



2018

Water Quality Report

Palgrave, Caledon
East, Centerville
and Cedar Mills

Palgrave - Caledon East
Drinking Water System

TABLE OF CONTENTS

| | |
|--|-----------|
| Our Commitment..... | 1 |
| 1. General Drinking Water System Information..... | 2 |
| 1.1 Where does the water come from?..... | 2 |
| 1.2 Expenditure Information..... | 4 |
| 2. How is Water Treated?..... | 4 |
| Palgrave Wells No. 2 and 3..... | 4 |
| Palgrave Well No. 4..... | 6 |
| Caledon East Well No. 3..... | 7 |
| Caledon East Wells No. 4 & 4A..... | 8 |
| 3. Region of Peel and Drinking Water Compliance in Ontario..... | 9 |
| 3.1 Annual Water Reports..... | 10 |
| 3.2 Sampling and Testing..... | 10 |
| 3.3 Certified Water Operators..... | 11 |
| 3.4 Water Quality Notification..... | 11 |
| 3.5 Water System Inspections..... | 11 |
| 4. How well did we do? | 12 |
| 4.1 Operation..... | 12 |
| 4.2 Customer Service - Quality and Efficiency..... | 13 |
| 5. Drinking Water Quality Programs..... | 15 |
| 5.1 Municipal Drinking Water Licensing Program..... | 15 |
| 5.2 Source Water Protection..... | 17 |
| 5.3 Private Well Abandonment Program..... | 18 |
| 5.4 Watermain Renewal Program..... | 20 |
| 5.5 Community Lead Testing Program..... | 21 |
| 5.6 Watermain Flushing Program..... | 21 |
| 5.7 Watermain Swabbing Program..... | 22 |
| 5.8 Hydrant Inspection Program..... | 22 |
| 5.9 Drinking Water Sampling Station Program..... | 23 |
| APPENDIX A - SUMMARY OF WATER TESTING RESULTS..... | 24 |
| APPENDIX B - FREQUENTLY ASKED QUESTIONS AND ANSWERS ON WATER QUALITY..... | 32 |
| Water Quality at Home Tips..... | 35 |
| Report Accessibility..... | 36 |

The Regional Municipality of Peel (Peel) takes pride in ensuring that its residents, businesses, and visitors are provided with clean and safe drinking water.

Peel treats its source water to remove contaminants and regularly tests the water quality to ensure its consumers are provided with high quality drinking water.

Thousands of water samples are collected throughout the year and tested for a variety of parameters. The results of the tests performed in 2018 confirm excellent quality of drinking water and have been consolidated in this annual report.

Our Commitment:

To supply our customers with quality drinking water and maintain compliance with all applicable legislative requirements.

If experiencing difficulty accessing or viewing the 2018 data results, please contact our Water Quality Team at 905-791-7800 ext. 4685 or at WaterQualityInquiries@peelregion.ca.

1. General Drinking Water System Information

Drinking Water Works Number: 220003993 (Palgrave - Caledon East Drinking Water System)

1.1 Where does the water come from?

The communities of Palgrave, Centreville, Cedar Mills and Caledon East, with a total population served of 12,719, are supplied by five (5) municipal wells, two (2) water storage reservoirs and a distribution network of 130 kilometres of watermains, 834 mainline valves, 2991 service connections and 739 fire hydrants.



Palgrave Wells No. 2 and 3 are deemed groundwater. Well No. 2 is screened within the Oak Ridges Aquifer Complex while Well No. 3 is screened within the Lower Aquifer Complex. Raw water from Well No. 2 is pumped to the Well No. 3 facility for treatment. Treatment for Palgrave Wells No. 2 and 3 consists of iron removal and disinfection. Iron is removed through oxidization by sodium hypochlorite followed by greensand filtration. Sodium hypochlorite (chlorine) is used for primary and secondary disinfection. The facilities are classified by the Ministry of the Environment, Conservation and Parks (Ministry) as a Class II water treatment subsystem.

Palgrave Well No. 4 is screened within the deep Thorncliffe Aquifer Complex and deemed groundwater. Water treatment process for Palgrave Well No. 4 consists of iron removal and disinfection. Iron is removed through oxidization by sodium hypochlorite followed by greensand filtration. Sodium hypochlorite (chlorine) is also used for primary and secondary disinfection. The facility is classified by the Ministry as a Class II water treatment subsystem.



Caledon East Well No. 3 is screened within the confined Caledon East Meltwater Channel and is deemed groundwater. Raw water is treated with sodium hypochlorite (chlorine) for primary and secondary disinfection. The facility is classified by the Ministry as a Class I water treatment subsystem.

Caledon East Wells No. 4 & 4A are screened in the lower sediments of the confined Thorncliffe Aquifer Complex and also deemed groundwater. Water treatment process includes iron removal and disinfection. Iron is removed through oxidization by sodium hypochlorite followed by greensand filtration. Sodium hypochlorite (chlorine) is used for primary and secondary disinfection. The facility is classified by the Ministry as a Class I water treatment subsystem.

The Old Church Booster Pumping Station interconnects **Palgrave and Caledon East distribution** networks allowing both water systems to serve as back up water supply to each other, to meet drinking water supply demands. Palgrave and Caledon East distribution networks are interconnected and classified by the Ministry as a single Class II distribution subsystem.

Palgrave - Caledon East drinking water system is monitored and controlled 24 hours per day, 7 days a week through a computerized Supervisory Control and Data Acquisition (SCADA) system. Palgrave and Caledon East treatment facilities are equipped with stand-by power generators to ensure continuity of treatment operation and supply in the event of a power failure.

1.2 Expenditure Information

Peel staff determine capital spending priorities to eliminate unnecessary expenditures while maintaining infrastructure.

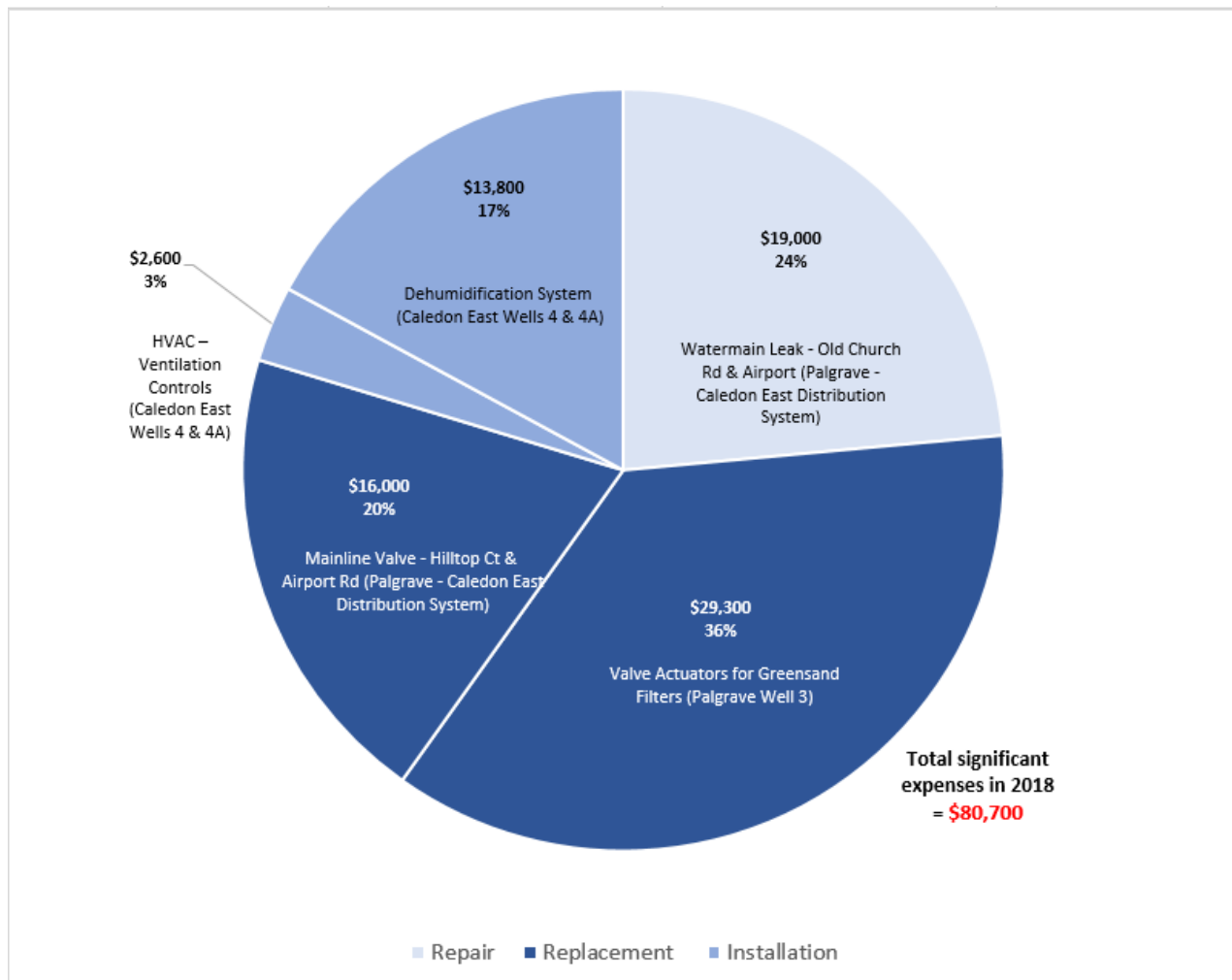


Figure 1 - Significant Expenses for Palgrave-Caledon East Drinking Water System in 2018

2. How is Water Treated?

Palgrave Wells No. 2 and 3

Water from Palgrave Well No. 2 is pumped to Palgrave Well No. 3 treatment facility where it combines with the raw water from Well No. 3. Sodium hypochlorite (chlorine) is first applied to oxidize dissolved iron into a particulate (solid) form which is later removed physically through a greensand media filter. When needed, the filter media is backwashed (cleaned). Clean water is pumped through the filter media, in a reverse flow, lifting and flushing out the iron particles that

have accumulated in the filter. The backwash water is pumped into a supernatant tank and allowed to settle. Clear water from the top of the supernatant tank is then returned to the starting point of the treatment process and sludge collected at the bottom of the tank pumped into a hauler truck for disposal.

Filtered water is then treated with sodium hypochlorite (chlorine) for primary and secondary disinfection. Disinfection is the process of killing or inactivating disease-causing microorganisms, like bacteria, to prevent waterborne illness and protect public health. The treated water is allowed to remain in contact with sodium hypochlorite for a period of time to ensure effective disinfection before reaching the first consumer. Water is pumped to the Palgrave Reservoir, which provides adequate storage and system pressure to maintain drinking water supply demands.

Palgrave Wells No. 2 and 3 treatment process and water distribution are presented in Figure 2.

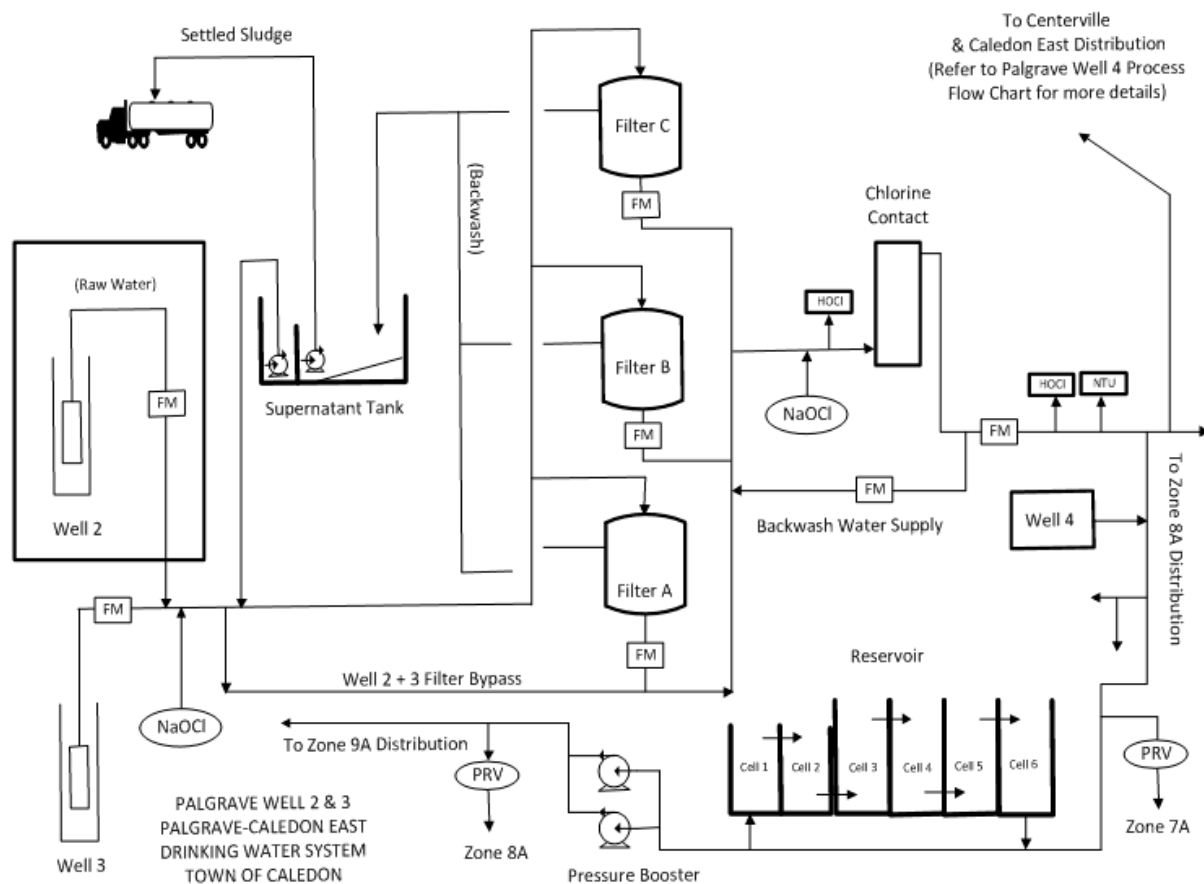


Figure 2: Palgrave Wells No. 2 and 3 Water Treatment Process and Distribution Process Flow

Palgrave Well No. 4

Groundwater is brought to the treatment facility by a submersible water pump installed in the well. Sodium hypochlorite is first applied to the raw water to oxidize dissolved iron into a particulate (solid) form which is later removed physically through a greensand media filter. When needed, the filter media is backwashed (cleaned). Clean water is pumped through the filter media in a reverse flow, lifting and flushing out the iron particles that have accumulated in the filter. The backwash water is pumped into a supernatant tank and allowed to settle. Clear water from the top of the supernatant tank is then returned to the starting point of the treatment process and sludge collected at the bottom of the tank pumped into a hauler truck for off-site disposal.

Filtered water is then treated with sodium hypochlorite (chlorine) for primary and secondary disinfection. Disinfection is the process of killing or inactivating disease-causing microorganisms, like bacteria, to prevent waterborne illness and protect public health. The treated water is allowed to remain in contact with sodium hypochlorite for a period of time to ensure effective disinfection before reaching the first consumer. Water is pumped to the Palgrave Reservoir, which provides adequate storage and system pressure to maintain drinking water supply demands.

Palgrave Well No. 4 treatment process and water distribution are presented in Figure 3, on the next page.

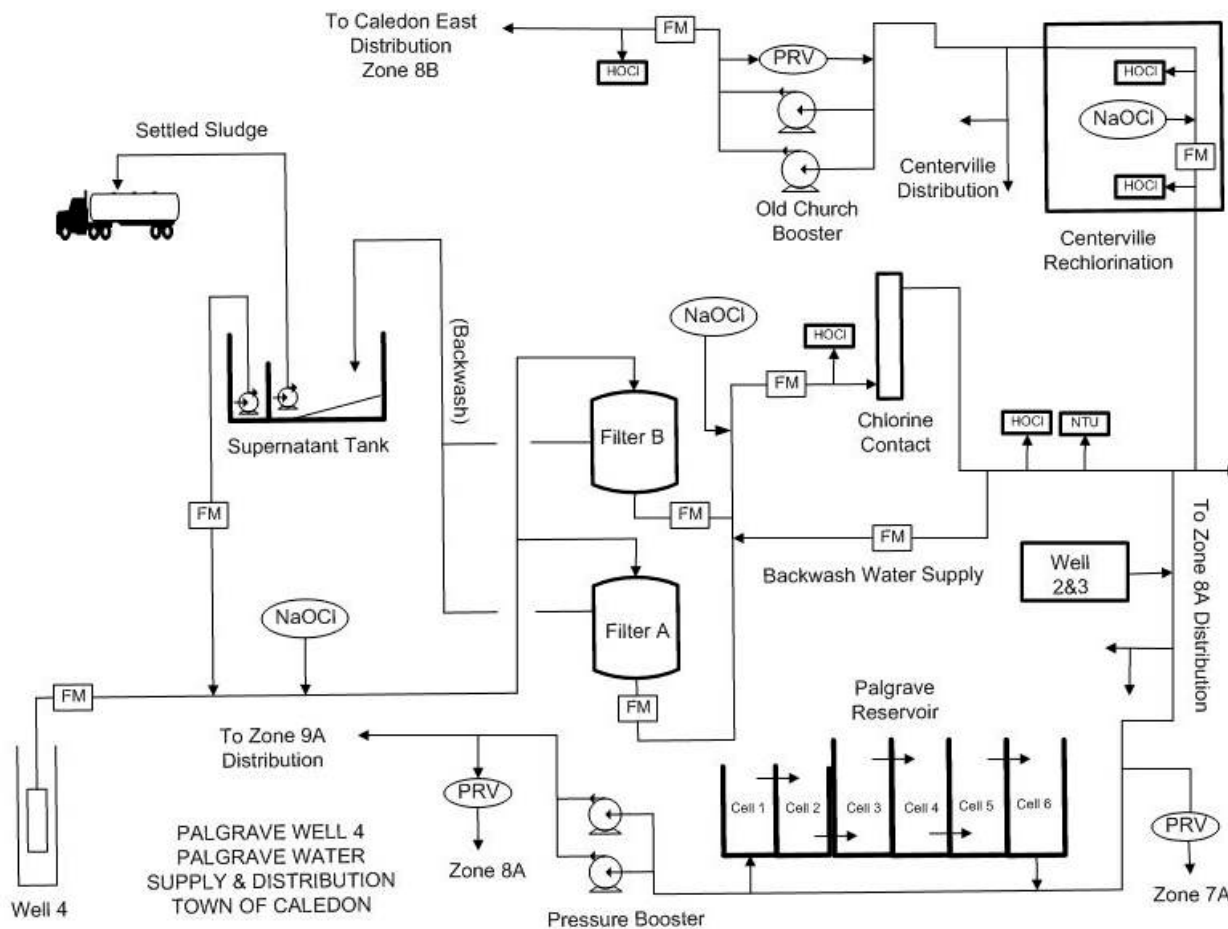


Figure 3: Palgrave Well No. 4 Water Treatment Process and Distribution Process Flow

Caledon East Well No. 3

Groundwater is brought to the treatment facility by a submersible water pump installed in the well. Raw water is treated with sodium hypochlorite (chlorine) for primary and secondary disinfection. The treated water is allowed to remain in contact with sodium hypochlorite (chlorine) for a period of time to ensure effective disinfection before reaching the first consumer. Water is pumped to the Caledon East Reservoir, which provides adequate storage and system pressure to maintain drinking water supply demands.

Caledon East Well No. 3 treatment process and water distribution are presented in Figure 4, on the next page.

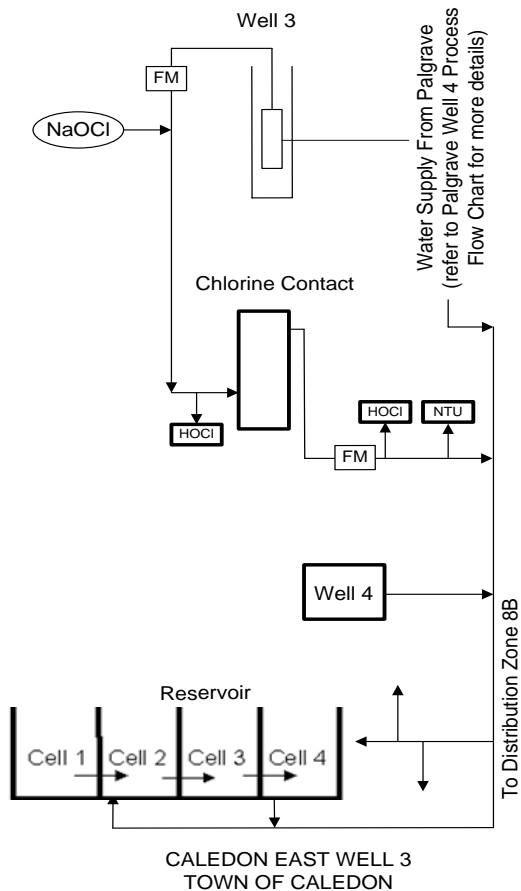


Figure 4: Caledon East Well No. 3 Water Treatment Process and Distribution Process Flow

Caledon East Wells No. 4 & 4A

Water from Caledon East Well No. 4A is pumped to Caledon East Well No. 4 treatment facility where it combines with the raw water from Well No. 4. Sodium hypochlorite (chlorine) is first applied to oxidize dissolved iron into a particulate (solid) form which is later removed physically through greensand media filter. When needed, the filter media is backwashed (cleaned). Clean water is pumped through the filter media in a reverse flow, lifting and flushing out the iron particles that have accumulated in the filter. The backwash water is pumped into a supernatant tank and allowed to settle. Clear water is then returned to the starting point of the treatment process and sludge collected at the bottom of the supernatant tank pumped into a hauler truck for off-site disposal.

Filtered water is then treated with sodium hypochlorite (chlorine) for primary and secondary disinfection. The treated water is allowed to remain in contact with sodium hypochlorite for a period of time to ensure effective disinfection before reaching the first consumer. The treatment

facility houses booster pumps and pressure-regulating tanks to service an adjacent subdivision (Granite Stones), which is situated at a higher elevation.

Caledon East Wells No. 4 and 4A treatment process and water distribution are presented in Figure 5.

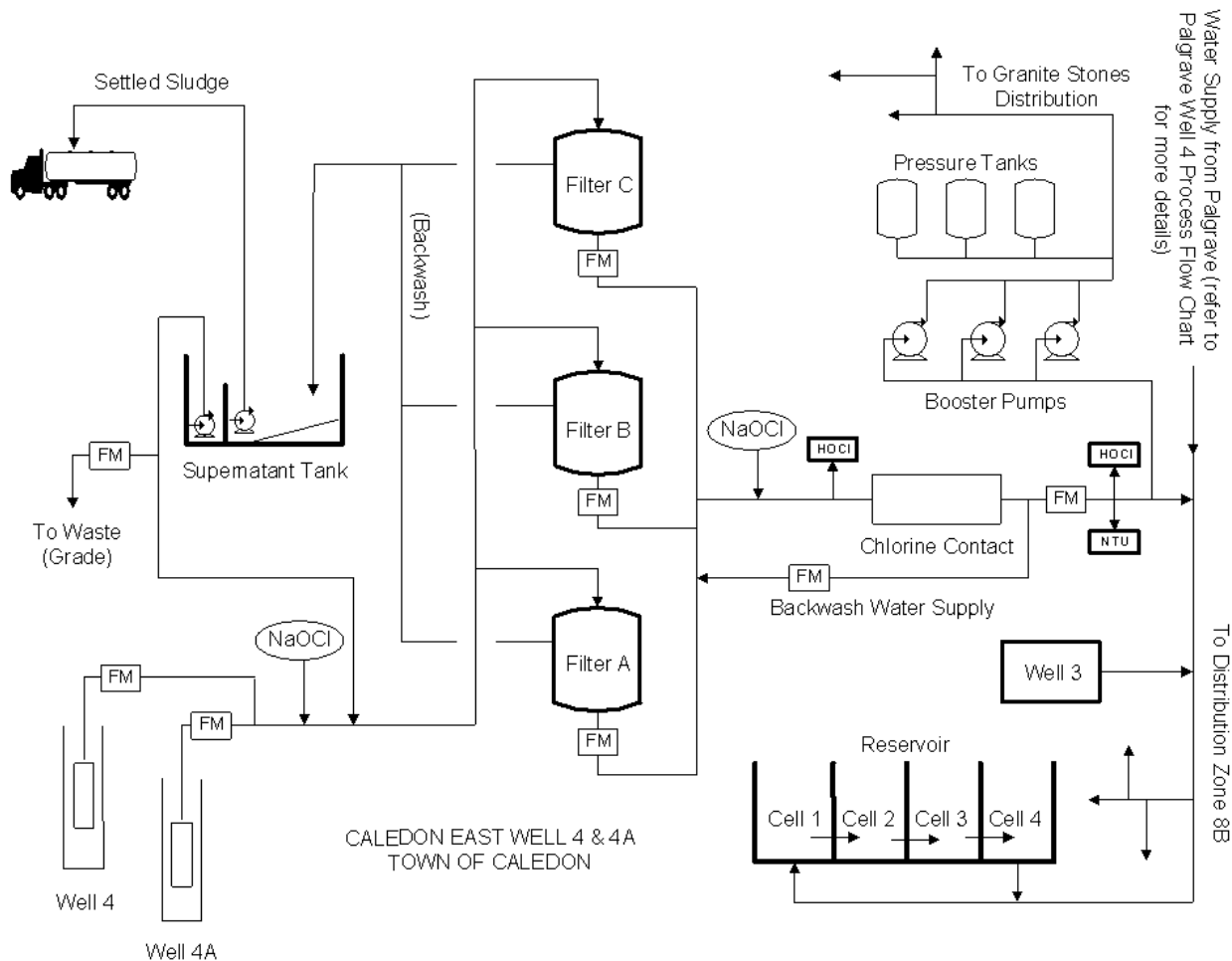


Figure 5: Caledon East Wells No. 4 and 4A Water Treatment Process and Distribution Process Flow

3. Region of Peel and Drinking Water Compliance in Ontario

Drinking water quality in Peel is regulated by the Ontario Government through the Ministry. The Ontario drinking water legislation sets requirements for municipal system owners and operating authorities with regards to operation and management, level of treatment, sampling and testing, training and certification of staff, and water quality notification.

3.1 Annual Water Reports

To comply with the Drinking Water Systems regulation (Ontario Regulation 170/03) under the *Safe Drinking Water Act, 2002*, every year, Peel prepares Water Quality Reports that provide information on the quality of water supplied and a Summary Report covering the operation and overall performance of the drinking water systems.

The Summary Report under Schedule 22 of Ontario Regulation 170/03 includes a statement of compliance with the *Safe Drinking Water Act, 2002*, the regulations, and the terms and conditions of all the approvals for Peel's drinking water systems. It also includes a summary of the quantities and flow rates of water supplied to assess the capability to meet the existing and planned uses of the water systems. This report is made available to Regional Council by March 31 of each year.

The Water Quality Reports and the Summary Report are made available to the public to ensure Peel consumers are kept informed. Each year, the reports are posted on the Region of Peel's web site (<http://www.peelregion.ca/pw/water/quality/>) and their electronic or paper copies may be obtained upon request by emailing Peel at WaterQualityInquiries@peelregion.ca or calling at 905-791-7800 ext. 4685.

Additionally, an ad is placed in the local newspapers to inform the consumers about the availability of Peel's Water Quality Reports.

3.2 Sampling and Testing

In compliance with drinking water legislation, drinking water systems are required to monitor the quality of drinking water to ensure it meets provincial standards.

Peel regularly samples and tests raw, treated and distribution system water for a number of microbiological, chemical, physical and radiological parameters. Peel has always had an extensive water sampling and monitoring program to better understand the quality and characteristics of its source water, to ensure effectiveness and optimization of treatment processes, and to diligently monitor and protect the drinking water supply. Sampling and testing is conducted by trained and qualified operators, who collect water samples from various representative sampling sites throughout the Region and immediately test them for first water safety indicators. As part of Peel's water quality monitoring programs, samples are collected for laboratory analysis for a vast number of health-related and aesthetic parameters.

The Ministry requires that all drinking water testing laboratories be accredited by the Standards Council of Canada (SCC) based on proficiency evaluation conducted by the Canadian Association for Laboratory Accreditation (CALA) as well as licensed by the Ministry for all drinking water tests performed. All laboratories used by Peel are accredited by the SCC, licensed by the Ministry, and adhere to strict drinking water sample collection, handling and transport protocols as well as analytical methods and reporting procedures.

3.3 Certified Water Operators

All water treatment plant, distribution system and maintenance operators, and technical staff have the appropriate Water Treatment, Water Distribution and Water Quality Analyst certification, as required by the Ontario drinking water legislation. The Ministry-mandated training and certification program ensures that all operators are certified to industry recognized standards. Peel has established a continuing education program for all staff responsible for operating drinking water systems and have an impact on drinking water quality. The program features in-house training that addresses Peel's specific needs with focus on the operation and management of Peel-owned drinking water systems and that offers the benefits of increased staff engagement through a custom designed training toolkit tailored to our business mandates. This helps the operators gain knowledge of the latest industry practices, technologies and advanced processes and to effectively maintain system water quality and quantity.

3.4 Water Quality Notification

In compliance with the regulatory requirements, Peel reports every event of adverse water quality to the Medical of Health and the Ministry and initiates timely corrective action to address and resolve the issue and implement control measures to prevent its reoccurrence. Peel has established a notification protocol for reporting of adverse water quality events and makes these reports and data publicly available in the Water Quality Reports. In 2018, there were no events of adverse water quality in the Palgrave - Caledon East Drinking Water System.

3.5 Water System Inspections

On an annual basis, Peel's drinking water systems undergo the Ministry inspection program to confirm compliance with provincial drinking water legislation. The Ministry's annual inspection program is an important aspect of drinking water supply to our consumers. Through these inspections, the Ministry ensures that Peel meets the sampling, testing and disinfection requirements, treatment standards, terms and conditions of all Ministry approvals and staff certification and training requirements as stated in the Ontario Regulations 170/03, 169/03, and 128/04 under the *Safe Drinking Water Act, 2002*.

Ministry inspections provide Peel with an overview of how well our drinking water systems are doing and how well we meet the province's stringent regulations. They also provide an opportunity to review our best management practices and, if necessary, implement new processes to continually improve the operation and management of Peel's drinking water systems.

For an overview of all the work the Ministry is doing to protect drinking water in Ontario, please visit the Ministry website for the Minister of the Environment and Climate Change report:

<https://www.ontario.ca/page/ministers-annual-report-drinking-water-2018>

4. How well did we do?

4.1 Operation

To protect the health of the public and to ensure consumers receive clean and safe drinking water, the Ministry has established the Ontario Drinking Water Quality Standards that make up [Ontario Regulation 169/03](#). These standards are established to ensure water is free of disease-causing organisms and harmful or radioactive chemicals, and are reviewed from time to time based on new science and to keep them aligned with the Canadian Drinking Water Quality Guidelines.

Ontario Regulations 169/03 and 170/03 were amended in 2015 including updates to parameters and their limits. Amendments are being phased-in gradually until 2020 to allow drinking water system owners and operating authorities time to collect baseline information and prepare for any necessary treatment process upgrades.

In 2018, Peel monitored water quality by undertaking tens of thousands of process samples and tests to ensure a safe and clean water supply. Appendix A provides a full summary of the water quality test results.

The Ministry performs annual inspections on all municipal drinking water systems, comprised of physical inspection of facilities and review of information and data for the inspection period. Score cards are issued by the Ministry based on the inspection findings in the scope of water quality monitoring, certification and training, reporting and corrective actions and treatment process monitoring. The Palgrave - Caledon East drinking water system's overall performance has been excellent the past five (5) inspection years.

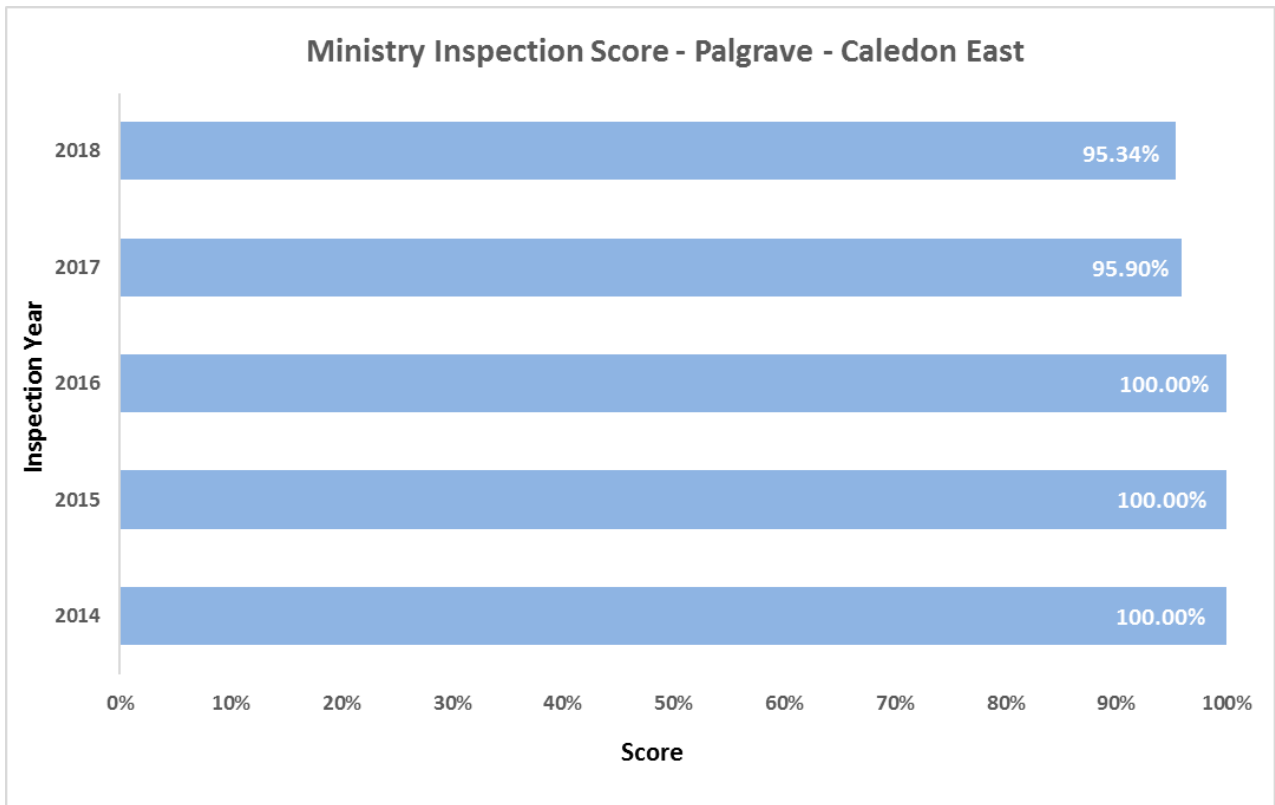


Figure 6: Palgrave - Caledon East Drinking Water System Ministry Inspection Score Graph

Note: Scores <100% reflect inspection findings that were largely administrative in nature and did not compromise the quality of the water supply.

For more information on the Ministry inspection methodology, please visit the Ministry’s website:

<https://www.ontario.ca/environment-and-energy/application-risk-methodology-used-measuring-municipal-drinking-water-system>

4.2 Customer Service - Quality and Efficiency

In 2018, all customer calls were responded to and resolved in a timely manner. Peel staff has made every effort to contact the customers and satisfactorily address their questions. Records of water quality calls received are logged in Peel’s database and kept on file. Figure 7 below shows the water quality enquiries over the past five years as compared with the served population of Peel. In 2018 Peel received 1660 enquiries, a slight decline from 2017. Figure 8 breaks down the enquiries by category.

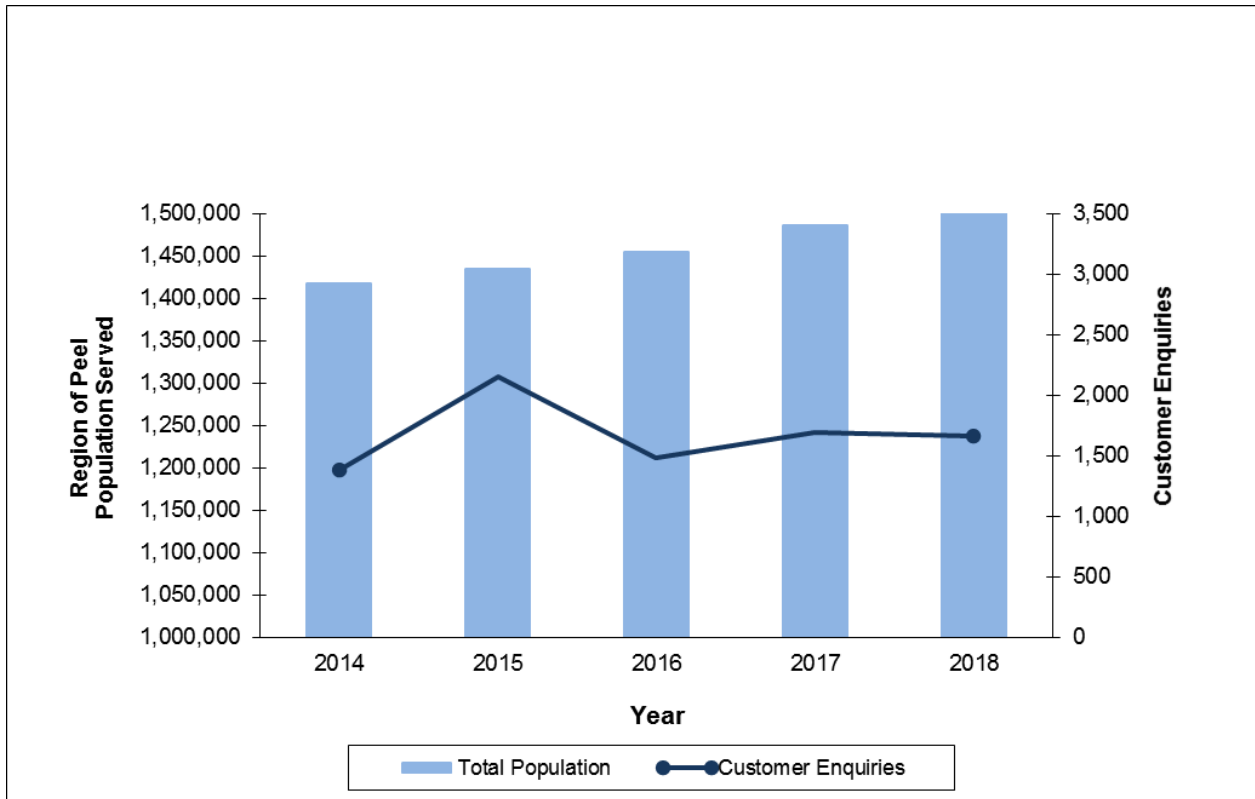


Figure 7: Water Quality Enquiries Customer Service Index

Note: High volume of public enquiries in 2015 due to frozen water services and watermain breaks caused by severe cold winter weather

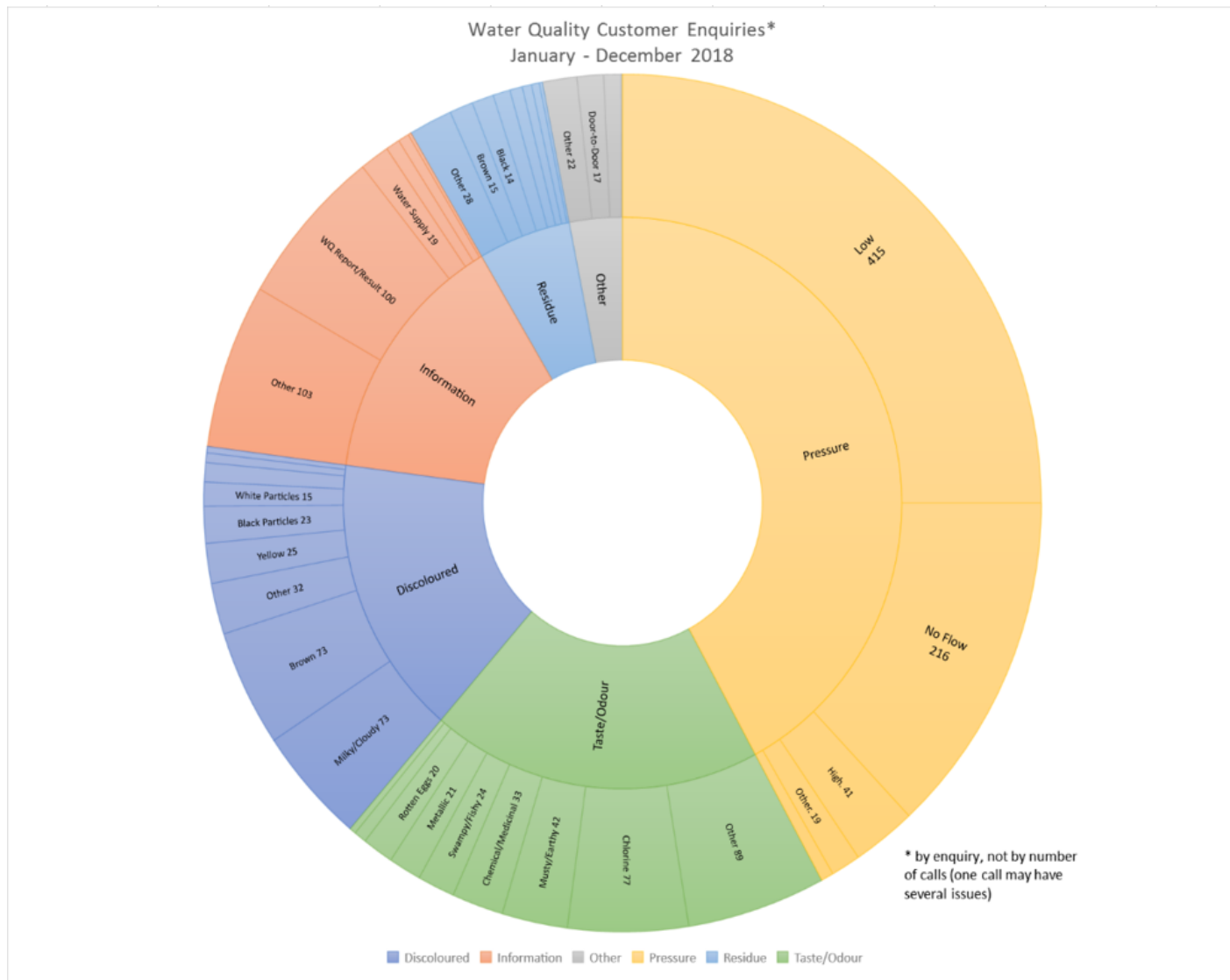


Figure 8: 2018 Customer Enquiries by Category

5. Drinking Water Quality Programs

5.1 Municipal Drinking Water Licensing Program

Under the *Safe Drinking Water Act, 2002* (SDWA), all municipal residential drinking water system owners in Ontario must have a Municipal Drinking Water Licence (the Licence) to operate their system(s). In order to be issued a Licence, the Ministry requires owners to have the following five prerequisites:

I. Drinking Water Works Permit (DWWP)

A permit describing the drinking water system and giving authority to establish or alter a drinking water system. Peel holds a valid DWWP for each of its five (5) drinking water systems.

II. Permit to Take Water (PTTW)

A valid permit to take water issued under the *Ontario Water Resources Act* specifying the approved rate of water taking. Peel holds a valid PTTW for each of its drinking water sources.

III. An Approved Operational Plan

The Operational Plan defines and documents the Quality Management System (QMS) for Peel's drinking water systems in accordance with the requirements of the Ministry's Drinking Water Quality Management Standard (DWQMS). The Operational Plan outlines the policy commitments and associated procedures, responsibilities and evaluation criteria that ensure drinking water quality and safety in all processes for water treatment and distribution; from source to tap.

IV. Accredited Operating Authority (Third-Party Audit of the QMS)

Municipal residential drinking water system owners must ensure that, at all times, an accredited operating authority is in charge of the drinking water systems. Peel owns five large municipal residential drinking water systems. As the operating authority of the South Peel Distribution System, as well as four groundwater systems in Caledon (Caledon Village - Alton, Cheltenham, Inglewood, Palgrave - Caledon East), Peel became an accredited Operating Authority in August 2011, and has been successfully maintaining this mandatory accreditation. The Ontario Clean Water Agency (OCWA), under contract, operates the Lakeview and Lorne Park Water Treatment Plants as well as the South Peel Transmission and Pumping System. OCWA has been, and remains, an accredited Operating Authority since July 2013.

Full Scope Accreditation recognizes that the operating authority has a QMS in place that conforms to the DWQMS as documented in the Operational Plan.

The Ministry has designated two accreditation bodies under the SDWA and Peel has worked with the third-party auditor, SAI Global, who provides accreditation auditing services. Continuance of accreditation is based on a three-year review cycle comprised of annual offsite surveillance audits in years one and two; and an offsite systems audit followed by an onsite accreditation audit in year three. The onsite verification audit for DWQMS reaccreditation was completed by SAI Global in February 2018 and included documentation and records review, facility tours and interviews with staff. Peel achieved full conformance to DWQMS and the current certificate of accreditation expires December 31st 2019. The year one and year two surveillance audits under the new certificate cycle were conducted in February 2016 and February 2017, respectively. The audits confirmed Peel's full conformance to the DWQMS and identified areas to review and further enhance the internal audit processes.

The Clean Water Act, 2006 and associated regulations aim to protect existing and future sources of drinking water from contamination or overuse. Source water protection is intended to be a shared responsibility of all stakeholders and is a key element of the Province's safety net and multi-barrier approach from source to tap. The source protection process is driven by locally-based source protection committees comprised of municipal, industrial, commercial, agricultural and public representation. Peel is a stakeholder across three Source Protection Regions, including Halton-Hamilton (H-H), Credit Valley-Toronto and Region-Central Lake Ontario (CTC) and South Georgian Bay Lake Simcoe (SGBLS) and is responsible for implementing various policies in the approved source protection plans.

Technical studies on both groundwater and surface water (Lake Ontario) vulnerable areas and threats to municipal drinking water sources are summarized in science-based assessment reports which are used to support the development of local source protection plans and policies. Both assessment reports and source protection plans are "living documents" expected to be amended as new information becomes available or as necessary to reflect changes to drinking water supply sources.

For more information on Peel's Source Protection Program, please visit www.peelregion.ca/sourcewater

5.3 Private Well Abandonment Program

The Region of Peel implemented a Private Well Abandonment Program for decommissioning of old, unused private wells within Peel. This work is performed in accordance with the requirements of the Ontario Regulation 903. The Program intends to gradually eliminate potential pathways of groundwater contamination in areas where groundwater is a source for drinking water. The Program is carried out on a first come, first serve basis, with each request being evaluated for program eligibility prior to the commencement of any decommissioning work.

A total of 56 private wells throughout Peel were decommissioned under this program in 2018 (see Figure 8), with a number of wells waitlisted for completion in early 2019. Participation in this program is promoted through public events, newspaper ads, electronic newsletters, mobile road signs, as well as outreach to local community centers and local real estate firms to help promote the program to individuals living within or moving into rural areas of Peel. Also, internal outreach to groups within Peel and education about the Private Well Abandonment Program help to maximize opportunities for rural Peel residents to take advantage of the program (see Figure 9).

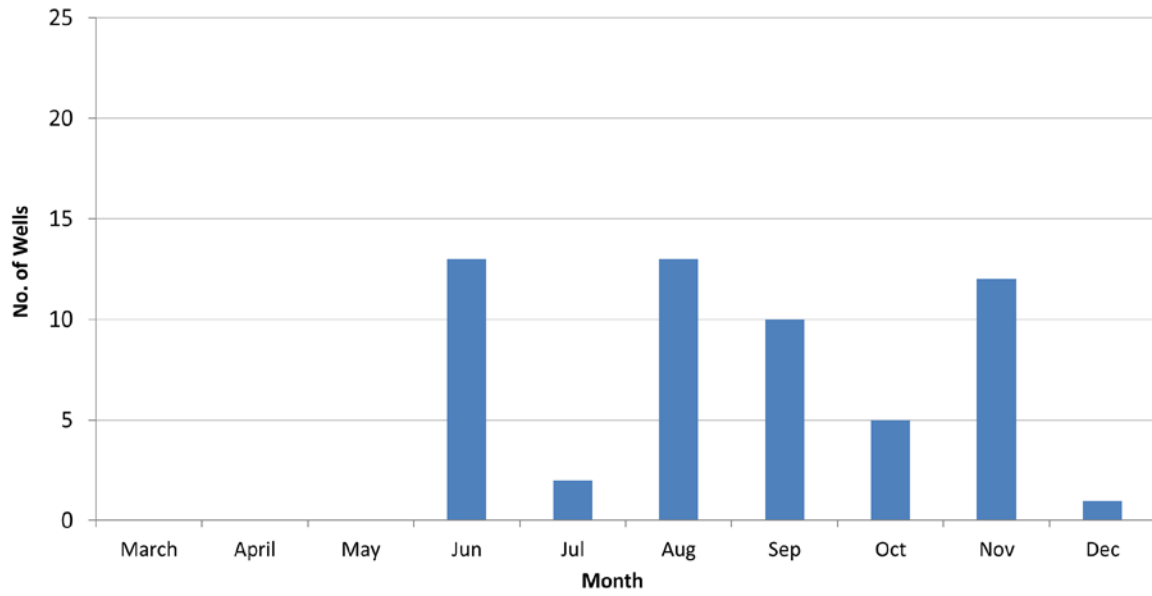


Figure 8: Total Number of Wells Decommissioned in 2018 in Peel

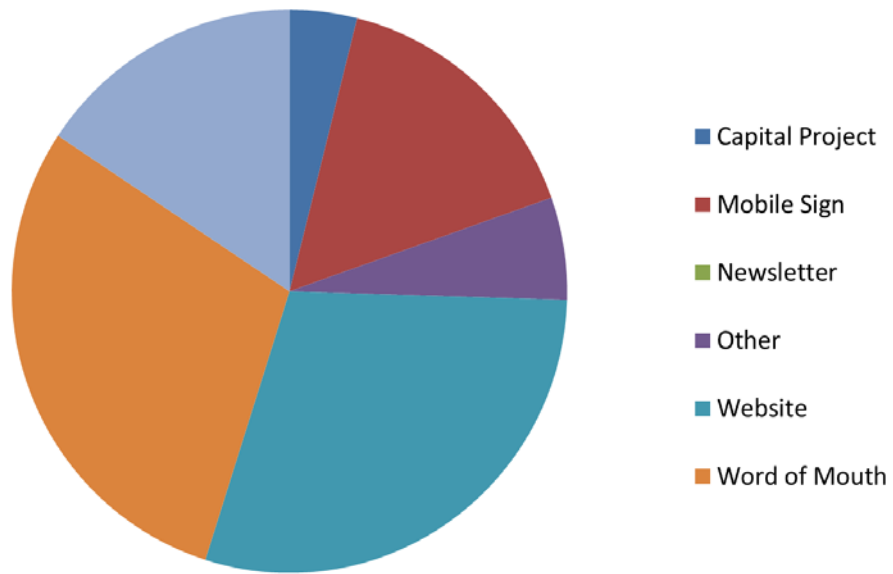


Figure 9: Program Participation Results for 2018

For more information on Peel's Private Well Abandonment Program, please visit: <http://www.peelregion.ca/pw/water/water-trtmt/wellhead-abandon.htm> or e-mail us directly at sourcewater@peelregion.ca

5.4 Watermain Renewal Program

Peel's overall infrastructure is aging, requiring more investment in preventive and planned maintenance. In response, Peel has established a comprehensive state of good repair program, which includes watermain assessment, rehabilitation and renewal. The program is an ongoing plan of upgrading Peel's watermain system to ensure long term integrity and sustainability. The program involves repair, rehabilitation or replacement of existing mains and water services to improve water flow, ensure good quality water and upsize if required to meet future planning needs; all to provide higher level of service to our consumers.

Peel determines priority of watermain replacement based on the following factors:

- Watermain age
- Water quality trend and customer feedback
- Watermain size and material type
- Watermain breaks and leak history
- Hydraulic performance of watermain
- Planned municipal and city projects related to water, wastewater and road assets
- Cost of replacement
- Customer complaints / enquiries
- Operational demands

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. Using these criteria, Peel plans the watermain renewal program in a financially responsible manner.

Every year, the watermain renewal program is allocated funding to replace a significant length of watermain with nearly \$55 million being allocated to this project in 2018.

5.5 Community Lead Testing Program

Established in 2007, Peel's Community Lead Testing Program fulfills the legislative requirements under the Ontario Regulation 170/03, Schedule 15.1. The scope of the program includes sampling and testing of drinking water for lead from private residential and non-residential locations as well as municipal water hydrants.

First years of sampling in Palgrave and Caledon East yielded excellent quality water and in accordance with the lead testing legislation, Palgrave - Caledon East Drinking Water System has been exempted from collecting plumbing samples and testing residential and commercial premises for lead.

The Region continues to test Palgrave and Caledon East's drinking water supply for alkalinity and pH semi-annually to monitor water chemistry to confirm its stability. As required by the regulation, Palgrave - Caledon East distribution system is sampled and tested for lead every three (3) years with sampling conducted between the dates of December 15 to April 15 and June 15 to October 15. The water distribution system was tested for lead in 2018, results of which can be viewed in Appendix A - Summary of Water Testing Results. Next round of sampling and testing for lead is scheduled for 2021.

Upon request from a resident, Peel staff coordinate testing of tap water for lead at homes that meet the criteria of our lead testing program:

- Any homes or buildings built prior to 1960
- Any plumbing connected to or suspected to be connected to lead service pipes
- Any plumbing made out of or suspected of being made out of lead

For more information on Peel's Community Lead Testing Program, please contact us at 905-791-7800, ext. 4685 or visit our website: <http://www.peelregion.ca/pw/water/quality/lead-in-water.htm>

5.6 Watermain Flushing Program

Peel's watermain flushing program is another element of the multi-barrier approach to ensuring safe drinking water. The primary objective of the watermain flushing program is to maintain adequate chlorine residuals in the water distribution system. Flushing is also conducted to improve water aesthetics by removing any mineral deposits that may have settled on the bottom of the watermains over time. Under the *Safe Drinking Water Act, 2002*, Ontario Regulation 170/03 and *Procedure for Disinfection of Drinking Water in Ontario* stipulate the acceptable chlorine

residual range. Certified Water Operators measure and record the chlorine residual during each flush. Flushing is conducted at locations where a low water demand may occur, such as dead-ends and new subdivisions and at a greater frequency where demand is lower. Flushing is also conducted following water system repairs and other situations where a check of chlorine residual is warranted.

5.7 Watermain Swabbing Program

The objective of the watermain swabbing program is removal of watermain mineral and residue build up to improve water quality and restore distribution system hydraulic capacity. Swabbing involves inserting a swab such as polyurethane foam into the watermain through a hydrant, and pushing it along by water pressure. As the swab passes through the pipe, it scours the sediment and residue attached to the watermain walls, which is flushed from the system through the exit hydrant.



Peel staff diligently assess the condition of watermains and regularly monitor water quality. Swabbing program activities and frequency are determined based on the monitoring programs and conducted in coordination with community residents.

5.8 Hydrant Inspection Program

Peel's hydrant inspection program fulfils a number of purposes. An annual inspection is necessary to determine the sustained functionality of each fire hydrant and hydrant branch valve to ensure they are operable for fire suppression purposes. Fire hydrant components that need repair are identified during the inspection. Deficiencies that affect the hydrant's operability are handled on a priority basis due to their primary function of fire protection. Hydrant inspection program yielded maintenance and repairs to 15 hydrants in the Palgrave - Caledon East distribution system in 2018.





All Region of Peel hydrants are installed with hydrant flow identifiers. These flow identifiers are in the shape of a Maltese cross. They are colour-coded based on the recommended colour coding scheme by the National Fire Prevention Association and designed to let the fire department know what the available flow is at the hydrant closest to the fire. The markers are reflective, making them highly visible at night.

5.9 Drinking Water Sampling Station Program

Peel installed a number of drinking water sampling stations throughout Caledon to improve drinking water quality assessment and monitoring methods and to improve customer service. Sampling stations are located at strategically selected points within the distribution system to ensure the water samples collected accurately represent the drinking water supplied to the consumers. The use of sampling stations has reduced the impact on customers by decreasing the need to enter homes or business facilities where hours of operation can limit access. In addition to unlimited access, Water Operations also benefit by having added control over important sampling conditions such as sample site cleanliness and security.



APPENDIX A - SUMMARY OF WATER TESTING RESULTS

Water Safety Indicators Information

➤ ***Escherichia coli* (E. coli)**

Escherichia coli (*E. coli*) is a species of fecal coliform bacteria that can be detected using approved lab methods. *E. coli* is present in fecal matter and prevalent in sewage, but is easily inactivated by chlorine. It is a strong indicator of recent fecal pollution. If *E. coli* is detected in a sample of drinking water, immediate corrective action needs to be taken including confirmatory samples collected.

➤ **Total Coliform**

Total Coliforms are part of a family of bacteria called Enterics. Coliform bacteria grow under the same conditions as disease-causing bacteria, which makes them useful *indicator organisms*. Presence of coliform bacteria in a sample of drinking water signifies potential contamination. If coliforms are detected in a sample of drinking water, corrective action needs to be taken including confirmatory samples collected.

➤ **Heterotrophic Plate Count**

Heterotrophic plate count (HPC) results give an indication of the overall quality of the water immediately following treatment and in the distribution system. HPC is not an indicator of water safety but is used as an indicator of water integrity within the distribution system.

➤ **Disinfection By-products**

Disinfection of drinking water is essential to protect the public from waterborne infectious and parasitic diseases. Disinfection inactivates bacteria and other microorganisms in the water and protects the water pipes from any subsequent contamination during storage and distribution. The most commonly used drinking water disinfectant is chlorine. Chemical disinfectants can combine with naturally-occurring organic compounds in the water, potentially leading to the formation of disinfection by-products, including trihalomethanes (THMs) and haloacetic acids (HAAs).

Terms you need to know when reviewing the water testing results in this paper:

| Term | Definition |
|-------------------------------------|--|
| MAC | Maximum Acceptable Concentration |
| IMAC | Interim Maximum Acceptable Concentration |
| Aesthetic Objectives (AO) | AO are established for substances that affect the taste, odour and appearance of water or interfere with water quality control practices. These substances do not affect health. |
| Operational Guidelines (OG) | OG are established for substances that need to be controlled to ensure the efficient treatment and distribution of water. |
| NTU | Nephelometric Turbidity Unit |
| CFU/mL | Colony Forming Units per millilitre |
| CFU/100mL | Colony Forming Units per 100 millilitres |
| µmho/cm | micro mho per centimetre (equivalent to microSiemens per centimetre) |
| L | litre |
| µg/L | micrograms per litre. This is a measure of concentration of a substance in water, also called parts per billion (ppb) 1000 µg/L = 1 mg/L |
| mg/L | milligrams per litre. This is a measure of concentration of a substance in water, also called parts per million (ppm) |
| < | less than laboratory analytical detection limit |
| > | greater than |
| Running Annual Average (RAA) | The 12-month running average of quarterly results |

Note: In 2018, Palgrave community was predominantly supplied with water from the Caledon East wells.

What are my raw (source) water characteristics?

Source: Groundwater 2018 - Palgrave and Caledon East Wells

| Water Parameters | Units | Palgrave Result/Range (Min-Max) | Caledon East Result/Range (Min-Max) | Parameter Information |
|-------------------------------|---|---------------------------------|-------------------------------------|---|
| Total Ammonia Nitrogen | mg/L | < 0.10 - 0.120 | < 0.050 - 0.090 | Natural decay of organic material |
| Chloride | mg/L | 8.3 - 11 | 18 - 190 | Non-toxic material naturally present in drinking water |
| Conductivity @ 25°C | µmho/cm | 480 - 490 | 550 - 1300 | Related to inorganics such as minerals dissolved in water |
| Hardness | mg/L (CaCO ₃) grains/US Gallon | 220 - 230 12.85 - 13.37 | 250 - 390 14.53 - 22.67 | Naturally occurring; related to mineral content, mainly calcium and magnesium |
| Iron (Fe) | µg/L | 690 - 940 | < 100 - 690 | Naturally occurring in mineral deposits and from sediment decay |
| pH | pH unit | 7.30 - 7.92 | 7.16 - 7.90 | Indicates water acidity |
| Sulphate (SO ₄) | mg/L | 30 - 40 | 38 - 41 | Naturally occurring |
| Temperature | °C | 8.60 - 9.80 | 8.00 - 11.20 | Varies seasonally |
| Total Kjeldahl Nitrogen (TKN) | mg/L | < 0.10 - 0.74 | < 0.10 - 0.37 | Comprised of ammonia-nitrogen and organically bound nitrogen. Related to natural decay of organic matter. |
| Turbidity | NTU | 0.03 - 0.52 | 0.09 - 0.39 | Tiny suspended particles of organic or inorganic matter |

Summary of Microbiological Testing for Palgrave - Caledon East Drinking Water System

| Sample Location | Number of Samples | Range of <i>E. coli</i> Results (CFU/100 mL) (Min - Max) | Range of Total Coliform Results (CFU/100 mL) (Min - Max) | Range of HPC Results (CFU/mL) (Min - Max) |
|------------------------------------|-------------------|--|--|---|
| Palgrave Well No.2 Raw | 53 | 0 - 0 | 0 - 0 | 0 - 7 |
| Palgrave Well No. 3 Raw | 53 | 0 - 0 | 0 - 0 | 0 - 1 |
| Palgrave Wells No. 2 & 3 Treated † | 53 | 0 - 0 | 0 - 0 | 0 - 1 |
| Palgrave Well No.4 Raw | 47 [†] | 0 - 0 | 0 - 0 | 0 - 12 |
| Palgrave Well No. 4 Treated † | 47 [†] | 0 - 0 | 0 - 0 | 0 - 0 |
| Palgrave Distribution | 205 | 0 - 0 | 0 - 0 | 0 - 1 |
| Caledon East Well No. 3 Raw | 53 | 0 - 0 | 0 - 1 | 0 - 1 |
| Caledon East Well No. 3 Treated † | 53 | 0 - 0 | 0 - 0 | 0 - 1 |

continued next page

| Sample Location | Number of Samples | Range of <i>E. coli</i> Results (CFU/100 mL) (Min - Max) | Range of Total Coliform Results (CFU/100 mL) (Min - Max) | Range of HPC Results (CFU/mL) (Min - Max) |
|------------------------------------|-------------------|--|--|---|
| Caledon East Well No. 4 Raw | 53 | 0 - 0 | 0 - 0 | 0 - 1 |
| Caledon East Well No. 4A Raw | 53 | 0 - 0 | 0 - 0 | 0 - 1 |
| Caledon East Well No. 4 Treated † | 53 | 0 - 0 | 0 - 0 | 0 - 1 |
| Caledon East Well No. 4A Treated † | 53 | 0 - 0 | 0 - 0 | 0 - 0 |
| Caledon East Distribution | 209 | 0 - 0 | 0 - 0 | 0 - 12 |

† Ontario Drinking Water Quality Standards: *E. coli* = 0 CFU/100mL; Total Coliform = 0 CFU/100mL

¹ Number of samples <53: Palgrave Well No. 4 was out of service for maintenance from March 23 to May 3

Summary of Results for Inorganic Parameters per Schedule 23 of O. Reg. 170/03 Tested at an Accredited, Licensed Laboratory on Annual Grab Samples of Treated Water

| Test Parameter | Units | MAC | Palgrave Result/Range (Min - Max) | Caledon East Result/Range (Min - Max) | Parameter Information |
|----------------|-------|------|-----------------------------------|---------------------------------------|--|
| Antimony (Sb) | µg/L | 6 | < 0.50 | < 0.50 | Naturally occurring metalloid rarely detected in Ontario Drinking Water |
| Arsenic (As) | µg/L | 10 | < 1.0 | < 1.0 | Sometimes found in high concentrations in ground water in hard rock areas through the natural dissolution of arsenic-containing minerals |
| Barium (Ba) | µg/L | 1000 | 120 - 170 | 120 - 150 | Common in sedimentary rocks. Hard water contains small amounts of Barium |
| Boron (B) | µg/L | 5000 | < 10 | 12 - 35 | Normally found in very small levels in drinking water |
| Cadmium (Cd) | µg/L | 5 | < 0.10 | < 0.10 | Rare element unlikely to be present as natural contaminant in drinking water |
| Chromium (Cr) | µg/L | 50 | < 5.0 | < 5.0 | Trivalent chromium naturally occurs and is not considered toxic |
| Mercury (Hg) | µg/L | 1 | < 0.1 | < 0.1 | Sources in drinking water can be air pollution, waste incineration and, metal refining operations |
| Selenium (Se) | µg/L | 10 | < 2.0 | < 2.0 | Naturally occurs in water at trace levels |
| Uranium (U) | µg/L | 20 | < 0.10 | < 0.10 - 0.54 | Normally present in mineral deposits and biological systems |

Summary of Community Lead Testing Program Results per Schedule 15.1 of O. Reg. 170/03 Tested at an Accredited, Licensed Laboratory on Distribution Water Samples

| Test Parameter | Unit of Measure | MAC | Range of Results (Min - Max) | Number of Samples | Number of Exceedances | Parameter Information |
|----------------|-----------------|-----|------------------------------|-------------------|-----------------------|--|
| Lead | µg/L | 10 | < 0.50 | 12 | 0 | Present as a result of corrosion of lead solder, lead containing brass fittings, or lead pipes |
| Alkalinity | mg/L | N/A | 200 - 240 | 12 | N/A | Water resistance to effects of acids added to water |
| pH | pH unit | N/A | 7.69 - 7.84 | 12 | N/A | Indicates water acidity |

Note: Alkalinity and pH are operational parameters. Alkalinity aesthetic objective is set at 500mg/L. Optimal range for drinking water pH is 6.5 - 8.5.

Summary of Results for Organic Parameters Tested per Schedule 24 of O. Reg. 170/03 at an Accredited, Licensed Laboratory on Annual Grab Samples of Treated Water

Note: Organic parameters are present to some degrees in all water supplies. The Region of Peel tests these parameters to ensure the water meets the Ontario Drinking Water Quality Standards.

| Test Parameter | Units | MAC | Palgrave Result | Caledon East Result | Parameter Information |
|--|-------|------|-----------------|---------------------|--|
| Alachlor | µg/L | 5 | < 0.50 | < 0.50 | Herbicide for weed control banned in 1985 |
| Atrazine + N-dealkylated metabolites | µg/L | 5 | < 1.0 | < 1.0 | Herbicide on corn crops for grass control. Highly persistent and mobile in soil |
| Azinphos-methyl (Guthion) | µg/L | 20 | < 2.0 | < 2.0 | Insecticide against foliage-feeding insects |
| Benzene | µg/L | 1 | < 0.10 | < 0.10 | Present in gasoline and other refined petroleum products |
| Benzo(a)pyrene | µg/L | 0.01 | < 0.0090 | < 0.0090 | Formed during the incomplete burning of organic matter and poorly adjusted diesel exhaust |
| Bromoxynil | µg/L | 5 | < 0.50 | < 0.50 | Herbicide for control of specific weeds |
| Carbaryl | µg/L | 90 | < 5.0 | < 5.0 | Insecticide used in agriculture and forestry |
| Carbofuran | µg/L | 90 | < 5.0 | < 5.0 | Insecticide used in agriculture |
| Carbon Tetrachloride | µg/L | 2 | < 0.10 | < 0.10 | Only found in ground water from old chlorinated solvent industry sites |
| Chlorpyrifos | µg/L | 90 | < 1.0 | < 1.0 | Common insecticide used on agricultural crops |
| Diazinon | µg/L | 20 | < 1.0 | < 1.0 | Insecticide for common household pests, flies, ants and cockroaches |
| Dicamba | µg/L | 120 | < 1.0 | < 1.0 | Herbicide for weed control in grain crops |
| 1,2-Dichlorobenzene | µg/L | 200 | < 0.20 | < 0.20 | Used in products such as degreasers and inks |
| 1,4-Dichlorobenzene | µg/L | 5 | < 0.20 | < 0.20 | Was widely used in toilet pucks and mothballs, banned in 1988 |
| 1,2-Dichloroethane | µg/L | 5 | < 0.20 | < 0.20 | Used as a solvent and fumigant |
| 1,1-Dichloroethylene (vinylidene chloride) | µg/L | 14 | < 0.10 | < 0.10 | Used in the food packaging industry and the textile industry for furniture and automotive upholstery |
| Dichloromethane | µg/L | 50 | < 0.50 | < 0.50 | Industrial solvent for paint and degreasing |

continued next page

| Test Parameter | Units | MAC | Palgrave Result | Caledon East Result | Parameter Information |
|--|-------|-----|-----------------|---------------------|---|
| (Methylene Chloride) | | | | | agent |
| 2,4-Dichlorophenol | µg/L | 900 | < 0.25 | < 0.25 | Present in drinking water only as a result of industrial contamination |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) | µg/L | 100 | < 1.0 | < 1.0 | Herbicide for cereal crops and lawn weed control |
| Diclofop-methyl | µg/L | 9 | < 0.90 | < 0.90 | Herbicide for grass control in grains and vegetables |
| Dimethoate | µg/L | 20 | < 2.5 | < 2.5 | Miticide and insecticide |
| Diquat | µg/L | 70 | < 7.0 | < 7.0 | Herbicide used as a desiccant in seed crops |
| Glyphosate | µg/L | 280 | < 10 | < 10 | Herbicide for weed control |
| Haloacetic acids (HAA) † | µg/L | 80† | 5.0 | | Primarily produced by the reaction of chlorine and natural organics |
| Malathion | µg/L | 190 | < 5.0 | < 5.0 | Insecticide used on fruits and vegetables |
| 2-Methyl-4-chlorophenoxyacetic acid (MCPA) | µg/L | 100 | < 10 | < 10 | Herbicide used on agriculture sites, fine turf, forestry applications and at industrial sites |
| Metolachlor | µg/L | 50 | < 0.50 | < 0.50 | Selective herbicide for pre-emergence and pre-plant broad leaf weed control |
| Metribuzin | µg/L | 80 | < 5.0 | < 5.0 | Herbicide for control of weed and grasses |
| Monochlorobenzene | µg/L | 80 | < 0.10 | < 0.10 | Industrial solvent |
| Paraquat | µg/L | 10 | < 1.0 | < 1.0 | Highly toxic herbicide used for desiccation of seed crops |
| Pentachlorophenol | µg/L | 60 | < 0.50 | < 0.50 | Formerly used extensively as a pesticide and wood preservative; environmentally persistent |
| Phorate | µg/L | 2 | < 0.50 | < 0.50 | Insecticide for sucking insects and larvae |
| Picloram | µg/L | 190 | < 5.0 | < 5.0 | Herbicide for broad leaf weed and brush control on roads |
| Total Polychlorinated Biphenyls (PCB) | µg/L | 3 | < 0.05 | < 0.50 | No longer used but environmentally persistent |
| Prometryne | µg/L | 1 | < 0.25 | < 0.25 | Herbicide used on select grass and weeds |
| Simazine | µg/L | 10 | < 1.0 | < 1.0 | Herbicide for pre-emergence weed control |
| Total Trihalomethanes (THM) † | µg/L | 100 | 11.9 | | Primarily produced by the reaction of chlorine and natural organics |
| Terbufos | µg/L | 1 | < 0.50 | < 0.50 | Insecticide |
| Tetrachloroethylene | µg/L | 30 | < 0.10 | < 0.10 | Industrial solvent |
| 2,3,4,6-Tetrachlorophenol | µg/L | 100 | < 0.50 | < 0.50 | Formerly used to preserve wood |
| Triallate | µg/L | 230 | < 1.0 | < 1.0 | Herbicide for wild oat control in crops |
| Trichloroethylene | µg/L | 5 | < 0.10 | < 0.10 | Industrial solvent |
| 2,4,6-Trichlorophenol | µg/L | 5 | < 0.50 | < 0.50 | Pesticide |
| Trifluralin | µg/L | 45 | < 1.0 | < 1.0 | Herbicide for summer weed control |
| Vinyl Chloride | µg/L | 1 | < 0.20 | < 0.20 | Synthetic chemical used in making plastic items |

† This MAC becomes effective on January 1, 2020

‡ Running annual average of samples collected quarterly in the water distribution system

During the reporting period, no test parameters included in Schedules 23 and 24 of O. Reg. 170/03 were subject to increased sampling frequency as a result of exceeding half of the Maximum Acceptable Concentration.

Operational Parameters - Annual Minimum, Maximum and Mean (Average) Results

| Operational Parameter/Location | Number of Samples | Units | Acceptable Range | Test Results | | |
|---|-------------------|-------|------------------|--------------|---------|----------------|
| | | | | Minimum | Maximum | Mean (Average) |
| Raw Water Turbidity Palgrave Well No. 2 | 105 | NTU | N/A | 0.03 | 0.40 | 0.18 |
| Raw Water Turbidity Palgrave Well No. 3 | 105 | NTU | N/A | 0.11 | 0.52 | 0.25 |
| Raw Water Turbidity Palgrave Well No. 4 | 80 | NTU | N/A | 0.11 | 0.47 | 0.23 |
| Raw Water Turbidity Caledon East Well No. 3 | 105 | NTU | N/A | 0.13 | 0.39 | 0.24 |
| Raw Water Turbidity Caledon East Well No. 4 | 77 | NTU | N/A | 0.09 | 0.34 | 0.17 |
| Raw Water Turbidity Caledon East Well No. 4A | 81 | NTU | N/A | 0.10 | 0.33 | 0.19 |
| Free Chlorine Residual Primary Disinfection Palgrave Wells No. 2 and 3 | 8760* | mg/L | 0.05 - 4.00 | 0.97 | 2.43 | 1.62 |
| Free Chlorine Residual Primary Disinfection Palgrave Well No. 4 | 8760* | mg/L | 0.05 - 4.00 | 0.83 | 2.53 | 1.47 |
| Free Chlorine Residual Primary Disinfection Caledon East Well No. 3 | 8760* | mg/L | 0.05 - 4.00 | 0.98 | 2.29 | 1.55 |
| Free Chlorine Residual Primary Disinfection Caledon East Well No. 4 and 4A | 8760* | mg/L | 0.05 - 4.00 | 0.81 | 2.53 | 1.66 |
| Free Chlorine Residual Secondary Disinfection | 419** | mg/L | 0.05 - 4.00 | 0.55 | 1.95 | 1.36 |

* 8760 represents continuous monitoring, which sample at a minimum frequency of once per minute. Occasional outlying results occur due to equipment maintenance, programming updates, SCADA alarm testing or signal anomalies.

** represents number of samples collected per O. Reg. 170/03 Schedule 7 Section 7-2(3) to (4)

**Summary of Results for Other Parameters Tested at an Accredited, Licensed Laboratory
on Grab Samples of Treated Water Collected**

| Test Parameter | Units | Type of Objective | Acceptable Range/ Upper Limit | Palgrave Result (Min-Max) | Caledon East Result (Min-Max) | Parameter Information |
|-----------------------------|---|-------------------|----------------------------------|----------------------------|-------------------------------|---|
| Alkalinity | mg/L | OG | 30 - 500 | 210 | 230 - 280 | Water resistance to effects of acids added to water |
| Conductivity @25°C | µmho/cm | N/A | N/A | 490 - 510 | 560 - 1300 | Related to inorganics such as minerals dissolved in water |
| Fluoride (F) | mg/L | MAC | 1.5 | < 0.10 | < 0.10 | Naturally occurring |
| Hardness* | mg/L (CaCO ₃) grains/US gallon | OG | 80 - 100 4.7 - 5.8 | 230 - 240 13.37 - 14.02 | 260 - 390 15.19 - 22.67 | Naturally occurring; related to mineral content, mainly calcium and magnesium |
| Iron (Fe) | µg/L | AO | 300 | < 100 | < 100 | In groundwater as a result of mineral deposits and chemically reducing underground conditions |
| Lead (Pb) | µg/L | MAC | 10 | < 0.50 | < 0.50 | Present as a result of corrosion of lead solder, lead containing brass fittings or lead pipes |
| Manganese (Mn) | µg/L | AO | 50 | < 2.0 | < 2.0 - 13.0 | In groundwater as a result of mineral deposits and chemically reducing underground conditions |
| Nitrate (NO ₃) | mg/L as N | MAC | 10.0 | < 0.10 | < 0.10 - 4.19 | Present in groundwater as a result of plant or animal material decay, fertilizers, sewage or treated wastewater |
| | | | | < 0.10 | < 0.10 - 3.94 | |
| | | | | < 0.10 | < 0.10 - 4.01 | |
| | | | | < 0.10 | < 0.10 - 4.14 | |
| Nitrite (NO ₂) | mg/L as N | MAC | 1.0 | < 0.010 | < 0.010 | Usually present in groundwater, and is oxidized to Nitrate when chlorinated |
| | | | | < 0.010 | < 0.010 | |
| | | | | < 0.010 | < 0.010 | |
| | | | | < 0.010 | < 0.010 | |
| pH | pH unit | OG | 6.5 - 8.5 | 7.67 - 7.76 | 7.38 - 7.80 | Indicates water acidity |
| Sodium (Na)** | mg/L | AO | 200 | 6.5 - 11 | 11.0 - 110 | Naturally occurring or due to water softening |
| Sulphate (SO ₄) | mg/L | AO | 500 | 36 - 38 | 36 - 42 | Naturally occurring |
| Total Dissolved Solids | mg/L | AO | 500 | 280 - 290 | 320 - 690 | Refers mainly to inorganic substances dissolved in water |
| Zinc (Zn) | µg/L | AO | 5000 | < 5.0 | < 5.0 - 22 | Caused by corrosion taking place in galvanized pipes |

Note: Nitrate and Nitrite are sampled quarterly

*Hardness levels between 80 and 100 mg/L are considered to provide an acceptable balance between corrosion and incrustation. Water supplies with hardness greater than 200 mg/L are considered tolerable while those in excess of 500 mg/L are unacceptable for most domestic uses.

** The Medical Officer of Health is notified when Sodium concentration exceeds 20 mg/L (MAC), per O.Reg.170/03

APPENDIX B - FREQUENTLY ASKED QUESTIONS AND ANSWERS ON WATER QUALITY

Frequently Asked Questions and Answers on Water Quality

➤ **Is my water safe to drink?**

To protect public health, the Ministry has established the Ontario Drinking Water Quality Standards. These standards help ensure that water used by the public is free from disease-causing organisms, harmful amounts of toxic chemicals and radioactive materials.

➤ **Why do we use chlorine?**

Chlorine is used to inactivate bacteria, viruses and other organisms that can cause illness. Ontario Regulation 170/03 regulates the amount of chlorine that must be added. The regulation states that we must maintain free chlorine residual at a minimum level of 0.05 mg/L and should not exceed a maximum level of 4.0 mg/L.

➤ **Is the water in Palgrave and Caledon East hard?**

Hardness is typically dissolved calcium and magnesium in water measured as calcium carbonate. Upon heating, hard water has a tendency to form scale deposits or white film and can form excessive scum with regular soaps. Conversely, soft water may result in accelerated corrosion of water pipes. Although Palgrave and Caledon East water is considered hard, it is still acceptable for domestic purposes (see page 31 for test results).

➤ **Should I buy a water softener?**

The purchase of a water softener is based mostly on personal preference. Soap suds are formed more readily with soft water, therefore less detergent is used. The use of a water softener also reduces the formation of hardness scale in pipes and hot water tanks. Some consumers do not like the feel of soft water. For example, after rinsing with soft water you may still feel a soap film on your skin.

➤ **Why does my kettle get a white film inside?**

When water is boiled, calcium and manganese precipitate out of the water and deposits on the heating element and inner surfaces of the kettle. This does not pose a health risk. The deposit can be prevented by regular rinsing with vinegar or lemon juice.

➤ **Why does the water sometimes look “cloudy” or “milky”?**

Tiny bubbles of air in the water cause the cloudiness. Those bubbles may also cause the water to appear white or foamy, similar to the appearance of water in a rushing stream. This does not indicate any problem and clears when the water is left to sit for a few minutes. This is an aesthetic issue, not a health concern. If cloudy water does persist, please notify the Region of Peel so that the matter can be investigated.

➤ **Is fluoride added to my water?**

The Region of Peel does not add fluoride to the water in the Palgrave and Caledon East areas. Any fluoride present in the water is naturally occurring.

➤ **Why does the water sometimes look “rusty”, yellow or tea-like?**

Yellow water is a common occurrence. Excessive levels of iron in drinking water may impart a yellowish or brownish colour, often seen on laundered clothes, plumbing fixtures, and the water itself. Running your tap for a few minutes can clear the colour. No health risks are associated with this discolouration. If you are experiencing problems and your neighbours are not, the hot water tank or the pipes in your home are likely causing the problem.

➤ **Does the Region of Peel knock on the door to test water or leave a bottle to fill?**

Some of our water programs require testing on private premises, such as residential homes or businesses. This would only be done by Peel with prior arrangements with the owner or tenant of the premise. Based on the stringent provincial guidelines, drinking water samples must be collected and handled by qualified persons and analysed at an accredited laboratory; therefore, Peel staff would not leave a bottle at the door requesting a sample of water for testing, and will always carry a Region of Peel identification card.

There are many responsible home water treatment businesses that offer products that live up to their claims. Unfortunately, some companies and salespersons resort to grabbing the public’s attention and misinforming them about the safety of the municipal drinking water supplies in an effort to sell their products.

As of March 1, 2018, door to door sales of water heaters and treatment devices will be prohibited by the Government of Ontario. To ensure that you are informed about the water quality in Peel and less likely to become a target of a company trying to sell you costly and inappropriate water treatment equipment, or if you have questions or concerns, please contact our Water Quality

Team at 905-791-7800 ext. 4685 or via e-mail to WaterQualityInquiries@peelregion.ca. You can find more information on our website at <http://www.peelregion.ca/articles/door-to-door-agents.asp>

➤ **Will you come to my house and take a sample?**

If your water is supplied by the Region of Peel then you have no reason for concern about the safety of your drinking water. The Region of Peel operates, maintains and monitors its municipal drinking water systems in accordance with strict provincial regulations and Peel's drinking water continually meets the established water quality standards.

Some of our water programs require testing on private premises, such as the Community Lead Testing Program. This testing would only be done by a certified Region of Peel operator with prior arrangements made with the owner or tenant. More information about the Community Lead Testing Program can be found in Section 5.5 of this report.

The Region of Peel collects a large number of samples from its drinking water systems to demonstrate high quality water supply. The Region will only respond to a customer enquiry/request by undertaking sampling at private taps if there is reason to believe that water quality has been compromised that impacts both the tap water and municipal supply system. Region staff occasionally sample at residential or commercial taps in conjunction with nearby work in the private or municipal water system. Region staff will carry a Region of Peel identification card.

➤ **Why is lead sometimes present in water?**

Lead is a metal substance that can dissolve in water. Traditionally, lead compounds were used in plumbing fittings and in solder to join pipes together in water distribution systems. If water stays in a piping system that contains lead for long periods of time, lead may dissolve into the water.

➤ **How does lead affect my Health?**

For more information, contact Peel Public Health at: <http://www.peelregion.ca/health/>

To view our Lead in Water Pamphlet, please visit:

<https://www.peelregion.ca/health/enviroNew/athome/lead.pdf>

Water Quality at Home Tips

| Water Quality Concern | Possible Cause | Suggested Solutions |
|--------------------------------------|---|---|
| Chlorine Odour and Taste | <ul style="list-style-type: none"> Chlorine getting combined with organics Chlorination of new water mains Effects of new plumbing Change of residency as chlorine form and concentration varies from location to location | <p>Chlorine is necessary to control disease-causing organisms. To minimize the chlorine taste and smell in water;</p> <ul style="list-style-type: none"> Fill a pitcher and let it stand in the refrigerator overnight Blend the water for 5 minutes or pour between containers about 10 times Boil the water, let it cool down and then refrigerate Home plumbing may be flushed for a minute before water use (especially in the mornings, after water stands in the lines overnight) |
| Musty/Earthy Odour | <ul style="list-style-type: none"> Algae that bloom in the lake in the summer produces a metabolite called 'geosmin', which causes musty/earthy odour | <ul style="list-style-type: none"> The algae are harmless and although the water may not be aesthetically pleasing, it is safe. |
| Rotten Egg/Septic Odour | <ul style="list-style-type: none"> Sink and floor drains Faucet aerators/screens Poorly maintained hot water tanks Dead-end water mains or areas with low water demand | <ul style="list-style-type: none"> Refrain from flushing solids/organics down the drain; stagnant wastewater in the drain may generate foul odours and potentially plug the drain Clean faucet aerators and screens on frequent basis Hot water tanks should be flushed periodically (every 2 to 3 years) to remove rust and scale |
| Milky/Cloudy Water | <ul style="list-style-type: none"> Air trapped in water due to water main breaks, water temperature or pressure change, plumbing work, construction work in the area, water shut-offs, faucet screens Hot water tank temperature may be set too high | <ul style="list-style-type: none"> Run all cold water taps at once for a couple of minutes to flush the lines and release the air Lower the hot water tank temperature if above 140F (60°C) |
| Blue/Green Stains on Fixtures | <ul style="list-style-type: none"> Copper in water due to copper plumbing | <ul style="list-style-type: none"> Run water for 30 seconds to reduce the effects of local plumbing (metal concentration) prior to water consumption Keep fixtures dry and drip-free |
| Brown/Dirty Water | <ul style="list-style-type: none"> Change in water flow due to: <ul style="list-style-type: none"> Water main break Hydrant use Local Fire Dead ends Poorly maintained hot water tanks No water use for a longer period of time; return from vacation | <ul style="list-style-type: none"> Open cold-water faucets and flush water for 5 to 10 minutes, until clear Refrain from doing laundry to prevent clothes staining Hot water tank should be flushed periodically (every 2 to 3 years) Run cold and hot water separately to verify the cause; if hot water is the cause - tank needs a flush Open several faucets and flush the water standing in pipes that may have dissolved pipe scale material |
| White Flakes/Particles | <ul style="list-style-type: none"> Flakes are scale caused by hardness Faulty or disintegrating hot water tank tubing or lining | <ul style="list-style-type: none"> Can be reduced by frequent cleaning of faucet aerators/screens and/or regular flushing of hot water tanks Contact the hot water tank company |
| Pink Staining on Fixtures | <ul style="list-style-type: none"> Pink pigmented bacteria called <i>Serratia marcescens</i> Originates from the Air, not the water | <ul style="list-style-type: none"> Scrub surfaces with a brush, disinfect with a strong bleach solution, allow disinfectant to penetrate for 10-20 minutes, rinse |

Report Accessibility

The 2018 Annual Reports can be viewed by the public online at:

<http://www.peelregion.ca/pw/water/quality/reports> or picked up at the Region of Peel Office at 10 Peel Centre Drive, Brampton.

Other sources from which you can get more information about drinking water and related issues:

| | |
|---|--|
|  <p>Region of Peel working with you</p> <p>For information on Water Quality:</p> <p>Region of Peel 10 Peel Centre Dr. Brampton ON L6T 4B9 Phone: 905-791-7800 Ext. 4685 Website: http://www.peelregion.ca/pw/water/quality/ E-mail: WaterQualityInquiries@peelregion.ca</p> |  <p>Region of Peel working with you</p> <p>For information on Lead Testing of Drinking Water:</p> <p>Region of Peel 10 Peel Centre Dr. Brampton ON L6T 4B9 Phone: 905-791-7800 Ext. 4685 Website: www.peelregion.ca/pw/water/quality/lead-in-water E-mail: WaterQualityInquiries@peelregion.ca</p> |
|  <p>Region of Peel working with you</p> <p>Region of Peel Public Health 7120 Hurontario St., 8th Floor Mississauga, ON L5W 1N4 Phone: 905-799-7700 Website: http://www.peelregion.ca/health/</p> |  <p>230 Advance Blvd. Brampton, ON L6T 4T6 Phone: 905-791-7800 Ext. 4409 Web Site: http://www.peelregion.ca/watersmartpeel/</p> |
|  <p>Ministry of the Environment, Conservation & Parks Public Information Centre Phone: 416-325-4000 Toll-Free: 1-800-565-4923 Web site: www.ontario.ca/environment</p> |  <p>Environment and Climate Change Canada Inquiry Centre Phone: 819-997-2800 Toll-Free: 1-800-668-6767 Web Site: http://www.ec.gc.ca</p> |