




TO: GENERAL COMMITTEE

SUBJECT: WATER OPERATIONS BRANCH 2015 ANNUAL REPORT
SUMMARY REPORT AND MANAGEMENT REVIEWS

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RECOMMENDED MOTION

1. That the "Water Operations Branch 2015 Annual Report to Council" (Annual Report to Council), dated February 1st, 2016, be received for information purposes.
2. That Staff Report ENV001-16, regarding the City of Barrie's Drinking Water System be received for information purposes. This Report covers legislative requirements under the O. Reg. 170/03, including the "Water Operations Branch 2015 Annual Report to Council", the "2015 Drinking Water System Annual Report" summary for public posting (referenced to as Section 11 of the O. Reg. 170/03) and the "Municipal Summary Report" (referenced to as Section 22 of the O. Reg. 170/03).
3. That the Water Operations Branch Management Review Meeting Minutes for the 2015 year, dated May 15th, 2015, August 26th, 2015, December 14th, 2015, and January 18th, 2016 be received for information purposes.

PURPOSE & BACKGROUND

4. The purpose of this Report is twofold. First, to provide information to Council on the year's performance of the Water Operations Branch and to satisfy the regulatory requirements of the *Safe Drinking Water Act* (SDWA). This includes requirements under the Drinking Water Quality Management Standard (DWQMS) and regulatory reporting requirements under O. Reg 170/03 (Section 11 and Schedule 22). This Report is a compilation of information that demonstrates Water Operations commitment to providing safe drinking water to the citizens of the City of Barrie while being transparent with its financial accountability. Second, to solicit from Council an acknowledgement of their receipt of this Report.
5. The "Water Operations Branch 2015 Annual Report to Council" summarizes the operating year of January 1st, 2015, through to December 31st, 2015.

6. There are two specific reporting requirements related to the O. Reg. 170/03: the Drinking Water Systems Regulation (O. Reg. 170/03) under the Safe Drinking Water Act (SDWA):
 - a) Section 11 requires that an Annual Report be prepared not later than February 28th of each year. This Report provides a brief description of the drinking water system; chemicals used; a breakdown of monetary expenses related to required equipment; a summary of all test results; a summary of adverse reports and corrective actions taken. In addition, the Report entitled, "2015 Drinking Water System Annual Report", must be available to the public upon request and be posted for viewing on the City of Barrie website.
 - b) Schedule 22 requires a Summary Report be prepared not later than March 31st of each year and a copy forwarded to members of Municipal Council to enable to the owner of the system to assess the capability of the system to meet existing and planned uses of the system. This Report entitled, "2015, Municipal Summary Report", lists the non-compliances in respect to the SDWA, O. Reg. 170/03, the Municipal Drinking Water License, Drinking Water Works Permit and orders applicable to the drinking water system received, and the corrective measures that were taken in respect to the non-compliances. It also summarizes the quantities of the water supplied during the reporting year, including monthly average and maximum daily flows along with a comparison to the rated capacities.
7. In addition, under the DWQMS, there is an obligation for the Operating Authority to report the results of the management reviews, the identified deficiencies, decisions, and action items to the Owner.
8. Specific components of the "Water Operations Branch 2015 Annual Report to Council" (Annual Report) includes the summary for public posting titled "2015 Drinking Water System Annual Report" (referenced to as Section 11 of the O. Reg. 170/03) and the "Municipal Summary Report" (referenced to as Schedule 22 of the O. Reg. 170/03). A copy of the "Water Operations Branch 2015 Annual Report to Council" can be found in the Councilors' Lounge for review. A copy of the Executive Summary of the Annual Report to Council is attached as Appendix A of this Staff Report.

ANALYSIS

9. The City of Barrie drinking water system consists of a Surface Water Treatment Plant (SWTP) and associated Low Lift Pumping Station (LLPS), 12 ground water wells, three (3) in-ground storage facilities, three (3) elevated storage reservoirs and seven (7) booster stations, distribution water mains and associated hydrants, valves, and appurtenances in five (5) major pressure zones throughout the City.
10. Source water from the SWTP is drawn from Kempenfelt Bay of Lake Simcoe at a depth of approximately 22m. The intake is situated on the southwest side of the bay, where lake water is conveyed through the LLPS and pumped to the SWTP for treatment. Water supplied from the ground water system relies on wells drilled into a deep aquifer that is not under the direct influence of surface water.
11. The SWTP provides water to Barrie's two southern pressure zones. Its regulatory approved treatment process employs primary screening, flocculation, ultra-membrane filtration (primary and secondary) and granular activated carbon contactors (for taste and odour control) followed by disinfection using chlorine gas. Treatment at each of the well stations consists of iron sequestration by addition of sodium silicate and disinfection with chlorine gas (and in one case, ultraviolet disinfection). The two systems effectively operate as separate entities with provision for

- emergency backup augmentation. Key processes within the water supply, treatment and storage facilities are continually monitored, recorded and alarmed through the SCADA (Supervisory Control and Data Acquisition) system.
12. The distribution system consists of approximately 3,700 hydrants and approximately 620 km of water main and transmission main ranging from 100mm to 1200mm diameter in size serving approximately 43,800 services providing water to approximately 147,000 customers.
 13. The total annual production for 2015 was 13,493,385 m³, a very modest increase from 2014 with an average daily flow of 36,968 m³ (1.3% increase from 2014) and a peak flow of 54,606 m³ (1.7% decrease from 2014) in the month of July, 2015.
 14. The Ministry of the Environment and Climate Change (MOECC) inspection for the 2015 year is scheduled to occur in the first quarter of 2016. The primary focus of this inspection is to confirm compliance with the MOECC legislation and control documents as well as conformance with the MOECC drinking water related policies for the inspection period.
 15. The MOECC inspection for the 2014 year, received in 2015, identified two (2) non-compliances during the inspection period. The two non-compliances were: a slight exceedance of the daily rated capacity for Well 15; and record keeping as it relates to chlorination for secondary disinfection. At no time did the issues identified pose a risk to public health. Corrective actions were initiated and completed for the non-compliances noted above.
 16. Under the Water Operations Branch Quality Management System (QMS), Top Management (Water Operations Branch Management Team) is responsible for ensuring that a Management Review is conducted at least once every twelve months. This continual improvement process is a requirement under the DWQMS with the objective of identifying deficiencies and establishing action plans to address those deficiencies.
 17. Management Reviews were conducted May 15th, 2015, August 26th, 2015, December 14th, 2015, and January 18th, 2016. The following results are based on data up to and including December 31st, 2015.
 - a) There were seventeen (17) reported Adverse Water Quality Incidents (AWQI). These incidents were the result of mechanical, programming and communications failures and sampling techniques (operator and/or lab). All AWQI were addressed and fully resolved in compliance with regulatory requirements.
 - b) More than 23 km of water main were swabbed in 2015 under the Swabbing Program representing approximately 4.2% of the water mains in Barrie.
 - c) Raw water and drinking water quality trending revealed no major changes from 2014.
 - d) A total of 30,943 work activities were performed in 2015 between the Groundwater Supply, Surface Water Supply, Water Customer Services and Water Distribution Services sections of the Water Operations Branch.
 - e) A total of 39 main breaks occurred in 2015, a 45% decrease from 2014.
 - f) Continued efforts to improve the Advanced Meter Infrastructure (AMI) System has generated into greater than ninety nine percent (99%) of all water meters providing up-to-date and accurate meter readings for billing purposes throughout each quarter of 2015.
 - g) In 2015, an average of 45 customer complaints were received per month (compared to 25 in 2014). The extremely cold winter resulted in a nearly two hundred and seven percent (206.81%) increase in "No Water Calls" received during the first two quarters of the year as frozen water services. The majority of 2015's customer complaints were associated with frozen services, coloured water and low pressure from system flushing.

- h) One emergency mock scenario was conducted on November 26th, 2015. The mock scenario test involved various customer inquiries and system emergencies which progressed into increasingly difficult situations; frozen services, no water, taste issues and water main breaks culminating in a possible loss of supply from the SWTP.
 - i) One (1) Internal Audit was conducted yielding three (3) Corrective Action Reports (CARs) and seven (7) Opportunities for Improvement.
 - j) The 2015 Year 3 Reaccreditation Audit was conducted through an off-site desk top surveillance audit and an external auditor's on-site verification/audit of the City of Barrie Operational Plan in December 2015. The external auditor identified zero (0) non-conformances. This resulted in maintaining accreditation for the 2015/2016 operating year.
18. Pursuant to the *Safe Water Drinking Act, 2002*, the Municipal Drinking Water Licence (MDWL) and Drinking Water Works Permit (DWWP) were issued on October 21st, 2014, with an expiry date of October 20th, 2019.
19. Copies of the O. Reg. 170/03, the City of Barrie's Municipal Drinking Water License, the City of Barrie's Drinking Water Works Permit and the City of Barrie's Permit to Take Water; the "City of Barrie 2015 Drinking Water System Annual Report"; the "Municipal Summary Report"; the Water Operations Branch Management Review meeting minutes, and a copy of this Staff Report for the 2015 reporting period have been attached as "Appendices" to the "Water Operations Branch 2015 Annual Report to Council" to be presented to Council.

ENVIRONMENTAL MATTERS

20. There are no environmental matters related to the recommendation other than regulatory compliance.

ALTERNATIVES

21. As this Report is being presented, as required legislatively, for information purposes only, no alternatives are presented.

FINANCIAL

22. There are no direct financial implications associated with the recommended motions.

LINKAGE TO COUNCIL STRATEGIC PRIORITIES

23. The recommendations included in this Staff Report are not specifically related to any of City Council's Strategic Priorities but is a requirement of ongoing service delivery.

APPENDIX A

EXECUTIVE SUMMARY

TO THE WATER OPERATIONS BRANCH 2015 ANNUAL REPORT TO COUNCIL

The City of Barrie is very fortunate to have access to a healthy supply of raw water from two supply sources, groundwater and surface water. In 2015, 13,493,385 m³ (13.5 billion litres) of drinking water was produced and distributed to the City of Barrie residents. To put this volume into perspective, the amount of water that the Water Operations Branch pumped, treated and distributed in 2015 is equivalent to filling all the tanks at Ripley's Aquarium of Canada 2,367 times.

The purpose of this report is to provide information to Council on the year's performance of the Water Operations Branch and to satisfy the regulatory requirements of the Safe Water Drinking Act (SDWA), including the Drinking Water Quality Management Standard (DWQMS) and regulatory reporting requirements under O.Reg 170/03 (Section 11 and Schedule 22). This report is a compilation of information that demonstrates Water Operations commitment to providing safe drinking water to the citizens of the City of Barrie whilst being transparent with its financial accountability.

The City of Barrie Drinking Water System is comprised of the Surface Water Treatment Plant (SWTP) and associated low lift pumping station (LLPS), 12 ground water wells, 3 in-ground storage facilities, 3 elevated storage reservoirs and 7 booster stations that provide treatment, storage and pressures for firefighting purposes. Approximately six hundred and twenty kilometers (620km) of water main deliver water through 5 pressure zones to 43,800 services that provide water to approximately 147,000 customers whose consumption is measured by water meters.

The total annual production for 2015 was 13,493,385 m³, a slight increase with the average daily flow of 36,968 m³ (1.3% increase from 2014). In 2015, a peak daily flow of 54,606 m³ occurred in July 2015 (1.7% decrease from 2014).

The total cost to operate the City of Barrie Municipal Drinking Water System was approximately \$1,271.50/ML with 96.2% of the projected budget being spent and 99% of the projected water revenues being collected. This allowed for the transfer of approximately \$6,370,222 to the Water Rate Reserve Fund. **

The 2015 Operating Budget for the Surface Water Supply Section was under spent by approximately 9% due to salary gapping and major expenses (hydro and chemicals costs) associated with running a treatment plant of its size. As was completed in 2014, conservative numbers were used for the 2015 budget because of the unpredictability and trend towards declining demand. The Ground Water Supply Sectional budget was underspent in 2015 due to two projects valued at \$400,000 that were postponed until 2016. The total 2015 production and treatment costs amounts to approximately \$422.30/ML. **

Distribution crews repaired 39 main breaks, representing a 45% decrease from 2014, at an average cost of \$6,900.00 per main break. In 2015, the Water Distribution Sectional budget was overspent by 17%. The main expenditures were equipment rentals and materials (asphalt, sand and gravel) associated with the repair of main breaks, service breaks and many frozen services. In addition, staff resourcing shortfalls required the need for third party contractors to complete tasks such as frozen services and main breaks, with >\$200,000 being spent on Contracted Services. Total distribution system operating costs for 2015 amounted to approximately \$4715.00/km of watermain. **

The Water Customer Services Section budget was 10% under spent in 2015. The cost of customer care in 2015 decreased by approximately 9% based on the combined average of "cost per service" and "cost per customer" values. Accounts for Overtime, Contracted Services, Field Supplies and Equipment Repairs were all overspent as a result of the 235 frozen services that occurred. However, significant increases in revenue for bulk water sales, stop and drain replacements and backflow revenues aided in offsetting these overages. In addition, recruitment for two key full time positions within the Section was not completed until late 2015, which meant that the salary budget was underspent. The total cost of customer care amounts to approximately \$22.38/service or \$6.70/population served. **

The first full year in which the Corporation was an Ontario 1Call member was 2015. This mandatory membership allows residents and/or contractors interested in excavating (anywhere in Ontario) to obtain locates of buried infrastructure with a single request to Ontario 1Call. A total of nine thousand, five hundred and forty four (9,544) locate requests were received and completed in 2015, a nearly 50% increase over the total for 2014.

In 2015, water quality complaint investigations averaged 45 complaints/month, which is a 105% increase from 2014. The observed rise can be directly attributed to the extremely cold winter experienced in 2015, which resulted in a ninety percent (90%) increase in "No Water Calls" received during the first two quarters of the year due to frozen water meters and/or services. Positive feedback from field staff and customers regarding the level of service continues with the use of previously implemented programs like the use of a Field Liaison Person ("Green Vest") and increased public communications prior to and during the annual Swabbing Program.

Approximately 3,000+ samples were collected for analysis to be used to assess and optimize system performance, develop corrective actions, to ensure safe water for consumption and to meet legislative requirements. Ninety-nine point nine percent (99.9%) of all samples met regulatory compliance.

There were seventeen (17) reported Adverse Water Quality Incidents (AWQI). These incidents were the result of mechanical, programming and communications failures and sampling techniques (operator and/or lab). All AWQI's were addressed and fully resolved in compliance with regulatory requirements.

The 2015 Re-accreditation Audit was conducted through an off-site desktop systems audit and on-site verification audit of the City of Barrie's Operational Plan in December 2015. There were zero (0) non-conformances identified by the external auditor and accreditation has been maintained for the 2015/2016 operating year.

Management Reviews are a requirement of the Ministry of Environment and Climate Change's (MOECC's) DWQMS and assist in identifying deficiencies and establishing action plans. Management Reviews were conducted in May, August and December of 2015 and January of 2016.

The development, implementation and continual improvement of processes and projects within the Water Operations Branch are driven by the following 5 priorities:

1. *To ensure the delivery of Safe Drinking Water that meets or exceeds regulatory requirements.*
2. *To ensure the delivery of Safe Drinking Water that meets or exceeds expectations and promotes customer confidence.*
3. *To employ and retain a respectful, competent, motivated and adaptive workforce that is dedicated to teamwork, continual learning and improvement for the long term.*
4. *To continually improve operational performance in a timely, sustainable and cost effective manner.*
5. *To maintain an effective balance between expenditures and revenues.*

A review of these priorities and associated programs and projects completed in 2015 can be found in Section 2 of this Report.

****References to financials are based on the 2015 ledger before it was finalized (2015 Estimate) – excluding debenture costs**