Minister's Annual Report on Drinking Water

2021

Ontario

Minister’s Annual Report on Drinking Water (2021)

Read an overview of our programs, policies and initiatives to protect drinking water in Ontario.

On this page

Minister’s message

As I release my first annual report on drinking water as Minister of the Environment, Conservation and Parks, I am very pleased to share that Ontario’s drinking water continues to be among the best protected in the world.

Our province is known for being home to the globe’s largest freshwater system, and our government has made it a significant priority to maintain and improve the quality of drinking water that Ontarians rely on year over year. As this report reflects, over the past year, we have

worked closely with our partners to help protect water resources from the source to when it enters our taps. We continue to develop and hone our best practices with new data and innovative solutions, and lead through initiatives that reduce plastics, toxins, and other harmful contaminants in our drinking water. We've invested in projects to restore the health of the Great Lakes, as well as in green infrastructure to help support upgrades to drinking water, wastewater and stormwater infrastructure in smaller communities. While the COVID-19 pandemic has presented challenges, we have done what it takes to continue delivering the quality drinking water services that Ontarians expect.

This is reflected in the 2020-21 drinking water data summarized in this report, which demonstrates the positive results of Ontario's ongoing actions to help ensure the safety of secure, reliable sources of drinking water. Among other accomplishments, the 2020-21 data shows that 99.9 per cent of all test results from municipal residential drinking water systems met Ontario's comprehensive drinking water quality standards.

While this is excellent progress, there are too many First Nation communities still without access to clean drinking water, and more must be done. In the year to come, we will be continuing to work with: the Walkerton Clean Water Centre and the Ontario Clean Water Agency; the federal government; and, most importantly with First Nation communities and organizations to support the long-term sustainability of each community's water infrastructure. For example, the Walkerton Clean Water Centre will be expanding training and services to First Nations communities throughout the province and the Ontario Clean Water Agency First Nations Advisory Circle has been established to help government better understand the needs and priorities of these communities.

We will also be working collaboratively with partners like Health Canada on new approaches to address emerging threats to drinking water quality like pesticides, synthetic chemicals, and fire-fighting foams. As part of Ontario's 2020 Budget, our government committed to investing an additional $25 million to help better manage wastewater and stormwater and further protect the health of our communities and waterways across the province. Beyond this, we are considering additional steps to support municipalities in protecting their drinking water systems against potential cyber security attacks that may target those systems.

I want to acknowledge that effective drinking water protection in all corners of the province is only possible through collaborative effort. I am very proud of all the work Ministry of the Environment, Conservation and Parks staff are doing with groups, agencies and organizations to keep our drinking water clean and safe, and I thank our partners for their many efforts as this would not be possible without their dedication.

The people of Ontario value safe water to drink, clean air to breathe and well-protected lands and greenspaces to enjoy. The Government of Ontario is committed to protecting these important environmental resources today and for generations to come.

The Honourable David Piccini
Minister of the Environment, Conservation and Parks

Ontario's drinking water standards

Ontario sets stringent limits for contaminants in drinking water. Most of these are based on Health Canada's Canadian Drinking Water Quality Guidelines and are reviewed on a regular basis to ensure that they reflect new information when it becomes available. The enforcement of the standards through regular monitoring and inspection of regulated drinking water systems is one of the most important tools for helping to ensure the delivery of high-quality drinking water in Ontario. The Ontario Drinking Water Quality Standards Regulation under the Safe Drinking Water Act, 2002, sets out standards for a total of 151 microbiological, chemical and radiological parameters.

As part of Ontario's commitment to continuous improvement, the Ministry of the Environment, Conservation and Parks ("ministry") independently tracks science and technology to inform the development of new/updated standards and guidelines through its own programs in addition to its participation on the Federal-Provincial-Territorial Committee on Drinking Water, which develops Canadian Drinking Water Quality Guidelines.

Furthermore, the Advisory Council on Drinking Water Quality and Testing Standards (ODWAC), comprised of drinking water experts from municipalities, universities and industry, provides non-binding recommendations to the Minister including whether and how to adopt Canadian Drinking Water Quality Guidelines as Ontario Drinking Water Quality Standards.

Lead

In March 2019, Health Canada reduced the Canadian Drinking Water Quality Guideline for lead from 10 micrograms per litre (µg/L) to 5 µg/L.

Ontario already has the most comprehensive testing regime for lead in drinking water in the entire country – requiring every fixture used to prepare food or provide drinking water in schools and child care centres to be sampled and tested. The ministry continues to evaluate our already comprehensive lead protection framework to better understand the implications of adopting the more stringent federal guideline for lead as an Ontario standard and other potential actions to strengthen the regulatory framework.

Emerging issues

1,4-dioxane

In March 2021, Health Canada introduced a new Canadian Drinking Water Quality Guideline of 50 µg/L for the chemical 1,4-dioxane. The substance 1,4-dioxane is primarily used as an industrial and commercial solvent and is used in the preparation of many industrial chemicals such as coatings and adhesives. Prior to the mid-1990's it was used primarily as a stabilizer in chlorinated solvents. Due to its environmental properties, 1,4-dioxane is more likely to be detected in groundwater than in surface water, often with chlorinated solvents. It is present in industrial and landfill sites and may migrate and impact nearby groundwater-based drinking water systems. Ontario does not currently have an Ontario Drinking Water Quality Standard for 1,4-dioxane. Current monitoring indicates that 1,4-dioxane levels are well below the Canadian Drinking Water Quality Guideline in all drinking water systems where the water has been tested. The ministry is undertaking additional monitoring for 1,4-dioxane around landfill sites to better understand the implications of adopting the Canadian Drinking Water Quality Guideline as an Ontario Drinking Water Quality Standard.

Pesticides

Health Canada and the Federal-Provincial-Territorial Committee on Drinking Water are reviewing how they develop and maintain drinking water guidelines for pesticides. New pesticide active ingredients are continually developed and may replace older pesticides which

get phased out of the market. It is important to monitor and regulate drinking water for those pesticides that are currently being used and may pose the greatest risk to drinking water and to remove those that are no longer relevant. Ontario revoked 13 such standards for pesticides from Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards) on January 1, 2016 because they were no longer detected in drinking water. Based on the outcome of the current inter-jurisdictional review, the ministry will continue assessing whether Ontario should have drinking water standards for various pesticides.

Per– and Polyfluoroalkyl Substances (PFAS)

Per– and Polyfluoroalkyl Substances (PFAS) are a group of more than 4,000 synthetic chemicals that have been used in industrial and consumer products since the 1940s. They have never been manufactured in Ontario but are found in the environment because they were used in products available here (e.g., coatings on non-stick cookware, stain and water repellant treatments for fabric, fire-fighting foams) and they have since migrated into the natural environment where they take a long time to break down. PFAS accumulate in humans and wildlife and may result in a number of significant health effects.

The current national guidelines were developed for a small number of specific PFAS. The ministry has developed interim drinking water advice that is more stringent than the national guidelines and recommends that PFAS in drinking water should be addressed if the combined level of 11 select PFAS is above 70 ng/L. This advice is used by ministry staff to evaluate drinking water which has been contaminated by PFAS, usually due to nearby use of fire-fighting foams.

In April 2021, Health Canada posted a notice of intent to address PFAS as a class, rather than as individual substances as has been the case to date through the Canadian Drinking Water Quality Guidelines. This proposed class-based approach is in line with the interim guidance developed by the ministry and we have begun to work collaboratively with Health Canada on new approaches for setting drinking water quality guidelines for these substances.

Cyber Security at Drinking Water Systems

Cyber security attacks on public infrastructure can compromise the ability of municipal utilities to provide clean and safe water, erode customer confidence, result in financial expenditure and legal liabilities, and cause compliance issues from loss of data.

Although there have been no cyber security attacks on drinking water systems in Ontario to date, this government takes cyber security very seriously and has undertaken initiatives to help reduce the risk of cyber security attacks and keep Ontarians' information safe and secure.

The Ontario government has established a Cyber Security Centre of Excellence that helps educate Ontario government ministries and broader public sector organizations about cyber security and best practices. They provide advice, guidance, information and services to strengthen digital resilience while meeting digital service delivery expectations. In addition, the Ontario government has established a cyber security website that provides guidance, tools and training for public and private sectors.

The ministry is also considering additional steps to help municipalities protect their drinking water systems from public attacks, such as the development of a Best Management Practices document on cyber security specific to measures that should be taken at municipal drinking water systems. The ministry is also proposing to amend the "List of Potential Hazardous Events" referenced in the ministry's Drinking Water Quality Management Standard to include cyber security/cyber-attacks among the matters that are to be considered in municipalities' risk assessments.

Key findings from the Chief Drinking Water Inspector 2020-21

Ontario's Chief Drinking Water Inspector reports annually on the performance of Ontario's regulated drinking water systems. Data associated with the 2020-21 Chief Drinking Water Inspector's report is also available on Ontario's 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 per cent 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 Ontario 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 2020-21 test and inspection results for Ontario's municipal residential drinking water systems and licensed laboratories show that:

- Drinking water supplied by municipalities was tested over 505,000 times and 99.9 per cent of tests met Ontario's drinking water quality standards.
- All municipal drinking water systems were inspected at least once and laboratories that test drinking water were inspected at least twice during the year, as required.
- Seventy-one per cent of municipal systems scored 100 per cent on their inspection. Ninety-nine per cent of final inspection ratings were greater than 80 per cent.
- One hundred per cent of laboratories received an inspection rating above 85 per cent.

Compliance and enforcement activities

Compliance and enforcement activities are conducted by inspectors and investigators to help ensure the regulated community follows Ontario's strict drinking water laws. These activities include education and outreach, routine inspections, following up on adverse water quality incidents, and where necessary, the issuance of an order or a referral for investigation to determine whether prosecution is warranted. Where the laws are not followed, the inspector works with the drinking water system owner and/or operator to bring the system into compliance. If the non-compliance is of a serious nature or the drinking water system owner and/or operator fails to come into compliance, inspectors may issue an order to help ensure compliance with the applicable legislation or regulation and may refer the matter for investigation. In 2020-21, ministry staff undertook the following enforcement activities:

- Two orders were issued to the owners of two separate municipal residential drinking water systems. The orders included requiring:
    - One owner to retain the services of a licensed engineering practitioner to assess the filtration system and implement any recommendations. The owner is currently in the process of implementing the recommendations and the ministry continues to monitor the situation.
    - One owner to retain a third-party operator to oversee the actions of the system's operator and report any instances of non-compliance and improper behaviour to the ministry on a bi-weekly basis. The order was amended to reduce the reporting frequency to monthly as the operator's behaviour improved. The owner complied with the order and has since retained a different operating authority.
- One order was issued to a private corporation requiring it to install backflow prevention devices and put a procedure in place to help protect the drinking water supply from cross-contamination. The corporation complied with the order.
- Two orders were issued to owners of non-municipal year-round residential drinking water systems:
    - One order required the owner to provide proper treatment and to monitor for primary disinfection.
    - One order required the owner to submit documentation that a certified operator was hired.
    - Both owners have complied with their orders.
- One order was issued requiring a school board to submit an action plan to help ensure that corrective actions for future lead exceedances are reported and implemented properly. The school board complied with the order.
- Three orders were issued to owners of licensed laboratories. All orders contained direction to conduct a root cause analysis to identify deficiencies in the adverse reporting process and implement corrective actions to address them. The orders were complied with in all cases.

Charges were laid for more serious violations committed at drinking water systems and resulted in convictions and fines totaling $48,500.

- One operating authority was convicted for failing to immediately report to the ministry a prescribed adverse result of a drinking water test.
- An operator was convicted for the inclusion of false and misleading information in a document that was required to be created and stored at municipal residential drinking water systems.
- One individual was convicted for failing to:
    - ensure at least one distribution sample was taken every week;
    - use an approved device to test for free chlorine residual;
    - immediately report to the ministry a prescribed adverse result of a drinking water test; and
    - ensure the drinking water system was operated by a properly certified person at a trailer park.
- A corporate entity was convicted for conducting upgrade and repair work without a well technician's license at a group home.

The ministry is also moving forward with a proposal that, if approved, would support the expanded use of administrative penalties under several of the ministry's statutes. Under the expanded regime, administrative penalties could be issued for a wider range of contraventions and to more regulated persons and facilities than they currently are, including in situations where drinking water laws are violated. Please see the section on administrative penalties below for further details.

Lead testing

Ontario has the most comprehensive provincial regime for testing lead in drinking water in the entire country and is the only province that requires lead testing in drinking water at all schools and child care centres. The Ministry of Health is not aware of any reported cases of lead poisoning in children due to drinking water in the last ten years.

Lead can enter drinking water through contact with plumbing that contains lead or that was constructed using lead solder. On July 1, 2017, the province expanded testing requirements in Ontario Regulation 243/07 made under the Safe Drinking Water Act, 2002, to help protect children from lead in drinking water. This change means that every tap or fountain used for

drinking water or to prepare food or drinks for children in schools and child care centres must be tested for lead at least once by January 2020 (for child care centres and schools with primary divisions) or January 1, 2022 (for schools without primary divisions).

When a school, private school, or child care centre's drinking water sample exceeds the standard for lead, the licensed laboratory must notify the facility operator, the local public health unit and the ministry within 24 hours. The facility operator must take immediate corrective action, including rendering the tap or fountain inaccessible to children by disconnecting or bagging it until the issue is resolved. Corrective actions can include increased flushing, replacing the fixture, or installing a filter or other device that is certified for lead reduction. Operators must also follow any other directions from their local Medical Officer of Health.

Data from schools and child care centres shows that the majority of test results in 2020-21 met the provincial standard for lead in drinking water. Ninety-three per cent of more than 27,000 test results met the standard during that period. Test results improved when water was flushed through the pipes before the sample was taken. Ninety-six per cent of flushed samples met Ontario's standard for lead. The fact that fewer flushed test results exceeded the standard than standing test results 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 installing filters on them and ensuring the filters are replaced in accordance with manufacturers' instructions.

Operator certification and training

Operators of drinking water systems must be trained and certified according to the type and class of the 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, which allows them to work in more than one type of drinking water system.

As of April 1, 2021, Ontario had 7,963 certified drinking water operators, holding 11,737 certificates. Of these, 155 people were employed as system operators in First Nation communities across the province, holding 217 drinking water operator certificates.

The Walkerton Clean Water Centre provides training for operators and owners of drinking water systems provincewide, with a focus on small and remote communities including First Nations. As of September 16, 2021, more than 98,000 persons had been provided with high-quality operator training programs 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.

The Walkerton Clean Water Centre has continued to build upon its 2020 launch of virtual training in response to the COVID-19 pandemic. Since the first virtual course was introduced in May 2020, the Walkerton Clean Water Centre has delivered more than 250 virtual training sessions to help ensure that drinking water operators were able to earn the continuing education units required for certification renewal despite restrictions associated with the COVID-19 pandemic. As of September 2021, 20 courses are available for virtual delivery.

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

Amendments to the Certification of Drinking Water System Operators and Water Quality Analysts regulation

In fall, 2021 Ontario moved forward with regulatory changes to allow the ministry and water systems to act quickly to help ensure drinking water and waterways are protected during an emergency, such as a pandemic. These changes, including extending operator certificates and allowing certain qualified but non-certified staff to temporarily maintain system operations, will help ensure the province's drinking water systems and sewage works have the staff needed to continue operations in an emergency.

Additional non-emergency changes were also made to operator certification regulations. Further information about these changes is available on the Environmental Registry (please see 019-3513 and 019-3515).

Accreditation audits for drinking water systems and drinking water testing services

Municipal residential drinking water systems and licensed laboratories 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 2021 all operating authorities for the aforementioned drinking water systems were actively accredited to the requirements of the Drinking Water Quality Management Standard and no accreditations were revoked or suspended. Likewise, all licensed laboratories were actively accredited to the requirements of the standard for testing and calibration laboratories and none of the licensed laboratories had their laboratory accreditation status suspended or revoked.

Investment in green infrastructure for smaller communities

The Investing in Canada Infrastructure Program (ICIP) is a $30-billion, 10-year infrastructure program, cost-shared between the federal, provincial and territorial governments, and other partners. ICIP was designed to support long-term economic growth, build inclusive, sustainable and resilient communities and support a low-carbon economy. Under ICIP, in 2018 Ontario signed its Integrated Bilateral Agreement (IBA) with the federal government for $11.8 billion over 10 years to cost-share projects under the following four streams: Public Transit; Green Infrastructure; Community, Culture & Recreation; Rural and Northern Communities. The COVID-19 Resilience Infrastructure Stream was added later to support post-pandemic recovery

In July 2021, the application intake for the second round of the ICIP Green Infrastructure stream opened to 408 eligible municipalities with populations under 100,000, 127 First Nations and eight Local Services Boards with eligible drinking water infrastructure assets. The intake closed on September 9, 2021, and the province sent emails to successful nominees on December 13, 2021.

The program is designed and delivered by the Ontario Ministry of Infrastructure, with support from the Ministry of the Environment, Conservation and Parks (MECP), along with other ministry partners. MECP and partner ministries review all applications submitted by eligible municipalities, First Nations, and Local Service Boards for technical scoring, and to conduct due

diligence checks such as financial risk assessments and to ensure alignment with provincial regulations and policies.

Through this intake, up to $330 million in federal-provincial funding will be made available to eligible applicants. This includes a dedicated funding carve out of 10 per cent of overall federal-provincial funding that has been allocated to First Nation projects to ensure a balance of funding is available for all of Ontario's communities.

Funds in this round will target projects that address critical health and safety needs in communities by increasing access to local drinking water infrastructure that is safer and more reliable.

This funding intake was informed by feedback from municipal and First Nation partners that reiterated the need for additional funding related to the improvement of drinking water infrastructure, and this intake will address some of this demand.

The first intake of the ICIP green stream, which closed in October 2020, focused on projects that addressed critical health and safety issues with drinking water, wastewater and stormwater infrastructure. MECP, along with other ministry partners, also supported the design of this intake and reviewed all project applications submitted. Under that intake, 76 projects worth more than $140 million in federal-provincial funding were nominated to the federal government, all of which have been approved as of earlier this year.

Through the Ontario Community Infrastructure Fund (OCIF), Ontario also provides funding to help 424 small, rural and northern communities address critical local infrastructure, including roads, bridges, water and wastewater infrastructure. As announced in the recent Fall Economic Statement, Ontario will be providing an additional $1 billion over the next five years to help build and repair local roads, bridges, water and wastewater infrastructure in small, rural and northern communities. This investment is part of the government's plan to build Ontario by getting shovels in the ground on critical infrastructure projects that support economic recovery, growth and job creation.

As well, Ontario continues to work with the federal government to fully implement the Clean Water Wastewater Fund (CWWF) and received a federal funding allocation of $534 million. Ontario made the decision to cost-share this program and has committed about $268 million in

funding to support approximately 1,300 projects across the province related to the rehabilitation of water, wastewater, and stormwater infrastructure.

Actions to support First Nation communities

First Nation communities in Ontario have the highest number of long-term drinking water advisories in the country. As of December 1, 2021, there were 34 long-term drinking water advisories impacting 24 First Nation communities in Ontario. This must change, and although the federal government and First Nations share primary responsibility for providing safe drinking water on First Nations' reserves, our government is committed to working in collaboration with them and to sharing technical expertise to help resolve the issue of water quality on reserves.

Ontario is available to provide First Nation communities with access to expertise in the design, construction, operation and maintenance of drinking water systems, as well as to facilitate access to operator training and certification programs. When asked, we provide technical advice to support safe, sustainable water infrastructure in First Nation communities so they can develop the capacity to end long-term drinking water advisories.

The province has collaborated with Political-Territorial Organizations, Tribal Councils and their member communities to assess existing water infrastructure against Ontario standards and support the development of such long-term community water infrastructure plans. Since 2017, a total of 63 drinking water and 17 wastewater assessments and site visits have been completed by our Indigenous Drinking Water Projects Office in 59 First Nation communities in Ontario.

Continued collaboration with NAN

This past summer, the ministry committed to continued collaboration with Nishnawbe Aski Nation (NAN) by updating an agreement, first signed in 2018, to undertake comprehensive assessments of the drinking water system infrastructure in their communities. This update was necessary to account for delays caused by COVID-19 which prevented in-person access to communities. This continued collaboration will involve a ministry-led core team of experts visiting communities to assess the current water infrastructure against Ontario's regulatory framework and to make recommendations to upgrade systems. The findings from these assessments will be used by NAN to prepare a water needs assessment for each community and to develop an

infrastructure strategy to support the long-term sustainability of their respective drinking water systems.

Investment in green infrastructure for smaller communities – First Nation project proposals

The ministry has partnered with the Ministry of Infrastructure to provide expertise to support the review of the recent intake of First Nation infrastructure project proposals under the Green Infrastructure funding stream of the Investing in Canada Infrastructure Program (please refer to the section titled “Investment in green infrastructure for smaller communities” for more information about this funding stream). It is anticipated that the projects chosen will support the sustainability of communities and their drinking water infrastructure.

Training for First Nation system owners and operators

Through the Walkerton Clean Water Centre (WCWC), Ontario has also been working with First Nations on the development of training programs to support operators, managers and community leaders in maintaining safe drinking water systems. Again, this year, the in-classroom sessions of the Entry-level Course for Drinking Water Operators (ELC) were impacted by the COVID-19 pandemic; however, other training programs for operators of First Nations water systems were delivered virtually and received positive feedback from participants. As of December 2021, 165 individuals had successfully completed the ELC, approximately half of whom are from Northern Ontario. WCWC’s courses help build capacity and have been positively received by First Nation participants and communities, who we have heard want to see this relationship continue.

The ministry is working with the WCWC to implement a streamlined and coordinated one-window intake of First Nation requests for provincial drinking water services, including the provision of training and pilot testing for First Nation owners and operators. The WCWC aims to continue to provide its training and pilot testing at no cost to First Nations. This would include engaging with First Nations to understand and ensure services meet their needs.

The Ontario Clean Water Agency (OCWA) also offers a full range of technical training in water and wastewater treatment, water distribution, wastewater collection, preventive maintenance,

electrical awareness, health and safety and compliance subjects. First Nations operator training services are delivered as part of OCWA's operations and engineering services or through third-party training agreements. In addition to training, OCWA trainers and mentors also provide advice to Chiefs and councils on their water systems. OCWA will be collaborating with First Nation communities to create a First Nations Advisory Circle focusing on enhanced conservation and protection of land and water. The aim of the First Nations Advisory Circle is to facilitate the sharing of knowledge and unique experiences in order to incorporate First Nations perspectives into OCWA's strategies. Further information on how OCWA supports First Nation communities' access to safe, sustainable drinking water can be found on the OCWA website.

More work must be done so that First Nation communities in the province can dependably access clean drinking water. Ontario is working collaboratively, in partnership with its agencies, First Nations and the federal government through Indigenous Services Canada to support the resolution of long-term drinking water advisories and to support the long-term sustainability of each community's water infrastructure.

Actions to address blue-green algae blooms

Blue-green algal blooms continue to be an issue that people across the province are concerned about, especially during the warmer months. As of December 7, 2021, ninety (90) of the blooms reported to the ministry this year were confirmed to be blue-green algae.

You can read more about blue-green algae, including what it is, how to recognize it, and Ontario's action plan to address blue-green algal blooms here.

When a blue-green algal bloom occurs, the ministry has protocols in place to protect public health and the environment, including drinking water systems. Ministry staff are responsible for assessing reports of suspected blue-green algal blooms. When a bloom is suspected, the ministry's role is to gather, assess and provide scientific and technical information, as appropriate. The ministry has a protocol in place to help ensure that there is consistent communication, engagement and collaboration with various governmental bodies including local health units, municipal staff, conservation authorities and other ministries and federal agencies. Public health agencies are the primary lead for health-related matters, including providing any formal public health messaging that may be required, such as beach advisories related to blue-

green algal blooms. Incidents reported to the ministry and confirmed as blue-green algal blooms are tracked by the ministry.

Additionally, the ministry is incorporating requirements for a blue-green algal bloom monitoring, sampling, and reporting plan into the Municipal Drinking Water Licence of the systems that use surface water as their source. Requirements will be incorporated into all licences by March 2022 and will serve to provide assurance that drinking water quality is being monitored in respect of blue-green algae.

The following section walks through the steps typically taken by the ministry and others when a report of a potential blue-green algal bloom is received.

Report of a Suspected Blue-Green Algal Bloom on a Lake with a Drinking Water Intake

The ministry receives the majority of reports of potential blue-green algal blooms in late summer or early fall when specific environmental conditions, such as calm water conditions and warm temperatures that favour the growth of blue-green algae, are present.

In many cases, initial reports of suspected blue-green algae blooms are received from concerned citizens by the Ministry's Spills Action Centre. Following the ministry's receipt of the report, an Environmental Officer (EO) from the local district office will notify local authorities such as the municipality and health unit of the suspected bloom. The EO will usually visit the site of the reported potential blue-green algal blooms (often the same day that the potential bloom was reported). Samples are collected and sent to the ministry's laboratory to determine whether cyanotoxins (toxins produced by some blue-green algae that are harmful to humans and animals) were present during the time of collection. If the results of the laboratory analyses indicate the presence of blue-green algae at levels indicative of a bloom, the EO will immediately notify the local health unit, the municipal drinking water system operator (if necessary) and the concerned citizen who reported the suspected algal bloom of the results.

In response, the local health unit, as the primary lead for health-related matters, will take action as necessary. Examples of actions may include posting news releases on their website, on social media, and/or through local media, posting signage at beaches, and notifying residents and visitors of the confirmed bloom and advising them of precautions that should be taken.

There are 203 municipal drinking water systems in Ontario with intakes drawing water from Ontario's lakes and rivers. Municipal drinking water plants must carefully monitor and may need to adjust their operations to ensure that microcystin-LR (a type of cyanotoxin produced by some blue-green algae and that has an associated Ontario Drinking Water Quality Standard) is dealt with effectively. Microcystin-LR has never been detected above the Ontario Drinking Water Quality Standard of 1.5 µg/L in treated drinking water. In some cases, the local drinking water system, owned and operated by the municipality, obtains its water from the lake where the bloom was located. All municipal systems with a surface water source are required to have treatment processes that include chemically assisted filtration (or technology that the ministry has determined to be equivalent). These treatment processes, combined with effective monitoring and operational changes, provide systems with the capability to effectively remove microcystin from source water. Some examples of actions a municipality might take if a blue-green algal bloom is confirmed in the lake from which it draws its drinking water include: increasing the frequency of testing of both the raw and treated water for total microcystin, and conducting more frequent visual inspections around the area of the water treatment plant and reporting any abnormal findings to the ministry.

The ministry's rapid response to a reported suspected blue-green algal bloom typically includes a site visit, sampling, laboratory analysis, and communication with the health unit, municipal drinking water system operator, and concerned citizens who reported the suspected algal blooms. The actions taken by the ministry, combined with the swift actions taken by the health unit and municipality, and the monitoring regime of the municipal drinking water treatment plant, exemplify the multi-level, collaborative approach taken to address blue-green algal blooms and protect the health of Ontarians.

Actions to protect water sources

Clean Water Act and source protection plan update

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 from risks such as handling or storing fuel and chemicals, pesticides, or manure. Together they protect sources for almost 440 municipal drinking water systems.

To help ensure that the quality of Ontario's drinking water continues to be protected and that source water protection, planning and implementation is supported by current science, the ministry has updated the Director's Technical Rules under the *Clean Water Act, 2006*. Updates to improve how risks to drinking water sources are identified and assessed, and will be used by source protection authorities and municipalities to help develop and implement the collaborative, watershed-based assessment reports and source protection plans that protect local drinking water supplies.

In 2021, four source protection plans were updated or amended to address new or changing systems, and the ministry continues to make updates to the Source Protection Information Atlas to keep stakeholders and the public aware of changes to drinking water systems and their associated vulnerable areas. The ministry also provided two training sessions to help ensure municipalities have risk management officials and inspectors in place to carry out their duties under the *Clean Water Act, 2006*. Ontario continues to provide ongoing funding to the source protection authorities to carry out their legislated duties and support municipalities in meeting their obligations.

By the end of 2020, local source protection authorities reported that, cumulatively:

- Over 260 municipalities have updated or are updating their official plans to implement source protection policies.
- Over 1,300 property-specific risk management plans have been established.
- Over 6,700 septic systems are undergoing regular inspections.
- Nearly 1,800 road signs have been installed to help increase awareness of drinking water protection zones.

The source protection authorities also note achievements in communicating the importance of source water protection. For example:

- In May 2020, the District of Muskoka published a standard operating procedure for source water protection, in association with the Severn Sound Environmental Association. The procedure outlines how to alert various parties when a threat to source water is present.
- Halton Region successfully established a Risk Management Plan with Suncor Energy for the handling and storage of fuel at both the active terminal site and off-loading dock in Lake Ontario.

- In the Thames Sydenham and Region Source Protection Region, the municipality of Leamington is in discussions with greenhouse developers to help to ensure that source water protection measures are considered during the preliminary site plan review/approval process for new greenhouse facilities.
- Lower Trent Conservation, Quinte Conservation and Conservation Ontario collaborated on developing the “Trust the Tap” social media campaign, commemorating the 20th anniversary of the Walkerton outbreak and highlighting the safety of Ontario’s municipal drinking water systems. As a sign of the success of the social media campaign, the “Trust the Tap” campaign’s webpage was viewed 5,831 times in the first month of posting.

COVID-19 Wastewater surveillance

Ontario has invested $22.8 million (over 2 years) in a COVID-19 wastewater surveillance initiative to test wastewater samples taken from communities across the province. This initiative uses wastewater sampling to supplement the clinical and public health data and helps local public health units identify potential COVID-19 outbreaks, which can inform decisions on where and how to mobilize resources in response.

The ministry has formed a collaborative partnership of government, academic and research institutions, public health units and municipalities to create a provincewide surveillance network that covers more than 75 per cent of the Ontario population. Monitoring wastewater for COVID-19 gives us a close to real-time way to track the spread of the virus – even before people begin showing symptoms.

Water quantity management enhancements

After several years of engagement with the public, including engagement with Indigenous communities, the ministry recently completed an extensive water quantity review. The review was conducted to determine whether Ontario’s existing water quantity management framework is adequate to manage existing or anticipated regional water scarcity considering climate change and population growth. This work included a review of the policies, programs and science used to manage water takings across the province, including groundwater takings for water bottling. It also included an assessment of the state of water resources in select areas of

Ontario and the effect water takings, population growth and climate change may have on these resources.

The review confirmed that Ontario has a strong foundation of policies, programs, and science tools for managing water takings. The review found that groundwater and surface water resources are generally sustainable under current climate conditions and levels of water use. An independent third-party review validated the ministry's findings that water takings for bottling are managed sustainably in Ontario under the existing water taking framework and that bottled water takings are not impacting the sustainability of groundwater resources. All reports associated with the review are available for download from the supporting materials section of the Environmental Registry posting: "Updating Ontario's Water Quantity Management Framework."

The water quantity review identified opportunities to enhance the current water taking framework to be more resilient to current and future water quantity management challenges. To that end, the ministry moved forward with enhancements to the province's water taking program as part of its commitment to help ensure our water resources are protected and used sustainably, now and for future generations. The new rules came into effect when the bottled water moratorium ended on April 1, 2021. These changes included:

- Requiring water bottling companies to have the support of their host municipalities for new or increased water takings.
- Establishing priorities of water use that can guide the ministry's decisions on how water should be shared among water users when there are competing demands for water. The ministry has published guidance to support the implementation of the new priorities of water use policy.
- Putting in place a new, more flexible approach for assessing and managing water takings in areas of the province where water sustainability is a concern. The ministry has published guidance to support the implementation of the new area-based water quantity management policy.

- Enabling the ministry to make more water taking data available to the public to increase transparency of how Ontario manages water resources. Water taking data is expected to be made available starting in late 2021.

Provincial Climate Change Impact Assessment

In August 2020, Ontario began work on a multi-sector provincial level climate change impact assessment that will evaluate climate change impacts by six regions and key sectors including infrastructure, food and agriculture, people and communities, natural resources, ecosystems and the environment, and business and the economy.

The assessment will consider how climate change will impact the natural environment, which includes consideration of water quality and quantity at a provincial scale. It will identify and assess how individual hazards such as drought and extreme precipitation will change over the coming decades (now to 2080). As part of the assessment process, engagement with subject matter experts and Indigenous organizations began in summer 2021 and will continue until early 2022. The final results of the assessment are expected in summer/fall 2022.

Administrative penalties

An administrative penalty (AP) is a financial penalty the regulator issues to a regulated person who contravenes the law. APs are used across government as a quick and effective tool to return non-compliant entities to compliance with the law, deter against future non-compliance and help ensure consequences that are proportionate to the contravention.

Ontario's current APs for environmental contraventions, environmental penalties, are limited in scope to certain air, land, and water contraventions and to about 140 industrial facilities. Environmental penalties are issued under the Environmental Protection Act and the Ontario Water Resources Act.

The ministry is committed to holding polluters accountable by strengthening enforcement tools to ensure compliance with environmental laws. That's why we are moving forward with a proposal that would support the expanded use of APs under several of the ministry's statutes, including the Environmental Protection Act, Ontario Water Resources Act, Safe Drinking Water Act, 2002,

Nutrient Management Act, 2002 and the Pesticides Act. The proposed changes would create more efficient, effective, and fair environmental enforcement.

The ministry's ability to issue APs, when implemented via proposed regulations, would be strengthened, as the proposal would ensure that APs could be issued for a wider range of contraventions and to more regulated persons and facilities than they currently are. For example, under the new proposal, an AP may be issued for violations such as when a municipal drinking water system does not have a certified drinking water operator, or when a condition of a permit to take water is violated.

In May 2021 the ministry held virtual engagement sessions to discuss the proposed development of regulations to support the expanded use of APs. Feedback from the engagement sessions will be used when creating the regulatory approach for APs that would be posted on the Environmental Registry for consultation.

The expansion of APs (if approved) would provide another tool in the ministry's compliance/enforcement toolkit.

Ontario Community Environment Fund

In May 2021, the ministry re-launched the enhanced Ontario Community Environment Fund (OCEF). Close to $900,000 in funding, collected from APs (i.e. environmental penalties) has been made available in four of the ministry's five regions. OCEF uses funds collected from environmental penalties to help communities improve the environment in areas impacted by pollution. The ministry's expansion of APs, to cover a broader range of regulated facilities and environmental violations, will be reflected in the amount of funding available through the program in future years.

It is anticipated that some projects may relate to the protection and conservation of water resources. Past examples have included planting riparian buffer strips, installing cattle exclusion fencing to protect water sources, providing water-science education and training to Indigenous youth, and restoring streams, shorelines and wetlands.

Great Lakes Local Action Fund

The Ontario government launched a call for applications for the new Great Lakes Local Action Fund in 2020 and selected 44 community-based projects to each receive up to $50,000 in the first round of funding. This fund provided a total of $1.9 million to these local projects that protect and restore coastal, shoreline and nearshore areas of the Great Lakes. The projects are led by community-based organizations, municipalities, conservation authorities and Indigenous communities and organizations across the Great Lakes basin. Applications were evaluated for their environmental benefit to the Great Lakes and/or their connecting rivers, as well as social and economic co-benefits, and soundness of project design.

The first round of projects began in spring 2021 and are to be completed by February 2022. A complete list of these projects can be found at https://www.ontario.ca/page/great-lakes-local-action-fund. Ontario is planning to launch the next round of funding in the near future.

Online pollution reporting tool

In May 2021, the ministry launched a new user-friendly online tool so the public can conveniently report incidents of pollution in real-time from a smartphone. The tool allows users to report incidents, including water pollution or illegal dumping of chemicals or waste that can contaminate groundwater. Using the tool, users can capture a wide range of information directly from the scene, including photographs, audio files and videos, so staff can respond quickly and effectively to keep communities safe. The user also has the option of creating a secure login so they can receive real-time status updates on the incident after it has been reported. Anyone can use the new tool, on any mobile device, to report potential pollution incidents quickly and get status updates. The tool is available at ontario.ca/reportpollution.

Municipal sewage (bypass and overflow) portal

The ministry is also making it faster and easier for municipalities to submit their wastewater data electronically to the government, while improving transparency and accountability of municipal wastewater facilities to local residents.

The Bypass and Overflow Portal (BOP) is a new government-to-government digital tool being piloted with 13 municipalities, one operating authority and 54 wastewater treatment plants. It is a web-based application designed for the reporting of wastewater bypasses and overflows discharged from municipal wastewater systems into Ontario waterways. The BOP allows for the capturing and storage of municipal wastewater discharge information for at least two years after the bypass or overflow event.

Moving away from the current paper-based process allows the ministry to use the information more strategically for strong environmental protections, while supporting the government's Digital First Strategy to deliver more efficient services, improve user experience and provide more timely responses to the public. Faster and more consistent reporting of bypasses and overflows may lead to safer drinking water by helping to ensure that the appropriate actions are swiftly taken to help prevent discharges from adversely impacting water ways that may serve as drinking water sources.

Signing of the ninth Canada-Ontario Agreement

Canada and Ontario have signed a new Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA). The term of the Agreement is from June 1, 2021 until May 31, 2026. This is the ninth Agreement between the two governments and marks the 50th anniversary of the signing of the first COA in 1971. The Agreement sets out specific actions each government will take to protect and restore the Great Lakes, such as climate change adaptation, supporting the continued implementation of the Canada-Ontario Lake Erie Action Plan to address toxic and nuisance algae, improving wastewater and stormwater management, completing environmental clean-up actions in Areas of Concern (geographic areas in the Great Lakes identified as having been severely degraded by human activities) and reducing plastic pollution and excess road salt.

The ninth COA has commitments to assess and address threats to the Great Lakes as a source of drinking water, including identifying sensitive areas and mitigating risks, providing data to assess issues and threats to drinking water sources, and developing education and outreach opportunities on the protection of drinking water sources. These actions and initiatives will help to improve Great Lakes water quality and help to ensure the protection and provision of safe, high-quality drinking water in regions where water in-takes are present.

Improving nutrient management in the Great Lakes

There continues to be a need for a coordinated and strategic response to nutrient management issues in the Great Lakes to reduce harmful and nuisance algal blooms, particularly in Lake Erie. Although scientists agree that nutrients (particularly phosphorus) are a major factor in creating favourable conditions for algal blooms, the reasons for the occurrence of blooms are now more complex than in past decades. The introduction of invasive species, particularly zebra and quagga mussels, changes in agricultural production (e.g., increased farm size, intensified production and shifts in field crop production), increased urbanization (e.g., growing population), and climate change are all contributing factors, which require new solutions and approaches.

For Lake Erie, emphasis continues to be on working with Ontario's partners (e.g., federal agencies, Indigenous communities, municipalities, agricultural organizations, conservation authorities, and non-governmental organizations) to implement actions under the Canada-Ontario Lake Erie Action Plan to: better manage wastewater and stormwater; keep phosphorus on farmland and out of waterways through best management practices; restore natural heritage features such as wetlands; improve monitoring and science; and enhance communication and outreach.

In addition, actions are underway to assess and address issues related to nearshore water quality, aquatic ecosystem health, and harmful and nuisance algal blooms in other Great Lakes. For example, there is work currently underway to improve our understanding of nutrient dynamics and algal bloom issues in Lake Ontario.

Reducing plastic pollution in the Great Lakes

Ontario is committed to protecting the Great Lakes and reducing plastic pollution which has become an increasingly pressing environmental issue.

In 2020-21 the Ministry provided $375,000 to Pollution Probe to support the Great Lakes Plastic Cleanup (GLPC) program – the largest freshwater deployment of plastic capture technology in the world – which involved the establishment of a network of organizations (Boating Ontario, Council of the Great Lakes Region (CGLR), Pollution Probe, Ports Toronto, and the University of

Toronto Trash Team) working together to raise awareness of plastic pollution in marinas across the Great Lakes and several inland waterways.

Ontario's investment deployed plastics capture technologies – SeaBins and LittaTraps™ – at marinas across the Great Lakes basin. Ten SeaBins were installed across 10 marinas and five LittaTraps™ were installed across two marinas. Other funding sources to the GLPC program helped realize a total of 21 participating marinas in the first year of the program in 2020.

Removing plastic pollution from the Great Lakes and educating the public about the proper disposal of plastic waste will help ensure impacts on fish and wildlife are reduced, biodiversity is protected, and water resources and ecosystems are safeguarded for future generations.

Wetlands Conservation Partner Program

Beginning in fiscal year 2020-2021, Ontario is investing $30 million in funding over five years ($6 million/year) for wetland restoration and enhancement through the Wetlands Conservation Partner Program (WCPP). The conservation of wetlands is an important part of improving the resilience of natural spaces across Ontario. Wetlands purify the air and water, protect biodiversity and natural heritage, provide recreational opportunities and support Indigenous traditional practices. For phase 1 of the WCPP, funds were provided to Ducks Unlimited Canada to undertake about 60 wetland restoration and enhancement projects, representing approximately 900 hectares of wetlands primarily located in the Lake Erie and Lake Ontario watersheds and connecting waterways. For phase 2, the program is expected to expand to include agreements with other conservation organizations to increase the number of wetland restoration projects, and with an emphasis on enhancing ecological functions, improving water quality, mitigating stormwater impacts, increasing climate change resiliency, improving ecosystem protection and preserving/increasing habitat for endangered species.

Initiatives to protect priority inland lakes

Some large inland lakes, such as Lake Simcoe and Lake of the Woods, are also experiencing water quality issues. Guided by the principle of adaptive management, the *Lake Simcoe Protection Act* requires that the Lake Simcoe Protection Plan (Plan) be reviewed every 10 years, to determine whether amendments are needed. In 2020 and 2021, the ministry engaged with

stakeholders, including the general public and key sectors, as well as Indigenous communities to gather information on their experiences with the Plan. The information gathered during the review, along with lessons learned from Plan implementation to date and the new information and data we have gathered through research and monitoring, will inform the Minister's decision on whether the Plan should be amended.

For Lake of the Woods, in 2021 Ontario supported the federal government in engagement sessions to obtain public input on desired ecosystem outcomes, whether targets are needed and at what level, potential strategies to reduce phosphorus, and managing knowledge gaps and uncertainty. Further work is underway between Ontario and Canada to discuss next steps to support work on Lake of the Woods.

There are also initiatives to protect water quality in other areas. The Ontario government has invested more than $4.25 million to protect the Muskoka River watershed as part of the Muskoka Watershed Conservation and Management Initiative. The funding will support 16 projects that will help safeguard the region from environmental pressures, such as severe weather and flooding, while also improving the health of the watershed. This funding is part of the province's initial $5 million commitment to the Muskoka Watershed Conservation and Management Initiative, and approximately $750,000 in remaining funds will support other on the ground projects that are currently being considered.

Conclusion

Despite the many challenges presented by the COVID-19 pandemic, the ministry has achieved positive outcomes to protect human health and the environment, including by supporting the continuity of water services and access to clean, safe drinking water. We have taken action in response to emerging challenges and innovations, including by tracking the COVID-19 virus in wastewater and making new regulatory changes to give the ministry and drinking water systems the tools they need to act swiftly to protect drinking water and waterways during an emergency. From the Ontario Community Environment Fund and digital-first pollution reporting tools to improving the management of harmful nutrients in the Great Lakes, we are delivering on our commitments to protect water resources.

The data summarized in this report and in the Chief Drinking Water Inspector's Annual Report shows that Ontario continues to have clean and safe drinking water that is among the best protected in the world. Our collaborative approach to drinking water management, combined with our strong protection framework, will continue to help ensure our drinking water is held to Ontario's high safety standards. Our ongoing work to protect source water and hold polluters accountable will also help ensure that Ontarians can enjoy a safe, clean environment for generations to come.