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2022 Water Compliance Update - Annual Summary

Risk Considerations

Region of Peel is committed to quality service in ensuring consistent supply of safe drinking water to its communities while protecting the natural environment.

Staff use annual inspections conducted by the Ministry of the Environment, Conservation and Parks along with in-house compliance checks and regular audits of the quality management system as mechanisms that identify opportunities for continual improvement and to address existing vulnerability. These methods involve a multi-layer coverage of processes and practices in the operation of the Region's drinking water systems, and management of existing and potential risks.



1. Drinking Water Quality Management System

Region's drinking water systems have been operating in conformance to the Ontario Drinking Water Quality Management Standard (DWQMS), as required by legislation, and maintaining their DWQMS accreditation status through annual third-party verification audits. These regular checks confirm Region's system performance and management processes with focus on continual improvement: maintenance of water infrastructure, monitoring of water quality, identification of potential risks and risk mitigation strategies including security, water treatment, and the impacts of climate change.

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Every year, staff completes a review and evaluation of the risks mandated by the province and other system specific risks to the delivery of safe drinking water with outcomes of measures that strengthen our water systems' capacity to prevent, mitigate, prepare for, and respond to emergencies. Also, every year, staff review the overall performance of the water systems during the Management Review, which aims to assess the adequacy, suitability to purpose and effectiveness of quality management, and the need for change and improvement of existing strategies.

2. Lead in Drinking Water

The Region's drinking water has consistently low levels of lead. Following the regulatory requirements, staff test drinking water twice a year in the distribution system (from hydrants) and private taps (inside homes and businesses). Test results are normally well below the acceptable lead level of 10 micrograms per litre (parts per billion).

Lead Testing Results 2012 – 2022

Drinking Water System	Distribution System Numbers			Private Plumbing Numbers*		
	Samples Collected	Exceedances		Samples Collected	Exceedances	
		#	%		#	%
Cheltenham	16	0	-			
Caledon Village – Alton	21	0	-			
Inglewood	14	0	-			
Palgrave – Caledon East	42	0	-			
South Peel	370	2	0.54%	1085	12	1.1%

* exempted from sampling private plumbing based on excellent results in the early years of the program

Lead is found in drinking water usually because of leaching from pipes made of lead or with lead fittings or welds. The use of lead plumbing was phased out throughout the 1970s and 1980s, leaving older homes and buildings at the highest risk of having lead plumbing. These older neighbourhoods may also have municipal service pipes, pipes between a municipal watermain and private property line, that contain lead.

If a drinking water test result exceeds the acceptable limit for lead, staff investigate the municipal service pipe and immediately replace it if it is lead-based. If a private water service pipe is found to be lead-based, Public Health staff assess the risks and encourage the property owner to replace the private plumbing or employ measures to reduce the lead levels at their tap.

If a lead-based municipal service pipe is discovered during watermain replacement work, it is replaced up to the private property line and the property owner is encouraged to replace their private water service.

Many communities throughout North America are proactively removing all lead from their water systems. In the interest of eliminating sources of lead in the Region's drinking water, Public Works and Public Health staff are collaborating to develop a program to identify and inventory all lead services throughout the Region and develop a plan to

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mitigate the risk and make the case for lead pipe removal. This is anticipated to be a multi-year project that will require engagement of local communities and significant funding.

3. Water Sector Cybersecurity

Safety of drinking water and protection of public health depends largely on the water system vulnerability to a variety of hazardous events, including natural disasters, equipment failure and other circumstances that can result in contamination or interruption to water supply. The list of potential threats and hazards to the integrity of water utilities has expanded in the last couple of years to include terrorist and vandalism actions and cybersecurity threats.

To deliver on our commitment to providing safe water supply, every year, staff review risks, taking into consideration cyber security threats. Review of municipal water system cyber resilience is now also expected through the amended mandates of the Ontario Drinking Water Quality Management Standard, including implementation of measures that improve cyber-defence of water infrastructure assets and reduce the risk of these threats compromising our ability to provide high-quality water to the customers.

In 2022, a security audit/penetration test (an authorized simulated cyberattack) was performed on the water supervisory control and data acquisition system (SCADA) to determine the level of risk from outside cyber threats. The system was found to be well protected. It maintained a virtual air gap between the internet and the Region's drinking water controls network using protective software and network hardware. In addition, several physical protections are in place at remote facilities to prevent unauthorized entry. Software protections are also in place at remote facilities to prevent unrecognized devices from plugging into the network remotely. The audit identified some minor improvements, and their implementation is ongoing with work to continue in 2023.

4. Source Protection and Climate Change Adaptation

Climate variability and the increasing changes in temperature and rainfall patterns (climate change) has been identified as a potential threat to drinking water quality, supply, and the environment. Climate change has been prescribed under Ontario drinking water legislation and, through the annual risk assessment, staff review its potential consequence on the Region's delivery of water services. This activity informs opportunities to implement control measures within existing systems and engineer solutions into future project designs.

Rise in temperature and precipitation and increased run-off of nutrients can stimulate the frequency and extent of algae blooms in Lake Ontario. Through source water protection and drinking water quality tracking programs, the Region has established a Harmful Algal Bloom Monitoring and Response Plan, which is reviewed and updated by Public Works and Public Health staff annually.

The Region jointly published and follows the requirements of the Credit Valley-Toronto and Region – Central Lake Ontario Source Protection Plan (Source Protection Plan) that identifies intake protection zones around our lake-based water treatment plants, and protection areas near our municipal wells. The Region's Risk Management Office performs inspections to identify and mitigate risks related to land use within these areas,

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with the interest of protecting sources of our municipal drinking water supplies. The Region also administers a well abandonment program that funds the safe abandonment of private wells that are no longer in active use, to eliminate potential sources of surface contamination into groundwater aquifers.

In support of the Source Protection Plan implementation, Region staff are part of the Lake Ontario Collaborative Group, together with City of Toronto and Durham Region, where information and best practices are shared, joint initiatives are undertaken, and, through which, occurrences of potential risks to source water are communicated.

One of the jointly implemented projects is the Lake Ontario Water Quality Forecasting System, which uses weather conditions and data from continuous monitoring analyzers in Lake Ontario to predict the direction, depth and spread of a contaminant in the lake and its potential to impact a drinking water intake over time. This new tool provides information for staff to make informed decisions on response level and duration of monitoring regarding spills into Lake Ontario.

In 2022, the Region staff facilitated installation of sensors at the raw water intakes to our water treatment plants that provide real-time monitoring data. Calibrated with the laboratory results, sensor data will be used to set action triggers to mitigate treatment process upsets and ultimately protect the quality of treated water.

Inflow and Infiltration

Climate change impacts to wastewater systems include increased potential for inflow and infiltration of stormwater into the sanitary sewer system. This may significantly reduce the capacity of the system, cause sewage backup in basements and area flooding as well as overwhelm wastewater treatment processes.

Region staff established the Inflow and Infiltration (I/I) Remediation Strategy that consists of investigative activities, studies, and remedial measures. The measures include home downspout disconnection, removing cross connections, maintenance hole and sewer lining, as well as construction of storage tanks and larger sewer pipes to collect the flow. Remedial measures with the highest return-on-investment are implemented first. Also, to address I/I in the Region's wastewater collection system, the Region has developed new design standards that are being implemented in newly constructed wastewater collection infrastructure.

5. Contaminants of Emerging Concern

In the last few years, with urban growth, increased modernization, and advancements in technology, more focus and awareness are directed toward contaminants of emerging concern and their impacts on the environment and human health. Examples include microplastics and per- and poly-fluoroalkyl substances (PFAS), which are not currently regulated nor included in the Ontario monitoring requirements for drinking water systems.

Region staff occasionally monitor for select emerging contaminants and participate in research studies with universities and governing agencies to understand the prevalence, impact, and removal methods of these compounds. The Region utilizes many treatment technologies that have been found effective in reducing concentrations of these

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contaminants. To gain better understanding, contaminants of emerging concern will be included in the development of a five-year Water and Wastewater Quality Management and Optimization Plan, which will be used to plan future sampling studies and improve our processes and practices.

6. Aging Infrastructure

The Region's overall infrastructure is aging, requiring more investment in preventive and planned maintenance. The Region has established a comprehensive asset management program, which includes infrastructure assessment and renewal on an ongoing basis to ensure long term integrity.

The watermain replacement and rehabilitation program involves repair or replacement of existing water pipes and upsize if required to meet future planning needs. The majority of the watermain replacement projects are undertaken in partnership and coordination with road re-construction and sanitary sewer renewal projects for improved cost effectiveness and minimized public inconvenience. The Region plans this program in a financially responsible manner and allocates it funding each year.

7. Backflow Prevention

In place since 2017, the Region's Backflow Prevention By-law ensures the protection of our drinking water by preventing contaminated water from private water systems or plumbing from entering our municipal drinking water.

Backflow is the flow of water from a high to a low-pressure area. It happens when there is a drop in pressure in the water distribution system. A cross connection is a connection between a potable water supply and any source of contamination.

Region staff conduct surveys at private facilities to identify cross connections and determine if backflow prevention devices are required. All backflow devices must also be tested every year by qualified persons and the test reports submitted to the Region.

Disruptions in the service delivery or impact to water quality and public health may result from emergencies or challenges with adaptation to environmental changes.

Through consideration of potential hazards and risks, like those summarized above, Region staff regularly identifies and prioritizes vulnerabilities of our drinking water systems, building culture of preparedness to potential threats and emergency situations.