March 09th, 2018

The Mayor and Council
Town of Cobourg
55 King Street West
Cobourg, Ont.
K9A 2M2

Dear Mayor Brocanier:

Re: Cobourg Water Treatment Plant
2017 Summary Report

We are pleased to provide the 2017 Summary Report. The report is required under the terms of Ontario Regulation 170/03, Schedule 22 and replaces the old “Compliance Report” that was required under the terms of the Certificate of Approval. This report includes the “Annual Report”, which is the short report with essential information that has already been advertised and made available for public viewing at Victoria Hall and at our office. It has also been posted on the Town website, which is a requirement for all municipalities with a water system serving more than 10,000 people. The Annual Report, prepared and distributed by February 28th, was also previously submitted to the Ministry of Environment electronically. In 2006, the requirement for submission to the MOE was deleted.

This Summary Report is intended for presentation to Council and I would recommend that it be formally accepted as you have in the past, once Council members have had an opportunity to review the report. I have provided an appendix for a resolution at the end of the report and I would suggest that a copy of the resolution be added to each copy of the report. A copy of the resolution would also be appreciated for our records.

I trust that the report meets with your satisfaction and we would appreciate any comments that you may have in order to tailor the report to your requirements.

If you would like any additional information, please feel free to contact us at your convenience.

Respectfully submitted,

Larry Spyrka
Manager of Water Services
MEMO

Date: March 09th, 2018
To: Mayor Brocanier and Council
From: Larry Spyrka, Manager of Water Systems
Subject: Cobourg Water Treatment Plant- 2017 Summary Report

Background:

As part of Ontario Regulation 170/03 under Schedule 22, I’m pleased to submit to Mayor and Council the 2017 Summary Report for the Cobourg Water Treatment Plant.

Discussion:

We have included four (4) bound copies and one (1) digital copy of the 2017 Summary Report for Council to review and we would recommend that it be formally accepted by Council with a resolution, as it has in the past. Once passed by Council, please attach a copy of the resolution to the last page in the document and forward a copy to Lakefront Utility Services Inc. for our records.

Recommendation:

Recommendation that: WHEREAS Council has received the Cobourg Water Treatment Plant 2017 Summary Report dated March 09th, 2018 from the Manager of Water Services, Lakefront Utility Services Inc.

Larry Spyrka
Manager of Water Services
Lakefront Utility Services Inc.
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Period of Operation

This report covers the operating period from January 1st, 2017 to December 31st, 2017.

Introduction

The Cobourg Water Treatment Plant takes water from Lake Ontario through an 856 metre long, 1050 mm. intake pipe. The raw water is pre-chlorinated and travels through a full treatment process including coagulation, flocculation, sedimentation and granular activated carbon filtration. The water is then chlorinated and after an appropriate detention time, it goes to a 6244 cu.m. in-ground reservoir, from where it is pumped to the distribution system. As the water is leaving the plant, the chlorine residual is rechecked and topped up to ensure a good residual in the distribution system.

The distribution system contains two pressure zones, each with its own elevated water storage tank. The Water Treatment Plant supplies water to the lower 1332 cu.m. Zone 1 tower, while a booster pumping station located between the two zones supplies water to the higher 3734 cu.m. Zone 2 tower. The booster station also has re-chlorination facilities, as does the Zone 1 and Zone 2 storage tanks.

In December of 2005, The Clean Water Act was introduced to promote water conservation and source water protection, while 2006 was to bring regulations to initiate a quality management system for all operating authorities. The Drinking Water Quality Management System (DWQMS) was finally implemented in 2007.

System Operation and Upgrades

Throughout 2017, the Cobourg Water System performed well, producing high quality water for our customers, as well as an ample supply for fire fighting requirements and new development within the municipality.

Water Treatment Plant

The Cobourg Water Treatment Plant operated very well in 2017. We continually worked on improving the processes at the Water Treatment Plant in 2017. There were many upgrades to the online analyzers and the SCADA (Supervisory Control and Data Acquisition) system. Staff replaced 5 on-line Turbidity analyzers (Raw Water, Clarifier Effluent, 2 Filter Effluent and Treated Finished Water), as well as a Suspended Solids meter for the filter backwash effluent. Both Filter Effluent Flow Mag Meters were replaced and new actuator valves were installed, this completes all the up-grades to the filtration process. The raw water Low Lift Pumps 1 & 2 had VFD (variable frequency drive) units installed for better efficiency and power consumption. As part of our energy conservation program we have replaced all the lighting at the Water Treatment Plant with LED lighting. General Diving completed another inspection of the clarifier
in 2017, there is some minor work needed that will be done in the spring of 2018, General Diving will also be completing minor repairs to the intake cribbing.

**Water Distribution System**

In 2017 the valve exercising program was challenged by failing equipment. This equipment was well past it's useful life expectancy. A replacement truck mounted valve exercising machine and truck have been ordered to replace the old unit. Staff are diligently working to get the program back on track. The contract for fire hydrant flow testing and painting with Skelly Engineering has been successfully completed. All hydrants in the system have been coated and colour coded in accordance with NFPA and AWWA standards. There were 6 watermain breaks and 3 service leaks in 2017. The deterioration of aging watermains continue to be a challenge to mitigate. In an attempt to improve water quality throughout the system, a more aggressive flushing program began in the fall of 2017. The flushing program will continue to attempt to improve water quality issues, with a focus on the downtown core. Harnden St., Matthew St., Blake St., Burke St., Victoria St., Henry St. and Perry St., all have a history of failures, water quality complaints, and flow restriction. Many of these streets are included in the 5 year capital plan.

The watermain on James St E, between Division and College was replaced in 2017 as part of the construction project. In preparation for the Strathy water tower to be taken out of service in 2019, distribution static pressure tests and fire hydrant flow tests were performed while the Strathy water tower was isolated. Test results were positive and found two issues that will be addressed before the project commences. One of the booster pumps was operated solely by the back up generator, the pump has been set up to run in conjunction with the others based on the tower level in Zone 2. The system also has the ability to operate based on pressure and flow demands in the system. Installation of a flow meter is required to properly monitor flows through the booster station during the period when Tower 2 is out of commission.

In collaboration with the Town of Cobourg, ARC GIS software and remote apps are currently being developed and implemented for asset management and operational efficiency. In the upcoming years the program will continue to grow and change as required to place LUSI in a leadership role in asset management.
Capital Work

James Street (College to Division)

We work with Cobourg Public Works on joint project replacing water main and sewer main on James Street between Division going east towards College, this was completed during the summer construction season.

Residential Water Meter Replacement Project

A multi-year joint project with Neptune to replace the Residential meters was initiated in 2017. LUSI staff started changing out older meters in late 2015 with the newer RF (Radio Frequency) meters. Neptune has replaced just over 2000 meter in 2017 and staff have replaced about 680 meters from 2015 to end of 2017. There are about 9000 residential in the Cobourg DWS, with the long-term goal is to replace them all. LUSI has budgeted to have Neptune replace 1000 meters in 2018.

Commercial Water Meter Replacement

This is another joint project that we have teamed up with Neptune, this project deals with the larger meters in the ICI (Industrial- Commercial- Institutional) sector, these meter sizes range from 1 inch to 6 inches to in size. An ICI meter audit was completed in 2015- 2016, this gave us a starting point to review what larger meters need to be inspected and serviced or replaced. We started replacing a few larger meters in 2017, while looking at our top 200 ICI customers through a field validation assessment program to compare the meter accuracy along with future recommendations for upgrades and to have an ongoing maintenance program for our ICI customers.

Cobourg WTP Workshop

We started construction of a new workshop/garage at the WTP in the fall of 2017, construction will be completed by September 2018 when the parking lot will be paved. This workshop gives staff a place to repair pumps, work on projects, and will move the water department inventory from the Ewart Street Facility.

DWQMS & Compliance

From a compliance standpoint, the Cobourg Drinking Water System met all regulatory requirements while continuing to provide safe clean drinking water. In 2017, Lakefront Utility Services Inc. successfully underwent an onsite, 3rd party re-accreditation audit of the Cobourg Drinking Water Quality Management System by NSF. Audits are completed annually to confirm conformance with the Drinking Water Quality Management Standard (DWQMS). The accreditation is valid for the next three years, at which point the system will be subject to another on-site audit. The final audit report identified six minor Corrective Actions, all of which have been addressed. See Appendix “D” – NSF Audit Report.

The Ministry of Environment and Climate Change conducted an announced compliance inspection of the Cobourg DWS on June 29, 2017. The Cobourg Water System received a final inspection rating of 100%. We continue to build a positive working relationship with the MOECC, and local health officials, while continually improving the water systems we manage.
Quantity of Water Provided

The volume of water allowed to be taken is regulated by Permit To Take Water (PTTW) No. 6423-8X8HF2. (See Appendix “E”). The permit allows water to be taken from Lake Ontario at a rate of 31,117 litres per minute, with a maximum taking of 31,822,000 litres (31,822 cu.m.) per day.

The summary of water consumption for 2017 (see Appendix “D”) indicates our average daily raw water flow for the year was 9,880 cubic metres/day, this is about 31% of the volume allowed in the Permit To Take Water. The highest daily flow was 12,521 cubic metres, which represents 39% of the allowable withdrawal volume. The average monthly flow for 2017 was down 2.4% from last year. There were no flow rate exceedances during 2017.

As indicated by these flows, the water system is operating well within the limits set out in the permit. We do not anticipate any problems with water supply in the near future.

The following table shows that the water demand on the system has not increased substantially over the last several years. Given the current water consumption trend for the Cobourg Water System, the plant will continue to meet the demands of the system in the upcoming years.

<table>
<thead>
<tr>
<th>DATE</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
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<tr>
<td>January</td>
<td>240,140</td>
<td>274,266</td>
<td>264,470</td>
<td>301,359</td>
<td>304,529</td>
</tr>
<tr>
<td>February</td>
<td>212,242</td>
<td>241,731</td>
<td>244,420</td>
<td>274,440</td>
<td>272,057</td>
</tr>
<tr>
<td>March</td>
<td>241,345</td>
<td>261,434</td>
<td>274,795</td>
<td>286,473</td>
<td>298,148</td>
</tr>
<tr>
<td>April</td>
<td>244,364</td>
<td>260,912</td>
<td>266,895</td>
<td>282,317</td>
<td>280,242</td>
</tr>
<tr>
<td>May</td>
<td>273,605</td>
<td>286,293</td>
<td>309,858</td>
<td>314,471</td>
<td>307,533</td>
</tr>
<tr>
<td>June</td>
<td>270,975</td>
<td>300,966</td>
<td>295,289</td>
<td>339,209</td>
<td>325,781</td>
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<tr>
<td>July</td>
<td>304,658</td>
<td>316,342</td>
<td>329,294</td>
<td>357,698</td>
<td>310,174</td>
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<tr>
<td>August</td>
<td>323,862</td>
<td>298,688</td>
<td>305,275</td>
<td>347,471</td>
<td>320,726</td>
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<tr>
<td>September</td>
<td>273,049</td>
<td>296,882</td>
<td>289,269</td>
<td>313,133</td>
<td>310,503</td>
</tr>
<tr>
<td>October</td>
<td>276,987</td>
<td>280,323</td>
<td>271,640</td>
<td>295,147</td>
<td>301,636</td>
</tr>
<tr>
<td>November</td>
<td>249,306</td>
<td>262,177</td>
<td>282,876</td>
<td>281,808</td>
<td>291,155</td>
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<tr>
<td>December</td>
<td>258,078</td>
<td>262,944</td>
<td>295,188</td>
<td>300,199</td>
<td>301,999</td>
</tr>
<tr>
<td>Total Flow</td>
<td>9,168,611</td>
<td>9,342,957</td>
<td>9,429,267</td>
<td>9,693,726</td>
<td>9,606,484</td>
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<tr>
<td>Monthly Avg.</td>
<td>264,051</td>
<td>278,580</td>
<td>285,772</td>
<td>307,810</td>
<td>300,540</td>
</tr>
<tr>
<td>Monthly Max.</td>
<td>323,862</td>
<td>316,342</td>
<td>329,294</td>
<td>357,698</td>
<td>320,726</td>
</tr>
<tr>
<td>Monthly Min.</td>
<td>212,242</td>
<td>241,731</td>
<td>244,420</td>
<td>274,440</td>
<td>272,057</td>
</tr>
<tr>
<td>Average Daily Flow</td>
<td>8,681</td>
<td>9,157</td>
<td>9,391</td>
<td>10,089</td>
<td>9,880</td>
</tr>
<tr>
<td>Max. Daily</td>
<td>15,339</td>
<td>11,843</td>
<td>14,039</td>
<td>13,406</td>
<td>12,521</td>
</tr>
<tr>
<td>Rated Capacity</td>
<td>31,822</td>
<td>31,822</td>
<td>31,822</td>
<td>31,822</td>
<td>31,822</td>
</tr>
</tbody>
</table>
Sampling and Analysis

All water quality testing for 2017 was conducted in accordance with the Safe Drinking Water Act, 2002 and Ontario Regulation 170/03. All analysis is done by SGS Lakefield Research Ltd., an accredited laboratory.

The bacteriological test results table lists all bacteriological sampling performed on the raw, treated, and distribution water during 2017. (See Appendix “G”)
Positive bacteriological analysis results in the raw water are normal for surface water sources. The treated water sample results, indicate that the water treatment plant is effectively removing all undesired bacteria from the raw water.

Chemical test results, contained in Appendix “H”, indicate that the water supplied to our customers does not contain elevated levels of any chemicals known to have effects on human health, many of the test results are well below the Maximum Acceptable Concentration (MAC) for the associated parameter. In most cases, the results are below the Method Detection Limit (MDL), as indicated by the (<) symbol beside the recorded number. This means that our water contains no traces of the chemical, or a smaller concentration than can be detected by current laboratory testing. It should also be noted, that the arsenic and uranium levels continued fall well below the provincial standards in the raw water and are further reduced through the treatment process.

Testing over the past year has been conducted based on the reduced lead sample schedule after there were some inconsistencies found in previous years’ sample data. Tests continue to show no evidence of elevated lead levels in the Cobourg Drinking Water system. In accordance with the lead testing regulations, another 30 residential, 3 commercial and 4 distribution samples will be analyzed. Based on the results of these samples, the Cobourg DWS will once again be eligible for the plumbing exemption sample schedule.

In 2017 there were no adverse water quality test results. There was one incident in which an observation of adverse conditions was reported to the MOECC and MOH. The incident occurred during the re-construction of James St., when a new length of watermain exceeding 6 metres was tied in to the existing water infrastructure. A boil water advisory (BWA) was issued to the affected residents as a precaution. Bacteriological samples were taken from three points on the isolated main, all of which indicated there were no contaminants in the system. The BWA was lifted under direction of the medical officer of health.

Treatment Chemical Usage

The Cobourg Water Treatment Plant uses chlorine gas as a disinfectant. During 2017, 9,768 kilograms of chlorine was used in the water treatment process.

Aluminium sulphate (alum) is used to assist in the removal of particulate matter (turbidity) in the water. During 2017, 122,155 litres of liquid alum was used in the treatment process, 14% less than 2016.

All chemicals used in water treatment must meet the current AWWA and ANSI/NSF 60 requirements. Appendix “G” documents our compliance with these standards.
Monitoring and Recording

Flow measuring devices that allow LUSI to record the volumes of water taken from Lake Ontario and the flows delivered to the distribution system are in place. These meters are calibrated annually and the results of the 2017 calibrations are included in Appendix “J”.

The other instrumentation (chlorine analyzers and turbidimeters) are calibrated by the operations staff, as required by operating conditions, manufacturers recommendations and by comparison with the results from daily testing.

Regulatory Compliance

As indicated in this report, to the best of our knowledge we have operated the Drinking Water System in compliance with the terms and conditions of the Drinking Water Works Permit, Municipal Drinking Water Licence, Certificate of Approval and the Permit to Take Water and all applicable regulations.

We are confident that the water system is in good operating condition and will provide good quality drinking water to our customers for the foreseeable future.

As per the terms and conditions of Ontario Regulation 170/03, Schedule 22, this 2017 Summary Report is duly signed and submitted to the Mayor and Council of the Town of Cobourg.

Larry Spyrka
Manager of Water Systems
Lakefront Utility Services Inc.