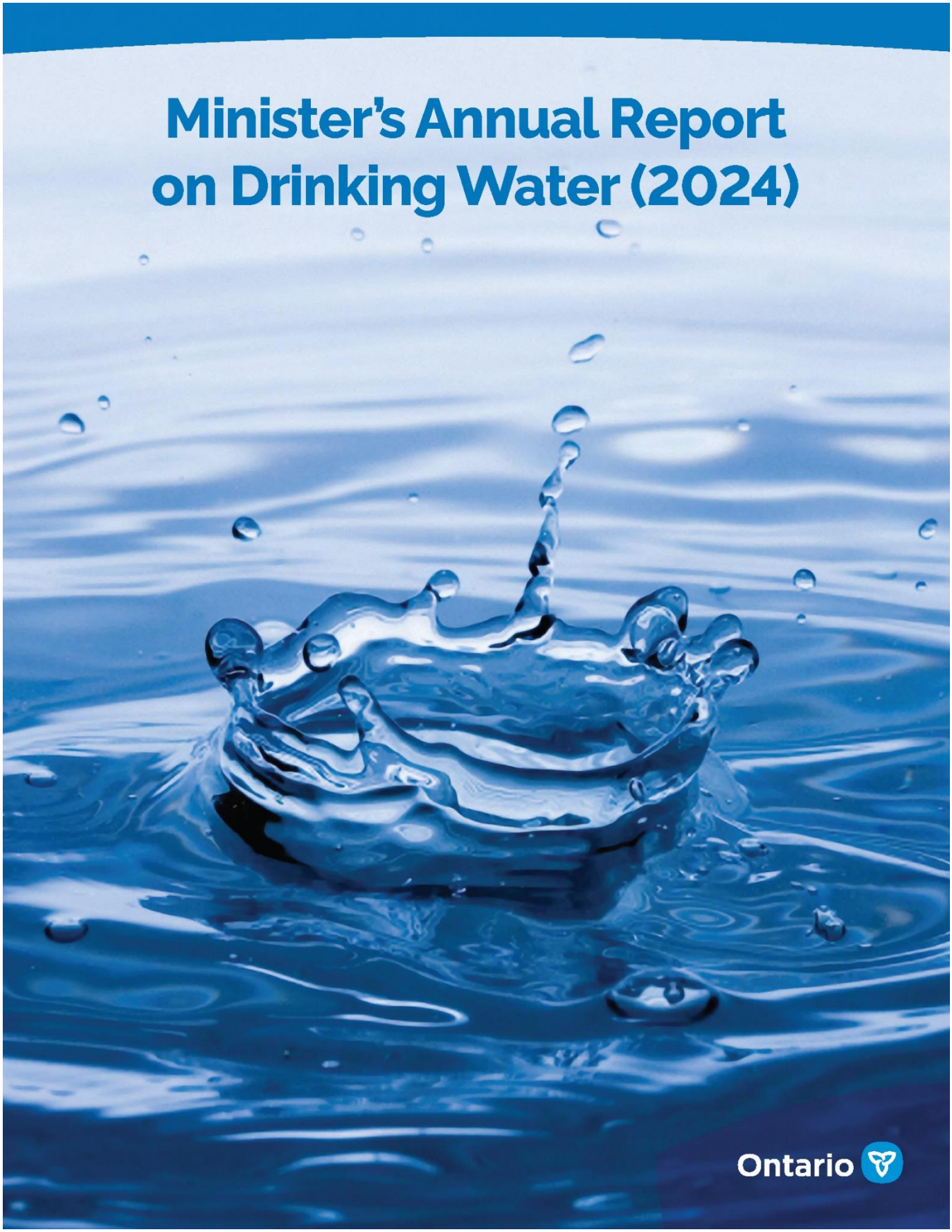
Minister's Annual Report on Drinking Water (2024)



Ontario

Minister’s annual report on drinking water (2024)

Read what we did this past year to protect Ontario’s drinking water.

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Introduction

Ensuring safe, clean drinking water to residents across the province continues to be a priority for the Ontario government. The province’s comprehensive legislation, along with strong monitoring, reporting and enforcement, help to ensure drinking water is held to high safety standards and is some of the safest and best protected in the world.

This report highlights many actions the Ontario government has taken this year to preserve this natural resource.

Data shows that 99.9% of the over 524,000 tests conducted met Ontario’s drinking water standards. This outstanding achievement is the result of the hard work and dedication of our municipal operators, inspectors, and laboratories, whose efforts contribute to keep Ontario’s water clean and safe.

Comprehensive measures taken to safeguard drinking water include compliance and enforcement activities, lead testing in schools and child care centres and thorough training for drinking water operators and inspectors.

The ministry also collaborated with First Nations to help address long-term drinking water advisories and partner organizations that invested in various projects to protect water sources.

Through ongoing testing and monitoring, relying on science and innovative technology, as well as successful collaborations, Ontario will continue to be a leader in providing clean, safe, and sustainable drinking water for generations to come.

Ontario's drinking water standards

One of the most important tools for helping to ensure the delivery of Ontario's high-quality drinking water is regular monitoring and sampling at regulated drinking water systems. Ontario has strict standards for contaminants in drinking water, most of which are based on Health Canada's Drinking Water Quality Guidelines and are reviewed on a regular basis to ensure that they reflect new information when it becomes available. The Ontario Drinking Water Quality Standards Regulation made under the *Safe Drinking Water Act, 2002*, sets out standards for a total of 151 microbiological, chemical, and radiological parameters.

In 2023, it was noted that the ministry was working on a new Drinking Water Benchmarks List that highlights the contaminants that may impact drinking water quality. This list is a comprehensive compilation of Ontario's Drinking Water Quality Standards, aesthetic objectives and operational guidelines. The ministry expects to consult on this list and how it gets updated in the near future.

The Ontario Drinking Water Advisory Council (ODWAC) provides technical and scientific advice and recommendations to the minister including whether and how to adopt Canadian Drinking Water Quality Guidelines as Ontario Drinking Water Quality Standards.

In 2024, ODWAC provided advice to the minister that the ministry not adopt the Canadian Drinking Water Quality Guideline for strontium as there is currently no health risk in Ontario drinking water from this contaminant. Scientific studies have shown that strontium is less toxic in water with high calcium levels since calcium is more readily absorbed and

incorporated into bone compared to strontium. Ontario's drinking water monitoring data shows that for all regulated systems in Ontario where strontium levels are higher than Health Canada's guideline of 7 mg/L, calcium is at least twice the level of strontium.

ODWAC has also provided advice to the minister that the ministry maintain the more stringent Ontario Drinking Water Quality Standard of 0.005 mg/L for cadmium instead of adopting the updated Canadian Drinking Water Quality Guideline of 0.007 mg/L. Drinking water data for Ontario shows that levels of cadmium found in distribution water are well below the current standard.

Finally, ODWAC has provided advice to the minister that the ministry rescind the current Ontario Drinking Water Quality Standard of 3.0 mg/L for chloramines consistent with Health Canada's rescission from the Canadian Drinking Water Quality Guideline in 2020 noting no health concerns related to chloramines in drinking water. ODWAC concurred with Health Canada's assessment noting that chloramine is a highly effective drinking water disinfectant and the health risks from chloramines or from any of its disinfection by-products are much lower than the risks from consuming water that has not been adequately disinfected.

Health Canada's drinking water objective for PFAS

Per- and polyfluoroalkyl substances (PFAS) are a family of synthetic inert chemicals manufactured for use in non-stick cookware, fire-resistant textiles, and highly effective fire-fighting foams among many other uses in industrial and consumer products. Unfortunately, the chemical characteristics that make them so useful also results in their persistence in the environment for many decades and accumulation in the soil, sediments, water, as well as the plants and animals. In humans, health impacts of PFAS exposure include liver damage, reduced immune system, and cancer.

On August 9, 2024, the Government of Canada withdrew the Canadian Drinking Water Quality Guidelines posted in 2018 for Perfluorooctanesulfonic acid (PFOS) and

Perfluorooctanoic acid (PFOA) and introduced a Drinking Water Objective of 30 ng/L for a sum of 25 PFAS. The ministry introduced a drinking water guidance value of 70 ng/L for 11 PFAS in 2017 which has been applied in Ontario where PFAS have been detected in water.

The ministry is reviewing the basis of Health Canada's new objective and will assess the applicability for its use in Ontario and the best way to implement it.

Monitoring results since 2016 for 23 drinking water systems participating in the ministry's voluntary Drinking Water Surveillance program show that levels in Ontario are generally below the Health Canada Objective. Some systems may have temporarily exceeded the Objective due to transient events (for example, nearby firefighting activities). The North Bay Drinking Water System is the only known system in Ontario that consistently exceeds the Objective due to historic PFAS contamination.

Emerging issues

Monitoring per- and polyfluoroalkyl substances (PFAS) in the Great Lakes

While the ministry considers the implementation of the Government of Canada's drinking water objective for use in Ontario, the concern for PFAS in the environment remains. The ministry continues to monitor PFAS within its existing programs, including the Great Lakes Nearshore Monitoring Network and the Lake Simcoe Monitoring Program. PFAS can enter lakes from treated wastewaters, through streams and from the air. More than 80% of Ontarians get their drinking water from Lakes Superior, Huron, Erie, and Ontario, monitoring for PFAS in the Great Lakes and Lake Simcoe helps ensure that these important drinking water sources are protected by better understanding the presence and prevalence of PFAS in the lakes.

With some exemptions, Canada has prohibited the manufacture, use and sale of PFAS and PFOA since 2012. In the nearshore waters of Lake Ontario, where drinking water is drawn from, water samples from 2023 were found to have lower concentrations of PFOS and PFOA than in previous years (2006 and 2018), as concentrations decreased following the restrictions.

Other PFAS compounds have become more commonly used since restrictions were placed on PFOS and PFOA, however, the concentrations of such replacement compounds have also decreased in the 2023 samples compared to those measured in Lake Ontario in 2018. The total concentrations of the sum of the 16 PFAS substances in the ministry's current analytical method were well below the Government of Canada's Drinking Water Objective of 30 ng/L for PFAS in both Lake Ontario and Lake Simcoe in 2023.

Novel treatment technology to reduce PFAS contamination in groundwater

While the decreases of PFAS in nearshore waters are encouraging, the ministry is exploring technologies that can remove these substances in groundwater. The ministry funded a research project through the Royal Military College that employs a novel treatment technology to reduce PFAS in contaminated groundwater. Such a treatment option could provide a significant advantage over the current energy-intensive incineration technologies typically employed to deal with PFAS especially since the technology can be applied in the field to directly treat PFAS-contaminated groundwater. This research project is expected to be completed in 2028, and results will be reported in the scientific literature.

Effects-based screening in water samples using bioassays

Environmental monitoring for contaminants has always been a challenge due to the many chemicals used in industry and in everyday life. Monitoring for individual chemicals or even a particular class of chemicals is expensive and assessing their impacts on plants and animal is difficult.

The ministry is evaluating tests that reveal the impacts of all chemicals present in samples from urban and urbanizing watersheds and wastewater effluents discharging to western Lake Ontario. This bioassay-based approach evaluates the effects of the contaminants on living organisms or cell cultures to assess the hazardous nature of the contaminants. If the bioassay indicates adverse impacts in a particular watershed, more detailed analysis can be carried out. The ministry is assessing the bioassay for contaminants at eight watersheds.

This project will result in enhanced monitoring in the Great Lakes basin with cost-effective and informative assessment tools and deliver on our commitments under the Harmful Pollutants Annex of the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health.

Key findings from the Chief Drinking Water Inspector report

Ontario's Chief Drinking Water Inspector reports annually on the performance of Ontario's regulated drinking water systems. Data associated with the 2023-24 Chief Drinking Water Inspector Report is also available on the Ontario Data Catalogue.

This year's results show that Ontario's drinking water continues to be among the best protected in the world.

Municipal and laboratory results

More than 80% of Ontario residents receive drinking water from a municipal residential drinking water system in the city or town where they live. These drinking water systems are inspected each year to make sure they are following the province's drinking water regulations.

In addition, laboratories licensed by the province to perform drinking water testing are inspected twice per year and must report all test results to the ministry within 10 days.

The 2023-24 test and inspection results for Ontario's drinking water systems and licensed

- 99.9% of the over 524,000 drinking water tests from municipal residential drinking water systems met Ontario's drinking water standards
- 74% of municipal residential drinking water systems received a 100% inspection rating
    - 99.8% of municipal residential drinking water systems received an inspection rating greater than 80%
- 62% of laboratories received a 100% rating in at least 1 of their inspections
    - 100% of laboratory inspections received an inspection rating greater than 80%
    - 32% of laboratories received a 100% in both inspections

Compliance and enforcement activities

Inspectors and investigators conduct compliance and enforcement activities to help ensure the regulated community is in compliance with Ontario's drinking water legislation.

In 2023-2024, the following orders were issued to address violations:

- 8 orders to owners of non-municipal year-round residential systems
- 3 orders to owners of systems serving designated facilities (for example, universities, health care facilities, children's camps and other facilities as defined in Ontario Regulation 170/03)
- 3 orders to licensed laboratories

In 2023-2024, owners and/or operators of four systems that supplied drinking water to municipal and non-municipal residential systems were charged with offences under the *Safe Drinking Water Act, 2002*, convicted, and fined for a combined total of $55,800.

For further details about these orders and convictions, please refer to the 2023-2024 Chief Drinking Water Inspector's Report or the 2023-2024 Drinking Water Quality and Enforcement Dataset on Ontario's Open Catalogue.

Lead testing at schools and child care centres

Ontario requires lead testing in drinking water in all schools and child care centres.

- data from schools and child care centres shows that 97.3% of the over 21,000 test results (standing and flushed) met the provincial standard for lead (10 micrograms per litre) in drinking water
- this number increases to 98.6% when only looking at flushed samples

Fewer flushed test results exceeded the lead standard than standing test results. This is consistent with previous years and demonstrates that flushing is an effective way to temporarily reduce lead levels below the standard for lead. More permanent solutions include replacing or removing problematic fixtures or using filters in accordance with the manufacturers' instructions.

The ministry's flushing and sampling for lead webpage is an excellent resource for more information about lead in drinking water to support the regulated community, parents and guardians.

Drinking water operator certification and training

Ontario's drinking water system operators must be trained and certified according to the type and class of system they operate. Depending on the classification level of the drinking water system in question, operators must complete between 60 and 150 combined hours of continuing education and on-the-job training every three years to renew their certificates. Operators can hold multiple certificates, allowing them to work in more than one type of drinking water system.

As of April 1, 2024, Ontario had 7,653 certified drinking water operators, holding 11,241 certificates in total. Of these operators, 183 were employed as system operators in First Nations across the province, holding 268 drinking water operator certificates in total.

The Walkerton Clean Water Centre provides training for operators and owners of drinking water systems province-wide, with a focus on small and remote communities, including First Nations. As of April 1, 2024, more than 117,000 participants had been provided with high-quality training programs to operators, owners and operating authorities on water treatment equipment, technology and regulatory requirements since the Walkerton Clean Water Centre opened its doors in 2004. Operator training programs also cover environmental issues such as water conservation and energy efficiency, with the aim of increasing the sustainability of drinking water operations.

Actions to support the delivery of clean, safe drinking water in Ontario

Drinking water and wastewater operator workforce assessment

Water and wastewater operators have the important job of monitoring, sampling and ensuring systems are operating properly. The long-term sustainability of the water operator workforce is crucial to assuring Ontarians that their drinking water is among the best protected in the world.

In 2024, the ministry led a multi-stakeholder project to assess workforce challenges and identify measures needed to help ensure that every Ontario region has a sufficient and qualified workforce for the water and wastewater sector.

The ministry collected input from stakeholders and partners, including industry associations, employers, Indigenous industry representatives and post-secondary

education institutions to develop a comprehensive strategy to support water operator recruitment and retention in Ontario.

Accreditation audits for drinking water systems and drinking water testing services

Licensed laboratories and operating authorities of municipal residential drinking water systems are required to be accredited by third-party organizations designated as accreditation bodies for the purpose of accreditation under the *Safe Drinking Water Act, 2002*.

In 2024, all operating authorities for the drinking water systems maintained their accreditation under the Drinking Water Quality Management Standard, with no accreditations revoked or suspended. Likewise, all licensed laboratories met accreditation requirements to the standard for testing and calibration laboratories, with no suspension or revocation of any r accreditation status.

Actions to support First Nations communities

First Nations communities in Ontario have the highest number of long-term drinking water advisories in the country.

Ontario continues to work with the Walkerton Clean Water Centre and the Ontario Clean Water Agency (OCWA), as well as the federal government and First Nations communities to support the resolution of long-term drinking water advisories and promote sustainable water management and infrastructure solutions on reserve, where requested.

Walkerton Clean Water Centre

The Walkerton Clean Water Centre provides a state-of-the-art facility and highly skilled research and training staff to meet the specific needs of drinking water operators in First Nations communities.

The centre continues to deliver specific training for First Nations operators and leaders that are responsible for drinking water systems. As of November 2024, 263 individuals had successfully completed the “Entry-Level Course for Drinking Water Operators for First Nations,” and 230 had successfully completed “Managing Drinking Water Systems in First Nation Communities.”

The centre continues to develop its curriculum with new courses scheduled to launch in 2025.

The Walkerton Clean Water Centre also offers a pilot testing program to help operators better understand source water characteristics, treatment process performance and alternative treatment options.

As of August 2024, the Walkerton Clean Water Centre had completed 24 pilot testing projects for First Nations clients with another project currently underway.

The centre also continues to work on a project engaging with First Nations communities to improve awareness and accessibility of existing drinking water services. Additionally, where needed, the centre develops new approaches to help strengthen and improve service delivery, build capacity and provide greater support for First Nations drinking water systems and their operators, management and leadership.

The first stage of this project involved partnering with First Nations to plan and conduct 'Voice of Customer' sessions involving community representatives and drinking water system operators.

The data from the engagement session identified insights into operational challenges and highlighted key areas for enhanced services and support in Ontario's First Nations communities through a series of recommendations.

The next stage of the project includes developing a framework that addresses the recommendations.

Ontario Clean Water Agency (OCWA)

OCWA also offers a full range of training in water and wastewater treatment, water distribution, wastewater collection, preventive maintenance, health and safety, asset planning and management and compliance subjects on a fee for service basis. First Nations operator training services are delivered as part of OCWA's operations and engineering services or through third-party training agreements.

In 2021, OCWA created a First Nations Advisory Circle that reports to OCWA's Board of Directors and provides advice and recommendations on how OCWA can enhance its partnerships with First Nations communities to better support their water and wastewater needs and concerns. Further information on how OCWA supports First Nations communities' access to safe, sustainable drinking water can be found on the OCWA website.

Drinking water source protection

In 2023, the ministry entered into funding agreements with Beausoleil First Nation and Sagamok Anishinabek First Nation to fund work related to the Best Practices for Source Water Protection guide.

This funding provides an opportunity for recipients to complete technical assessments to better understand their drinking water systems, their water sources, and water quality risks, and to develop action plans to address those risks.

Actions to protect water sources

Investing in Lake Simcoe improvement projects

Ontario has invested annually to support its partners, including the Lake Simcoe Region Conservation Authority, community-based groups, researchers, and other organizations to continue to build on the significant progress made to protect and restore Lake Simcoe.

Since 2018, Ontario has committed more than $13 million in programs and projects to improve the ecological health of Lake Simcoe and its watershed and protect access to safe and clean water in the region.

In 2024, Ontario invested $289,000 in 3 new multi-year projects that are engaging local youth and community members in environmental stewardship activities like workshops, field trips and other educational opportunities focused on restoring the Lake Simcoe watershed.

Learn about the measures Ontario has taken to implement the Lake Simcoe Protection Plan.

Protecting source water through river monitoring

Now in its 60th year, the Provincial (Stream) Water Quality Monitoring Network (PWQMN) is used to report on the state of Ontario's streams and rivers and remains an essential component of Ontario's commitment to protect our source water resources. The network monitors streams and rivers at over 400 sites to understand how water quality varies across the province and evolves over time.

This data, available on the Ontario Data Catalogue, is used to report on watershed health and to support source protection planning. The ministry recently enhanced the PWQMN to include more winter sample collection to better understand the impact of a changing climate on water quality.

- currently, 3,000 stream water quality samples are collected each year
- over the course of 60 years, over 2,000 sites in Ontario have been monitored at one time or another (438 currently active)
- the database contains close to 9,000,000 data records

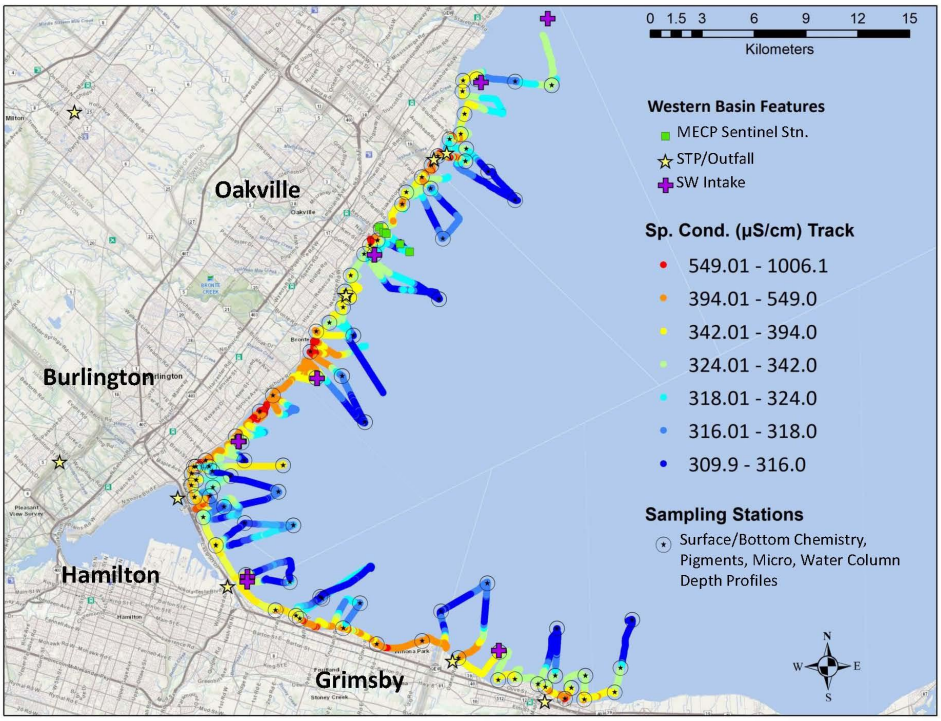
For more information on stream water quality status and trends, read the latest State of the Great Lakes Report, Water Quality in Tributaries sub-indicator report.

Nearshore water quality study in the western basin of Lake Ontario

In 2023, the ministry conducted a study on water quality within Lake Ontario's western basin, an area facing significant stress due to rapid urban development and the impacts of climate change. The study aimed to characterize water quality and environmental conditions along the nearshore area extending about 5 kilometres into the lake, which includes several municipal drinking water intakes.

The study found that nearshore water quality in this part of Lake Ontario is significantly influenced by rivers and discharges from wastewater treatment plants. The movement of pollutants in the nearshore is driven by lake hydrodynamics such as the shoreline water flow and wind-driven mixing, which can transport pollutants over large distances. This may be particularly relevant during winter months where climate change is contributing to reduced ice cover, which increases the effects of wind on the transport of pollutants.

This study is part of a broader effort by the ministry to understand the movement of pollutants within the Great Lakes, including movement from land to lake as well as in the nearshore area of lakes, and how this movement affects water quality in source water areas.



The map shows continuous water quality data for specific conductivity collected by the ministry in the western basin of Lake Ontario in 2023. This data is helping the ministry understand how the movement of pollutants in the lake is affecting water quality at drinking water sources.

Clean Water Act and source water protection update

Ontario continues to ensure our municipal sources of drinking water are protected through ongoing oversight and implementation of the source protection program under the *Clean Water Act, 2006*. Local source protection authorities (generally, conservation authorities), along with 19 source protection committees, support implementing these source protection plans and ensure they are kept up to date.

Source protection plans have been in effect for all 38 source protection areas in Ontario since 2016. These locally developed plans contain policies to protect sources of drinking water for almost 440 municipal drinking water systems (and 3 First Nations' systems) from

risks such as the application, handling and storage of road salt, pesticides, or fuel and other activities that can be detrimental to the quality and quantity of our drinking water.

Ontario continues to fund source protection authorities to carry out their responsibilities, and support municipalities in meeting their obligations. In 2024, the ministry made a historic investment by signing three-year agreements with source protection authorities, totaling more than $20 million. These longer-term agreements provide certainty and stability for source protection planning between 2024 and 2027.

The ministry also supports municipalities by providing training to risk management officials and inspectors, so they are qualified to carry out their duties under the *Clean Water Act, 2006*. Two full training courses were delivered over 2023-24.

As populations move and grow in Ontario, municipal drinking water systems must be adapted accordingly to support new developments and source protection plans are updated to ensure new or changed drinking water sources are protected. Plans may also be updated to reflect new science or new policy approaches to mitigate drinking water threats. Since the last minister's annual report, eleven source protection plans were amended to update science, incorporate changes to drinking water systems, and address implementation challenges. Some of the technical work conducted over 2023-24 focused on delineation of protection zones around drinking water sources where activities can impact the quality of sources of drinking water, assessing drinking water threats such as wastewater, stormwater management activities, road salt activities, handling and storage of fuel, etc. aligning with the latest Technical Rules made in 2021 under the *Clean Water Act, 2006*. For example:

- In the South Georgian Bay-Lake Simcoe source protection plan, wellhead protection areas for the Colgan drinking water system were changed due to increased water takings to support growth and development.

- In the Ausable Bayfield-Maitland Valley source protection plan, wellhead protection areas for the Century Heights drinking water system and Lucknow drinking water system were changed to incorporate a new well and increase water takings for an existing well, respectively, to service the growing communities.

By the end of 2023, local source protection authorities reported that, cumulatively:

- Nearly 270 municipalities have completed and/or are updating their official plans to conform with source protection plan policies that aim to manage or prevent risks associated with specific activities to ensure they do not contaminate or deplete sources of drinking water.
- More than 1,900 property-specific risk management plans are in place across the province covering over 2,400 properties and addressing over 3,600 drinking water threat activities, such as the handling and storage of road salt, fuel, and organic solvents, among other activities.
- Provincial ministries have completed 99.7% of the reviews and amendments to their prescribed instruments (e.g., permits, approvals, licenses, etc.) that govern existing drinking water threat activities.
- Over 7,200 septic systems are undergoing regularly scheduled inspections.
- Over 2,100 road signs have been installed across the province on certain municipal roads and provincial highways to help increase awareness of drinking water protection zones.

The source protection authorities also note accomplishments in their continuous effort to protect sources of drinking water. For example:

- Cataraqui Source Protection Authority analyzed well water sample data provided by Public Health Ontario to better understand bacteria concentrations in their jurisdiction and identify hot spots to target education and outreach efforts. A local working group

was formed for municipalities that do not have communal water systems; thus, are not included in a source protection plan under the *Clean Water Act, 2006* to promote the use of the ministry's Best Practices for Source Water Protection guide and create an action plan to address areas of water quality concern.

- Staff from the Lake Simcoe Region Source Protection Authority and York Region met with Fire Chiefs from local municipalities in York Region and Simcoe County to increase awareness of source water protection and discuss ways fire services staff can help prevent contamination of municipal water sources. As a result, Central York Fire Services plans to include source water protection in their staff training program, add source water protection mapping into their system, and add known dense non-aqueous phase liquid (DNAPL) and organic solvent threat sites to their Pre-Plan and Dispatch notification system.

- In 2023, the City of Stratford piloted a new Unidirectional Flushing Program, a method of cleaning the inside of water mains within the distribution system to improve and maintain water quality. The city also completed a system-wide leak detection survey and made repairs to limit water loss and enhance conservation.

- The City of Barrie is sharing a spill response plan template with developers as part of planning applications for construction and site management to help prevent and/or manage spills.

- Orangeville marked the first full year of its water softener rebate program, for the replacement of existing residential water softeners with more efficient models or salt-free water conditioning alternative to promote water conservation and reduce salt loading to municipal sewers.

Conclusion

Ontario's drinking water protection framework continues to keep the province's drinking water safe from source to tap, ensuring that it remains among the safest in the world.

Moving forward, we will continue to work closely with First Nations, municipalities and other stakeholders to strengthen our ability to address the challenges of a rapidly growing population, climate change, and other emerging issues facing our drinking water system.

Working together, we will take action to build more comprehensive water monitoring programs, advance treatment technologies and better support workforce development to provide clean and safe drinking water to Ontarians, both now and in the future.