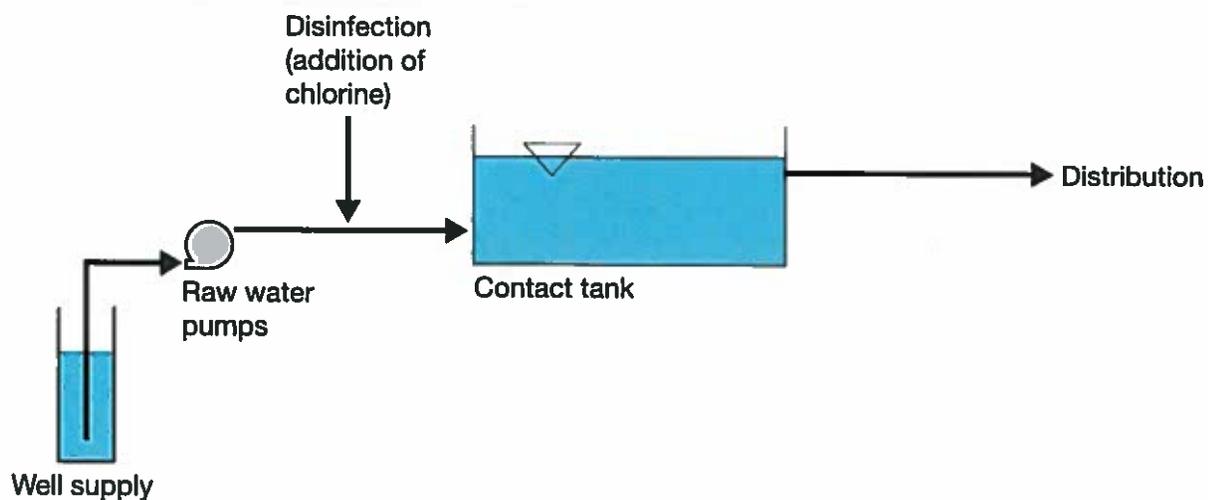
In Ontario, all municipal drinking water systems must have a disinfection process in place and all water must be disinfected before it is supplied to the public. The most widely used disinfectant is chlorine, which is a low-cost powerful disinfectant which continues

disinfecting as water passes through the distribution system.

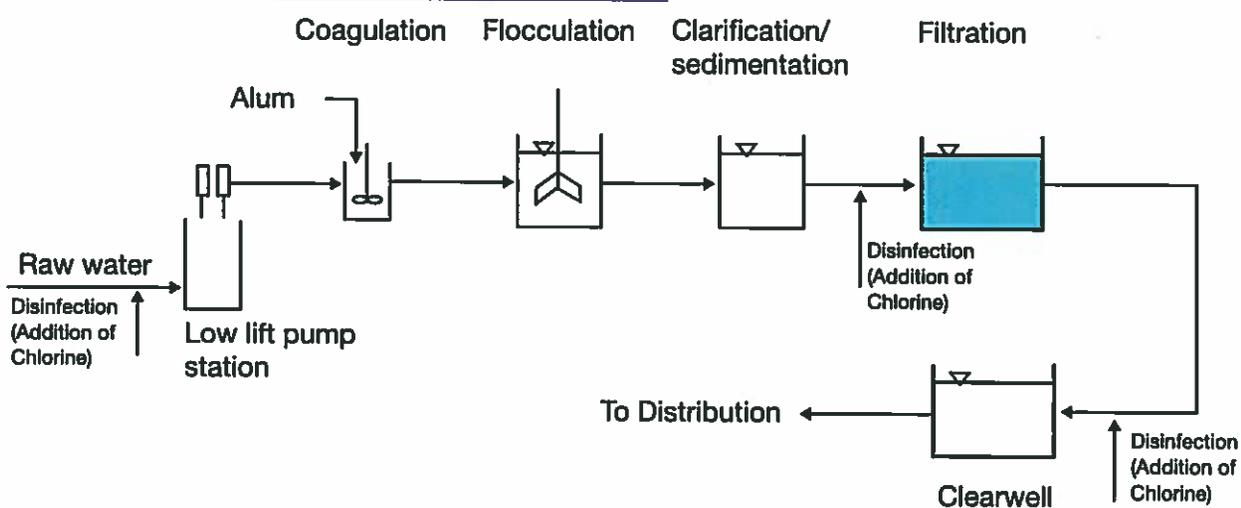
Drinking water systems using surface water or groundwater that is under the direct influence of surface water must also provide a filtration process ahead of the disinfection.

Some municipalities use certain treatment processes to address aesthetic problems with drinking water, such as taste and odour issues, that do not pose a risk to public health but which consumers find objectionable, or to address specific issues that are more local in nature, like zebra mussel control.

### Typical groundwater treatment process



### Typical surface water treatment process



<b>Coagulation</b>	Coagulation is a chemical process that causes smaller particles to bind together and form larger particles. The process is used to improve the removal of particles through sedimentation and filtration in the drinking-water treatment process.
<b>Flocculation</b>	Flocculation is the gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals to form larger particles that can then be removed by sedimentation and filtration.
<b>Clarification/ sedimentation</b>	Clarification removes suspended solids prior to filtration. In Ontario, the most common method of clarification used is sedimentation – or allowing suspended material to settle using gravity.
<b>Filtration</b>	Filtration removes particles from the water that were not removed during clarification by passing the water through a granular or media filter that retains all or most of the solids on or within itself, and removes pathogens trapped in the solids prior to disinfection.
<b>Disinfection</b>	Disinfection is usually the addition of chlorine to raw or filtered water to remove or inactivate human pathogens such as viruses, bacteria and protozoa in water, or for the purpose of maintaining a consistent level of chlorine in a drinking-water distribution system.



### Beyond Conventional Treatment

Communities can face unique water-treatment challenges from causes that include low-quality water sources, treated water being degraded as it moves through the distribution system or the need to meet increasing consumer demand.

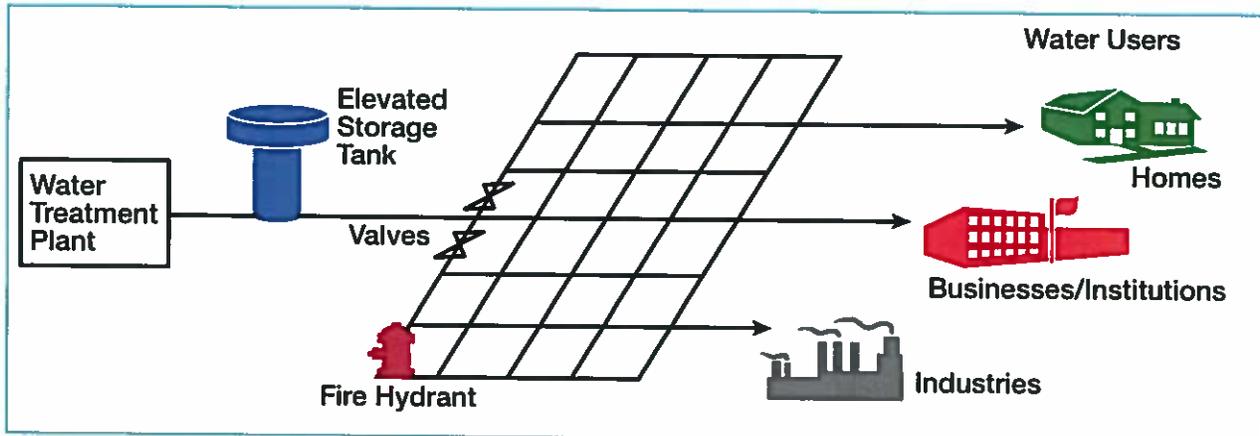
As a result, your community may use other water treatment processes, some of which are described in the chart below, to meet your community's unique challenges.

Type of water treatment process	What it does
<b>Membrane filtration</b>	Helps remove micro-pollutants
<b>Biofiltration</b>	Improves taste and odour and reduces disinfection by-products and subsequent need for coagulants
<b>Advanced oxidation process</b>	Helps reduce disinfection by-products and micro-pollutants and improves taste and odour and disinfection
<b>Sludge recirculation clarifiers</b>	Improves system capacity
<b>Magnetic ion exchange resins</b>	Reduces disinfection by-products and subsequent need for coagulants and disinfectant
<b>Dissolved air floatation</b>	Reduces algae
<b>Activated carbon</b>	Improves taste and odour
<b>Ultraviolet (UV) light</b>	Disinfects water without using chemicals

## Water Distribution

The water distribution system is the network of pipes, valves, fire hydrants, storage tanks, reservoirs and pumping stations that carry water to customers. Municipalities that get their treated water from a treatment facility in another municipality and only have a distribution system are still required to exercise due diligence

and oversight. Clean, treated drinking water can become contaminated through a poorly maintained distribution system. System owners are required to maintain a consistent level of disinfectant throughout the distribution system to act as a barrier against contamination.



### Types of Pipes

The most common types of material used for pipes include:

- Plastic - polyvinyl chloride (PVC) or polyethylene pipes; are widely used today
- Cast-iron - long-used; sturdy but capable of corroding in some cases
- Ductile-iron - widely-used, newer version of cast-iron; more flexible and less likely to corrode
- Asbestos-cement – no longer manufactured but still used in many distribution systems

### Water Mains/Piping

Water mains are normally buried in the public street right-of-way. A trunk main is a larger size main used to move large quantities of water. The smaller diameter pipe which connects a water main to an individual building is called a water service. These smaller pipes contain a buried valve to allow service shut-off. Water service piping inside the property line is considered plumbing and is outside municipal jurisdiction.

The pipes of the distribution system must be large enough to meet domestic and industrial needs and provide adequate and ample flow for fire protection.

### Valves

Valves are installed at intervals in the piping system so that segments of the system can be shut off for maintenance or repair.

### Hydrants

Hydrants are distributed in residential, commercial and industrial areas, and are primarily used by fire departments in fighting fires. Fire hydrants and system valves should be operated and tested at regular intervals.

### Water Storage Facilities

Water storage facilities exist in most municipalities to provide a reserve supply for times of emergency or heavy use (e.g. firefighting) and can include:

- elevated tanks (providing water pressure to a system)
- standpipes (also supply pressure from a high point of land)
- hydro-pneumatic systems (use air pressure to create water pressure in small systems)
- surface or in-ground reservoirs (where water can be stored and pumped out for use)

### Pumping Stations

Pumping stations are facilities including pumps and equipment for pumping fluids from one place to another. Pumping facilities are required whenever gravity cannot be used to supply water to the distribution system under sufficient pressure to meet all service demands.

### Water Meters

Water meters record the amount of water treated and delivered to the water system and measure the amount of water used by customers.

### Water Distribution Atlas

Your municipality may maintain a water distribution system atlas which provides detailed mapping of the distribution system and information on infrastructure and maintenance records. Detailed mapping helps your municipality plan for future repairs and is essential for quick response to problems such as water main breaks.

### For Further Information



#### To learn more about drinking water, visit these websites:

**[www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)** – The Government of Ontario's webpage offering a single point of access to information on drinking water and drinking water services in Ontario.

**[ontario.ca/bw44](http://ontario.ca/bw44)** - Ontario Ministry of Economic Development, Employment and Infrastructure's guide for information relating to asset management planning.

**[www.wcwc.ca](http://www.wcwc.ca)** – The website of the Walkerton Clean Water Centre, an agency of the Ontario Government, which provides information on available training and education offered by the Centre, especially to those serving small and remote communities.

**[www.ocwa.ca](http://www.ocwa.ca)** – The website of the Ontario Clean Water Agency, an agency of the Ontario Government, which includes information on water and sewage works and related services provided by the Agency.

**[www.e-laws.gov.on.ca](http://www.e-laws.gov.on.ca)** – The Ontario Government website providing access to provincial laws and regulations.

**[www.omwa.org](http://www.omwa.org)** – The website of the Ontario Municipal Water Association.

**[www.owwa.com](http://www.owwa.com)** – The website of the Ontario Water Works Association, a section of the American Water Works Association ([www.awwa.org](http://www.awwa.org)).

## Glossary

The following is a list of drinking water related terms and phrases you may come across when carrying out your oversight responsibilities.

### A

**Accreditation body:** a person designated or established as an accreditation body under Part IV of the Safe Drinking Water Act, 2002.

**Accredited operating authority:** an operating authority accredited under Part IV of the Safe Drinking Water Act, 2002.

**Adverse Water Quality Incident (AWQI):** an event in which an adverse test result triggers a process of notification and corrective measures.

**Aquifer:** a layer of soil, sand, gravel or rock that contains groundwater.

**Asset management planning:** is the process of making the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The objective is to maximize benefits, manage risks, and provide satisfactory levels of service to the public in a sustainable manner.

**Audit:** a systematic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a quality management system conforms to the requirements of the Drinking Water Quality Management Standard (DWQMS).

### B

**Backflow preventer:** a mechanical device for a water supply pipe to prevent the backflow of water into the water supply system from the service connections.

**Boil water advisory:** notice issued by local Medical Officer of Health to advise the community to boil or disinfect water before consumption. It is designed to make water safe to drink when there is a health risk through contamination that can be corrected by boiling or disinfecting the water.

### C

**Chemically assisted filtration:** a water treatment process that uses chemicals, such as alum, as a coagulant to bind small particles

together into larger particles that are then easily filtered out when the water passes through sand beds or other filters.

**Chlorine residual:** the concentration of chlorine remaining in the chlorinated water at the end of a given contact time that is available to continue to disinfect. Measured as Free Chlorine, Combined Chlorine and Total Chlorine.

**Clarification/Sedimentation:** removal of suspended solids prior to filtration. In Ontario, the most common method of clarification used is sedimentation - or allowing suspended material to settle using gravity.

**Coagulation:** a chemical process that causes smaller particles to bind together and form larger particles. The process is used to improve the removal of particles through sedimentation and filtration in the drinking-water treatment process.

**Colony counts:** a scientific measure that identifies the number of bacteria, yeast or moulds that are capable of forming colonies.

**Conservation Authorities:** local watershed management agencies that deliver services and programs that protect and manage water and other natural resources in partnership with government, landowners and other organizations. (<http://conservation-ontario.on.ca/>).

**Contaminant:** any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that causes or may cause an adverse event.

**Cross-connection:** the physical connection of a safe or potable water supply with another water supply of unknown or contaminated quality such that the potable water could be contaminated or polluted.

**Cryptosporidium:** a single-celled protozoan parasite found in the intestinal tract of many animals. If the animal waste containing Cryptosporidium contaminates drinking water, it may cause gastrointestinal disease in humans.

## D

**Designated facility:** under the Safe Drinking Water Act, 2002, designated facilities are defined as facilities that serve people who are potentially more susceptible to illness if they drink water that is of poor quality. These facilities include schools, universities and colleges, children and youth care facilities.

**Disinfection:** usually the addition of chlorine to raw or filtered water to remove or inactivate human pathogens such as viruses, bacteria or protozoa in water, or for the purpose of maintaining a consistent level of chlorine in a drinking-water distribution system.

**Drinking water:** (a) water intended for human consumption, or (b) water that is required by act, regulation, order, municipal by-law or other document issued under the authority of an act to be “potable” or to “meet or exceed the requirements of the prescribed drinking water quality standards.”

**Drinking water advisory:** notice issued by local Medical Officer of Health when a drinking water problem cannot be corrected simply by boiling the water or through disinfection. Under a Drinking Water Advisory, consumers are advised to use another source of drinking water until further notice.

**Drinking water system:** a system of works, excluding plumbing, that is established for the purpose of providing users of the system with drinking water and that includes:

- (a) anything used for the collection, production, treatment, storage, supply or distribution of water
- (b) anything related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the treatment system, and
- (c) a well or intake that serves as the source or entry point of raw water supply for the system.

**Drinking Water Quality Management Standard (DWQMS):** The Drinking Water Quality Management Standard is a made-in-Ontario standard that sets out a framework for the

operating authority and the owner of a drinking water system to develop a quality management system that is relevant and appropriate for their specific system. Operating authorities are accredited if they can demonstrate that they meet the requirements of the DWQMS through third-party verification.

**Drinking Water Quality Standards:** standards prescribed by Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards) for microbiological, chemical and radiological parameters which when above certain concentrations have known or suspected adverse health effects and require corrective action.

**Drinking water works permit:** A drinking water works permit is an MOECC-issued approval that sets specific requirements for when a new municipal residential drinking water system is installed or when an existing system is being modified.

## E

**E. coli (*Escherichia coli*):** a species of bacteria naturally present in the intestines of humans and animals. If animal or human waste containing E. coli contaminates drinking water, it may cause gastrointestinal disease in humans. Most types of E. coli are harmless, but some active strains, especially O157:H7, produce harmful toxins and can cause severe illness.

**Exceedance:** violation of a limit for a contaminant as prescribed in the Ontario Drinking Water Standards Regulation (O. Reg. 169/03).

## F

**Filtration:** removes particles from the water that were not removed during clarification by passing the water through a granular or media filter that retains all or most of the solids on or within itself, and removes pathogens prior to disinfection.

**Financial plan:** Ontario Regulation 453/07 under the Safe Drinking Water Act, 2002 sets out the requirements for a financial plan. Financial plans help municipalities build capacity to plan for drinking water systems’ long-term financial sustainability. A financial plan must be in place before a licence can be issued or renewed, and must apply for a minimum of a six-year period that starts in the year the new (or renewed) licence will

be issued. Financial plans must contain details of a system's financial position, financial operations and cash flow and are required to be approved by a resolution of municipal council.

**Flocculation:** the gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals to form larger particles that can then be removed by sedimentation and filtration.

## G

**Giardia:** protozoa, usually non-pathogenic, that may be parasitic in the intestines of vertebrates including humans and most domestic animals. If animal waste containing Giardia contaminates drinking water, it may cause gastrointestinal disease in humans.

## H

**Heterotrophic Plate Count (HPC):** HPC is a microbiological test that gives an indication of general bacterial population. HPC results are not an indicator of water safety and should not be used as an indicator of potential adverse human health effects. This is a routine test to monitor water plant operations and assure treatment is working properly.

## L

**Laboratory:** a place where drinking water tests are or will be conducted. In Ontario, laboratories must be accredited and licensed for each type of drinking water test they perform. Laboratories may conduct other types of tests as well.

## M

**Medical Officer of Health:** with reference to a drinking water system, the medical officer of health for the health unit in which the system is located; if none exists, authority resides with the Chief Medical Officer of Health.

**Microbiological organism:** an organism so small that it cannot be seen without a microscope, including bacteria, protozoa, fungi, viruses and algae.

**Municipal Drinking Water Licence (MDWL):** A municipal drinking water licence is an approval

to operate a municipal residential drinking water system. The licence outlines specific operational parameters for the system including rated capacity, maximum flow rates and sampling, testing and monitoring requirements. The MDWL replaces the Certificate of Approval, which has been phased out for municipal drinking water systems.

**Municipal drinking water system:** a drinking water system (or part of a drinking water system):

- that is owned by a municipality or by a municipal service board established under s. 195 of the Municipal Act, 2001
- that is owned by a corporation established under s. 203 of the Municipal Act, 2001
- from which a municipality obtains or will obtain water under the terms of a contract between the municipality and the owner of the system, or
- that is in a prescribed class

## O

**Operating authority:** with reference to a drinking water system, the person or entity that is given responsibility by the owner for the operation, management, maintenance or alteration of the system.

**Operational plan:** documents the Quality Management System (QMS) for a subject drinking water system.

**Owner:** with reference to a drinking water system, every person who is a legal or beneficial owner of all or part of the system (but does not include the Ontario Clean Water Agency [OCWA] or any of its predecessors where OCWA is registered on title as the owner of the system).

## P

**Pathogen:** an organism that causes disease in another organism.

**Permit to Take Water:** permit from the Ministry of the Environment and Climate Change under the Ontario Water Resources Act, 1990, required of any person who takes over 50,000 litres of water per day from any source.

**Potable water:** water that, at a minimum, meets the requirements prescribed by O. Reg. 169/03 (Drinking Water Quality Standards). Other

definitions include: water of sufficiently high quality that it can be consumed or used without risk of immediate or long-term harm; water that satisfies the standards of the responsible health authorities as drinking water; water that is 'fit to drink'.

**Protozoa:** a very diverse group comprising some 50,000 organisms that consist of one cell. Most are able to move on their own. Some are a health concern in drinking water. (See *Giardia* and *Cryptosporidium*)

**Provincial Officer Order:** an order issued by a Ministry of the Environment and Climate Change Provincial Officer to any person who contravenes any act governed by the Ministry of the Environment and Climate Change.

## R

**Raw water:** surface or groundwater that is available as a source of drinking water but has not received any treatment.

## S

**Source water:** untreated water in streams, rivers, lakes or underground aquifers which is used for the supply of raw water for drinking water systems.

**Source water protection:** action taken to prevent the pollution or depletion of drinking water sources, including groundwater, lakes, rivers and streams. Source water protection under Ontario's Clean Water Act helps ensure public health through developing and implementing local plans to manage land uses and potential contaminants.

## T

**Total coliform bacteria:** a group of waterborne bacteria consisting of three main sub-groups with common characteristics that is used as an indicator of water quality. The presence of total coliform bacteria in water leaving a treatment plant, or in any treated water immediately after treatment, could indicate inadequate treatment and possible water contamination.

**Treatment system:** any part of a drinking water system that is used in the treatment of water, including:

- anything that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing
- anything related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system
- a well or intake that serves as the source or entry point of raw water supply for the system.

**Turbidity:** a visible haze or cloudiness in water caused by the presence of suspended matter, resulting in the scattering or absorption of light. The cloudier the water, the greater the turbidity.

## W

**Walkerton Inquiry:** the public commission of inquiry led by Justice Dennis O'Connor into the events that occurred in May 2000 when the water supply in the Ontario town of Walkerton became contaminated with a strain of *E.coli* bacteria.

**Waterborne illness:** a disease transmitted through the ingestion of contaminated water. Water acts as a passive carrier of the infectious agent, chemical or waterborne pathogen.

**Water quality:** a term used to describe the chemical, physical and biological characteristics of water, usually in respect to its suitability for a particular purpose, such as drinking.

**Watershed:** a region or area bounded peripherally by a divide and draining into a particular watercourse or body of water.

**Be informed.  
Ask questions.  
Get answers.  
It's your duty.**

[www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)

For more information, call  
the Ministry of the Environment and Climate Change  
at 1-800-565-4923

Email: [drinking.water@ontario.ca](mailto:drinking.water@ontario.ca)

© Queen's Printer for Ontario, 2014

PIBS# 7889e01

