

NO: R072

COUNCIL DATE: April 23, 2018

REGULAR COUNCIL

TO: **Mayor & Council**

DATE: **April 19, 2018**

FROM: **General Manager, Engineering**

FILE: **5600-43**

SUBJECT: **City of Surrey Water System Annual Report for 2017**

RECOMMENDATION

The Engineering Department recommends that Council:

1. Receive this report for information; and
2. Direct staff to forward to the Medical Health Officer (“MHO”) in accordance with the requirements of the *Drinking Water Protection Act*, a copy of this report and the related report titled “City of Surrey Water System Annual Report for 2017”, a summary of which is attached to this report as Appendix “I”.

INTENT

This report represents the 2017 Annual Report of the City of Surrey Water System, which has been prepared in accordance with the requirements of the *British Columbia Drinking Water Protection Act*.

DISCUSSION

As a water system operator, the City of Surrey monitors on an on-going basis the quality of the water it delivers to its customers. Section 15(b) of the *British Columbia Drinking Water Protection Act* (the “Act”) (provincial regulation) requires a water supplier to report the results of water quality monitoring in accordance with the requirements described in Section 11 of the *Act*. The City satisfies this requirement through the preparation of an annual written report that is made available to water consumers and is forwarded to the MHO as information. The City, in cooperation with the Fraser Health Authority (“FHA”) and Metro Vancouver, has developed a water quality monitoring and reporting plan for the City’s water distribution system. The protocol document sets out monitoring parameters, the reporting structure and response plans to emergency situations such as incidents of high bacteria counts or other types of contamination, should they occur.

A Summary of the City of Surrey Water System Annual Report for 2017 is attached to this report as Appendix "I". This full report will be available for viewing on the City's website and forwarded to the MHO subject to approval by Council of the recommendations contained in this report.

The City of Surrey purchased all of its water in 2017 from Metro Vancouver. Metro Vancouver monitors all of the parameters of the City's source water within the Metro Vancouver system from the reservoirs of the North Shore Mountains through the Metro Vancouver distribution system to the delivery points in Surrey.

Within the City distribution system, samples are taken on a regular basis and tests are conducted on those samples which include bacteria, turbidity (cloudiness), as well as chemical and physical parameters unique to distribution systems. Weekly samples are obtained at 51 water sampling sites located strategically across the City's water distribution system. These samples are collected by Metro Vancouver staff and are forwarded to the Metro Vancouver testing laboratory in Burnaby.

In 2017, three thousand one hundred fourteen (3,114) water samples were analyzed for E. Coliform and Total Coliform and all of the samples were found to be in compliance with Schedule A of the B.C. Drinking Water Protection Regulation and the Guidelines for Canadian Drinking Water Quality. These bacteria occur naturally in water, soil and vegetation. When total coliform bacteria are present in a water sample, it may indicate a change in water quality or a sampling error.

Chlorine Levels

Our low chlorine residual results in our distribution system have improved by 70% from 2015 to 2017. Although there has been improvement in our chlorine residual, at times portions of the City's distribution system have experienced lower than desirable chlorine residual. The lower than desirable chlorine residual values may be attributed to mainline segments which are "dead ended"; that is they are not looped or interconnected with other segments of mainlines. The City, where possible, is requiring looping of existing dead-ended mains either as new development occurs or through Capital Projects. Where it is not possible to loop, blow offs, which are valves that are installed at the end of the non-looped water mains that gives the City the availability to flush the water main at main ends. Further, the City institutes a flushing and maintenance program to improve water quality in affected areas.

Cross Connection Control Program

The City administers a comprehensive Cross Connection Control program to minimize the risk of contaminants originating from private properties entering into City's water network and private property's plumbing system. The program includes enforcement of annual testing of backflow preventers, installation of backflow preventers for all new construction (plumbing permit requirement) and existing industrial, commercial and institutional properties by a cross connection survey requirement.

In 2017, the number of testable backflow preventers registered with the City increased by 944 (8.5%) for a total of 12,040 devices. These assemblies were installed through development, renovations or the cross connection control survey requirement. Annual testing of back flow preventers is required by the City and the results show 97% of the devices have successfully passed the test. Owners that are found to be in non-compliance were notified to comply or face Bylaw enforcement.

SUSTAINABILITY CONSIDERATIONS

The City of Surrey Water System Annual Report for 2017 supports the objectives of the City's Sustainability Charter 2.0. In particular, this Annual Report relates to the Sustainability Charter 2.0 theme Water. Specifically, this Annual Report supports the following Strategic Direction (SD) and Desired Outcome (DO):

- Water, Air and Soil SD6: Develop and encourage stronger policies and strategies that support clean water, soil and air; and
- Water DO16: Surrey's water is clean, abundant and safe for drinking

CONCLUSION

The City remains diligent and proactive in monitoring, operating and maintaining the City's water distribution system to ensure that the City's water customers continue to receive safe and clean drinking water.

Based on the above discussion, it is recommended that Council:

1. Receive this report for information; and
2. Direct staff to forward to the MHO in accordance with the requirements of the *Drinking Water Protection Act*, a copy of this report and the related report titled "City of Surrey Water System Annual Report for 2017", a summary of which is attached to this report as Appendix "I".

Fraser Smith, P.Eng., MBA
General Manager, Engineering

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Appendix "I" - Summary of the City of Surrey Water System Annual Report for 2017

Summary of the City of Surrey Water System Annual Report for 2017

In 2017, the City of Surrey purchased all the water that it supplied to its residents from Metro Vancouver (i.e., the Greater Vancouver Water District).

The City’s water distribution mains are approximately 1,857 km in length making it the longest distribution network in British Columbia. Main length increased by 0.4% in 2017 due to growth and development.

Surrey’s geography and development pattern is serviced with 39 pressure zones and nine pumping stations.

The City’s maintenance program includes a unidirectional flushing program of its mains once every five years. This is to maintain high water quality throughout the distribution network. This program combined with pipe upgrades and water supply controls by Metro Vancouver has minimized the need for any abrasive, or mechanical cleaning of the City’s water mains.

Monitoring of the water quality within the City’s system is undertaken at 51 strategically located sampling sites. Weekly samples are collected and then tested by Metro Vancouver at their Water Laboratory in Burnaby. Tests include bacteriological analysis, turbidity, and chlorine residuals.

In 2017, 16% of the City’s water operating and maintenance budget was spent ensuring the City’s water quality met the B.C. Drinking Water Protection Regulation (“BCDWPR”). Three thousand one hundred fourteen (3,114) water samples were analyzed and all were in compliance with Schedule A of the BCDWPR.

The City has response procedures dealing with water quality issues or infrastructure failures such as water main breaks. These procedures incorporate steps for repairs and communication between the City, Metro Vancouver, and Fraser Health Authority (“FHA”).

Chlorine residuals are monitored throughout the distribution system. In 2017, 90% of the 3,114 samples taken were greater than 0.2 mg/L (increase of 16% from 2016).

Where there are increased Heterotrophic Plate Counts (“HPC”), as the result of low chlorine residual and circulation issues, staff flush the affected section to replace water in the mains thus increasing chlorine residuals. HPC is not mandatory under the 2017 Guidelines for Canadian Drinking Water Quality; however, the City of Surrey continues to use this methodology to ensure the quality of the water is maintained. The City continues to improve these low flow areas by looping of mains and increased water usage through service connections to new residences and businesses.

Metro Vancouver Water Laboratory performs tests quarterly on water within the City’s system for disinfection by-products (Haloacetic Acids and Trihalomethanes), and semi-annually for pH and select metal concentrations. Sampling sites for these tests were selected in accordance with a monitoring and reporting plan established between the City and Metro Vancouver staff. The results of these tests meet or exceed the 2017 Guidelines for Canadian Drinking Water Quality.

In 2017, a total of seven chlorine analyzers were added to the following pump stations: Clayton, Grandview, Kennedy, Newton, Sunny Side 1 & 2 and Whalley. Through SCADA, the levels of free chlorine in the water leaving the reservoirs and entering the City's distribution system can be continuously monitored online.

There were no reported incidences of tampering or vandalism with the City's water system in 2017. System security includes lighting, locks, and alarms at pump stations as well as back flow prevention check valves on service connections. The City also has a cross-connection program to guard against contaminants entering the system due to faulty connections.

In 2017, the number of testable backflow preventers registered with the City increased by 944 (8.5%), for a total of 12,040 assemblies. These assemblies were installed through development, renovations or the Cross-Connection Control ("CCC") survey requirement. Through the CCC survey, the City ensures institutional, Commercial and Industrial ("ICI") operations remain in compliance with the Surrey Waterworks Cross Connection Control By-law, 2013, No. 17988.

The City of Surrey remains diligent in maintaining its water distribution system to high quality standards and in ensuring the delivery of high quality water to the City's residents and businesses.