St. Andrews/Rosedale Distribution System

Certificate of Approval No. 6314-654PDH (Sept. 2004)
Works No. 260001250

- 2009 Summary Report -

Prepared by:
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ST. ANDREWS/ROSEDALE DISTRIBUTION SYSTEM

2009 SUMMARY REPORT

Facility description:	**Water booster pumping station**
Capacity:	**898 m^3**
Service area:	**St. Andrews/Rosedale Subdivision**
Service population:	**1850**
Raw water source:	**St. Lawrence River (water supplied by the City of Cornwall)**
Operations manager:	**Chris Eamon (613)-551-2720**

This report is a summary of water quality information for the St. Andrews/Rosedale Distribution System, published in accordance with Schedule 22 of Ontario's Drinking Water Systems Regulation for the reporting period of January 1, 2009 to December 31, 2009. The St. Andrews/Rosedale Distribution System 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 Stormont. A copy of the Summary report is to be provided to the members of the municipal council not later than March 31, 2010.

"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

Water enters from the Cornwall Distribution System at two points, one on Mack Street and one at the corner of Highway 138 and Cornwall Centre Road. Each of these locations contains a metering chamber, which is owned and monitored by the City of Cornwall. In each of these metering chambers, a system of check valves has been installed to prevent backflow into the Cornwall Distribution System.

The booster pumping station and re-chlorination facility consists of the following:

- Duty pumps – two vertical in-line centrifugal booster pumps (one duty, one standby) each rated at approximately 10.4 L/s at a Total Dynamic Head (TDH) of 12.5 m,

- Disinfection system – a sodium hypochlorite disinfection system with automatic switchover consisting of two (2) solution feed pumps each rated at approximately 0.315

L/h at a pressure of 1750 kPa; a 100 L capacity hypochlorite solution tank with spill containment,

- Standby power – provision for connection to portable diesel unit,
- Instrumentation – flow meter and chlorine residual analyzer,

together with all necessary mechanical and electrical work, instrumentation and controls.

The elevated tank is located on the south side of County Road 18. It has a ground elevation of 71.5m. The tower's overflow is at an elevation of 120.3 m. The main water storage cavity is 9.4 m in diameter. It has an effective capacity of 770 m^3. It is fed and emptied via a 200 mm diameter riser.

The tower is equipped with a Rosemount pressure sensor, which sends signals to the lift station to turn the pumps on or off.

Compliance with Terms and Conditions of the Certificate of Approval

The St. Andrews/Rosedale Distribution System is operated and maintained in accordance with O. Reg. 170/03 dated June 1, 2003 (last amendment – O. Reg. 418/09) and Certificate of Approval No. 6314-654PDH dated September, 2004.

The distribution system is operated to treat water at a rate not exceeding the maximum flow rate of 898 m^3/day. The flows into the treatment system did not exceed the maximum flow rate at any time during the year. The average water taking for the year was 212m^3/day, 24% of the authorized water taking.

Free chlorine residual in treated water is continuously monitored at the point of entrance into the distribution system. The Prominent chlorine analyzer is accurate to ±2% of the measured value. The online analyzer is monitored, at minimum, every 72 hours. The on-line chlorine analyzer is checked with the hand-held chlorine analyzer and adjusted as required. An alarm system calls out when the chlorine goes below 0.10 mg/L or above 3.50 mg/L. Operators at the St. Andrews Booster Stations try to keep the chlorine residual around 0.60 mg/L. (See Appendix I for flows and average chlorine residual.) The chlorine analyzer was calibrated July 7, 2009 by Ken Harris Instrumentation.

Operators in charge of the St. Andrews Booster Station keep a daily log book recording flow meter readings, free chlorine residual (both continuous and grab samples), and other physical and chemical parameters of the treated water. The booster station is checked (at minimum) every 72 hours.

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 (10 samples per month) on the distribution samples, (representing the water stream from which they are taken) and trihalomethanes are analyzed 4 times a year. (See Appendix II for chemical parameters.) All samples are analyzed at Caduceon Environmental Labs in Nepean, Ontario. Caduceon and its 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.

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 III. Under Ontario Regulation 170/03, Schedule 15, Section 15.1-5, the St. Andrews/Rosedale Distribution system is eligible for reduced sampling and reduced frequency (every 3 years).

Free chlorine residual in the distribution system is monitored by an alarmed online analyzer with datalogging. The analyzer is checked (at a minimum) every 72 hours. The distribution analyzer will alarm out when the chlorine residual goes below 0.15 mg/L for a period greater than 15 minutes. The distribution chlorine analyzer was calibrated July 7, 2009 by Ken Harris Instrumentation.

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

The St. Andrews/Rosedale Distribution System is classified Water Distribution 2 (Certificate Number 3669). Operators responsible for the operation of the St. Andrews/Rosedale Distribution System hold valid licences applicable to this type of water distribution system.

Following all maintenance or repairs to the water distribution system, 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 (Chlorine, liquefied gas) 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 is in the process of being updated and implemented to ensure adequate equipment and material are available for dealing with emergencies, upset conditions and equipment breakdowns in the works.

An operating manual is in the process of being updated, incorporating the requirements of the Certificate of Approval. The manual will include 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 will also contain procedures that are required for adequate operation and maintenance of the monitoring equipment. The manual will be completed upon acceptance by the MOE of the Quality Management System Plan submitted October 22, 2009.

Drawings will be 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 water booster station and the elevated storage reservoir has been prepared and kept up to date, including timely incorporations 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. (See Appendix VI for complaint form.)

Non-Compliance with Regulatory Requirements and Actions Required

The Ministry of the Environment conducted an unannounced inspection of the St. Andrews/Rosedale Distribution System on February 10, 2009 for the 2008/2009 inspection period. This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the report.

1. All trihalomethanes water quality monitoring requirements prescribed by legislation were not conducted within the required frequency. Samples are required to be taken and tested for THM's every 3 months. Each sample that is required to be taken and tested every 3 months must be taken between 60 and 120 days after the previous sample was taken. A review of the DWIS records for the subsystem revealed that the quarterly samples were taken on February 19, 2008; July 7, 2008; September 2, 2008; November 10, 2008 and February 9, 2009. The samples taken on February 19, 2008 and July 7, 2008 were taken 139 days apart and therefore, were not in compliance with ss. 13-6(1) and 6-1.1(4) of O. Reg. 170/03.

Action(s) Required
The Operating Authority was aware of the sampling non-compliance when questioned by the Inspector. The late sample was taken upon becoming aware of the non-compliance issue and sufficient steps have been taken to ensure the samples are taken at the required times in the future. No further actions are required.

Maintenance

- Jan. 15 – repaired communication line between water tower and booster station (Bell Aliant)
- Feb. 9/09 – replaced Endress and Hauser recorder (Ken Harris Instrumentation)
- Feb. 10/09 – compliance inspection (MOE)
- May 26/09 – repaired door slide bolt and hinges (Cornwall Glass)
- July 23 – replaced pH probe on chlorine analyzer (Ken Harris Instrumentation)
- July 29 & 31 – Township conducting flow testing on hydrants
- Dec. 13 – ran system manually due to planned power outage

APPENDIX I
FLOW DATA

ST. ANDREWS/ROSEDALE DISTRIBUTION SYSTEM SUMMARY REPORT

Municipality: Township of South Stormont

Reporting Year: 2009
Water Source: St. Lawrence River

Description: Water received from City of Cornwall

Month	Treated Flow			Treated Water Physical/Chemical Parameters					
	Total Flow m^3	Avg. Day m^3/day	Max. Day m^3/day	Free Chlorine (Booster Station) Avg. mg/L	Min. mg/L	Max. mg/L	THM mg/L	Safe Distribution	Unsafe/Poor Distribution
January	5,582	180	271	0.92	0.50	2.05		10	
February	4,801	171	278	0.93	0.51	5.02	0.044	10	
March	5,402	174	241	0.77	0.43	2.01		10	
April	6,637	221	786	0.76	0.34	4.44		10	
May	6,952	224	710	0.77	0.44	1.57	0.045	10	
June	7,712	257	458	0.73	0.46	2.10		10	
July	7,117	230	513	0.79	0.46	2.95		10	
August	9,058	292	517	0.85	0.41	1.62	0.043	10	
September	6,627	221	421	0.88	0.24	2.70		10	
October	6,441	208	480	0.86	0.30	2.62	0.061	10	
November	5,379	179	237	0.86	0.53	1.71		10	
December	5,901	190	245	0.87	0.23	2.28		10	
Total	77,609							120	0
Average		212		0.83			0.048		
Minimum					0.23				
Maximum			786			5.02			
ODWS							0.100	120	

APPENDIX II
LABORATORY ANALYSIS RESULTS

St. Andrews/Rosedale Distribution System

Microbiological parameters	MAC	Number of Samples	Range CFU/100 mL	Adverse Water Incidences	Typical Source of Contamination
Total Coliform (CFU/100 mL)	0	120	0-<1	0	Indicates possible presence of fecal matter
E. Coli (CFU/100 mL)	0	120	0-<1	0	Definite indicator of fecal matter
HPC (CFU/1 mL)	N/A	38	0-22	0	Cannot distinguish harmful forms of bacteria from harmless forms.

Booster Station

Physical Parameters	MAC	Number of Samples	Annual Average (range)	Adverse Water Incidences	Typical Source of Contamination
Free Chlorine (mg/L)	--	8760	0.83 (0.23-5.02)	0	Based on MOE Procedure B13-3 a minimum free chlorine residual of 0.2 mg/L and a maximum free residual of 3 mg/L should be maintained at all times in order to control microbiological quality in the system.

Distribution System

Physical Parameters	MAC	Number of Samples	Annual Average (range)	Adverse Water Incidences	Typical Source of Contamination
THM's (mg/L)	0.100*	4	0.048 (0.043-0.061)	0	Chlorine combining with naturally occurring organics (precursors) left in the water after filtration
Free Chlorine (mg/L)	--	8760	0.56 (0.15-2.57)	0	Based on MOE Procedure B13-3 a minimum free chlorine residual of 0.2 mg/L and a maximum free residual of 3 mg/L should be maintained at all times in order to control microbiological quality in the system.

MAC - Maximum Acceptable Concentration
mg/L - milligrams per litre
NA - not applicable
NTU - Nephelometric Turbidity Unit
*Running annual average of quarterly samples

APPENDIX III
LEAD RESULTS SUMMARY

Lead Sampling 2009

Distribution System

Physical Parameters	MAC	Number of Samples	pH Range	1st Litre Range	Alkalinity Range	Adverse Water Incidences	Typical Source of Contamination
Lead (mg/L)	0.010	6	7.51-7.75	<0.00002-0.0026	85-88	0	Present as a result of corrosion of lead solder, brass fittings containing lead or lead pipes. Lead ingestion should be avoided.

Plumbing serving private residences

Physical Parameters	MAC	Number of Samples	pH Range	1st Litre Range	2nd Litre Range	Adverse Water Incidences	Typical Source of Contamination
Lead (mg/L)	0.010	30	7.19-7.94	<0.00002-0.0020	<0.00002-0.0020	0	Present as a result of corrosion of lead solder, brass fittings containing lead or lead pipes. Lead ingestion should be avoided.