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2019-2020 Chief Drinking Water Inspector annual report

Learn about the performance of our regulated drinking water systems and laboratories, drinking water test results, and enforcement activities and programs.

Message from the Chief Drinking Water Inspector

It is my honour to serve as your Chief Drinking Water Inspector and I am pleased to provide my annual report showcasing Ontario's drinking water protection activities from April 1, 2019 to September 30, 2020 and compliance results from April 1, 2019, to March 31, 2020. This year was a very busy, challenging and unique year.

This year marked the 20th anniversary of the tragic events that took place in Walkerton, Ontario. As we remember the past, I'd like to acknowledge the families and the community of Walkerton who continue to live with the lasting effects and ongoing impacts of the tragedy. I would also like to recognize Justice Dennis O'Connor who played a vital role in identifying the causes of the water crisis and making recommendations that underpinned the transformation of Ontario's drinking water protection framework. He provided key reflections throughout his report that resonate with me including this one:

> "The Walkerton experience warns us that we may have become victims of our own success, taking for granted our drinking water's safety. The keynote in the future should be vigilance. We should never be complacent about drinking water safety."
>
> *O'Connor, 2002, p. 8*

It is critical that we continue to enhance the framework and hold ourselves accountable. You can read more about the transformation of Ontario's drinking water protection in this report.

Safeguarding drinking water involves many individuals and organizations, such as the Chief Medical Officer of Health and public health units, municipalities, conservation authorities, water associations, the Walkerton Clean Water Centre, and the Ontario Clean Water Agency. Establishing collaborative relationships with these stakeholders and partners is a key aspect of the drinking water protection framework.

I would like to take a moment to thank the many people across the province whose work embodies the spirit of the recommendations made by Justice O'Connor in the Walkerton report. Take, for example, John-Paul Palmer, a Water Compliance Specialist with the City of Guelph who began working at the Guelph Drinking Water System as an operator in 2001. As part of his role to ensure that the City of Guelph's drinking water system continues to provide safe drinking water, he has developed a proactive monthly compliance review that mirrors a drinking water inspection. This additional step has allowed the early identification of issues and permitted the City to resolve them before they become problematic. This helps to ensure that Guelph's Drinking Water System performance improves year after year. Note here that our common goal is to provide safe drinking water and that a positive working relationship and support from the ministry's inspector is critical to the success of the compliance program.

Through my experience as Chief Drinking Water Inspector over the past two years, I have met drinking water system owners, operators and frontline ministry water inspectors across the province who, like John-Paul, strive to ensure the continued excellence of Ontario's drinking water quality. The COVID-19 pandemic has reaffirmed the critical role the owners and operators of our drinking water and wastewater systems and water inspectors play within our communities. When the pandemic was declared, the Ontario government worked quickly to give owners and operators supports to protect the health and safety of employees so they could continue to operate our water systems and to help ensure that clean, safe drinking water remained available. Additional details on our ministry's pandemic response are also presented in this report.

The performance results in this annual report show that Ontario's drinking water systems continue to be operated well, our water is still among the best protected in the world and we remain committed to transparency and accountability.

Here is a brief summary of the 2019-2020 results:

99.9%

of the over 523,000 drinking water tests from municipal residential drinking water systems met Ontario's strict, health-based drinking water standards

71%

of 657 municipal residential drinking water systems received a 100% rating. 99.7% of systems received an inspection rating above 80%

95.4%

of the over 50,000 test results met Ontario's standard for lead in drinking water at schools, private schools and child care centres. 97.5% of flushed test results met the standard

I would like to extend a special thank you to my colleague, Dr. David C. Williams, Chief Medical Officer of Health, for providing an update on the performance of small drinking water systems regulated by the Ministry of Health. I would also like to thank him and his team for the amazing work they have done throughout the pandemic, and for their continued partnership and contribution to the overall protection of Ontario's drinking water.

It is a great privilege to work with the many individuals, including my team and the water community at large, who are strongly committed to providing the highest quality of drinking water to the people of Ontario today and for future generations.

Melissa Thomson
Chief Drinking Water Inspector
Ministry of the Environment, Conservation and Parks

Message from the Chief Medical Officer of Health

This has been an unprecedented year in public health with the COVID-19 global pandemic. While this has preoccupied much of the year, we must not forget that 20 years ago, the people of Walkerton were immeasurably impacted by the contamination of their drinking water with *E. coli*. Out of this unfortunate incident came the recommendations of the Walkerton Report, resulting in more rigorous standards and improved water quality.

As I look at the results of the Small Drinking Water Systems Program for 2019-2020, I am pleased to see positive trends continue. There are progressively fewer high-risk systems and the number of adverse water quality incidents continues to decline.

The program's success is a testament to the ongoing collaboration between Ontario's 34 public health units, Public Health Ontario laboratories, the Ministry of Natural Resources and Forestry and the Ministry of the Environment, Conservation and Parks. This continued commitment helps to deliver a safe drinking water program for Ontarians and demonstrates that the lessons learned from Walkerton are still with us today.

I am grateful to our drinking water partners and to the local boards of health for their dedication and partnership in ensuring that Ontarians and their communities continue to enjoy safe drinking water.

David C. Williams, MD, MHSc, FRCPC
Chief Medical Officer of Health

Ministry of Health

Continued operations during pandemic

In 2020, the world experienced many unforeseen challenges as a result of the COVID-19 pandemic. Collectively, the Ontario government, owners and operators and the water community had to adapt to rapid changes, communicate to identify challenges and determine supports needed to ensure the continued delivery of safe drinking water. The ministry anticipated that the pandemic could have significant impacts, such as staff shortages and operators being unable to meet the requirements to renew their operator certificates, on operations at drinking water and wastewater systems across the province. To support the continuity of drinking water and wastewater operations, the province responded in two ways:

- A temporary emergency order was made under the *Emergency Management and Civil Protection Act* *(https://www.ontario.ca/laws/statute/90e09)* on March 24, 2020.
- Temporary regulatory relief was granted based on a framework of established criteria and where it promoted the safety of the operators but did not compromise the safety of the drinking water.

These two actions gave drinking water and wastewater system owners and operating authorities the ability to adapt to changes brought on by the pandemic.

Temporary emergency order (operator certification)

The temporary emergency order enabled system owners to maintain and employ qualified water and wastewater system operators during the pandemic. The emergency order extended operator certificates and licences that expired while the order was in effect and provided flexibility to water and wastewater system owners so they could:

- redeploy qualified operators as needed to address staff shortages
- reassign and reschedule operator work should there be a significant need at a different system
- temporarily employ qualified but non-certified individuals to perform operational duties, if needed, including knowledgeable technical personnel, supervisors, managers, professional engineers and operators with certificates that expired in the past five years

Skilled, competent and well-trained operators are critical to maintaining safe water quality. The ministry's Operator Certification Program establishes professional standards related to education, training, experience and examinations which ensures Ontario's operators are skilled and competent. These requirements also set the minimum training hours they are required to complete for ongoing learning. A temporary delay in certificate renewal and the flexibility to redeploy and employ qualified operators ensured these operators were available to respond during the COVID-19 pandemic but did not lessen the skills and qualifications of drinking water and wastewater operators.

As part of the government's plan to safely and gradually reopen the province (https://www.ontario.ca/laws/statute/20r17) , on July 15, 2020, changes were made to the temporary emergency order for water systems staff to ensure the province's drinking water systems and sewage works continue to operate and provide clean, safe drinking water to the public. The amendments phased out provisions that temporarily allowed drinking water and wastewater systems to use qualified, non-certified staff and to redeploy staff to maintain system operations as drinking water and wastewater system owners had limited need for these temporary provisions. Systems had a transition period until July 31, 2020, to reorganize and return to using certified and licensed staff.

In addition, the order included certification-related provisions because it was anticipated that opportunities for operators to take the training required for certificate renewal would remain limited in the coming months.

To help ensure that operators maintain their certificates and licences, the order extended operator certificates and licences expiring up to October 31, 2020 by six months and adjusted training requirements for wastewater operators during the 2020 calendar year. This allowed operators to remain certified and licenced as they focus on providing safe drinking water and proper treatment of wastewater. These measures have also helped to ensure that drinking water operators have adequate time to complete the training required to renew their certification.

- As of March 31, 2020, there were 8,207 certified drinking water operators and 8,001 licensed wastewater operators in Ontario.
- Through the emergency orders, certificates for 1,285 drinking water operators and licences for 1,297 wastewater operators were extended.

System-specific regulatory relief

The ministry also allowed temporary system-specific regulatory relief to address challenges posed by the pandemic such as operational flexibility to accommodate social and physical distancing or adjust processes to help protect staff. Relief was only granted

when requested and when ministry officials were satisfied that public health and the environment would continue to be protected. This temporary relief has been issued with an expiry date that may be extended during the COVID-19 pandemic.

As of September 30, 2020, the ministry had received 330 requests for relief from owners and operators of municipal and non-municipal drinking water systems and owners of municipal wastewater systems.

Of these requests, the ministry:

- approved and issued relief for 286 requests
- continued to review 9 requests

The remaining 35 requests were either matters covered by the emergency order, were withdrawn by the applicant or did not result in relief being granted by the ministry.

The tables below give a breakdown of the types of relief provided by the ministry.

Table 1: Relief that the ministry provided to drinking water system owners and operators as a result of the pandemic

Description	Municipal systems	Non-municipal systems
Temporary relief from lead sampling assessed as low risk to protect system operators and residents (e.g. relief from having to sample within private homes while continuing to sample from locations in the distribution system near these homes like fire hydrants and pump houses)	41	16
Temporary flexibility in water quality sampling where this was determined to be low risk (e.g. collecting fewer samples or varying sample locations when samples could not be collected from businesses impacted by the COVID-19 pandemic)	43	24

Description	Municipal systems	Non-municipal systems
Flexibility in timelines for annual equipment calibration (e.g. calibration activities undertaken by external vendors)	56	1
Extending timelines for required reporting (e.g. preparation of annual reports)	18	7
Other system-specific relief (e.g. flexibility in timelines for implementing new procedures or flexibility in timing of operational checks to align with other activities)	29	17

Table 2: Relief that the ministry provided to municipal wastewater system owners and operators as a result of the pandemic

Description	Municipal systems
Flexibility in timelines for calibration of flowmeters (e.g. calibration activities undertaken by external vendors)	29
Extending timelines for required reporting (e.g. preparation of annual performance reports, quarterly reporting)	22
Relief from raw sewage sampling (e.g. where raw sewage sampling will not impact routine operation of the system in the short term)	41
Relief from overflow/bypass sampling (e.g. where the volume of and nature of the flow can be estimated based on historical data)	15

Description	Municipal systems
Other system-specific relief (e.g. flexibility in timelines for installing equipment)	10

Further detail on these requests for relief is given in Appendix 1.

The province acknowledges that drinking water and wastewater systems may continue to face challenges as the pandemic continues. The continued operation of these systems is essential for the health and well-being of Ontarians and we will continue to support operators and the entire drinking water community as we all face challenges due to COVID-19.

Marking the 20th anniversary of the tragedy in Walkerton

Twenty years ago, in May 2000, seven people died and thousands fell ill from drinking contaminated water in Walkerton, Ontario.

The Municipality of Brockton, where Walkerton is located, wanted to commemorate the 20th anniversary in a way that could bring hope and healing, and help the community move forward. To do this, the municipality, in partnership with the Walkerton Clean Water Centre, launched a scholarship fund to honour those who suffered from the tragedy and to support the next generation of students who embrace environmental stewardship and the protection of clean water.

The Walkerton Clean Water Legacy Scholarship (https://www.brockton.ca/Modules/News/index.aspx?newsId=e87274e0-0782-4213-a882-747e3fbd2fee) is available for local students pursuing careers in environmental science or clean water management. The municipality and the Walkerton Clean Water Centre will fund the first recipient in the Spring of 2021.

The Walkerton Clean Water Centre also collaborated with the Ontario Municipal Water Association to host a two-hour webinar called Remembering and Never Forgetting the Walkerton E. coli Tragedy (https://omwa.org/water3/video-remembering-and-never-forgetting-the-walkerton-e-coli-tragedy/) to commemorate the anniversary. The webinar covered topics such as lessons learned from the tragedy and how Ontario's water future was improved by the changes recommended in the Walkerton Inquiry report.

Lessons learned

In the inquiry that followed this event in Walkerton, Justice O'Connor made 121 recommendations that outlined how to improve drinking water protection in Ontario. In the report, he advised that:

> "While it is not possible to utterly remove all risk from a water system, the overall goal is to ensure that Ontario's drinking water systems deliver water with a level of risk so negligible that a reasonable and informed person would feel safe drinking the water."
>
> *O'Connor, 2002, p. 5*

The establishment of the drinking water protection framework (details in the following section of the report) was undertaken with this goal in mind. A unique drinking water protection framework was established by developing a source water protection program, strong legislation and stringent health-based standards, requiring regular inspections and regular and reliable testing as well as the use of highly trained operators.

Creating this framework was a significant undertaking and would not have been possible without the hard work and collaboration of many individuals and groups across the province and water sector including municipalities, water associations, conservation authorities, the Walkerton Clean Water Centre, public health units, and licensed laboratories.

The legacy of this drinking water protection framework continues today. Its greatest strength remains the dedicated people who work for the province, across the water sector and in our communities to safeguard our drinking water every day. The commitment of these individuals is what makes Ontario's drinking water among the best protected in the world.

Story from the frontline: From Water Inspector to Program Coordinator

In 2001, when Kevin Belsito was hired as a water inspector, the ministry was undertaking an extensive review of the drinking water program and developing new inspections protocols. Kevin remembers, "These were the early days of the drinking water program, and the ministry was taking action to deal with the Report of the Walkerton Inquiry."

The government decided, in 2000, that municipal residential drinking water systems would be inspected annually, a requirement that is still in place today. Kevin, who was part of a new group of water inspectors, received intensive training about water treatment technologies, regulatory requirements, industry best practices and compliance. "It was the beginning of the drinking water protection framework," recalls Kevin.

Following their extensive training, Kevin and his colleagues returned to their respective offices with a very clear sense of purpose. They had a responsibility to help restore Ontarians' faith in the quality of their drinking water.

Due to the rapid changes to the regulatory framework, municipalities were also

adapting to new and more rigorous requirements. Water inspectors worked diligently to identify issues at drinking water systems, and to work with municipal drinking water system operators to take swift action to address any issues.

The years that followed were among the busiest and most rewarding of Kevin's career. He was involved in developing new inspection tools, processes and information technology systems, as well as providing ongoing support and training for ministry water inspectors and supervisors.

Now a Drinking Water Program Coordinator who focuses on making ongoing improvements to the drinking water protection framework, Kevin says that his early experiences as a water inspector still influence how he performs his work today. Twenty years later, he is still demonstrating an unwavering commitment to keeping drinking water safe for Ontarians.

Major milestones in the establishment of the drinking water protection framework in Ontario

2002

Passing the *Safe Drinking Water Act*, which helped to implement Justice O'Connor's recommendations and form the foundation for a stronger regulatory framework.

2003

Adopting water quality guidelines as Ontario's Drinking Water Quality Standards.

2003

Implementing rigorous laboratory licensing requirements.

2004

Implementing strict drinking water system operator certification and training requirements.

2004

Founding the Walkerton Clean Water Centre, a key training partner for the province.

2005

Implementing stringent requirements on this ministry, such

as the frequency of inspections.

2006

Passing the *Clean Water Act*, which requires local areas to develop plans to protect sources of municipal drinking water.

2009

Implementing requirements for a drinking water quality management system for the operation of municipal systems.

2012

Implementing the statutory Standard of Care requirement, increasing accountability for decision makers responsible for municipal drinking water systems.

2016

Implementing all source protection plans.

Reaching these milestones does not mean that Ontario can be complacent about drinking water safety. Resources and training need to remain a top priority and Ontario must continue to be steadfast in its commitment to the protection of drinking water and ensuring transparency and accountability.

Ontario recognizes that there are still challenges in the drinking water protection framework, in particular for First Nations communities. Although the federal government is primarily responsible for safe drinking water on First Nations reserves, Ontario is committed to sharing drinking water expertise and technical experience with Canada and First Nations to make sustainable progress in this area.

Protecting Ontario's drinking water

Overview of Ontario's drinking water protection framework

The fundamental principle that underpins the drinking water protection framework is the use of multiple protective barriers. As noted in the Report of the Walkerton Inquiry:

> “The best way to achieve a healthy public water supply is to put in place multiple barriers that keep water contaminants from reaching people.”
>
> *O’Connor, 2002, p. 72*

Multiple barriers are described as follows:

> “Every step in the chain, from water supply through treatment to distribution, needs careful selection, design, and implementation, so that the combination of steps provides the best defence against calamity if things go wrong.”
>
> *O’Connor, 2002, p. 72*

Ontario took the recommendations and the multi-barrier concept from the Inquiry very seriously when establishing the approach to drinking water protection that is still in place today. The result is a network of safeguards and oversight measures that guides the provincial approach to the delivery of safe drinking water (see Figure 1).

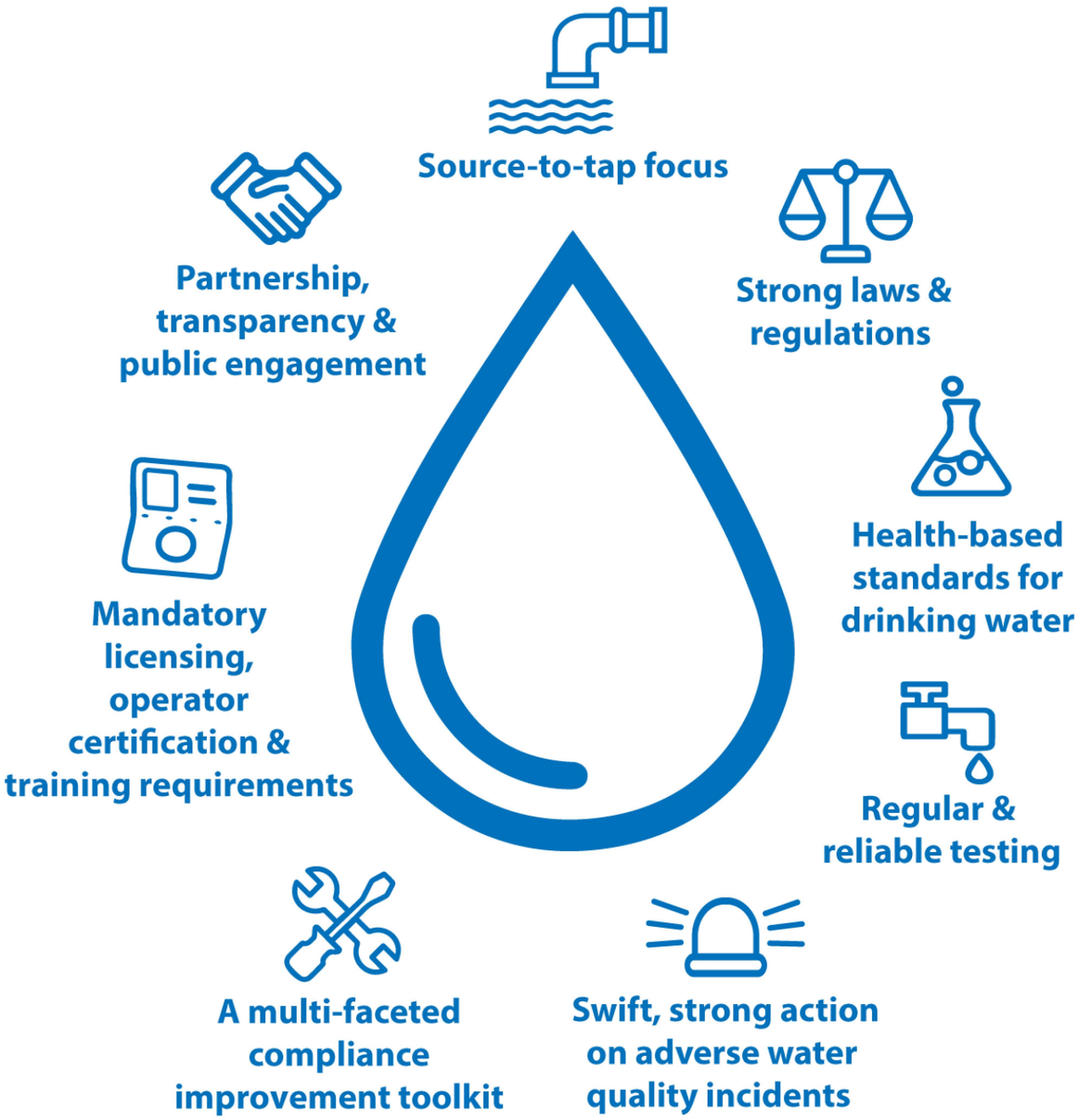


Figure 1: Drinking water protection framework.

The eight components consist of source-to-tap focus; strong laws and regulations; health-based standards for drinking water; regular and reliable testing; swift, strong action on adverse water quality incidents; a multi-faceted compliance improvement toolkit; mandatory licensing, operator certification and training requirements; and partnership, transparency and public engagement. All the components work together to protect drinking water.

The province reviews the framework on a regular basis to look for opportunities to strengthen and modernize it as the science of drinking water protection continues to evolve. The framework also reflects the belief that providing safe drinking water is a shared responsibility and that actively engaging the regulated community will help to enhance consumer protection and maximize compliance.

Components of the drinking water protection framework

Source-to-tap focus

- Protecting our local drinking water sources is an important first step in helping to ensure that Ontario's communities can be confident in the quality and quantity of their drinking water.

- The *Clean Water Act* *(https://www.ontario.ca/laws/statute/06c22)* required local committees to develop source protection plans (https://www.ontario.ca/page/source-protection) that identified land-use practices that may impact raw water supplies. The plans contain polices to help ensure incompatible land-use practices are effectively managed or prevented from contaminating or depleting sources of drinking water.
- These plans were approved by the Minister of the Environment, Conservation and Parks and are currently being implemented.

Strong laws and regulations

- The *Safe Drinking Water Act* *(https://www.ontario.ca/laws/statute/02s32)* , the *Clean Water Act* *(https://www.ontario.ca/laws/statute/06c22)* , and the *Health Protection and Promotion Act* *(https://www.ontario.ca/laws/statute/90h07)* and their regulations help form the foundation for the drinking water protection framework. These laws establish the rules that people who are involved in protecting drinking water are required to follow.

Health-based standards for drinking water

- Ontario has health-based drinking water quality standards that establish the maximum allowable levels for chemicals, radiological chemicals and microbiological organisms.
- Drinking water test results are compared against these standards to determine if the water is safe to drink.

Regular and reliable testing

- Ontario's drinking water is carefully monitored through regular testing by operators who take thousands of drinking water samples every year.
- The samples are tested at provincially licensed laboratories and help ensure that drinking water quality meets Ontario's health-based standards.

Swift, strong action on adverse water quality incidents

- An adverse water quality incident occurs when a drinking water test result does not meet a health standard, or a drinking water system experiences an operational issue.
- To help ensure that risk to public health is quickly addressed, drinking water system owners, operators and licensed laboratories are required to report the incident to the Ministry of the Environment, Conservation and Parks and the local medical officer of health.
- Drinking water system owners and operators are required to take corrective action to resolve the incident.
- The province's role is to assess adverse water quality incidents and ensure owners and operators take all required actions to address and resolve potential threats to the safety of Ontario's drinking water.

Mandatory licensing, operator certification and training requirements

- Continued certification and training of Ontario's drinking water operators promotes the effective management and operation of drinking water systems by knowledgeable, skilled and well-trained staff.
- The licensing of municipal residential drinking water systems requires system owners and operating authorities to conform with the requirements of Ontario's drinking water quality management standard, which requires them to develop and adopt preventative management strategies to address risks to public health, establish sound policies and promote continual improvement of their system.
- Laboratories that test drinking water are accredited to ensure that testing is completed competently, and the licensing process confirms they use approved drinking water test methods and have appropriate drinking water policies and procedures in place.

A multi-faceted compliance improvement toolkit

- The ministry undertakes a range of activities to improve compliance including:
  - providing information to improve drinking water system owners' and operators' understanding of their regulatory requirements and to enable them to make informed decisions and take effective actions
  - conducting targeted inspections to assess compliance
  - issuing a provincial officer's order or requesting an investigation where significant non-compliant behaviour is identified
- All activities are undertaken based on the level of risk of each non-compliant behaviour.

Partnership, transparency and public engagement

- The ministry works collaboratively with various water protection organizations and the public by regularly reaching out and consulting on policies to protect drinking water. We also communicate with the public on the state of Ontario's drinking water on an annual basis through our drinking water reports.

Update on ministry actions to protect drinking water

In 2019-2020, the ministry continued to strengthen drinking water protection in the following ways:

- beginning the licence renewal process for municipal residential drinking water systems and including new requirements (e.g. directing at-risk municipal drinking water system owners to monitor source water for toxins during peak algal bloom season)
- making effective a new standard for haloacetic acids on January 1, 2020. Haloacetic acids are disinfection by-products formed when chlorine reacts with organic matter that may be present in treated water. Proper operating practices at the drinking water system can reduce the level of organic matter entering the treatment sequence and thus reduce the formation of haloacetic acids. A standard for haloacetic acids will ensure that drinking water systems are optimized for drinking water disinfection while

minimizing the formation of disinfection by-products

- engaging with conservation authorities, provincial ministries, and municipalities on updates to the science framework and threats to drinking water sources to ensure that the quality of Ontario's drinking water continues to be protected and supported by current science
- piloting a "year-at-a-glance" report to increase the points of contact between water inspectors and the owners and operators of non-municipal year-round residential drinking water systems to improve compliance

These actions are examples of the ministry's continuous efforts to improve drinking water protection in Ontario.

Performance report

Drinking water in Ontario

In Ontario, the majority of residents receive their drinking water from a municipal residential drinking water system. Other residents of Ontario receive water from non-municipal sources or have a private supply such as a well or cistern (e.g. hauled water).

The provision of safe drinking water is essential to protecting public health. As advised in the Walkerton Inquiry report:

> "Few informed observers, if any, would argue against the need for the Province to ensure that drinking water systems are overseen in a consistently strong and effective manner."
>
> *O'Connor, 2002, p. 5*

In Ontario, the regulation of drinking water systems is shared by two ministries, the Ministry of Environment, Conservation and Parks and the Ministry of Health.

The Ministry of the Environment, Conservation and Parks regulates:

- municipal residential drinking water systems that are owned by municipalities and supply drinking water to homes and businesses
- non-municipal year-round residential drinking water systems that are privately owned and supply drinking water all year-round to people's homes in places such as trailer parks, apartments and condominium and townhouse developments where there are six or more private residences
    - they also include drinking water systems owned by local services boards, which are volunteer organizations that are set up in rural areas where there is no municipal structure

- public and privately-owned systems serving designated facilities that have their own source of water and provide drinking water to facilities such as children's camps, schools, health care centres and senior care homes
- licensed laboratories that perform testing of drinking water
- operator certification and training

The Ministry of Health regulates:

- small drinking water systems that provide drinking water to the public where no municipal drinking water system exists, such as restaurants, bed and breakfasts, campgrounds and other public settings, when those systems do not serve designated facilities

Information on small drinking water systems is covered later in this section.

Table 3 breaks down the number of drinking water systems and laboratories that the Ministry of the Environment, Conservation and Parks regulates.

Table 3: Number of drinking water systems and laboratories regulated by the Ministry of the Environment, Conservation and Parks in 2019-2020

Category	Number of drinking water systems and laboratories
Municipal residential drinking water systems	657
Non-municipal year-round residential drinking water systems (e.g. year-round trailer parks)	466
Systems serving designated facilities (e.g. a school on its own well supply)	1,425
Licensed laboratories	52

Drinking water quality and adverse water quality incidents

Owners and operators of drinking water systems are responsible for diligent monitoring and sampling of drinking water as it travels from the source through to the treatment and distribution system to the consumer. Operators collect samples and submit them to laboratories that are licensed to test Ontario's drinking water. Operators also perform on

site monitoring and maintenance of their drinking water systems such as taking chlorine readings, reviewing continuous monitoring data, flushing hydrants and replacing or repairing watermains. These activities are conducted to help ensure Ontario's drinking water remains well protected and safe to drink.

A key component of the drinking water protection framework is regular sampling and testing of drinking water to confirm that it meets Ontario's strict health-based standards. Samples that are submitted to licensed laboratories are tested for microbiological organisms, such as *E. coli* and total coliforms (a group of closely related bacteria; *E. coli* is a type of bacteria in this group), and chemical substances, such as lead and nitrates. Any exceedance of a prescribed drinking water standard is considered an adverse water quality incident and must be reported immediately, and corrective action undertaken.

In 2019-2020, nearly all test results for systems regulated by the Ministry of the Environment, Conservation and Parks met Ontario's drinking water quality standards as shown in Table 4.

Table 4: Summary of drinking water test results for system types in 2019-2020

Category	Number of tests results	Microbiological adverse test results	Chemical and radiological adverse test results	Percentage of test results meeting standards
Municipal residential systems	523,838	618	154	99.85%
Non-municipal year-round-residential systems	45,013	96	54	99.67%
Systems serving designated facilities	60,042	171	38	99.65%

Year over year, there were changes in the number of test results meeting the standard for all drinking water system categories compared to last year's results. Such changes are minor and are consistent with the variation in results that we see from the past sixteen

years (Figure 2).

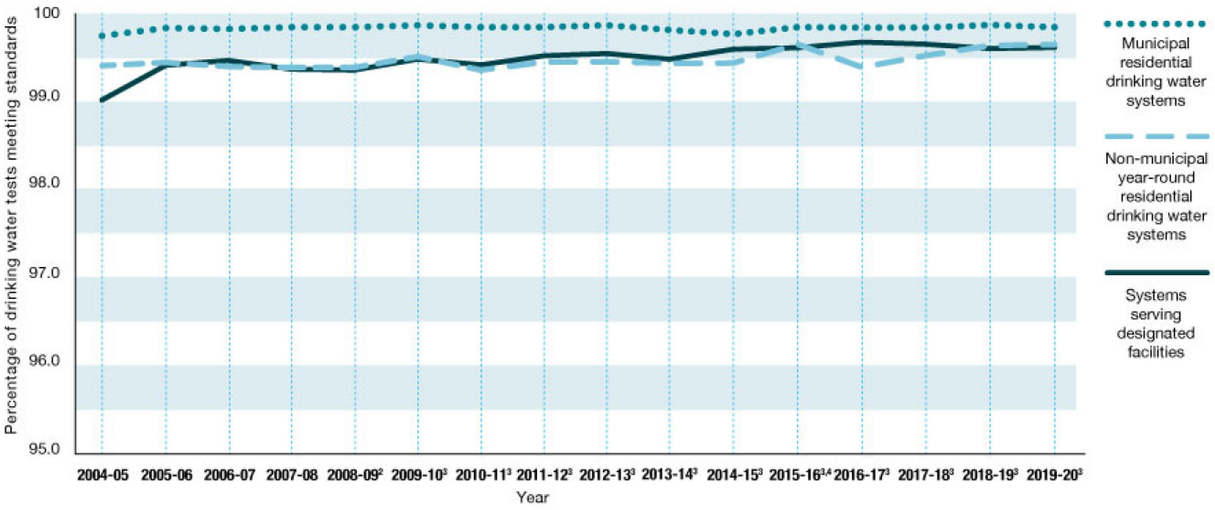


Figure 2: Trends in percentage of drinking water tests meeting Ontario Drinking Water Quality Standards, by system type

A chart showing trends in percentage of drinking water tests meeting standards for municipal residential drinking water systems, non-municipal year-round residential drinking water systems and systems serving designated facilities over 16 years. The trend is consistent for all three system types showing that over 99% of drinking water test results since 2004-2005 have met standards.

For municipal residential drinking water systems, the percentage of drinking water test results meeting standards ranged from 99.74% in 2004-2005 to 99.85% in 2019-2020.

For non-municipal year-round drinking water systems, the percentage of drinking water test results meeting standards ranged from 99.41% in 2004-2005 to 99.67% in 2019-2020.

For systems serving designated facilities, the percentage of drinking water test results meeting standards ranged from 99.06% in 2004-2005 to 99.65% in 2019-2020.

Notes for Figure 2:

1. There were slight variations in the methods used to tabulate the percentages year-over-year due to regulatory changes and different counting methods.
2. Lead results were not included as they were reported separately.
3. Lead distribution results were included but lead plumbing results were reported separately in a section called Ontario's actions to reduce exposure to lead.
4. The total trihalomethanes running annual average calculation changed part way through fiscal year 2015-2016.

The table below captures the last sixteen year-over-year percentages for drinking water tests meeting standards.

Table 5: Trends in percentage of drinking water tests meeting Ontario Drinking Water Quality Standards for system types

Year	Municipal residential systems	Non-municipal year-round-residential systems	Systems serving designated facilities
2004-2005	99.74%	99.41%	99.06%
2005-2006	99.84%	99.45%	99.42%
2006-2007	99.83%	99.40%	99.49%
2007-2008	99.85%	99.40%	99.39%
2008-2009	99.87%	99.40%	99.38%
2009-2010	99.88%	99.51%	99.49%
2010-2011	99.87%	99.38%	99.43%
2011-2012	99.87%	99.45%	99.52%

Year	Municipal residential systems	Non-municipal year-round-residential systems	Systems serving designated facilities
2012-2013	99.88%	99.47%	99.57%
2013-2014	99.83%	99.46%	99.49%
2014-2015	99.79%	99.46%	99.60%
2015-2016	99.84%	99.67%	99.61%
2016-2017	99.84%	99.40%	99.69%
2017-2018	99.84%	99.53%	99.67%
2018-2019	99.87%	99.66%	99.61%
2019-2020	99.85%	99.67%	99.65%

Notes for Table 5:

1. There were slight variations in the methods used to tabulate the percentages year-over-year due to regulatory changes and different counting methods.
2. Lead results were not included as they were reported separately.

3. Lead distribution results were included but lead plumbing results were reported separately in a section called Ontario's actions to reduce exposure to lead.
4. The total trihalomethanes running annual average calculation changed part way through fiscal year 2015-2016.

Aging infrastructure, equipment malfunctions, sampling errors and impacts to source water, such as spills and drought conditions may cause adverse test results in drinking water. Recognizing that issues do arise, the framework is designed such that regular monitoring and sampling is required to ensure that water quality issues are identified, and that swift action is taken to resolve adverse water quality incidents.

Operational issues in drinking water systems such as insufficient disinfection or equipment malfunctions are also considered adverse water quality incidents. Laboratories and drinking water system owner and operators must report all adverse water quality incidents to the ministry's Spills Action Centre and to the local medical officer of health. An adverse water quality incident indicates that a drinking water standard has been exceeded or there is a problem within a drinking water system. The report of an adverse event does not necessarily mean that the drinking water is unsafe but that an incident has occurred, and strong action is required to ensure the issue is resolved.

Corrective actions are undertaken by owners and operators of the drinking water system and depend on the system's category and the type of incident. Corrective actions required by the *Safe Drinking Water Act* *(https://www.ontario.ca/laws/statute/02s32)* include one or more of the following:

- resampling and retesting
- immediately flushing the system
- reviewing operational processes to identify and correct faulty processes
- increasing chlorine doses and flushing the system
- any other steps directed by the local medical officer of health

Steps directed by the local medical officer of health may include additional sampling and testing. The local medical officer of health can also issue a boil water or drinking water advisory.

The ministry's water inspectors follow up on all adverse water quality incidents. Inspectors continue to monitor an incident, including working with the local medical officer of health and system owners and operators until the incident is resolved. They also review tests results and operational activities during their inspections to ensure all required actions were taken. All of these steps are critical to the success of Ontario's drinking water protection framework and work together to help ensure that regulated drinking water systems continue to provide high-quality drinking water.

Table 6 summarizes adverse water quality incidents for different system types.

Table 6: Summary of adverse water quality incidents for system types in 2019-2020

Category	Number of adverse water quality incidents	Number of systems reporting
Municipal residential systems	1,248	330
Non-municipal year-round-residential systems	399	173
Systems serving designated facilities	396	268

Adverse water quality incident process

Ontario's drinking water quality standards (https://www.ontario.ca/laws/regulation/030169) protect consumers by establishing the maximum allowable concentration of chemical and biological substances that can be present in drinking water. Standards are set based on consideration of effects that may result from short-term or long-term exposures and therefore an occasional exceedance over the long-term may not necessarily pose a health risk. Immediate actions are taken by drinking water treatment operators to address any exceedance and help ensure that public health is protected.

For example, nitrate may be present in drinking water naturally or as a result of runoff from agricultural fertilizer use and sewage, or as the result of chlorination of the distribution system for disinfection.

If this substance is detected in a drinking water sample above its respective drinking water quality standard, it is considered to be an adverse water quality incident and drives immediate action.

This is the process that must be followed when an adverse water test result for nitrate occurs:

1. The laboratory immediately reports the adverse water quality incident to this ministry's Spills Action Centre, local medical officer of health and the owner and operator of the drinking water system.
2. The owner and operator of the drinking water system immediately report the incident to the Spills Action Centre and the local medical officer of health.

3. The owner or operator takes the required corrective actions to restore the quality of the drinking water. For a detection of nitrate at a drinking water system, this includes:
    - collecting resamples and submitting them to the laboratory for testing
    - taking any other steps as required by the local medical officer of health until the adverse water quality incident is resolved to the satisfaction of the medical officer of health

Story from the frontline: Profile of an experienced water inspector

After finishing a master's degree in physics in Slovakia, Viktoria Light immigrated to Canada and began working in the water department of the City of Toronto. After one year with the city, she became the first female Operator-in-Charge at the largest water treatment plant in Canada at the time, the R.C. Harris Water Treatment Plant in Toronto.

Experiencing the complexities and intricacies of water treatment processes helped Viktoria realize the importance of proper treatment and being able to provide enough supply of drinking water to customers. This inspired her to seek new opportunities in the drinking water field and she joined the ministry as a water inspector in 2004.

Viktoria's experience and keen observation skills help her identify issues while conducting inspections at drinking water systems. In August 2019, she inspected a drinking water system and observed a large hole next to one of the wells that is used to provide water. The hole potentially created a direct path for surface water or other foreign material to enter the well and contaminate the ground water source. Viktoria worked with owner and operator and required them to hire a licensed well contractor who plugged the hole to help prevent contamination of the well.

In addition to conducting inspections of drinking water systems, Viktoria's responsibilities include:

- responding to adverse water quality incidents related to water
- providing regulatory and technical advice to her colleagues, the regulated community and the local medical officer of health
- liaising with the ministry's engineering and technical support teams
- providing support and creating briefing materials for management
- preparing reports and correspondence in response to complaints
- referring instances of non-compliant behaviour to the ministry's investigations team

Viktoria also finds time to take part in ministry projects that help enhance the overall drinking water protection framework. She has helped to develop and review questions that inspectors ask when conducting drinking water system inspections as well as how to rate the risk of non-compliance with those questions. Viktoria brings extra value to these projects as she understands the challenges faced by owners and

operators of drinking water systems having worked as an operator herself.

Inspections

Ontario helps to keep drinking water system and laboratory owners accountable by conducting comprehensive inspections on a regular basis.

Municipal residential drinking water systems are inspected on an annual basis and all laboratories permitted to test drinking water are inspected a minimum of two times per year. This is a requirement of the Compliance and Enforcement regulation (https://www.ontario.ca/laws/regulation/050242) , which is detailed later in this section.

The ministry developed a risk-evaluation methodology to prioritize when and how often an inspection is needed at non-municipal year-round residential systems and systems serving designated facilities. This risk evaluation is based on factors such as compliance history, the number and reasons for any adverse water quality incidents and input from local medical officers of health. Each year, a risk evaluation is performed to identify systems that should be inspected.

The inspection program is central to the ministry's mandate to ensure that Ontarians have access to safe drinking water. The primary purpose of an inspection is to confirm compliance with Ontario's legislation as well as to see if the operation of the system or laboratory meets the ministry's drinking water policies and guidelines.

The ministry uses a comprehensive approach for its inspection of water systems that focuses on source, treatment, and distribution components as well as management practices. The ministry's approach to inspecting laboratories is equally as rigorous and focuses on chain of custody (or the path of a sample from the time it is collected to when it is accepted by the laboratory), reporting, sample handling, subcontracting and management practices.

During the inspection of a drinking water system, a water inspector assesses requirements such as the operation and maintenance of the treatment and distribution system, sampling and monitoring, operator certification, reporting and corrective actions and policies and procedures.

During an inspection of a laboratory, a laboratory inspector assesses requirements such as policy and procedures, methodology, document and record-keeping practices and reporting.

Inspection results

In 2019-2020, the ministry conducted 1,004 inspections at drinking water systems and 104 at licensed laboratories. A breakdown is given in Table 7.

Table 7: Number of inspections conducted in 2019-2020

Category	Number of inspections
Municipal residential drinking water systems	657
Non-municipal year-round residential drinking water systems	96
Systems serving designated facilities	251
Licensed laboratories	104

The ministry assigns a rating for each inspection conducted at a municipal residential drinking water system (https://www.ontario.ca/page/application-risk-methodology-used-measuring-municipal-drinking-water-system-inspection-results) or licensed laboratory (https://www.ontario.ca/page/application-risk-methodology-used-measuring-licensed-and-out-province-drinking-water-testing) . A risk-based inspection rating is calculated based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences.

In 2019-2020:

- 71% of municipal residential drinking water systems received a 100% rating.
- 99.7% of municipal residential drinking water systems received an inspection rating above 80%.
- 37% of laboratories received a 100% rating in at least one of the two annual inspections.
- 99.0% of laboratory inspections received ratings above 80%.

An inspection rating of less than 100% does not indicate that drinking water is unsafe. It shows areas where a system's or laboratory's operation can improve. The ministry works with owners and operators of systems and laboratories to help ensure that they address specific areas requiring attention.

For 2019-2020 data, the ministry identified the following areas:

Municipal residential drinking water systems

- Ensuring that continuous monitoring equipment is performing and recording tests correctly.
- Ensuring operating treatment equipment is working and being calibrated properly

(e.g. ultraviolet radiation equipment, correct dosage of chlorine is used).

- Using the correct disinfection products and procedures when performing modifications or repairs.
- Maintaining secondary disinfection (e.g. ensuring chlorine residuals do not drop below the required levels).

Non-municipal year-round residential systems

- Collecting microbiological samples in the distribution system and performing turbidity monitoring at the proper frequencies and correct locations.
- Ensuring treatment equipment is operated properly (e.g. ultraviolet radiation equipment, correct dosage of chlorine is used).
- Ensuring reporting requirements for adverse water quality incidents are met.
- Maintaining secondary disinfection (e.g. ensuring chlorine residuals do not drop below the required levels).

Systems serving designated facilities

- Collecting microbiological samples at the proper frequency and correct location.
- Ensuring maintenance of treatment equipment is conducted and reported properly (e.g. changing ultraviolet bulbs and filters).
- Ensuring reporting requirements for adverse water quality incidents are met.
- Ensuring persons operating the drinking water system possess the proper designation and training.

Licensed laboratories

- Ensuring that a record is made when samples for lead testing are preserved with acid prior to analysis.
- Ensuring that results reported to the ministry include all the required information.
- Ensuring training of laboratory personnel is properly documented for all policies and procedures related to drinking water testing and reporting of results.
- Ensuring that laboratory personnel are conducting drinking water testing according to the licensed test method.

When inspectors identify non-compliance issues at systems or laboratories, the ministry may take actions such as:

- identifying suggestions to address areas of non-compliance in the inspection report
- discussing crucial inspection findings with the owner and/or operator
- requiring updates to their policies and procedures
- providing the inspection report to other affected parties, including the local medical officer of health and the local conservation authority

- providing education and outreach on issues that are not directly related to drinking water safety, such as administrative non-compliance issues
- issuing a provincial officer's order that requires the system owner and/or operator to take corrective action by a specific deadline
- referring the incident to the ministry's Environmental Investigations and Enforcement Branch

Deficiencies and orders

The Compliance and Enforcement regulation (https://www.ontario.ca/laws/regulation/050242) requires the ministry to undertake mandatory action, such as issuing an order or referring non-compliant behaviour for investigation, for deficiencies at municipal residential drinking water systems and for infractions at laboratories.

A deficiency is a violation of specified provisions of the *Safe Drinking Water Act* *(https://www.ontario.ca/laws/statute/02s32)* and its regulations that could or does pose a drinking water health hazard. An infraction is a violation of specified provisions of the *Safe Drinking Water Act* and its regulations by a licenced laboratory. For example, water treatment equipment that is not operated according to provincial requirements may impact the quality of drinking water and adversely affect the health of those using the system. See more information on the Compliance and Enforcement regulation later in this section.

In 2019-2020, the ministry identified six deficiencies at two systems.

The first system's owner, who failed to employ a certified operator, was referred for investigation. The owner was also required to ensure all operators were properly certified.

For the second system, the ministry issued one order because the inspector identified five deficiencies during the inspection. This order directed the owner of the system to provide proper treatment, monitor treatment equipment, respond to an alarm in a timely manner, review data within the necessary timeframe, and create required records. The inspector is monitoring the progress of the owner's actions and the ministry is also considering further enforcement actions. None of the deficiencies identified presented an immediate drinking water health hazard.

The ministry identified four infractions at four laboratories. The infractions were for testing without a licence and improper subcontracting. All four laboratories were issued orders to address the infractions and have complied with the required actions contained within the orders.

The ministry also issued 11 orders to six non-municipal year-round residential drinking water systems and four systems serving designated facilities to address non-compliant activities. For example, one order directed the owners to collect raw and distribution microbiological samples and properly report adverse water quality incidents.

Story from the frontline: Profile of a new water inspector

Megan Smith, a new water inspector with the ministry, found her first inspection of a drinking water system to be both challenging and rewarding. After joining the

ministry's water compliance program in November 2019, she underwent a rigorous training program that involved weeks of online learning, taking the Operator-In-Training course at the Walkerton Clean Water Centre, in-class training and job shadowing. In February 2020, Megan conducted her first non-municipal inspection under the guidance and direction of an experienced water inspector.

Together, Megan and her mentor inspected a non-municipal year-round residential drinking water system that serves a trailer park located in northern Ontario. Megan was responsible for preparing for the inspection by reviewing test results and the system's engineering evaluation report prior to completing the physical inspection of the system. During the inspection, Megan identified issues with sampling and testing, as well as operational and maintenance checks, and logbook records. Under the guidance of her mentor, she wrote the inspection report, including requiring actions to address the identified issues.

In order to help the owners understand the actions required of them, she created a simple compliance tracking sheet which broke down each item in a way that was easy to understand. Once the owners were given the inspection report and compliance tracking sheet, the ministry continued to follow up with the owners until all the instances of non-compliance were resolved.

Megan's key takeaway from her first inspection was that she must help to ensure those who provide drinking water to the public are held to a high standard and her primary responsibility is the protection of public health.

Convictions

Inspectors may refer non-compliant activities to the ministry's Environmental Investigations and Enforcement Branch. The decision to refer non-compliant behaviour for investigation depends on a number of criteria, including the compliance history of the inspected system, what steps the system owner has taken or is taking to resolve the issue, how cooperative the system owner has been in trying to resolve non-compliance issues and the potential impact of the non-compliance to the health of the users of the system.

In 2019-2020, the province of Ontario convicted one individual who worked at a municipal residential drinking water system. The individual was convicted of charges relating to giving false or misleading information in the form of logbook entries and was fined $15,000. The ministry was notified of the issue by the municipality when it became aware of the problem through auditing activities.

Owners of two non-municipal year-round residential drinking water systems were convicted and fined a total of $9,500. The convictions were related to non-compliant activities such as failing to:

- collect the required samples
- comply with an order to confirm a certified operator had been hired

The owners and corporations at three systems serving designated facilities were convicted and fined a total of $8,250. The convictions were related to non-compliant activities such as:

- supplying drinking water to users of a system without first performing sampling and testing for *E. coli* and total coliforms after being shut down for seven days or more
- failing to collect samples once a month
- failing to maintain treatment records and logs for operational tests and sampling

Further information on drinking water quality, inspections, orders and convictions data is available on the Drinking Water Quality and Enforcement (https://data.ontario.ca/en/dataset/drinking-water-quality-and-enforcement) page on the Ontario Data Catalogue.

Ontario's accountability to the Compliance and Enforcement regulation

One of Justice O'Connor's concerns from the Walkerton Inquiry was that routine inspections of municipal residential drinking water systems were not occurring. He explicitly stated,

> "I am concerned, however, that the current attitudes toward inspections will change as the memory of the Walkerton outbreak fades. When budget-cutting pressures return in the future, for example, there may be pressures to reduce inspection frequency."
>
> *O'Connor, 2002, p. 435*

Annual inspections of municipal residential drinking water systems are a critical component of the drinking water protection framework and were formalized as a requirement in the Compliance and Enforcement regulation in 2005, under the *Safe Drinking Water Act*.

The Compliance and Enforcement regulation also outlines other requirements that the ministry's compliance program must meet. The government is obligated to report on whether the ministry has met its requirements under this regulation. For 2019-2020, the ministry has fulfilled its requirements.

Actions included:

- completing an annual inspection at all 657 municipal residential drinking water systems in the province
- ensuring that at least one in every third inspection of a municipal drinking water system was unannounced (202 inspections were unannounced and 455 were announced in 2019-2020)
- completing two annual inspections at each of the 52 licensed laboratories
- ensuring at least one of the two inspections conducted at each licensed laboratory was unannounced
- ensuring all inspection reports for municipal drinking water systems and licensed

laboratories were issued within 45 days of the completion of the inspection

- taking mandatory action within 14 days of finding a deficiency at a municipal residential drinking water system or an infraction at a licensed laboratory

In addition to setting requirements for inspection and compliance activities, the Compliance and Enforcement regulation also provides the public with the right to request an investigation of an alleged contravention of the *Safe Drinking Water Act* or any of its regulations. In 2019-2020, no member of the public made an application for an investigation.

2019-2020 highlights of Ontario's small drinking water system results

Across Ontario, thousands of businesses and other community sites use a small drinking water system to supply drinking water to the public. The sites include restaurants, places of worship and community and recreation centres, resorts, rental cabins, motels, lodges, bed and breakfasts, campgrounds, and other public settings, and are most often located in semi-rural and remote communities that may not have access to a municipal drinking water supply.

Until November 30, 2008, small drinking water systems were regulated under O. Reg. 252/05, under the *Safe Drinking Water Act* *(https://www.ontario.ca/laws/statute/02s32)* . On December 1, 2008, small drinking water systems were transferred from the (then) Ministry of the Environment to the Ministry of Health. They are now governed by Ontario Regulation 319/08 (Small Drinking Water Systems) under the *Health Protection and Promotion Act* *(https://www.ontario.ca/laws/statute/90h07)* .

Prior to the implementation of the Ministry of Health's Small Drinking Water Systems Program, few if any small drinking water systems were regularly inspected and little was known about the water quality of these systems or if water sampling was even occurring. The issue was identified in the Walkerton Inquiry report, "small systems lack economies of scale, and as a result it may be more expensive, on a per capita basis, for them to meet regulatory requirements. In addition, they may have difficulty attracting, retaining, and affording the expertise they need." (O'Connor, 2002, p. 472)

The Small Drinking Water Systems Program responded to the need for a unique and innovative program and is overseen by the Ministry of Health and administered by local boards of health. Public health inspectors conduct detailed inspections and risk assessments of all small drinking water systems in Ontario, and provide owner/operators with a tailored, site-specific plan to keep their drinking water safe. This customized approach has reduced unnecessary burden on small system owner/operators without compromising strict provincial drinking water standards.

Since implementing the Small Drinking Water System Program, public health units have conducted detailed inspections and risk assessments on existing and new small drinking water systems across Ontario. Upon finalizing a risk assessment, each small drinking water system is issued a directive which could include customized requirements for water testing, treatment options and operator training.

Public health inspectors conduct a site-specific risk assessment for every small drinking water system in the province. As of March 31, 2020, a total of 23,892 [1] risk assessments have been completed for the approximately 10,000 small drinking water systems. Based on the assessment, the public health inspector determines what owners and operators must do to keep their drinking water safe and will issue a directive for the system. The directive may include requirements for water testing, treatment options or training.

Public health inspectors use a web-based application to conduct risk assessments and establish sampling requirements for a small drinking water system, and assign a level of risk (low, moderate or high). The risk category is determined by grading factors that are applied to results of a drinking water source and treatment components questionnaire, and a distribution component questionnaire. Systems categorized as “high risk” are required to be re-inspected every two years. Systems categorized as “low or moderate risk” are required to be re-inspected every four years.

- Over the past eight years, we have seen progressively positive results including a steady decline in the proportion of high-risk systems (9.61% in 2019-2020 down from 16.65% in 2012-2013). As of March 31, 2020, over three quarters (78.40%) of small drinking water systems are categorized as low risk (up about one percent from the previous year).
- Over 90% of systems are categorized as low/moderate risk and subject to regular re-assessment every four years; while the remaining systems, categorized as high risk (9.61%), are re-assessed every two years.

The Small Drinking Water System Program reflects a customized (risk-based) approach for each small drinking water system depending on the level of risk rather than “one-size-fits-all” requirements with a goal to prevent, reduce and/or eliminate adverse effects.

Regular sampling is performed by operators of their drinking water systems. The water samples are submitted by the operators for testing to private licensed labs and the results recorded in a Laboratory Result Management Application.

- In 2019-2020, 97.98% of 99,924 drinking water samples submitted from small drinking water systems have consistently met Ontario Drinking Water Quality Standards.

Through the Ministry of Health’s Small Drinking Water System Program, public health units provide information to small drinking water system owners and operators on:

- how to protect their drinking water at the source by identifying possible contaminants
- how and when to test their water
- treatment options and maintenance of treatment equipment, where necessary
- when and how to notify the public, whether it is a poor water sample test result or equipment that is not working properly

- what actions need to be taken to mitigate the problem

In the event of an adverse test result, the laboratory will notify both the owner/operator of the small drinking water system and the local public health unit for immediate response to the incident (see section below on "Response to adverse water quality incidents"). Details of the adverse water quality incident will be also be tracked in the application.

Adverse water quality incidents can result from an observation (e.g. an observation of treatment malfunction) or adverse test result (i.e. water sample does not meet drinking water standards under O. Reg. 169/03).

- In the past year, a decline of 11.93% in total number of adverse water quality incidents was observed from 1,232 in 2018-2019 to 1,085 in 2019-2020; and the number of small drinking water systems that reported an adverse water quality incident for the same period also declined 13.52% from 969 in 2018-2019 to 838 in 2019-2020. [2]

The small drinking water system adverse water quality incident data demonstrates the success and value of the Ministry of Health's Small Drinking Water System Program because adverse incidents are now being systematically captured and appropriate action can now be taken and tracked to help protect drinking water users.

In the early years that the program was implemented, we were not surprised to see adverse water quality incidents in a small drinking water system as owners/operators complied with sampling requirements in accordance with their directive and instituted improvements in their drinking water system over time. Looking at the longer-term results and in particular over the last six years, we have seen a progressive decline in the number of adverse water quality incidents.

- Since 2013-2014, a significant downward trend in both total adverse water quality incidents and the number of systems that reported an adverse water quality incident has occurred, with some fluctuations. As of 2019-2020, total adverse water quality incidents decreased 28.48% and 31.09% fewer systems reported an adverse water quality incident compared to 2013-2014 data (which had 1,517 adverse water quality incidents for 1,216 systems).

Note, the Ministry of Health is not aware of any reported illnesses related to these incidents. This is likely in part because, through the Ministry of Health's small drinking water system program, operators now know when and how to notify users when their drinking water may not be safe to drink and are working with public health units to take appropriate corrective actions to mitigate any problems.

Response to adverse water quality incidents

When an adverse water quality incident is detected by the lab, the owner/operator of a drinking water system is required to notify the local medical officer of health and to follow up with any instruction that may be issued by a public health inspector or medical officer of health.

Response to an adverse water quality incident may include issuing a drinking water

advisory to notify potential users of the system whether the water is safe to use and drink or if it requires boiling to render it safe for use. The public health unit may also provide instruction to owner/operators of a drinking water system on necessary corrective action to be taken on the affected system to mitigate the risk.

Through the Ministry of Health's Small Drinking Water System program, small drinking water system owners and/or operators work closely with public health inspectors to follow the directive which contains their system-specific water protection plan and resolve any issues to protect drinking water users.

The Small Drinking Water Systems Program has comprehensively addressed the Walkerton Inquiry recommendations that many small drinking water systems, which had never before been regulated, be included in the post-Walkerton regulatory framework. In doing so, we have reinforced a world-class system that safeguards our water from source to tap and supports this government's commitment to smarter regulatory practices without putting public health and safety at risk.

Story from the frontline: Public health inspector helps drive reduction in risk

Chris Eaton, Public Health Inspector with Peterborough Public Health, has seen a dramatic increase in the safety of drinking water provided by small drinking water systems in Peterborough County. From January 1, 2012 to March 31, 2020, the number of systems that he has assessed as high risk has dropped from just over 100 to less than 10 as shown in Table 8. The number of moderate-risk systems has also decreased, and the number of low-risk systems has more than doubled.

This significant accomplishment can be attributed to hard work on the part of the owners and operators of these small drinking water systems and their effort to comply with directives. They installed effective treatment equipment, conducted proper sampling, kept good records and took training courses to learn more about the operation of small drinking water systems. This reduction in risk was also driven by Chris identifying those systems which were non-compliant and working with those owners and operators to ensure that they comply with the requirements of the regulation and their directive.

When Chris inspects a system, he makes direct observations of the system components, the site and surrounding property. Chris will also review records and documentation pertaining to the operation of the system and historical observations of the well record and sampling results. Finally, Chris will interview the operator to determine experience and competencies in operating the small drinking water system. This information is entered into a risk categorization tool to determine the risk level of the system. Based on the observations and risk category, Chris will issue a site-specific directive to the owner. The directive will include requirements such as sampling frequency, treatment requirements, operational checks, record keeping, posting signage and training requirements. Once the directive is issued to the owner, Chris will continue to monitor the system for compliance and respond to any adverse water quality incident.

High-risk systems often have untreated water sources or improperly treated drinking water. Moderate-risk systems have treatment, but the treatment may not meet all the requirements and low-risk systems have secure groundwater sources or have treatment systems that are compliant and have appropriately trained operators.

Inspecting small drinking water systems has provided Chris great satisfaction. He knows that he has made a meaningful contribution through his work as an inspector, because the people who live in or visit Peterborough County have access to safe drinking water.

Table 8: Trend in risk level for small drinking water systems in Peterborough County from 2012 to 2020

Risk level	January 1, 2012 [3]	March 31, 2020
High	108	6
Medium	104	79
Low	93	260

Ontario's actions to reduce exposure to lead

Lead exposure is of public health concern due to the potential behavioural and health effects, especially in vulnerable groups. Blood lead levels of Canadians have declined in the past 40 years due to ongoing actions to reduce lead exposure from all sources. Drinking water generally accounts for a small fraction of total lead exposure to humans. Ontario's Chief Medical Officer of Health has not received any reports of lead toxicity in Ontario children that have been linked primarily to drinking water in the last 10 years. Ontario has the most stringent provincial testing regime in Canada when it comes to lead in drinking water, and we've made significant progress in reducing lead in drinking water since 2007.

Drinking water supplied by municipal water treatment plants must meet the provincial standard for lead, which is 10 micrograms per litre. Corrosion in older distribution pipes, home service lines and plumbing however, may result in elevated lead levels at the tap.

While new water infrastructure is installed according to current provincial design guidelines using materials with low-lead content, older infrastructure within Ontario's towns and cities may contain lead. Under certain conditions, chemical reactions in these older pipes will dissolve and wear away the metal, releasing lead. Where infrastructure is

not visible (i.e. below ground), it can be difficult to assess its age and condition. This can make it hard to identify what components of the infrastructure are contributing to elevated lead levels within a distribution system.

In 2007, elevated lead levels were detected in drinking water samples in homes located in London, Ontario. This resulted in a request by the Chief Drinking Water Inspector for all municipalities to test the water delivered to the homeowner's tap to monitor lead levels. The province required municipalities and non-municipal year-round residential system owners to actively sample for lead within their communities and to take corrective action when elevated levels were identified. Municipalities that identified high levels of lead in their communities were required to develop a lead reduction strategy. Ontario works with the municipalities on the development of their lead reduction strategies and assesses whether the approved strategies are being implemented to help reduce levels of lead in drinking water.

Ontario also wanted to protect children from exposure to lead, as children six and under are the most vulnerable to health effects from lead. A regulation specific to schools, private schools and child care centres (https://www.ontario.ca/laws/regulation/070243) was made in 2007 to require the owners of these facilities to flush pipes and fixtures and test for lead in plumbing, as well as take corrective actions where there is an exceedance of the standard for lead.

Lead from components such as plumbing fixtures and solder has the potential to enter the drinking water that is sitting in a facility's plumbing overnight. The longer that drinking water sits in the pipes, the more lead that can leach out. The following actions are required to minimize lead exposure in facilities:

- flushing the plumbing either daily or weekly, before children arrive, based on the facility's sample results
- collecting samples where the water in the plumbing has been unused for at least six hours, referred to as a standing sample. These samples have a higher potential of containing lead that has leached into the drinking water
- collecting samples after the tap has been turned on for a specific amount of time, referred to as a flushed sample. Flushed samples represent the water that children consume

In July 2017, the ministry strengthened this regulation by requiring child care centres and schools with a primary division to sample for lead at every drinking water fountain and tap that provides drinking water to children or is used in food preparation for children by January 1, 2020. Non-primary schools are required to complete their sampling by 2022. Once all taps have been tested, owners and operators are required to continue to test for lead at a minimum of one tap or fountain that is used to provide drinking water or used in food preparation for children on an annual basis or, under certain conditions, every three years at their facilities.

The ministry follows up on lead exceedances and works with operators of schools and child care centres, as well as the local medical officer of health, to resolve issues. The ministry also conducts inspections at schools and child care centres.

Actions required of municipalities

All Ontario municipalities have been required to test for lead since 2007 to determine whether lead in drinking water is an existing or developing problem within their communities.

- Samples are required to be taken from a number of residential and non-residential buildings and from the distribution system.
- Municipalities with historical sample results below Ontario's standard for lead are still required to sample but at a reduced frequency.
- Where lead is found to be an ongoing problem at a community level, municipalities are required to develop a lead reduction strategy.
- Municipalities must provide the results of samples tested for lead to the occupants of private residences where the samples were collected.
    - Where the test result does not meet the standard for lead, they must also provide the occupant with advice from the local medical officer of health, which may include suggestions to replace the fixture or install a filter.

The majority of plumbing test results from samples taken for the community lead testing programs in municipalities met Ontario's current standard for lead - 10 micrograms per litre.

Municipal community lead testing - plumbing test results for 2019-2020:

5,121

test results

96.88%

met the lead standard

3.12%

or 160 results did not meet the lead standard

Results of lead testing are provided to occupants of private residences by the drinking water system owner.

Lead reduction strategies are system-specific plans prepared by municipalities to reduce the amount of lead in drinking water, and include actions such as:

- altering water treatment processes and using chemical additives that prevent the corrosion of pipes
- replacing lead service lines
- upgrading water treatment equipment
- encouraging homeowners to have their plumbing sampled and tested, and to replace fixtures or plumbing that contain lead

Lead reduction strategies can take years to develop and implement. Often, complex issues related to water chemistry in the system need to be evaluated and replacing lead service lines is frequently done in conjunction with other work to minimize disruption to roadways and residents.

Since community lead testing became mandatory in 2007, 21 municipalities have been required to prepare lead reduction strategies. Currently, eleven municipalities have fully implemented alterations to treatment processes to prevent lead corrosion of pipes and two municipalities have indicated that all lead service lines within their municipalities have been replaced.

Seven municipalities continue to make significant process. Corrosion control plans have to resolve complex issues with water chemistry in the system, prior to implementation. Lead source removal strategies can take years to implement, as lead service line replacements are often undertaken in conjunction with other work to minimize disruption to transportation corridors and residents.

The ministry routinely monitors lead sampling data. In 2019-2020, the ministry started working with an additional municipality to address lead exceedances, and to clarify aspects of their proposed lead reduction strategy.

The Drinking Water Quality and Enforcement (https://data.ontario.ca/dataset/drinking-water-quality-and-enforcement) page of the Ontario Data Catalogue provides additional information on lead reduction strategies and testing results for municipal residential systems.

Actions required of non-municipal year-round residential drinking water systems

Non-municipal year-round residential drinking water systems supply water on a year-round basis to six or more private residences (e.g. houses, apartments, condominium units, townhouses) or trailer parks with six or more water service connections.

Owners of these systems are required to:

- test tap water for lead twice per year at a specified number of homes and non-residential buildings
- collect and test for lead levels within the distribution system

The results of this testing help to determine if levels of lead in drinking water are an existing, developing or potential problem within a community.

The majority of plumbing test results from samples taken for the community lead testing program associated with non-municipal year-round residential drinking water systems met Ontario's current standard for lead.

Community lead test program for non-municipal year-round residential drinking water - lead plumbing test results in 2019-2020:

971

test results

99.38%

met the lead standard

0.62%

or six results did not meet the lead standard

Results of lead testing are provided to occupants of private residences by drinking water system owner.

Non-municipal year-round residential drinking water system owners must provide the results of samples tested for lead to the occupants of private residences where the samples were collected. Where the test result does not meet the standard for lead, they must also provide the occupant with advice from the local medical officer of health, which may include suggestions to replace the fixture or install a filter.

When samples exceed the lead standard in a distribution sample, system owners and operators are required to report the results as an adverse water quality incident. They must work with the local medical officer of health and take corrective actions to resolve the issue. This ministry follows up with the owners and operators to ensure that they have implemented the corrective measures.

The Drinking Water Quality and Enforcement (https://data.ontario.ca/dataset/drinking-water-quality-and-enforcement) page of the Ontario Data Catalogue provides additional information on municipal and non-municipal systems.

Actions required of schools, private schools and child care centres

Ontario has over 11,000 public schools, private schools and child care centres. To help prevent children from being exposed to lead in drinking water, the ministry requires the owners and operators of these facilities to take the following actions:

- flush the plumbing at the start of the day either on a weekly or daily basis, depending on factors such as the age of the plumbing in the building (i.e. older buildings are more likely to have lead plumbing); lead test results from previous drinking water sampling; the location and use of drinking water fixtures; and whether there is an NSF certified filter installed on a drinking water fixture
- sample for lead at every drinking water fountain and tap that provides drinking water to children or is used in food preparation for children
- report lead levels that are greater than the provincial standard to this ministry, the local medical officer of health and the Ministry of Education
- take corrective actions to address lead exceedances
    - If a test result from a flushed sample fails to meet the standard, owners and operators must take immediate action to make the tap or fountain inaccessible to

children by disconnecting or bagging it until the problem is fixed.

- Corrective actions can include increased flushing, replacing the fixture, or installing a filter or other device that is certified for lead reduction.
- Owners and operators must also follow any other directions from their local medical officer of health.

The majority of the test results in schools, private schools and child care centres met the standard for lead (Table 9).

Table 9: Lead test results for schools, private schools and child care centres in 2019-2020

Sample type	Total number of results	Number of test results meeting Ontario's Drinking Water Quality Standard for lead	Number of lead exceedances (of total number of results)	Percentage of test results meeting Ontario's Drinking Water Quality Standard for lead
Lead – Flushed	25,417	24,786	631	97.52%
Lead - Standing	25,353	23,663	1,690	93.33%
Lead – Total for standing and flushed samples	**50,770**	**48,449**	**2,321**	**95.43%**

A comparison of the flushed and standing lead exceedances demonstrates that flushing is effective at temporarily reducing lead levels at the tap. Permanent solutions include removing or replacing the fixture or installing and maintaining a filter at the fixture.

To find test results for your local school, private school or child care centre, contact them directly or visit the Drinking Water Quality and Enforcement (https://data.ontario.ca/dataset/drinking-water-quality-and-enforcement) page on the Ontario Data Catalogue.

Download the “2019-20” file, open the spreadsheet called “Test Data – Raw Data” and search for the name of your school or child care centre.

Update on testing every drinking water tap and fountain

The ministry asked facility owners and operators to submit a drinking water fixture inventory listing the number of drinking water fixtures at their facilities and to identify how many have been tested to date.

The inventories submitted show the majority of facilities have met the testing requirements.

> As of April 22, 2020, operators of:
>
> - 8,351 facilities declared they are either a child care centre or a school or private school with a primary division (grade 3 or below)
> - 85% of facilities have submitted an inventory of their drinking water fixtures (9,494 of 11,203)
> - 5,681 facilities have completed their drinking water fixture sampling
> - 68% of child care centres and schools or private schools with a primary division have met the sampling deadline
>
> The ministry is contacting owners and operators of the 1,709 registered facilities that have not submitted an inventory to determine whether the school, private school or child care centre is still operating. If they are operating and do not voluntarily submit an inventory, the facility will be targeted for an inspection. Based on the outcome of the follow-up, the ministry will deregister facilities that are no longer open and take compliance action, such as education and outreach, inspections and orders where necessary at facilities that have not met the sampling deadlines.

Lead compliance program results for schools, private schools and child care centres

The ministry uses a targeted compliance approach with schools, private schools and child care centres. This approach includes:

- following up on test results that exceed Ontario’s standard for lead by confirming facility operators have undertaken all actions required by the regulation and the local medical officer of health including submitting required documentation
- conducting inspections on site at the facility or via telephone
- verifying that conditions are met when operators notify the ministry they would like to move to a reduced sampling schedule

In 2019-2020, ministry inspectors followed up on 2,321 lead exceedances at 815 facilities and inspected 78 facilities. To determine which facilities to inspect, the ministry uses a risk-based approach and considers the facility’s compliance and sampling history and whether

the facility operator submitted an inventory of the facility's drinking water fixtures.

A facility, which has tested all of its drinking water taps and fountains and has a sampling history that indicates there is no issue with lead in drinking water, is able to change from annual sampling to sampling every third year. In 2019-2020, the ministry confirmed that 300 facilities were eligible to move to a reduced sampling schedule.

For detailed information on these schools, private schools and child care centres, please visit the Drinking Water Quality and Enforcement (https://www.ontario.ca/data/drinking-water-quality-and-enforcement) page on the Ontario Data Catalogue.

Story from the frontline: A water inspector's actions to protect children

In October 2019, Mahmod Mahmod, a water inspector with the ministry, conducted an inspection of a child care centre in eastern Ontario. During his inspection, a review of the centre's records showed that the child care centre operator had not properly collected drinking water samples for lead testing.

To address this issue, Mahmod required the owner to develop and implement a process to review annual testing to ensure that regulatory requirements were being met. The owner of the child care centre was also required to submit documentation to demonstrate that the required actions had been addressed.

Mahmod worked with the owner to assist them in their development of a procedure that is designed to ensure drinking water samples for lead testing are collected at the proper frequency at the child care centre moving forward. Once the procedure was complete, he reviewed it and was satisfied that the owner had met all the required actions identified in his inspection.

Update on Health Canada's guideline

In 2019, Health Canada revised its Canadian Drinking Water Quality Guideline for lead in treated drinking water from 10 to 5 micrograms per litre. The ministry recognizes that lead in drinking water is an important issue for parents and the public. That's why the ministry will be consulting with Ontarians on whether and how to adopt Health Canada's reduced guideline for lead in drinking water, proposing changes that build on Ontario's already stringent lead protection framework (such as changing testing requirements for municipalities) and increasing transparency in lead testing results. The ministry expects to begin this consultation process in early 2021.

Looking ahead

Throughout this report we have remembered past events that have led us to our current framework and highlighted the current state of Ontario's drinking water. It is also important to look ahead at what the ministry is working on to continue improving drinking water protection and compliance.

Environmental Compliance Hub Ontario

In recognition of the important role that technology can play in helping to protect public health, the ministry launched a major multi-year project in 2016 to modernize the ministry's compliance processes. The project involves consolidating eight existing data applications into one. Environmental Compliance Hub Ontario (ECHO) was launched in an initial phase in July 2020, with full implementation targeted for April 2021.

ECHO will allow the ministry to better analyze and use its compliance data to measure how the regulated community is performing and whether the ministry is achieving its targeted compliance outcomes. ECHO will eventually allow us to make several other improvements to our processes that will help reduce unnecessary burdens on the regulated community, including:

- improvements to the way drinking water test results are submitted
- an online portal that will allow the regulated community to submit adverse water quality incident information and other types of reports and notifications electronically

"Year-at-a-glance" report

As previously mentioned, data and analytics help us to drive better compliance outcomes. An example of how data and analytics can be used to promote compliance was demonstrated through a pilot project completed in 2019 that had the ministry sharing testing and profile information with owners of non-municipal year-round residential drinking water systems. Each owner received a tailored "year-at-a-glance" report, which summarized available ministry data, including:

- their drinking water system profile information
- a summary of required samples versus the records of samples taken that were in the ministry's database
- a list of adverse water quality incidents reported for their system

The goals of the project were to:

- correct outdated profile information
- correct erroneous sample data
- decrease the number of missed samples across the sector each year
- initiate actions to correct chronic adverse water quality results
- improve compliance and inspection performance as a result of increased communication from the ministry

Initial results of the pilot project were successful, and positive feedback was received from drinking water system owners.

In 2020, this "year-at-a-glance" report became an annual part of the compliance approach used for non-municipal year-round residential drinking water systems and was expanded to owners of drinking water systems serving designated facilities. Going forward, the use of this concept will be explored in other parts of the ministry to improve compliance outcomes in other programs using this system-focused approach.

Administrative monetary penalties

Ontario is looking to expand the use of administrative monetary penalties (AMPs). The intent is to provide more options for provincial officers such as water inspectors to address non-compliance.

An AMP is a financial penalty issued to a violator, by the regulator, for breaking the law. AMPs are used across government as a quick and effective tool to return the violator into compliance with the law, deter against future non-compliance and ensure consequences are proportionate to the contravention.

Legislative changes were made in 2019 to provide the government with the enabling authority needed to issue administrative monetary penalties for environmental contraventions. The authority would apply to key environmental statutes, including the *Safe Drinking Water Act*.

These changes aim to address gaps in the ministry's compliance and enforcement toolkit - the new administrative monetary penalties could be used where there is non-compliance with the law but where prosecution may not be the most appropriate tool to restore compliance or address the non-compliance.

Consultation and stakeholder engagement are planned on a proposal to implement new administrative monetary penalties.

Conclusion

Over the past year, Ontarians have demonstrated a commitment to working together to overcome adversity. As we continue to navigate through these difficult times and adjust where needed, we will continue to provide supports to our ministry partners, stakeholders, businesses and the public for the delivery of clean, safe drinking water. We also remain committed to focusing on areas for continued improvement such as access to clean drinking water for all First Nations communities, updating the source protection science framework to ensure continued protection of Ontario's drinking water and increased transparency and access to data.

As we move forward into 2021 to face whatever new challenges and opportunities arise, Ontarians can have confidence that the province and its many collaborative partners will remain vigilant in their efforts to safeguard our province's drinking water and continue to provide some of the best drinking water in the world.

Appendix 1: Municipal and non-municipal drinking water systems and municipal wastewater systems that sought regulatory relief due to COVID-19 pandemic (as of September 30, 2020)

> **Data last updated:** September 21, 2023

Relief provided by the ministry

System type	Licence # / System #	System name	Type of reli
Municipal Drinking Water	100-101	Collingwood Drinking Water System	Timeframe extended fo annual sche maintenanc calibration c certain mea equipment (flowmeters)
Municipal Drinking Water	009-101	South Peel Drinking Water System	Flexibility in timelines to develop anc implement a harmful alga bloom monitoring, reporting ar sampling pl
Municipal Drinking Water	009-101	South Peel Drinking Water System	Temporary r from outsta lead sample plumbing th does not se residences f period endi April 15, 202
Municipal Drinking Water	009-101	South Peel Drinking Water System	Temporary r from limitec portions of watermain disinfection procedure.
Municipal Drinking Water	009-103	Inglewood Drinking Water System	Temporary r from limitec portions of watermain disinfection procedure.

Download other formats

JSON: mecp-cdwi-covidrelief-en-utf8-2020-12-18.json (https://data.ontario.ca/en/datastore/dump/5c70a894-a030-4a79-a3f0-94edabcfc0b4?format=json)

CSV: mecp-cdwi-covidrelief-en-utf8-2020-12-18.csv (https://data.ontario.ca/en/datastore/dump/5c70a894-a030-4a79-a3f0-94edabcfc0b4?bom=True)

Print selection

Reference

O'Connor, D. R. (2002). Report of the Walkerton inquiry: a strategy for safe drinking water, part 2 (http://www.archives.gov.on.ca/en/e_records/walkerton/report2/index.html) . Commission of the Walkerton Inquiry, Ontario Ministry of the Attorney General.

Updated: October 24, 2023
Published: December 21, 2020

Footnotes

- [1] ^ The reported number of risk assessments will change as new systems come into use/change in use, and routine re-inspections and risk assessments are completed. Risk categories may also fluctuate (e.g. if recommended improvements are taken to reduce the system's risk). Similarly, a system may require reassessment to determine if the risk level has changed (e.g. if the water source or system integrity is affected by adverse weather events or system modifications).
- [2] ^ An adverse test result does not necessarily mean that users are at risk of becoming ill. When an adverse water quality incident is detected, the small drinking water system owner/operator is required to notify the local medical officer of health and to follow up with any action that may be required. The public health unit will perform a risk analysis and determine if the water poses a risk to health if consumed or used and take additional action as required to inform and protect the public. Response to an adverse water quality incident may include issuing a drinking water advisory that will notify potential users whether the water is safe to use and drink or if it requires boiling to render it safe for use. The public health unit may also provide the owners and/or operators of a drinking water system with necessary corrective action(s) to be taken on the affected drinking water system to address the risk.
- [3] ^ The date of January 1, 2012 is given here because that was the deadline the Ministry of Health gave to the public health units to identify and assess the risk of all small drinking water systems in their area.

			samples for period endi April 15, 202
Municipal Drinking Water	234-102	Madsen Drinking Water System	Temporary r from outsta residential a business lea samples for period endi April 15, 202
Municipal Drinking Water	003-101	Blackstock Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in distribution system, and reduce the number of microbiolog samples col in the distri system.
Municipal Drinking Water	003-102	Port Perry Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing

			chlorine res sampling in distribution system, and reduce the number of microbiolog samples col in the distrib system.
Municipal Drinking Water	003-103	Bowmanville Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in distribution system, and reduce the number of microbiolog samples col in the distrib system.
Municipal Drinking Water	003-104	Greenbank Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in

			sampling in distribution system, and reduce the number of microbiolog samples col in the distrib system.
Municipal Drinking Water	003-105	Uxbridge Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in distribution system, and reduce the number of microbiolog samples col in the distrib system.
Municipal Drinking Water	003-106	Cannington Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in distribution

			system, and reduce the number of microbiolog samples col in the distril system.
Municipal Drinking Water	003-107	Beaverton Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in distribution system, and reduce the number of microbiolog samples col in the distril system.
Municipal Drinking Water	003-108	Orono Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in distribution system, and reduce the

			reduce the number of microbiolog samples col in the distrib system.
Municipal Drinking Water	003-109	Newcastle Drinking Water System	Temporary r to extend timelines fo notifying the ministry dire of changes t system to re administrati burden, pro operational flexibility fo completing chlorine res sampling in distribution system, and reduce the number of microbiolog samples col in the distrib system.