

The Corporation of the City of Kawartha Lakes
Committee of the Whole Report

Report Number WWW2019-009

Date: September 10, 2019
Time: 1:00 p.m.
Place: Council Chambers

Ward Community Identifier: All

Title: Wastewater Effluent Monitoring Feasibility Review

Description: Review of the feasibility and financial impacts of metering sanitary sewage discharge on the overall user rate for Institutional, Commercial, and Industrial (ICI) properties

Author and Title: Rob MacPherson, Water and Wastewater Technician

Recommendation(s):

That Report WWW2019-009, **Wastewater Effluent Monitoring Feasibility Review**, be received; and

That this recommendation be brought forward to Council for consideration at the September 24, 2019, Regular Council Meeting.

Department Head: _____

Financial/Legal/HR/Other: _____

Chief Administrative Officer: _____

Background:

At the Council Meeting of March 19, 2019, Council adopted the following resolution:

12.1.32 CW2019-077

That the March 19th, 2019 memorandum from Mayor Letham regarding **Wastewater Billing**, be received; and

That staff be directed to review the feasibility and financial impacts of metering sanitary sewer discharge on the overall user rate for Institutional, Commercial and Industrial (ICI) properties connected to municipal wastewater systems and report their findings to Council no later than Q3, 2019.

Carried

This report addresses that direction.

Rationale:

The City of Kawartha Lakes follows the best practices outlined in the *Canada-wide Strategy for the Management of Municipal Wastewater Effluent Model Sewer Use By-law, 2009*, created by the Canadian Council of the Ministers of the Environment (CCME) with regards to City sewer systems. The CCME Model Sewer Use By-law consists of a “Core” by-law, intended for smaller communities that are primarily residential, with additional “Advanced Clauses” that provide options for industrial sewer use controls and other source protection initiatives. The intent is to ensure that the municipal water and sewage systems are using modern practices and are sustainable over the long term. These best practices ensure the protection of the health of its residents and the environment. The concepts of user-pay and full cost pricing are key elements to this end. Currently, the City of Kawartha Lakes, as with most other municipalities in Ontario, install flow meters on municipal water services being used to track each property’s volume of water consumption. Utility services then use the measured water consumption to calculate the amount of wastewater entering the sanitary sewage system.

Staff reviewed best practices among municipal wastewater utilities across North America, particularly within Ontario. All of the municipalities based their wastewater volumes on their metered water volume consumption with varying degrees of rate structures. The three basic rate structures identified for metered services associated with sanitary waste are:

Declining Block Rate – this rate structure charges a successively lower price for set volumes, as consumption increases through a series of "blocks." That is to say that within set volume ranges, or blocks, the charge per-unit is set at one rate. Within the next volume range, the charge per unit decreases to a lower rate, and so on. This type of structure is typically used to represent the commodity nature of water and that larger users may place less cost on the system on a per unit marginal cost basis. Although there are a fair number of utilities with this type of structure, there has been a decline in popularity in recent years due to the fact that residential customers will typically pay higher rates for their services than non-residential customers.

Larger municipalities such as Toronto and Peel apply this type of rate structure for ICI properties connected to municipal services but all use very stringent acceptance criteria before a business will receive this rate structure as the metering process usually costs more than the price reduction in the user rate. The business applying for the reduced rate has to hire a third-party consultant, at their own cost, to verify at least a minimum of 15% of the water consumed was not re-entering the municipal sewer system. The business would also be responsible for the cost of installing a flow meter, the maintenance, and calibration costs required for the equipment, and the cost associated with monitoring the equipment. That is why all of the municipalities researched that use this rate structure require a minimum water volume consumption of 4000 m³ (4,000,000 L) per month before the municipality would enter into an agreement as it was determined it would not make financial sense for the municipality or the business below these volumes. Once the business had consumed over 4000 m³ in one month, a thirty percent reduction was provided on the consumption rate past 4000 m³. 4000 m³ of water is a considerably higher consumption usage than any ICI property within CKL presently use.

Increasing (or Inverted) Block Rate – the increasing block rate works essentially the same way as the declining block rate, except that the price of water in successive blocks increases rather than declines. Under this method the consumer's bill rises faster with higher volumes used. This type of structure is considered a "conservation" rate structure and is typically used by communities with water shortage issues to reflect the burden on the limited water supply placed by larger users and/or users with widely varying demands.

Constant Rate – this rate is a volume-based rate, in which the consumer pays the same price per unit consumed, regardless of the volume. All residential, institutional, commercial, and industrial customers pay a fixed monthly charge based on the metered volumetric charge collected through the amount of water used each month.

This rate is typically considered the most effective structure to be used by a municipality because it is by far the easiest to understand and implement, follows all related Federal and Provincial Acts and ties relatively well with the cost of

service. According to the CCME, that is why 83% of municipalities in Ontario base their sewage charges on their metered water consumption in a uniform, constant rate. The City of Kawartha Lakes uses this rate structure.

With consideration of the above information, Staff recommend keeping the rate structure the same and not implementing an effluent metering program within the City.

Other Alternatives Considered:

In the existing structure, all residential, institutional, commercial, and industrial customers pay a fixed monthly charge based on the size of their water meter and then a volumetric charge based on the amount of water used each month. The wastewater charges are then based on the volume of their metered water as set out in By-law 2018-039 – “A By-Law to Regulate Water and Wastewater Services in the City of Kawartha Lakes”.

As part of the by-law certain ICI properties that are not able to meet the identified effluent concentration limits are still able to release their wastewater into the sewer system if they enter an Extra Strength Surcharge Agreement (ESSA) with CKL. This process is also referenced as an “Advanced Clause” of the CCME Sewer Use Model. Although high-strength wastewater produced by certain industrial/commercial dischargers is capable of being treated at our Water Pollution Control Plants there is a higher cost associated with the process to treat high-strength wastewater. Treatment requires additional chemicals, electricity, and wears down the treatment equipment faster. The intent of the program is to recover the additional costs associated with the treatment of high-strength wastewater discharge as a way to support the sustainable operation and maintenance of the Water Pollution Control Plants (WPCP) within CKL.

As there are no ICI properties in CKL that are potentially consuming volumes of water to make an effluent metering program feasible for the municipality to administrate, one potential alternative to consider would be to allow ICI properties that have entered into an ESSA the ability to install an approved meter on their waste stream at their own cost. They would need to prove that the property is not releasing a similar flow into the sewer system as their water meter would indicate, and all of the wastewater would need to be measured. The property would also be required to maintain and calibrate the device per manufacturer specifications and provide the updated information to the City accordingly.

As discussed previously, it should be noted that the vast majority of municipalities in Canada base their sewage charges on their metered water consumption. This has been determined by multiple government agencies as the best practice for utility services to charge their users in a fair and even way to

operate and maintain their respective wastewater treatment facilities and infrastructure.

Financial/Operation Impacts:

There are no financial implications from the recommendation provided in this report.

The financial implications of implementing a sewer metering program are explained herein. In order to install separate meters and maintain them for sanitary sewer discharge it would dramatically increase capital and operating costs. There are several considerations that must be made when accounting for the cost of metering sanitary sewer discharge for ICI properties. In most cases, the properties must hire a third-party to track their water consumption and confirm that a significant amount of water that was metered (usually in the 15 – 25% range) did not enter the sanitary sewer for it to make financial sense for the business to request a sanitary sewage meter. After speaking with local environmental consulting groups the estimated cost to monitor these flows for two to three months was \$6000 for mobilization/demobilization, installation of a rental flow monitor and field maintenance.

There are multiple styles of flow meters for commercial/industry waste but the most commonly utilized style is known as a magnetic flow meter as they are the most reliable and precise for measuring thicker sludge and wastewater effluent associated with ICI properties. The cost of a flow meter varies greatly as the meter selection depends on type waste traveling through the meter (dirtier wastewater will clog the meter and give false readings), pipe size, calibration costs and maintenance requirements. Magnetic flow meters vary in cost significantly, ranging from \$500-\$5000 based on sizing and effluent type. The installation cost will also vary as each property has unique needs (spacing, piping, confined spaces, etc.) and each qualified plumber has their own pricing rates. A reasonable estimate for a standard installation is an additional \$1000. Once the device is installed it will require annual calibrations and maintenance. As the City does not have the resources to track, calibrate, and maintain the meters, it will cost an additional ~\$500 for each meter to be serviced by a third-party every year.

For each property that has a sanitary sewer meter installed this represents an estimated cost of \$8,000 to \$12,000 for the first year and an additional \$500 for calibration and maintenance costs annually thereafter. The device life expectancy varies based on the type and concentration of effluent passing through the meter but is expected to last ~20 years before device replacement is required. These costs do not take into account the additional resources required by the municipality to track the devices and administer the program (i.e. track usage flows, document maintenance and calibration records, send utility bills,

contact properties out of compliance etc.). As there are over 800 ICI properties connected to municipal services within CKL this would represent a \$6,400,000 - \$9,600,000 (32.9 % - 49.3% of the 2019 Water and Wastewater Division budget) additional cost if flow meters were to be installed on the wastewater line, with an additional \$400,000 in calibration costs per year after installation (2.1% of the 2019 Water and Wastewater Division budget).

In a detailed review of a local manufacturing business, the typical monthly water consumption, and therefore the wastewater consumption was 136.3 m³. Assuming they are able to hire an environmental consultant and show that 15% of the flows are not entering the sewer system, that would mean that only 115.86 m³ is entering the sewer system. With this new flow, the business could potentially see a reduction in invoicing of \$29.86 per month through metering their waste stream. The business would pay an average of \$83.33 per month to maintain their flow meter (using a meter life span of 20 years and environmental consultant firm only hired once). Assuming the waste stream is compliant with the concentration limits set in By-law 2016-006 and no additional sampling or equipment is needed by City staff, it would cost approximately \$40.00 per month for the City to administer a sanitary meter program for the business. This means the business would be losing an additional \$93.47 per month to meter their waste effluent as opposed to using the consumption rate metered on their incoming water. Therefore staff do not recommend metering sanitary sewer discharge for Institutional, Commercial and Industrial (ICI) properties connected to municipal wastewater systems as it is not financially feasible to undertake.

Relationship of Recommendation(s) To The 2016-2019 Strategic Plan:

The recommendation to Council is consistent with the Council Adopted Strategic Plan in several ways:

Goal 1 “Vibrant and Growing Economy”– will be met through the proper servicing and collection of appropriate user fees to fund the maintenance, capacity and growth of the municipal water and wastewater systems.

Goal 3 “Healthy Environment” – will be met through community preparedness by ensuring that the necessary funds are secured in order to sustain water and wastewater infrastructure necessary to protect and prevent any adverse impacts towards the environment.

Enabler 3 “Municipal Service Excellence” – E3.3 Service Excellence – E3.3.1 –Review and adopt best municipal practices (and continue to review operational efficiencies using lean methodology).

Enabler 4 “Efficient Infrastructure and Asset Management” - E4.3
Environmentally efficient municipal infrastructure - E4.3.1 - Develop municipal operations and practices that lead toward environmentally efficient municipal infrastructure.

This Report is also in line with the City’s values, specifically continuous improvement and excellence, as the by-law aids in the sustainability of the municipal drinking water systems and wastewater systems as well as provides excellent, efficient, and safe services for the public of Kawartha Lakes.

Attachments:

Appendix A – By-Law 2016-006



Appendix A - By-law
2016-006.pdf

Consultations:

Director of Public Works, Public Works

Supervisor, Water and Wastewater Operations, Public Works

Department Head E-Mail: brobinson@kawarthalakes.ca

Department Head: Bryan Robinson