

South Dundas Regional Water Treatment Plant

Drinking Water Works Permit No. 165-201
Municipal Drinking Water Licence No. 165-101
Works No. 220001012

- 2011 Summary Report -

Prepared by:
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SOUTH DUNDAS REGIONAL WATER TREATMENT PLANT

2011 SUMMARY REPORT

Facility description:	Ultrafiltration (Zenon membrane filtration), booster station, 2 elevated tanks
Capacity:	9,495 m³/day
Service area:	Villages of Morrisburg and Iroquois
Service population:	3,700
In-service date:	2006
Raw water source:	St. Lawrence River
Disinfection method:	Sodium Hypochlorite
Operator in Charge:	Troy Brownell (613) 551-4542

This report is a summary of water quality information for the South Dundas Regional Water Treatment Plant, published in accordance with Schedule 22 of Ontario's Drinking Water Systems Regulation for the reporting period of January 1, 2011 to December 31, 2011. The South Dundas Regional Water Treatment Plant is categorized as a Large Municipal Residential Drinking Water System.

This report is prepared by Caneau Water and Sewage Operations Inc. on behalf of the Corporation of the Township of South Dundas. A copy of the Summary report is to be provided to the members of the municipal council not later than March 31, 2012.

"The report must list the requirements of the Act, the regulations, the system's approval and any order that the system failed to meet at any time during the period covered by the report and specify the duration of the failure; and for each failure referred to, describe the measures that were taken to correct the failure." – O. Reg. 170/03 s. 22(2)

"The report must also include the following information for the purpose of enabling the owner of the system to assess the rated capability of their system to meet existing and planned uses of the system:

1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows and daily instantaneous peak flow rates.
2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval."

O. Reg. 170/03 s. 22 (3)

System Description

The South Dundas Regional Water Treatment Plant is located at 99 Augusta Street in the village of Morrisburg. The water treatment plant is a membrane filtration plant that began producing water in June 2006. The treatment process includes ultrafiltration (ZeeWeed membrane system manufactured by Zenon Environmental Inc) through one of three membrane cassettes which are housed in large concrete tanks, taste and odour removal through granular activated carbon (GAC) contactors, and primary disinfection provided by sodium hypochlorite, which is injected downstream of the GAC tanks. The water then passes through the chlorine contact chamber and a baffled clearwell into a high lift pumping well, all of which are located beneath the water treatment plant. An 11.5 km transmission main joins the distribution systems in Morrisburg and Iroquois. The original Iroquois Water Treatment Plant was converted into a booster station. The

rated capacity is 158.6 L/s. The distribution system now services a combined population in Morrisburg and Iroquois of approximately 3,700.

Compliance with Terms and Conditions of the Municipal Drinking Water Licence 165-101

The Morrisburg Water Treatment Plant and distribution system is operated and maintained in accordance with O. Reg. 170/03 dated June 2003 (last amendment – O. Reg. 106/10) and the Municipal Drinking Water Licence.

In accordance with the MDWL, Performance Limits 1.1 – “The maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 9,495 m³”. (See Appendix I for total flow and average and maximum daily flow.) The maximum daily volume was not exceeded at any time during 2011.

The Morrisburg Water Treatment Plant has a valid Permit to Take Water, Number 7756-6E7GET (issued July 12, 2005 and expiring July 11, 2015), authorizing the taking of no more than 10,445 m³/day. The average water taking for the year was 2,957 m³/day, 28% of the authorized water taking. The maximum daily flow into the treatment system for the year was 5,875 m³.

The Morrisburg Water Treatment Plant chlorinates at the raw water intake when the water temperature is above 10 degrees Celsius, providing enhanced chlorine contact retention time and also to control zebra mussel populations in the raw water intake pipes.

The works and related equipment and appurtenances used to achieve compliance with the MDWL are properly operated and maintained, including effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this certificate and the Act and regulations, adequate laboratory facilities, process controls and alarms, and the use of the process chemicals that come in contact with the water being treated is suitable for the process and appropriate for drinking water.

An Endress and Hauser flow meter measures the flow rate and daily quantity of water being taken from the source (intake) and conveyed to, and through, the water treatment plant. (See Appendix I). Annual calibration of the flow meter was completed June 7, 2011.

Free chlorine residual and turbidity in treated water are continuously monitored at the point of entrance to the distribution system. The Prominent chlorine analyzer is accurate to ±2% of the measured value. A low chlorine alarm calls out at a value that is above the required CT, and the high lift pumps will shut down when the chlorine reaches the required CT, or the lowest Cl₂ level of 0.20 mg/L, to prevent non-chlorinated water from being produced. A high chlorine alarm calls out at 2.50 mg/L and the high lift pumps will shut down at 3.50 mg/L to prevent super-chlorinated water from being produced. Operators monitor free and total chlorine residual every day (5 days a week) with a Hach hand-held analyzer and adjust as required. Annual calibration of the on-line chlorine analyzer was completed on June 7, 2011. The Hach 1720C turbidimeter is accurate to ±0.1 NTU (Nephelometric Turbidity Unit). The turbidimeter is checked monthly using a hand-held turbidity analyzer and adjusted accordingly. Annual calibration of the on-line turbidity analyzer was completed on June 7, 2011 by Ken Harris Instrumentation. If the turbidity reaches 1.00 NTU (Nephelometric Turbidity Units) for a period of 14 minutes, 50 seconds, the affected Zenon train will shut down and alarm out to prevent turbid water from entering the contact chamber. (See Appendix I for minimum and maximum monthly turbidity, and minimum, maximum and average chlorine residual.) An adverse water report was made on March 10th regarding a turbidity exceedance from March 5-8, 2011. The exceedance reported was turbidity

greater than 0.10 NTU for greater than 1% of the readings for the month of March. The turbidity analyzer was cleaned on March 4th and was reassembled and put back into operation shortly afterwards. The turbidity exceedance wasn't noticed until March 8th since the operator wasn't able to access Zenotrac (online monitoring) until that time. Upon accessing Zenotrac, the turbidity on one of the analyzers was found to be above the criteria. The turbidity analyzer was checked and it had been reassembled incorrectly after cleaning, causing a piece of plastic to become dislodged, thus causing the exceedance. It was then reassembled a second time and the turbidity returned to normal.

Operators in charge of the South Dundas Regional Water Treatment Plant keep a daily log book recording flow meter readings, free and total chlorine residual (both continuous and grab samples), and turbidity. (See Appendix I)

Samples are collected throughout the year from the treated water to determine whether or not the water is safe for human consumption (in accordance with O. Reg. 170/03, Schedule 10 and 13, Microbiological and Chemical Sampling and Testing). Bacteriological analysis is performed weekly (1 sample per week from the raw water and 1 sample per week from the water treatment plant and 13 distribution system samples per month, chemical analysis is performed once a year (treated – Schedule 23 and 24) and 4 times a year in the distribution system (nitrates and THMs). Sodium and fluoride (treated water) are tested once every 60 months. (See Appendix II – 2011 Annual Report for the Ministry of the Environment.) All samples are analyzed at Caduceon Environmental Labs in Nepean, Ontario. Caduceon and their subcontracted labs are accredited by the Standards Council of Canada. Written procedures have been established for the notification of the Medical Officer of Health and the Ministry of the Environment Spills Action Centre should a sample result indicate an exceedance has occurred. In the reporting year, there was one adverse water quality incident report: the water treatment sample collected on August 15th was reported NDOGN – No Data (Background Overgrown). The Ministry of Health issued a Boil Water Advisory on August 17th and it was lifted August 18th after the set of samples collected August 17th showed no bacterial contamination.

Lead sampling takes place twice a year, in the spring and fall in plumbing that serves private residences, plumbing that does not serve private residences and in the distribution system. Results are summarized in Appendix II – 2011 Annual Reports for the Ministry of the Environment. Under Ontario Regulation 170/03, Schedule 15, Section 15.1-5, the South Dundas Regional WTP is eligible for reduced sampling and reduced frequency (every 3 years).

Effluent discharged from the backwash wastewater facility is analyzed quarterly for Total Suspended Solids (annualized average). The results are summarized in Appendix II – 2011 Annual Report for the Ministry of the Environment.

Two alarmed, online chlorine analyzers with datalogging are installed in the distribution system. The analyzer is checked, at minimum, every 72 hours. The analyzer will alarm out when the chlorine goes below 0.15 mg/L for a period greater than 15 minutes. The online chlorine analyzers were calibrated on June 7, 2011 by Ken Harris Instrumentation. Distribution data was lost for the Iroquois Tower for the period of January 19 to February 15 and April 15 – May 16, 2011, and for the Morrisburg Distribution for the period of April 15 – May 16, 2011. Ken Harris Instrumentation installed new data recorders at both locations in the distribution system on May 15, 2011.

All records and information relating to or resulting from the monitoring, sampling and analyzing activities required by the MDWL are retained for a minimum of 5 years.

The South Dundas Regional Water Treatment Plant is classified Water Treatment 2 and Water Distribution 2 (Certificate Number 1582, 1583). Operators responsible for the operation of the South Dundas Regional Water Treatment Plant hold valid licences applicable to this type of water treatment plant.

Following all maintenance or repairs to the water treatment facility, all affected areas are disinfected in accordance with the MOE's "Procedure for Disinfection of Drinking Water in Ontario" dated June 2006. All chemicals used in the treatment process and all materials contacting the water meet both the American Water Works Association (AWWA) quality criteria and the American National Standards Institute (ANSI) safety criteria. All chemicals have been registered by a testing institution accredited under the Standards Council of Canada Act or by ANSI.

A contingency plan has been implemented to ensure adequate equipment and material are available for dealing with emergencies, upset conditions and equipment breakdowns in the works.

An operating manual incorporates the requirements of the MDWL. The manual includes monitoring and reporting of the necessary and in-process parameters essential for control of the treatment process and for the assessment of the performance of the works. It also contains procedures that are required for adequate operation and maintenance of the monitoring equipment.

Drawings are prepared and kept up-to-date showing the new works as constructed (record drawings), including timely incorporation of all modifications made to the works throughout its operational life.

A Process and Instrumentation Diagram (PID) for the entire water treatment plant has been prepared and is kept up-to-date, including timely incorporation of all modifications made to the works throughout its operational life.

All record drawings and diagrams and all existing record drawings which are currently in retention throughout the operational life of the water works are readily available for inspection by Ministry staff.

Procedures have been established and are followed for receiving, responding to, and recording complaints about any aspect of the works, including recording the steps that were taken to determine the cause of complaint and the corrective measures taken to alleviate the cause and prevent its reoccurrence.

Non-Compliance with Regulatory Requirements and Actions Required

The 2011-2012 Compliance Inspection was commenced on December 15, 2011 and concluded on January 9, 2012 by the Ministry of the Environment. The Compliance Inspection Report was not available upon completion of the Summary Report for Municipalities and will be discussed in the 2012 Summary Report. A copy of the Compliance Inspection Report will be available at the Township office once received.

Maintenance:

- Mar. 8 – installed new keypad for alarms (Glengarry Security)
- March – recovery cleans on all Zenon trains

- Repaired and reinstalled train #1 permeate pump frequency drive module (Marleau Mechanical)
- July 12 – cleaned low lift strainer and ran Train #1 in supervisory mode for one production cycle (Caneau)
- July 12 – Capital Controls on site – opened Rockwell software and licence expiry notification popped up – reactivated licence
- July 15 – shingling roof at low lift (Robert Jordan Construction)
- July 18 – load testing of main plant generator (GAL Power)
- July 19 – load testing of generator at Iroquois booster station (GAL Power)
- July 26 – Simplex on site for annual alarm inspection
- July 29 – GAL Power on site to diagnose problems in Kohler computer – suspects overvoltage or voltage spike – reset and rebooted Kohler computer – mobile system still controlling genset for weekend
- Aug. 11 – troubleshooting generator controller (GAL Power)
- Aug. 17 – Boil Water Advisory (BWA) issued for Morrisburg and Iroquois – resamples collected on the 17th showed no microbiological contamination and the BWA was lifted on August 18th.
- Sept. 14 – repaired leaking module on Zenon Train #2
- completed recovery cleans on all trains
- contacted GE Water Process for adjustments to codes for the backpulse step when draining recovery cleans to neutralization – reduced backpulse flow rates to avoid backpulse TMP issues
- Nov. 15 – Capital Controls on site to fine tune PID loop which controls primary chlorination dosing – eliminated the high/low post filtration chlorine alarms at this point
- Dec. 15 – MOE Compliance Inspection

Alarm Response:

- Jan. 22 @ 7:15 am – Zenon general alarm – permeate pump drive fault – shut down train #1 for weekend – two trains adequate for production – Marleau Mechanical and Surgeson on site January 25th to repair permeate pump drive problem – removed from master control cabinet for troubleshooting and repairs or replacement
- Feb. 13 @ 1:15 am – PLC Zenon alarm – all trains abnormal shutdown – no evident cause – loss of communication – acknowledged alarms and returned trains #2 and 3 to operational status
- Feb. 21 @ 1:35 am – PLC alarm – low lift pump faulted – high temperature in ABB drive control – shut down unit – found cooling fan in cabinet not working – Marleau Mechanical removed it for repair/replacement (new fan installed Feb. 28).
- Mar. 26 @ 7:00 pm – A/C power loss – all trains went into abnormal shutdown – operator acknowledged and reset Zenon HMI and trains returned to normal operation
- Apr. 1 @ 12:40am – PLC alarm – low clearwell alarm – Zenon train #1 in recovery clean so 2 trains running – clearwell alarm set point was activated when supplying Iroquois – happens sometimes when only 2 trains are in production
- Apr. 11 @ 2:00am – PLC alarm – loss of communication to main PLC – A/C power loss due to thunder storms in area – UPS took surge but malfunctioned (burnt out after surge) – UPS is part of circuit and must be active – plugged into power to restore PLC and replaced UPS next day
- Apr. 11 @ 6:05am – PLC alarm – A/C power loss due to thunder storms – low lift pump disconnect – acknowledged and checked low lift – all systems returned to normal at low lift and main plant

- Apr. 24 @ 5:30am – PLC alarm – high clear well level – production setpoint exceeded marginally – no issues
- Apr. 24 @ 11:30am – low clearwell – low membrane tank level – strainer differential pressure high alert – all due to strainer fouling due to high algae levels in river which plug strainer – cleaned strainer
- Apr. 25 @ 5:00am – PLC alarm – low clearwell and membrane tank issue – strainer fouled and plugged – cleaned strainer
(strainer issues happen during spring and fall due to turnover of the river – temperature inversions – and algae builds up and is drawn into the intake and fouls the strainer – the strainer is frequently pressure washed to remove debris)
- May 13 2:40 am – PLC alarm – Zenon general alarm – all Zenon trains in abnormal shutdown – loss of communication to the low lift – communication problem only lasted a few seconds via the communication link and then restored – acknowledged all alarms - all Zenon trains reset
- May 18 @ 12:48am – PLC alarm – Iroquois tower communications lost – also Zenon general alarm – all Zenon trains in abnormal shutdown – acknowledged all alarms and restarted trains. Called tech support later that morning to inquire about the communication loss issue – Tech support said that (a) monitoring will not show loss of communication unless it is lost for at least 5 minutes and (b) maintenance is done on the system between 8pm and 5am and may be causing these issues.
- May 21 @ 3:00pm – PLC alarm – low chlorine day tank level – caused by start float getting stuck – activated float by hand and filled day tank – replaced float – all other plant checks normal
- June 3 @ 5:00 am – communication loss and restore – no resets needed – spoke with Capital Controls and he suggested it may be an alarm timer issue and could be eliminated
- June 8 @ 9:50pm – PLC alarm – high high chlorine at Iroquois tower – checked analyzer with hand-held analyzer and confirmed reading – flushed hydrant near tower to draw down – Iroquois boost analyzer was out of calibration on the low side – recalibrated analyzer with multiple hand-held checks and continued draining tower via hydrants until 2:00 am June 9th when residuals were lowered.
- June 8 – high chlorine at Iroquois booster station – shut off pumps – recalibrated analyzer
- June 10 @ 4:00pm – low high lift well – out of alarm upon arrival – well level in alarm for 16 seconds – levels okay
- June 18 @ 10:20pm – Iroquois high lift uncommanded stop fault – due to A/C power loss – acknowledged and reset pump
- June 28 @ 8:05pm – PLC alarm due to severe thunder storm – multiple power dips – multiple alarms until 8:35 pm when storm passed – all normal but air compressor showing fault and continued in fault until June 30th – Marleau Mechanical on site to check Master control cabinet and found overload tripped out – checked voltages and ran compressor – all normal
- July 7 @ 4:25 am – high lift pump high well alarm – upon arrival it was out of alarm – reset SCADA – all normal
- July 12 @ 3:45 am – Train #1 abnormal shutdown and primary disinfection pump #1 in fault – all alarms reset and acknowledged. Train #1 had a permeate low flow alarm – ran the chlorine pumps manually and both appear okay – trains #2 and 3 back in production at 6:00 am
- July 17 @ 3:50 am – pump #2 fault at Iroquois Booster station due to thunder storm – reset – all normal
- July 17 @ 8:20 pm – communication loss, Zenon alarm, Iroquois high lift pump fault and chlorine pump fault – all trains in abnormal shutdown – communication had been

restored – acknowledged high lift pump fault in Iroquois at Booster station – checked chlorine pumps and ran manually – all normal. 9:27pm – high chlorine at Booster Station in Iroquois – visited the site prior to WTP – noticed chlorine residual at 2.54 mg/L and opened sink tap to remove the highly chlorinated water – residual was dropping. Back at WTP at 10:25 pm – Chlorine residual at the booster station appears to have dropped back to normal – 1.39 mg/L – Iroquois tower is full, Morrisburg tower is 71% full and clear well was at 4920 mm. All trains were in standby and high lift pumps were off. Low lift station checked and all okay.

- July 18 @ 12:10 am – Zenon trains abnormal shutdown, communication loss and high lift pump #2 all in alarm – thunderstorms in area – Acknowledged all alarms – high lift pump #2 back on to continue filling the Morrisburg water tower – Distribution chlorine is 1.27 mg/L and the clearwell is at 4840 mm. All trains in standby mode – Iroquois booster station checks – all okay.
- July 19 @ 4:01 pm – high post filtration chlorine alarm – reset high alarm to 3.00 mg/L for high and 5.00 mg/L for high high alarm. At 7:20pm, returned post filtration high chlorine alarm to 2.50 mg/L and high high to 3.00 mg/L.
- July 23 @ 12:40 am – communication loss to Iroquois facilities – all trains in abnormal shutdown – trains will not reset – called WTC to find out if it is widespread – PC and internet connection down as well – told by support desk that systems were down at WTC for scheduled repairs and may be offline until 4:00 am – notified him that it was a water treatment system but nothing he could do to change the maintenance – went to low lift to check router and modem when tech called about maintenance. Technician said notification was given to the municipality that the system would be down. Called Jeff Mallory to consult. Returned to plant and communication had been restored at 1:12 am – acknowledged all alarms and started all trains for one supervisory cycle – all chlorine levels normal
- July 26 @ 3:15 pm – PLC alarm – low permeate flow on Train #3 – checked and replaced flapper in air release valve to enable correct priming – Train #3 will not permeate – turned Train #3 off – checked air release and priming sequence – good negative pressure – flow meter indicates system okay – all other trains okay
- July 27 @ 3:21 am – general PLC alarm – problems on entry panel on arrival – rebooted system – post filtration high chlorine alarm – trends show high chlorine for only 8 seconds (supposed to alarm out after 3 minutes) – will have Capital Controls look at alarm setpoints – replaced electrolyte and cap on chlorine probe – recalibrated analyzer – all normal
- July 27 @ 6:45 pm – low clearwell - level in clearwell dropped while filling towers – lowered alarm setpoint – all normal
- July 28 @ 3:45 pm – PLC general alarm – upon arrival, PLC nor SCADA in alarm – possible power surge – checked plant for problems – SCADA blinking so rebooted SCADA – all normal
- July 29 @ 11:10 pm – A/C power loss – trains #1 and 2 in abnormal shutdown – reset trains – all normal
- July 30 1:24 am – A/C power loss at Iroquois Booster station due to thunder storms
- July 31 @ 6:30 am – communication loss alarm , zebra mussel chlorinator alarm – on arrival, no communication to low lift – plant shutdown – rebooted SCADA but no response – called WTC for consultation – Jeff Mallory also called WTC – WTC technician did not respond to emergency – prepared to treat water in manual mode - communication back on at 9:50 pm – increased speed on trains to fill clearwell more quickly – turned all three high lift pumps off – system filling – reduced alarm setpoints while filling towers – returned high lift pumps back to auto - all normal at 12:30 pm

- Aug. 1 @ 8:42 am – general PLC alarm – train #1 abnormal shutdown – reset alarms and put train #1 back into production. Also low low clearwell alarm – flow meter not communicating - contacted Capital Controls - on site @ 3:45 pm and got flow monitor stabilized – production returned to normal – all normal @ 5:00pm
- Aug. 1 @ 8:30pm – abnormal shutdown train #3 – even in off position, flow readings were unstable – turned train #3 off for night – will monitor system and check water levels- Ken Harris Instrumentation contacted – all okay at 10:00 pm
- Aug. 2 @ 5:00pm – GAL power on site at 5:40pm to disconnect portable backup generator (delivered to Long Sault) – at 7:00 Gal Power tested permanent generator and couldn't get it to start.
- Aug. 3 @ 12:10am – GAL Power delivered mobile generator at 2:00am – at 12:52, all trains in abnormal shutdown and communication loss – communication loss restored at 1:08 am – generator installed and tested at 4:05 am – all normal
- Aug. 11 @ 1:50am – Zenon general alarm - loss of communication at 1:49 am but was restored – disabled Zenon Train #1 to ensure communication with low lift was re-established – all appears normal with Iroquois communications
- Aug. 18 @ 5:50 pm – A/C power outage at Iroquois Booster Station due to storm – alarms were acknowledged and reset
- Aug. 21 @ 7:30 am – Iroquois Booster Station - scheduled power outage in Iroquois with Hydro One and Rideau St. Lawrence
- Aug. 25 @ 2:10am A/C power loss – storm passed through area – all appeared normal
- Sept. 4 @ 8:10am – pump #3 fault at booster station due to A/C power loss– reset alarm at plant
- Sept. 4 @ 12:00 pm – PLC Zone 3 – chemical leak detector alarm – replaced sensor at caustic dosing area – corrosion and high humidity in room – no leakage
- Sept. 5 @ 11:20 am – Iroquois high lift pump 1 uncommanded stop fault – pump #3 in operation – pump 1 had restored and reset itself – all appears normal on SCADA – Pump 3 filling tower – suspect A/C loss or dip in Iroquois
- Sept. 13 @ 4:05 pm - Train #2 low low pressure alarm – turned Train #2 off – will get assistance tomorrow to remove modules and repair the leak
- Sept. 14 @ 10:45 pm – post filtration chlorine residual high high alarm – reading 3.9 mg/L – all trains in stand by
- Sept. 18 @ 6:20 pm – post filtration chlorine residual high high alarm - reading 2.70 mg/L – checked with hand held and reading is 2.20 mg/L.
- Oct. 1 @ 4:52am – maintenance on communication system – continuation of work from September 30th. Temporary communication loss from low lift and Iroquois facilities – returned to normal operations at approximately 6:00am
- Oct. 2 @ 11:00am – A/C power loss due to storm – acknowledged alarms and reset all malfunctioned equipment
- Oct. 2 @ 1:50pm – A/C power loss due to storm at Iroquois booster station – reset all malfunctioned equipment
- Oct. 20 @ 1:55am – high post filtration chlorine alarm – checked analyzer and refilled electrolyte – recalibrated analyzer and ran Zenon trains to check residual during operation – trends returned to accurate readings – high alarm was at end of short production cycle but returned to normal after production and calibrations were complete
- Oct. 21 @ 8:08pm – high post filtration chlorine alarm – recalibrated and refilled electrolyte – reading stabilized during production cycles. The recalibration of the analyzers will sometimes take time to stabilize and react properly. The post-filtration issues occur occasionally and seem to be unavoidable even with regular maintenance and calibrations – they also tend to be at the end of short production cycles at the plant.

- Oct. 27 @ 4:35pm – Zenon train #3 abnormal shutdown – reset train #3 – train went into standby mode – all other plant checks were normal. On October 28th, operators replaced the rolling seal of the air release valve on the vacuum line on Zenon train #3. This was the cause of the abnormal shutdown on train #3
- Nov. 5 @ 11:30am – PLC alarm and Iroquois Booster Station high lift pump #1 uncommanded stop fault – temporary fault – high lift pump was running upon arrival – pumps had started after the completion of a valve replacement in Iroquois earlier that morning – operator was in Iroquois when the pump failed and returned to the Morrisburg WTP to acknowledge the PLC alarm
- Nov. 11 @ 9:50pm – PLC alarm – loss of communication from low lift and all trains abnormal shutdown – communication had been restored upon arrival – acknowledged alarms and restarted all trains to production mode – operator contacted Westport telephone company and left voice message to be contacted if there was work being done to communication system
- Nov. 12 @ 3:15pm – PLC alarm – high post filtration alarm – acknowledged alarms and worked on primary chlorination analyzer – removed probe and added electrolyte to cap and ran filtration system to calibrate analyzer – analyzer stabilized and readings were steady
- Nov. 19 @ 12:48pm – PLC alarm – Zenon train #3 abnormal shutdown – trains #1 and 2 were operating normally – checked Zenon HMI and reset alarm – restarted train #3 and it returned to normal production – checked low lift trends and noticed evidence of low flows just before train #3 went into abnormal shutdown
- Nov. 28 @ 7:10pm – PLC alarm – low high lift well at WTP – during filling of Iroquois Tower and Iroquois boost reservoir, the high lift well level dropped below the low alarm setpoint – Zenon train #3 was soaking in a recovery clean and only 2 trains were available to supply permeate – at no time were there CT issues and the well was above alarm level by 7:48pm – Iroquois tower had filled by 7:11pm and the high lifts were filling the reservoir. There was also a high chlorine day tank alarm – stop float didn't activate – shut transfer pump off manually – replaced float mechanism November 29th.

APPENDIX I
Flow Data

South Dundas Water Treatment Plant Summary Report

Municipality: Township of South Dundas

Year: 2011

Source: St. Lawrence River

Design Capacity: 9,495 m³

Description: Zenon Membrane Filtration, taste and odour control, chlorination

Month	Raw Flow		Treated Flow										Bacteria (Number of Samples)					
	Total Flow m ³	Total Flow m ³	Total Flow m ³	Avg. Day m ³ /day	Max. Day m ³ /day	Avg. mg/L	Min. mg/L	Max. mg/L	Min. NTU	Max. NTU	NO ₂ mg/L	NO ₃ mg/L	THM mg/L	Raw Water	Plant	Safe Distribution	Unsafe or Poor Distribution	
January	104,887	91,042	2,937	3,521	1.15	0.82	1.51	0.02	0.38					5	5	13		
February	104,161	91,252	3,259	3,942	1.24	0.90	1.48	0.02	0.07	0.2	0.40	0.030		4	4	13		
March	114,248	99,328	3,204	4,209	1.12	0.74	1.29	0.02	0.09					4	4	13		
April	97,470	86,220	2,874	3,482	1.14	0.73	1.35	0.02	0.13					4	4	13		
May	100,508	88,421	2,852	3,627	1.10	0.83	1.36	0.02	0.04	<0.1	0.40	0.051		5	5	13		
June	99,561	85,584	2,853	3,539	1.23	0.95	1.48	0.02	0.05					4	4	13		
July	110,476	88,531	2,856	3,757	1.28	1.02	1.77	0.02	0.06					4	4	13		
August	107,378	84,813	2,736	3,265	1.32	1.01	1.48	0.02	0.07	0.10	0.20	0.063		5	6	17	1	
September	97,637	81,162	2,705	3,247	1.23	0.98	1.61	0.02	0.07					4	4	13		
October	99,276	85,705	2,765	3,713	1.26	1.11	3.45	0.02	0.02					5	5	13		
November	98,131	84,609	2,820	3,709	1.25	0.90	1.68	0.02	0.03	<0.1	0.30	0.050		4	4	13		
December	125,144	112,409	3,626	5,875	1.10	0.70	1.65	0.02	0.04					4	4	13		
Total	1,258,877	1,079,076												52	53	160	1	
Minimum						0.70		0.02										
Maximum				5,875			3.45		0.38									
Average			2,957		1.20					0.15	0.33	0.049		52	52	156		
ODWS										1	10	0.100						

APPENDIX II
2011 Annual Report
Ministry of the Environment



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	220001012
Drinking-Water System Name:	South Dundas Regional Water Treatment Plant
Drinking-Water System Owner:	Township of South Dundas
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1 – December 31, 2011

Complete if your Category is Large Municipal Residential or Small Municipal Residential

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

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

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

Township of South Dundas
4296 County Road 31
Williamsburg, ON
K0C 2H0

Complete for all other Categories.

Number of Designated Facilities served:

Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []

Number of Interested Authorities you report to:

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []

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

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 South Dundas Regional Water Treatment Plant is located at 99 Augusta Street in the village of Morrisburg. The water treatment plant is a membrane filtration plant that began producing water in June 2006. The treatment process includes ultrafiltration (ZeeWeed membrane system manufactured by Zenon Environmental Inc) through one of three membrane cassettes which are housed in large concrete tanks, taste and odour removal through granular activated carbon (GAC) contactors, and primary disinfection provided by sodium hypochlorite, which is injected downstream of the GAC tanks. The water then passes through the chlorine contact chamber and a baffled clearwell into a high lift pumping well, all of which are located beneath the water treatment plant. An 11.5 km transmission main joins the distribution systems in Morrisburg and Iroquois. The original Iroquois Water Treatment Plant was converted into a booster station. The rated capacity is 158.6 L/s. The distribution system now services a combined population in Morrisburg and Iroquois of approximately 3,700.

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite, sodium bisulfite, citric acid, sodium hydroxide

Were any significant expenses incurred to?

- Install required equipment - No
- Repair required equipment - No
- Replace required equipment - No

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

Repaired low lift building roof - \$5,000.00
Spare PLC cards - \$10,000.00
Zenotrac monitoring renewal - \$10,000.00
Replaced 5 zeeweed modules - \$6,000.00
Free chlorine analyzer for Iroquois booster station - \$5,000.00

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	Corrective Action	Corrective Action
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			Measure		Date
March 10/11	Turbidity	>0.10 NTU for >1% of readings for the month	NTU	Turbidity analyzer was reassembled improperly after cleaning – was reassembled	March 8/11
Aug. 17/11	TC/EC	NDOGN	mg/L	Resampled/ boil water advisory	Aug. 17-18/11

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	52	0-15	<2-100		
Treated	53	0-NDOGN	0-NDOGN	53	0->500
Distribution	160	0	0	52	<2->500

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 #)
Raw Turbidity	8760	0-9.99 NTU
Permeate Turbidity		
Train #1	8760	0.02-0.06NTU
Train #2	8760	0.02-0.38NTU
Train #3	8760	0.02-0.28NTU
Chlorine	8760	0.70-3.45mg/L
Fluoride (If the DWS provides fluoridation)		

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

NOTE: Record the unit of measure if it is not milligrams per litre.

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
Dec. 17/10	Total Suspended Solids	Feb. 7/11	0	mg/L
Dec. 17/10	Total Suspended Solids	May 19/11	0	mg/L
Dec. 17/10	Total Suspended Solids	Aug. 25/11	14	mg/L



Dec. 17/10	Total Suspended Solids	Nov. 7/11	8	mg/L
	*Annual Average Concentration		5.5	mg/L

*** Municipal Drinking Water Licence – Schedule C – Residue Management 1.5.2**

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	02-05-11	0.0001	mg/L	
Arsenic	02-05-11	0.0009	mg/L	
Barium	02-05-11	0.023	mg/L	
Boron	02-05-11	<0.005	mg/L	
Cadmium	02-05-11	<0.00002	mg/L	
Chromium	02-05-11	<0.002	mg/L	
*Lead				
Mercury	02-05-11	<0.00002	mg/L	
Selenium	02-05-11	<0.001	mg/L	
Sodium	04/06/07	13.7	mg/L	
Uranium	02-05-11	0.00034	mg/L	
Fluoride	04/06/07	0.20	mg/L	
Nitrite	07-02-11	0.2	mg/L	
	02-05-11	<0.1	mg/L	
	08-08-11	0.1	mg/L	
	07-11-11	<0.1	mg/L	
Nitrate	07-02-11	0.4	mg/L	
	02-05-11	0.4	mg/L	
	08-08-11	0.2	mg/L	
	07-11-11	0.3	mg/L	

*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	6	<0.00002-0.00021	0



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	02-05-11	<0.3	ug/L	No
Aldicarb	02-05-11	<3	ug/L	No
Aldrin + Dieldrin	02-05-11	<0.02	ug/L	No
Atrazine + N-dealkylated metabolites	02-05-11	<0.5	ug/L	No
Azinphos-methyl	02-05-11	<1	ug/L	No
Bendiocarb	02-05-11	<3	ug/L	No
Benzene	02-05-11	<0.5	ug/L	No
Benzo(a)pyrene	02-05-11	<0.005	ug/L	No
Bromoxynil	02-05-11	<0.3	ug/L	No
Carbaryl	02-05-11	<3	ug/L	No
Carbofuran	02-05-11	<1	ug/L	No
Carbon Tetrachloride	02-05-11	<0.2	ug/L	No
Chlordane (Total)	02-05-11	<0.04	ug/L	No
Chlorpyrifos	02-05-11	<0.5	ug/L	No
Cyanazine	02-05-11	<0.5	ug/L	No
Diazinon	02-05-11	<1	ug/L	No
Dicamba	02-05-11	<5	ug/L	No
1,2-Dichlorobenzene	02-05-11	<0.1	ug/L	No
1,4-Dichlorobenzene	02-05-11	<0.2	ug/L	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	02-05-11	<0.1	ug/L	No
1,2-Dichloroethane	02-05-11	<0.1	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	02-05-11	<0.1	ug/L	No
Dichloromethane	02-05-11	<0.3	ug/L	No
2-4 Dichlorophenol	02-05-11	<0.1	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	02-05-11	<5	ug/L	No
Diclofop-methyl	02-05-11	<0.5	ug/L	No
Dimethoate	02-05-11	<1	ug/L	No
Dinoseb	02-05-11	<0.5	ug/L	No
Diquat	02-05-11	<5	ug/L	No
Diuron	02-05-11	<5	ug/L	No
Glyphosate	02-05-11	<25	ug/L	No
Heptachlor + Heptachlor Epoxide	02-05-11	<0.1	ug/L	No
Lindane (Total)	02-05-11	<0.1	ug/L	No
Malathion	02-05-11	<5	ug/L	No
Methoxychlor	02-05-11	<0.1	ug/L	No
Metolachlor	02-05-11	<3	ug/L	No
Metribuzin	02-05-11	<3	ug/L	No
Monochlorobenzene	02-05-11	<0.2	ug/L	No
Paraquat	02-05-11	<1	ug/L	No
Parathion	02-05-11	<3	ug/L	No
Pentachlorophenol	02-05-11	<0.1	ug/L	No
Phorate	02-05-11	<0.3	ug/L	No
Picloram	02-05-11	<5	ug/L	No
Polychlorinated Biphenyls(PCB)	02-05-11	<0.05	ug/L	No
Prometryne	02-05-11	<0.1	ug/L	No
Simazine	02-05-11	<0.5	ug/L	No



THM (NOTE: show latest annual average)		49	ug/L	No
Temephos	02-05-11	<10	ug/L	No
Terbufos	02-05-11	<0.3	ug/L	No
Tetrachloroethylene	02-05-11	<0.2	ug/L	No
2,3,4,6-Tetrachlorophenol	02-05-11	<0.1	ug/L	No
Triallate	02-05-11	<10	ug/L	No
Trichloroethylene	02-05-11	<0.1	ug/L	No
2,4,6-Trichlorophenol	02-05-11	<0.1	ug/L	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	02-05-11	<10	ug/L	No
Trifluralin	02-05-11	<0.5	ug/L	No
Vinyl Chloride	02-05-11	<0.2	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