Ministry of the Environment, Conservation and Parks

Tap Water Safety in Ontario

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Ontario

Presentation Outline

1. Water Sources
2. Water Treatment
3. Ontario's drinking water protection framework
4. Inspections
5. Private Wells
6. Bottled Water

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Where does tap water come from?

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Ontario's Water Resources

Drinking water that is supplied to our homes comes from one of two main sources:

- Surface water
- Groundwater

Water travels from the source through the drinking water system, which may be publicly or privately owned or an individual water system, such as a private well.

Water Source

Surface water

Surface water is water that comes from lakes, rivers, streams and ponds.

Ontario has more than 250,000 lakes, including the Great Lakes. Together, they contain about one fifth of the world's fresh surface water.

The Great Lakes provide drinking water to more than 70% of Ontarians

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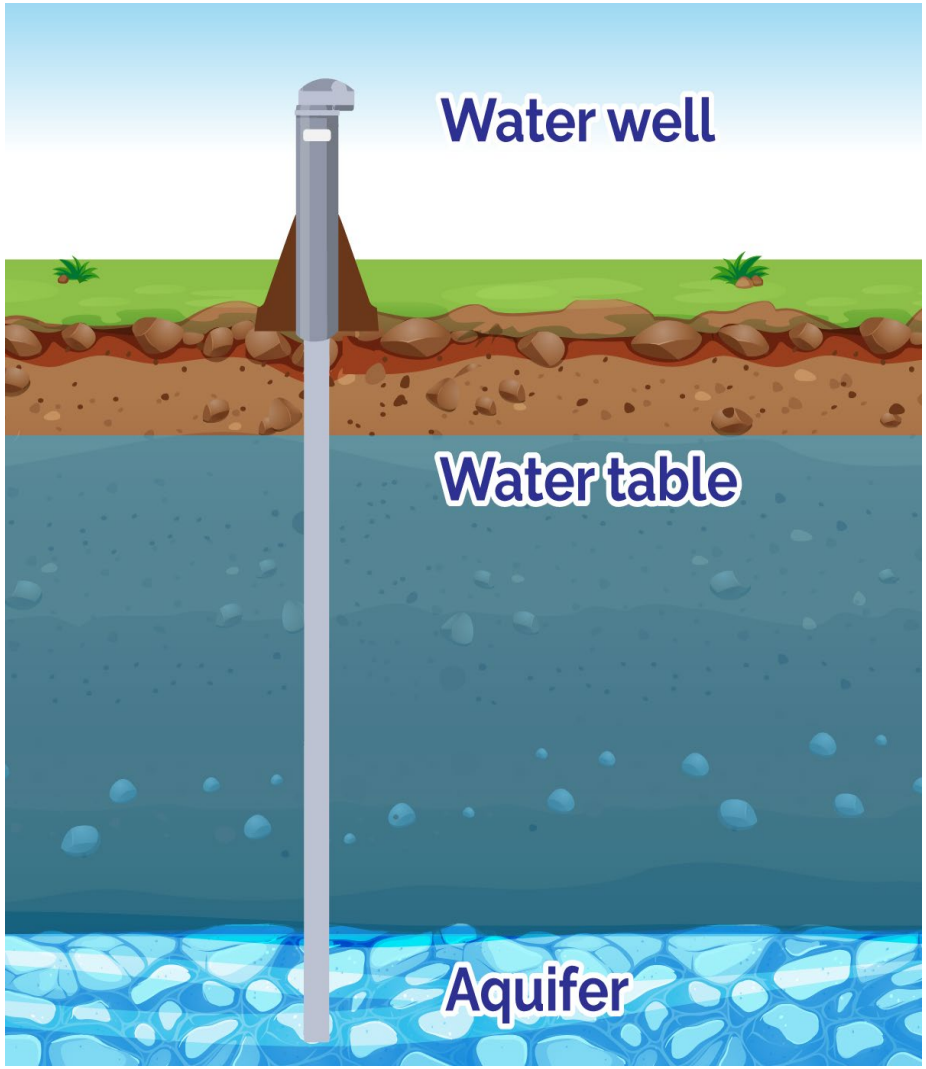
Water Source - Ground Water

Groundwater is found below the earth's surface. We tap into this water through wells.

Over 2.5 million people in Ontario get their drinking water from groundwater.

Groundwater also helps to keep our rivers flowing when rainfall is low and supports Great Lakes water levels and aquatic ecosystem health.

Up to 70% of the water flowing into rivers and streams and 40% of the water flowing into the Great Lakes basin start as groundwater.



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Drinking Water Treatment

Where drinking water is supplied to homes from either a municipal or privately owned drinking water system, the water must be treated once it is taken from the source and prior to being supplied to homes.

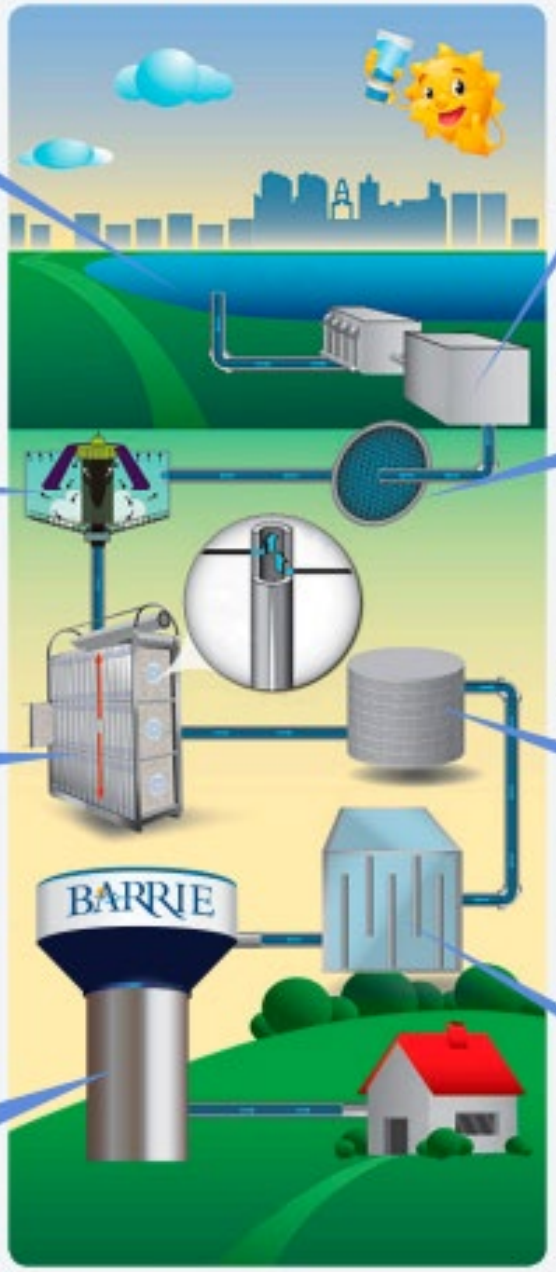
The type of treatment that is required depends on:

- Source (ground or surface water)
- Source water characteristics – testing of source water helps to identify what chemical and microbiological parameters may be commonly found in the water so that the treatment system can remove or treat the water appropriately.
    - Microbiological characteristics
        - Bacteria, viruses, protozoa
    - Chemical characteristics
        - Inorganic and organic chemicals such as nitrates, pesticides
    - Physical characteristics
        - Cloudy water due to suspended particles

How is water treated so it is safe for you to drink?

- Drinking water systems use treatment processes that will reduce or eliminate the potential for the presence of pathogens (organisms that can cause illness) in drinking water.
- Different water sources necessitate different levels of treatment.
- Primary disinfection inactivates/removes pathogens before water is delivered to the public. Depending on the raw water source's quality, this usually is accomplished by a combination of:
    - Filtration
    - Chlorine
    - Ultraviolet light
- Secondary disinfection introduces and maintains a disinfectant residual (generally a chlorine residual) to protect drinking water from microbiological recontamination or bacterial regrowth to protect drinking as it travels from the water treatment plant to your tap.

SURFACE WATER PROCESS



1 Intake

Raw water is gravity-fed from Kempenfelt Bay to the low lift pumping station and directed through a screen to remove larger particles. Seasonal pre-chlorination is done for zebra mussel control.

2 Pumping

Water is pumped from the low lift pumping station to the Surface Water Treatment Plant (SWTP) where it is directed through a number of treatment processes as described in the following steps.

3 Screening

The water goes through screens to remove particles greater than 0.5 mm in size.

4 Mixing

A solution is added to the water. With gentle mixing, FLOCs are formed (large particles formed by smaller particles bonding together).

5 Membrane Filters

The membrane filtration process removes FLOCs as small as 0.02 microns. There are 5 primary membrane trains that house the membrane filters. Clean water is drawn into the fibre and all other particles are left behind, allowing only clean water to be drawn through the fibres.

6 Carbon Filters

The membrane-filtered water is sent to the Granular Activated Carbon Contactors. Any unpleasant taste and odours are removed by the carbon.

7 Chlorine

Chlorine is injected into the filtered water to ensure water is free of all harmful agents. It then travels through large chambers where it is provided time to disinfect the water.

8 Storage

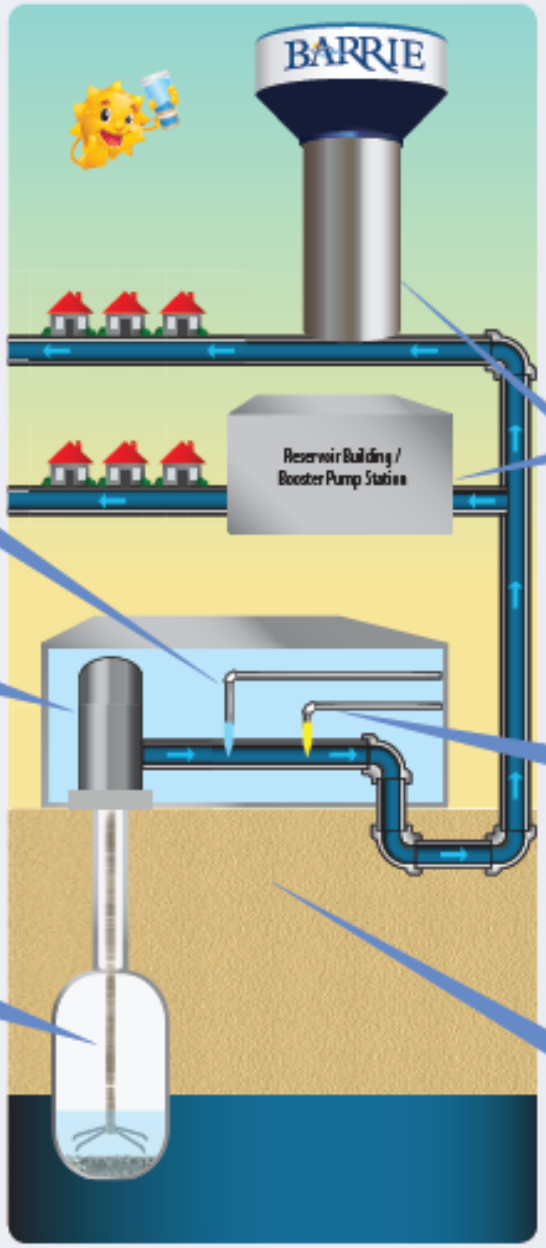
Water is stored in reservoirs and towers, ready for use in the community.

The City of BARRIE

FOR MORE INFORMATION: barrie.ca/WaterServices • 705-792-7920 • WaterOperations@barrie.ca

The City's Water Operations Branch is located at 20 Royal Parkside Drive, Barrie

GROUNDWATER PROCESS



4 Chlorine
Water is treated with a controlled and monitored dose of chlorine. Chlorine is used to disinfect, creating healthy, safe drinking water.

3 Pumping
Water is lifted to the surface by pumps from deep, small-diameter wells.

2 Drilling
Water is supplied by drilling deep into the ground to reach an Aquifer (body of underground water).

6 Storage
Water is pumped to the reservoirs and towers where it is stored, ready for use in the community.

One well in Barrie uses ultraviolet light for treatment, which sterilizes the water.

5 Iron Removal
Minerals from the ground remain in the water. Sodium Silicate is added to remove iron.

1 Site Selection
Well sites are chosen then tested for numerous qualities. Strict regulations are stated by the Province to provide optimal drinking water.

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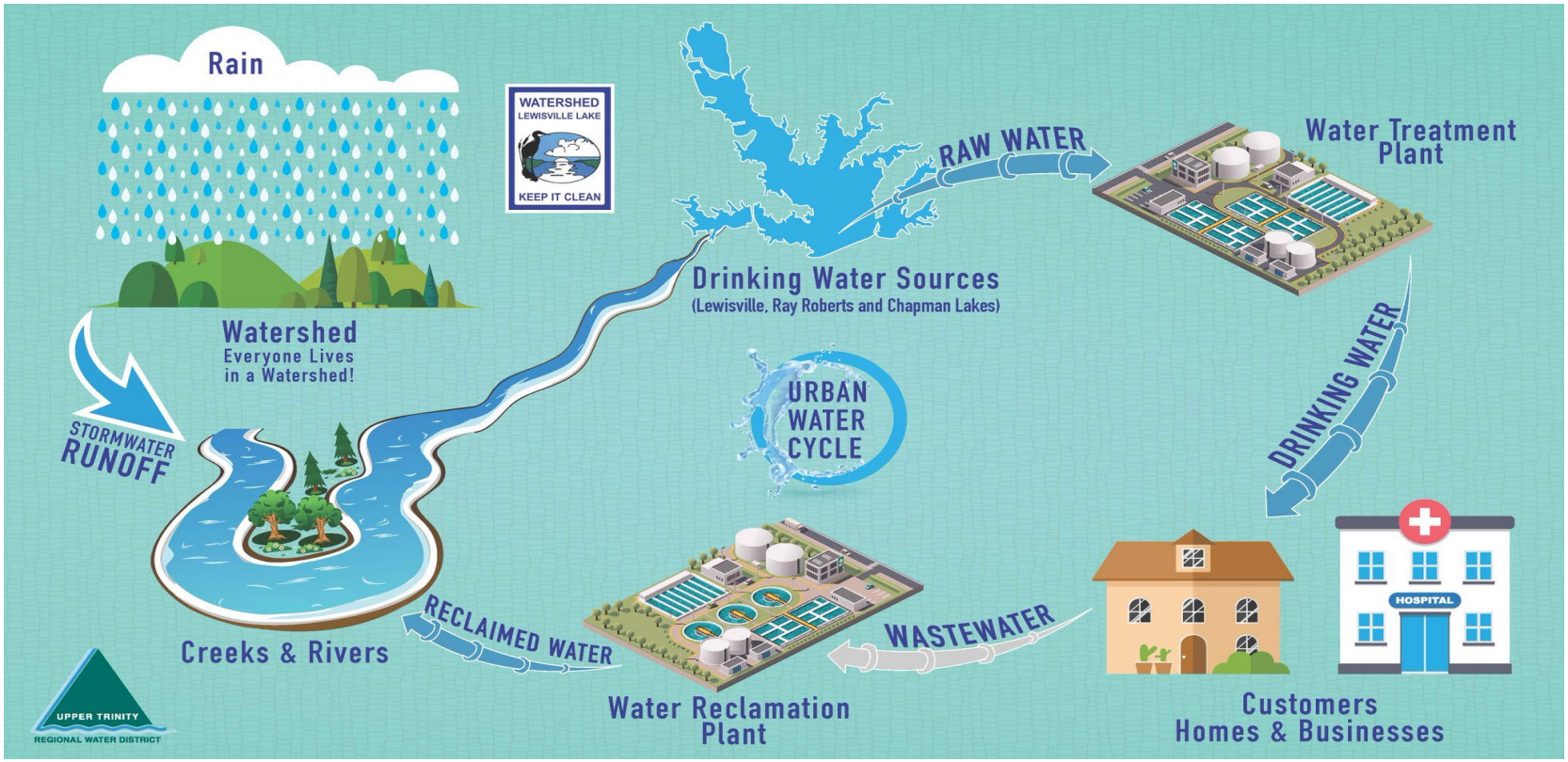
How do we know our tap water is safe to drink?

Checks and Balances

Drinking water protection starts at the source and continues until you turn on your tap.

Ontario has safeguards in place at every step of the process to address risks to the quality of your drinking water, and deal with potential problems before they become issues.



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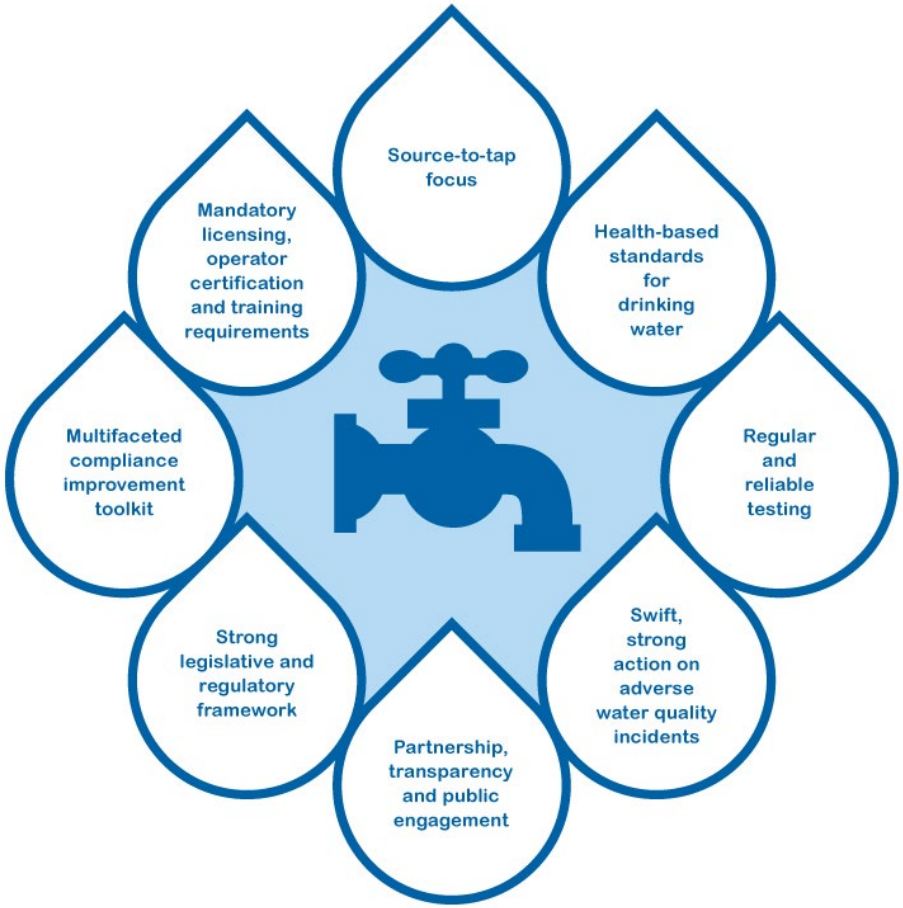
Shared Responsibility

Providing safe drinking water is a shared responsibility. Government, municipalities, drinking water system owners and operators, local health units, the Walkerton Clean Water Centre and water industry associations help to ensure that high quality tap water is delivered to your home.



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Drinking Water Protection Framework

Ontario's Drinking Water Protection Framework includes eight components that comprise Ontario's Drinking Water Protection Framework are:

- Source-to-tap focus
- Strong laws and regulations
- Health-based standards for drinking water
- Regular and reliable testing
- Swift, strong action on Adverse Water Quality Incidents
- Mandatory licensing, operator certification and training requirements
- A multi-faceted compliance improvement toolkit
- Partnership, transparency and public engagement

Source-To-Tap Focus

- Protecting our local drinking water sources is an important first step in helping to ensure that Ontario's communities can be confident in the quality and quantity of their drinking water.
- The *Clean Water Act* ensures communities protect their drinking water supplies through prevention – by developing collaborative, watershed-based source protection plans that are locally driven and based on science.
- There are 19 multi-stakeholder source protection committees across the province representing business, public, municipal and indigenous interests. These committees have developed 38 local source protection plans that identify actions to protect sources of municipal residential drinking water systems. Together, these plans protect almost 450 municipal drinking water systems, an area where over 95% of Ontario's population live.
- These plans are approved by the Minister of the Environment, Conservation and Parks and are currently being implemented.

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Strong Laws and Regulations

- Ontario's strong laws establish clear rules for drinking water safety and protection
- This framework allows everyone to understand the requirements and how they are applied.
- The *Safe Drinking Water Act*, the *Clean Water Act*, and the *Health Protection and Promotion Act* and their associated regulations protect drinking water sources, regulate drinking water systems and set out standards for drinking water quality.

Requirements for drinking water system owners/operators

- Ensure drinking water meets prescribed Ontario's Drinking Water Quality Standards and the requirements of the Safe Drinking Water Act
- All sampling, testing and monitoring requirements are complied with
- Drinking water tests are done by licensed, accredited laboratories
- Anyone who operates or works on their system is properly trained and licensed
- Owner, operating authority, & the laboratories all have obligations to report Adverse Water Quality Incidents (AWQIs)

Who does Ontario regulate?

Owners of:

- *Municipal residential drinking water systems* that are owned by municipalities and supply drinking water to homes and businesses
- *Non-municipal year-round residential drinking water systems* that are privately owned and supply drinking water all year-round to people's homes in places such as trailer parks, apartments and condominium and townhouse developments where there are six or more private residences
- *Public and privately-owned drinking water systems serving designated facilities* that have their own source of water and provide drinking water to facilities such as children's camps, schools, and senior care homes
- *Small drinking water systems* that provide drinking water to the public where no municipal drinking water system exists, such as restaurants, bed and breakfasts, campgrounds and other public settings, when those systems do not serve designated facilities
- *Licensed laboratories* that perform testing of drinking water

Operators of drinking water systems (certification and training)

What Else Does Ontario Regulate?

The Chief Drinking Water Inspector and the Minister of the Environment, Conservation and Parks have requirements under the Safe Drinking Water Act.

Some of the requirements include;

- Municipal residential drinking water systems must be inspected annually for compliance with legislative requirements.
- Drinking water testing laboratories must be licensed and inspected twice per year.
- The Ministry must produce annual reports on drinking water for the public (Chief Drinking Water Inspectors Report and Minister's Report).

Health-Based Standards for Drinking Water

Ontario has regulated health-based standards for 151 parameters and drinking water systems perform thousands of tests a year to make sure they are being met.
Standards are based on the best available science, and are regularly reviewed to provide the highest level of protection

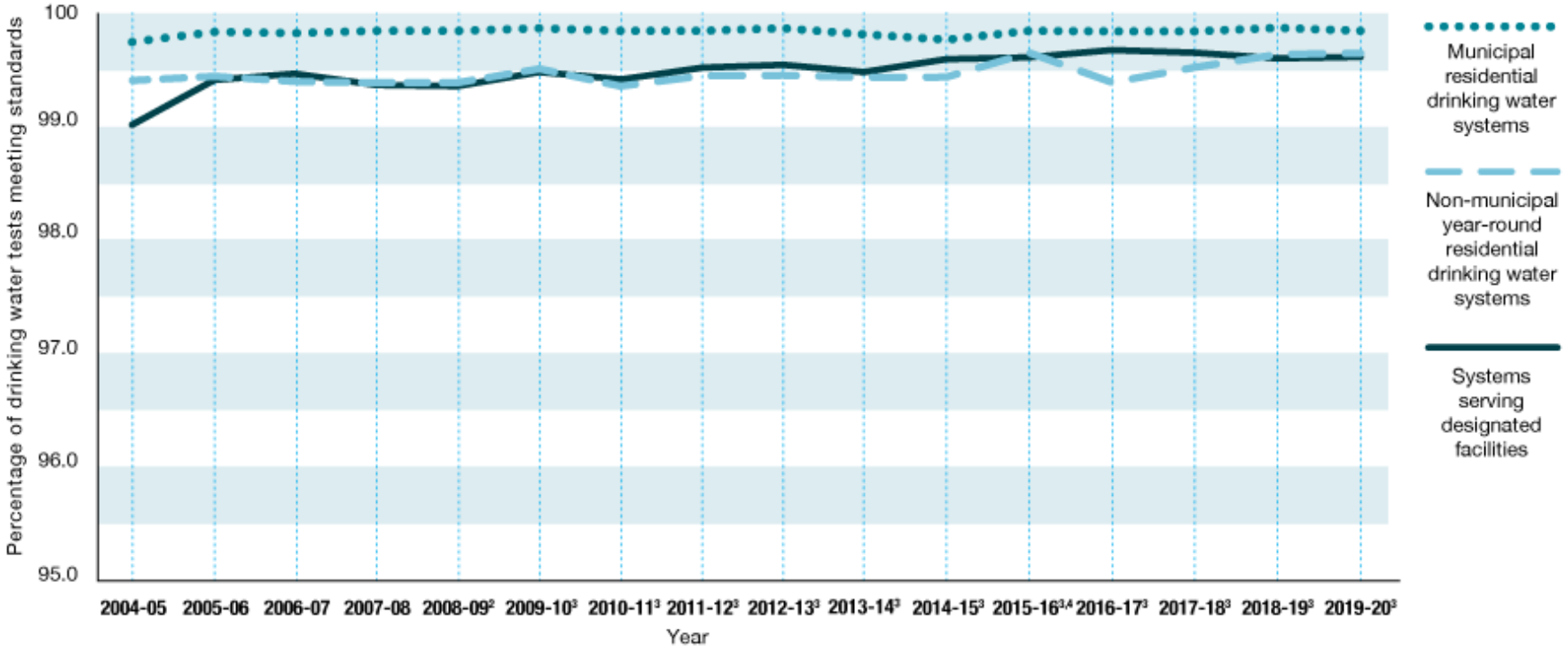
Regular and reliable testing

Ontario's drinking water is carefully monitored through regular testing by operators who take thousands of drinking water samples every year.

The samples are tested at provincially licensed laboratories and help ensure that drinking water quality meets Ontario's health-based standards.

>1,000,000 samples are taken from regulated drinking water systems across the province in 2019/2020

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



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Swift, Strong Action on Adverse Water Quality Incidents

- An adverse water quality incident occurs when a drinking water test result does not meet a health standard, or a drinking water system experiences an operational issue.
- Drinking water system owners, operators and licensed laboratories are required to report the incident to the Ministry of the Environment, Conservation and Parks and the local medical officer of health and are required to take corrective action to resolve the incident.
- The province's role is to assess adverse water quality incidents and ensure owners and operators take all required actions to address and resolve potential threats to the safety of Ontario's drinking water.
- If there is concern that the water may not be safe for public consumption, the local Medical Officer of Health may issue a boil or drinking water advisory.

Advisories

- Advisories are issued by the local public health unit when drinking water quality is threatened and they feel additional safeguards are required to protect the users.
  - The actions specified in the advisory are in addition to the corrective actions required by the Safe Drinking Water Act.
- An advisory will provide direction as to what a user can do with the water.
  - If the instruction is to boil it before consuming it's called a Boil Water Advisory or BWA.
  - if the instruction is to use alternative water supplies, this is generally referred to as a Drinking Water Advisory or DWA.
  - In either case, the advisory will contain specific instructions from the health unit about what to do for everyday activities such as brushing teeth, washing and preparing food and bathing in addition to drinking.
- An advisory issued by the local health unit is a legally binding order and must be followed.
  - Only a local health unit can issue a BWA or DWA and only they can decide when to lift it.
- Generally the health unit will provide instruction to the owner/operator of the drinking water system as to what must happen before an advisory is lifted.

Mandatory licensing, operator certification and training requirements

- Operators of Ontario's drinking water systems have continued certification and training to ensure effective management and operation of drinking water systems by knowledgeable, skilled and well-trained staff.

- Laboratories that test drinking water are accredited to ensure that testing is completed competently, and the licensing process confirms they use approved drinking water.

- The licensing of municipal residential drinking water systems requires system owners and operating authorities to conform with the requirements of Ontario's drinking water quality management standard, which requires them to develop and adopt preventative management strategies to address risks to public health, establish sound policies and promote continual improvement of their system.

Multi-faceted Compliance Improvement Toolkit

The ministry undertakes a range of activities to improve compliance including:

- providing information to improve drinking water system owners' and operators' understanding of their regulatory requirements and to enable them to make informed decisions and take effective actions
- conducting targeted inspections to assess compliance
- issuing a provincial officer's order or requesting an investigation where significant non-compliant behaviour is identified

All activities are undertaken based on the level of risk of each non-compliant behaviour.

Partnership, transparency and public engagement

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

Transparency and Public Reporting

Drinking Water Quality and Enforcement Open Data

Contains information about drinking water systems, laboratories and facilities including schools, private schools and child care centres, including:

- adverse water quality incidents
- test results
- inspections and enforcement activities

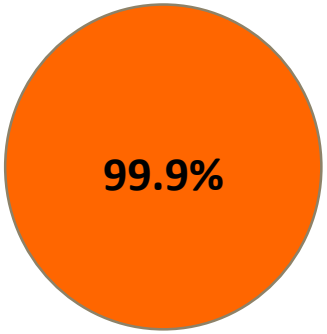
Chief Drinking Water Inspector's Report

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

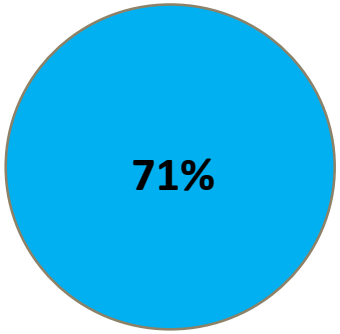
Minister's Annual Report on Drinking Water

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

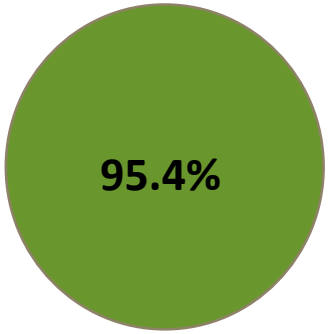
Performance Results from the 2019-2020 Report



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



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



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

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Inspections

- Water inspectors visit the treatment plant and the distribution system components (pumphouses, reservoirs etc.)

- The review of treatment plant records includes:
  - sample results,
  - equipment documentation,
  - logbooks,
  - maintenance records
  - reports regarding the source water or treatment facility, and
  - any other documents or items
  - the inspector deems relevant.

Inspection Video

Drinking Water Treatment

*Filmed pre-COVID

Private Wells

If a homeowner has a well on their property, they are responsible for it.

Specific rules must be followed for maintaining and, if necessary, abandoning a well to help protect the safety of the water and the groundwater resource.

If the homeowner is considering constructing a new well on the property, or needs to upgrade the existing well, there are rules that a **person constructing** the well must follow.

The Ministry of the Environment, Conservation and Parks operates a public Wells Help Desk to help ensure that information is available to the public. The Wells Helps Desk also receives and forwards well complaints to the appropriate ministry office, answers general questions on wells, assists well owners to locate their well record and assists the well industry sector in obtaining licences, well record forms and well tags.

Bottled Water

- In Canada, bottled water is regulated by the federal government as a food under the *Food and Drugs Act*. Under the Act and its regulations, all bottled water offered for sale in Canada must be safe for people to drink.
  - Specific limits are set for arsenic, lead and coliforms (microbiological organisms)
  - water may not contain 'poisonous or harmful substances'
  - Specific labelling requirements
- Ontario does not regulate bottled water but does require any water bottling facilities, however, water bottling facilities must apply for permits to take water from groundwater sources if the facility plans to take more than 50,000 litres of water on any day.