



**ANNUAL REPORT**

<b>Drinking-Water System Number:</b>	260091117
<b>Drinking-Water System Name:</b>	Tri-County Drinking Water System
<b>Drinking-Water System Owner:</b>	Tri-County Water Board
<b>Drinking-Water System Category:</b>	Large Municipal Residential
<b>Period being reported:</b>	January 1 <sup>st</sup> to December 31 <sup>st</sup> , 2016

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></p> <p><b>Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [X]</b></p> <p><b>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]</b></p> <p><b>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</b></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>West Elgin Municipal Office 22413 Hoskins Line Rodney, ON N0L 2C0</p> </div>	<p><b><u>Complete for all other Categories.</u></b></p> <p><b>Number of Designated Facilities served:</b></p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div> <p><b>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]</b></p> <p><b>Number of Interested Authorities you report to:</b></p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div> <p><b>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]</b></p>
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**List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:**

<b>Drinking Water System Name</b>	<b>Drinking Water System Number</b>
Southwest Middlesex Distribution System	260005502
West Elgin Distribution System	260094627

**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

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 Tri-County Drinking Water System consists of the Tri-County Water Treatment Plant (WTP) and the Tri-County Transmission Main. The Tri-County WTP is a membrane filtration surface water treatment facility with a total design capacity of 12,160m<sup>3</sup>/day, located at 9210 Graham Road in the Municipality of West Elgin. The low lift pumping station is located south of the WTP at 8662 Graham Road, on the shores of Lake Erie.

The water treatment facility consists of an intake system, a low lift pumping station, a treatment system and distribution pumping system. The Tri-County Drinking Water System serves the following systems: Southwest Middlesex, West Elgin, Dutton-Dunwich, Newbury and Bothwell Distribution Systems. The Southwest Middlesex and West Elgin Distribution Systems receive all their water directly from the Tri-County Drinking Water System. Dutton-Dunwich receives a portion of their water supply from the Tri-County Drinking Water System with the remainder coming from the Southwold Distribution System. Newbury and Bothwell Distribution Systems receive water indirectly from the Tri-County Drinking Water System via the Southwest Middlesex Distribution System.

#### Intake

The intake consists of one 700mm diameter polyethylene pipe extending approximately 610m into Lake Erie at a depth of 5.7m. A zebra mussel chemical control system is used seasonally. There is a second intake located at the shoreline, this is used only as a backup if required due to water quality or a blockage. The raw water is screened by two coarse screens.

#### Low Lift Pumping Station

Raw water is pumped from the low lift wet wells by four low lift pumps to the Water Treatment Plant.

#### Treatment Plant

##### Filtration

At the water treatment plant the water is pre-filtered by four automatic strainers to protect the filter membranes from coarser particles and algae in the raw water.

After the water has been strained it enters the membrane filtration system which removes fine particles, sediment, algae, protozoa and bacteria. Filtered water can be directed through the UV advanced oxidation process (AOP) unit to the treated water storage tanks.



## Disinfection

Disinfection is achieved by the use of sodium hypochlorite for primary disinfection. Note that UV is intended for use with hydrogen peroxide (AOP) for taste and odour control. The treated water is stored in treated water storage tanks where it is pumped into the distribution network by the high lift pumps. Post chlorination of the treated water is done at two points. The first dosing point is upstream of the treated water storage tanks and the second dosing point is downstream of the four high lift pumps before the distribution header.

## Process Drain Water

Waste water from the floor drains and online analyzers are directed to the process water handling facilities that include a settling basin and constructed wetlands. Flush water that cleans the pre-strainers and the membranes is also sent to the process water handling facilities.

## Monitor and Control

The water treatment process and distribution components are controlled by a dedicated Supervisory Control and Data Acquisition (SCADA) computer system and monitored by certified operators.

## Standby Power

Two diesel generators are available to permit the treatment plant to remain in operation should a power failure occur.

## **Distribution**

The Tri-County Drinking Water System serves several communities. The Tri-County Distribution System includes the West Lorne Standpipe and ends prior to entering the Southwest Middlesex (SWM) Distribution System at the SWM Reservoir.

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

Chlorine Gas  
Sodium Hypochlorite 12%  
Hydrogen Peroxide 50%  
Citric Acid 50%\*  
Caustic Soda 50%\*  
Calcium Thiosulfate (Captor) 30%\*  
\*used in the cleaning process of the membranes

**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**

- replaced AIT-7004, AIT-2003, AIT-7001 pH probe
- replaced AIT-7004 free chlorine probe
- replaced control panel for air make up unit
- troubleshooting of communication issues in distribution system
- repair pre-chlorination system
- repair surge relief valve
- repair air compressor
- repaired positioner on flow control valve Racks 1, 3, 4
- repairs to highlift pumps 1, 2 and 3
- repair Marsh Line flow meter
- upgraded clean-in-place pneumatic system
- repaired outdoor lighting
- inspection of leak on South Storage Tank
- repaired potable waterline at lowlift and repaired electrical damage due to flooding
- replaced pressure switch for PRV-7061
- repairs to air conditioning unit
- replaced fire alarm in chemical room
- repaired flow control valve on Rack 3
- inspection of Pall membrane system
- replaced sump pump in Marsh Line chamber
- repairs to UV system
- replaced altitude valve

**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
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.

	No. of Samples Collected	Range of E.Coli Results (cfu/100mL)		Range of Total Coliform Results (cfu/100mL)		Number of HPC Samples	Range of HPC Results (cfu/mL)	
		Minimum	Maximum	Minimum	Maximum		Minimum	Maximum
<b>RW</b>	52	0	52	0	20000	n/a	n/a	n/a
<b>TW</b>	52	0	0	0	1	52	10	240
<b>Distribution</b>	104	0	0	0	0	104	10	90

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 #)	Unit of Measure
<b>Turbidity (Rack 1)</b>	8760	0.01 – 0.99	ntu
<b>Turbidity (Rack 2)</b>	8760	0.01 – 0.99	ntu
<b>Turbidity (Rack 3)</b>	8760	0.01 – 0.99	ntu
<b>Turbidity (Rack 4)</b>	8760	0.01 – 0.50	ntu
<b>Free Chlorine (Primary Disinfection)</b>	8760	1.02 – 3.33	mg/L
<b>Free Chlorine (Secondary Disinfection)</b>	8760	0.75 – 3.26	mg/L
<b>Free Chlorine (Distribution—Grab)</b>	417	0.52 – 2.22	mg/L

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

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
2014-12-09	Suspended Solids	2016-01-04	15	mg/L
		2016-04-11	13	
		2016-07-04	5	
		2016-10-03	6	
		Avg.: 9.75		

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

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
<b>TREATED WATER</b>					
Antimony: Sb (ug/L) - TW	2016/09/12	0.17	6.0	No	No
Arsenic: As (ug/L) - TW	2016/09/12	1.7	25.0	No	No
Barium: Ba (ug/L) - TW	2016/09/12	21.0	1000.0	No	No
Boron: B (ug/L) - TW	2016/09/12	21.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2016/09/12	0.017	5.0	No	No
Chromium: Cr (ug/L) - TW	2016/09/12	0.31	50.0	No	No
Mercury: Hg (ug/L) - TW	2016/01/04	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2016/09/12	0.22	10.0	No	No
Uranium: U (ug/L) - TW	2016/09/12	0.281	20.0	No	No
Fluoride (mg/L) - TW	2014/05/12	0.11	1.5	No	No
Nitrite (mg/L) - TW	2016/01/04	<MDL 0.003	1.0	No	No
	2016/04/11	<MDL 0.003	1.0	No	No
	2016/07/04	<MDL 0.003	1.0	No	No
	2016/10/03	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2016/01/04	0.252	10.0	No	No
	2016/04/11	0.268	10.0	No	No
	2016/07/04	0.07	10.0	No	No
	2016/10/03	0.104	10.0	No	No
Sodium: Na (mg/L) - TW	2016/09/12	14.5	20*	No	No

\*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

**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 Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Distribution - Lead Results (ug/L)	n/a	n/a	n/a	10	n/a
Distribution - Alkalinity (mg/L)	4	90	103	n/a	n/a
Distribution - pH	4	8.12	8.46	n/a	n/a

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

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TW	2016/01/04	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2016/01/04	0.1	5.00	No	No
Azinphos-methyl (ug/L) - TW	2016/01/04	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2016/01/04	<MDL 0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW	2016/01/04	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2016/01/04	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2016/01/04	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW	2016/01/04	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2016/01/04	<MDL 0.16	5.00	No	No
Chlorpyrifos (ug/L) - TW	2016/01/04	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2016/01/04	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2016/01/04	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2016/01/04	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2016/01/04	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2016/01/04	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2016/01/04	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2016/01/04	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2016/01/04	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4- D) (ug/L) - TW	2016/01/04	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2016/01/04	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2016/01/04	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW	2016/01/04	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2016/01/04	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2016/01/04	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2016/01/04	<MDL 0.02	190.00	No	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW	2016/01/04	0.120	100.00	No	No
Metolachlor (ug/L) - TW	2016/01/04	0.02	50.00	No	No
Metribuzin (ug/L) - TW	2016/01/04	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2016/01/04	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW	2016/01/04	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2016/01/04	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW	2016/01/04	<MDL 0.15	60.00	No	No



Phorate (ug/L) - TW	2016/01/04	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW	2016/01/04	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW	2016/01/04	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW	2016/01/04	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2016/01/04	<MDL 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2016/01/04	<MDL 0.35	30.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2016/01/04	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2016/01/04	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2016/01/04	<MDL 0.44	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2016/01/04	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW	2016/01/04	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2016/01/04	<MDL 0.17	2.00	No	No
<b>DISTRIBUTION WATER</b>					
Trihalomethane: Total (ug/L)	Annual Running Average	46.25	100.00	No	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
n/a	n/a	n/a	n/a