

Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils

A guide for municipal councillors to help them understand their responsibilities under the Safe Drinking Water Act, 2002 and provide them with information on how Ontario's drinking water is safeguarded.

Introduction

A message from the Chief Drinking Water Inspector of Ontario

Safeguarding drinking water, now and for our future generations, is a vitally important role.

It requires leadership, vigilance and ongoing collaboration between the province and Ontario municipalities.

More than 80% of Ontario's population receives their drinking water from a municipal drinking water system. Drinking water quality and inspection results show Ontario's municipalities are achieving strong and consistent performance levels. It is because of this dedication to excellence at the municipal level that Ontario's drinking water continues to be of the highest quality.

As good as current results are, constant attention is needed to keep our drinking water safe.

If you are a municipal councillor who has decision-making responsibilities for a municipal drinking water system or who oversees an accredited operating authority, you have a serious and unique role in protecting the people of your community.

This guide will help you understand your responsibilities under the *Safe Drinking Water Act, 2002* and provide you with information on how Ontario's drinking water is

protected.

I encourage you to use this resource to answer questions about the statutory standard of care with respect to drinking water systems and operations and as basic reference material on drinking water. I look forward to continuing our work with municipalities to further improve how water resources are protected and managed for the benefit of the people of Ontario.

Melissa Thomson
Chief Drinking Water Inspector of Ontario

A message from Ontario's Chief Medical Officer of Health

Safe drinking water is one of the key pillars of public health in Ontario. Ensuring that Ontarians, regardless of socioeconomic status or geographic location, have access to safe drinking water is essential to the health of our population. Protection of our drinking water is a vital responsibility shared by many partners.

The Ministry of Health and Long-Term Care shares a strong commitment to excellence with the Ministry of the Environment, Conservation and Parks by supporting Boards of Health and communities to provide safe drinking water in the province. Ontario's Boards of Health work together with municipalities in many ways to protect the public, including when your community's drinking water may not be safe for consumption.

As municipal councillors with oversight responsibilities for municipal drinking water systems, you are a critical partner in providing safe drinking water to the people of Ontario. I encourage you to use this resource guide, in your paramount role, to help protect Ontario's drinking water and keep your community healthy.

Dr. David Williams
.....
Chief Medical Officer of Health of Ontario

"Since Dr. John Snow's 1854 discovery in London, England, that drinking water could kill people by transmitting disease, the developed world has come a long way towards eliminating the transmission of water-borne

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

Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

What you need to know about your drinking water responsibilities

The people of Ontario are entitled to expect safe, high quality drinking water. It is a matter vital to public health. As a member of a municipal council, you have an important role to play to ensure your community has access to safe, high quality drinking water — and you may be legally obliged to do so.

Section 19 of the *Safe Drinking Water Act, 2002*

(<https://www.ontario.ca/laws/statute/02s32#BK22>) sets out the legal responsibilities and duties of persons who oversee municipal drinking water systems. These responsibilities and duties are commonly described as either a duty of care or standard of care. They apply to any person who exercises decision-making authority over a municipal drinking water system or who oversees the accredited operating authority of such a system. This guide is intended for municipal councillors to whom the duty or standard of care applies. To determine whether it applies to you in particular circumstances, you should consult with your legal advisor. When this guide uses the words "you" or "your," it is referring to municipal councillors to whom the duty applies.

Three things to remember as a municipal councillor:

One: It's Your Duty. The *Safe Drinking Water Act, 2002*

(<https://www.ontario.ca/laws/statute/02s32#BK22>) includes a statutory standard of care for individuals who have decision-making authority over municipal drinking water systems or who oversee the operating authority of the system. This can extend to municipal councillors. There are legal consequences for not acting as required by the standard of care, including possible fines or imprisonment.

Two: Be Informed. Ask questions and get answers. You don't have to be an expert in drinking water operations, but you do need to be informed about them. Your decisions can have an impact on public health. Seek advice from those with expertise and act prudently on that advice.

Three: Be Vigilant. Complacency can pose one of the greatest risks to drinking water systems. It is critical you never take drinking water safety for granted or assume all is well with drinking water systems under your care and direction. The health of your community depends on your diligent and prudent oversight of its drinking water.

“Water is unique as a local service. It is, of course, essential to human life and to the functioning of communities, (and) the consequences of a failure in the water system (are) most seriously felt by those who depend on it locally. Municipal ownership, and the ensuing responsibilities, should provide a high degree of public accountability in relation to the local water system.”

Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

Understanding your responsibilities for overseeing drinking water

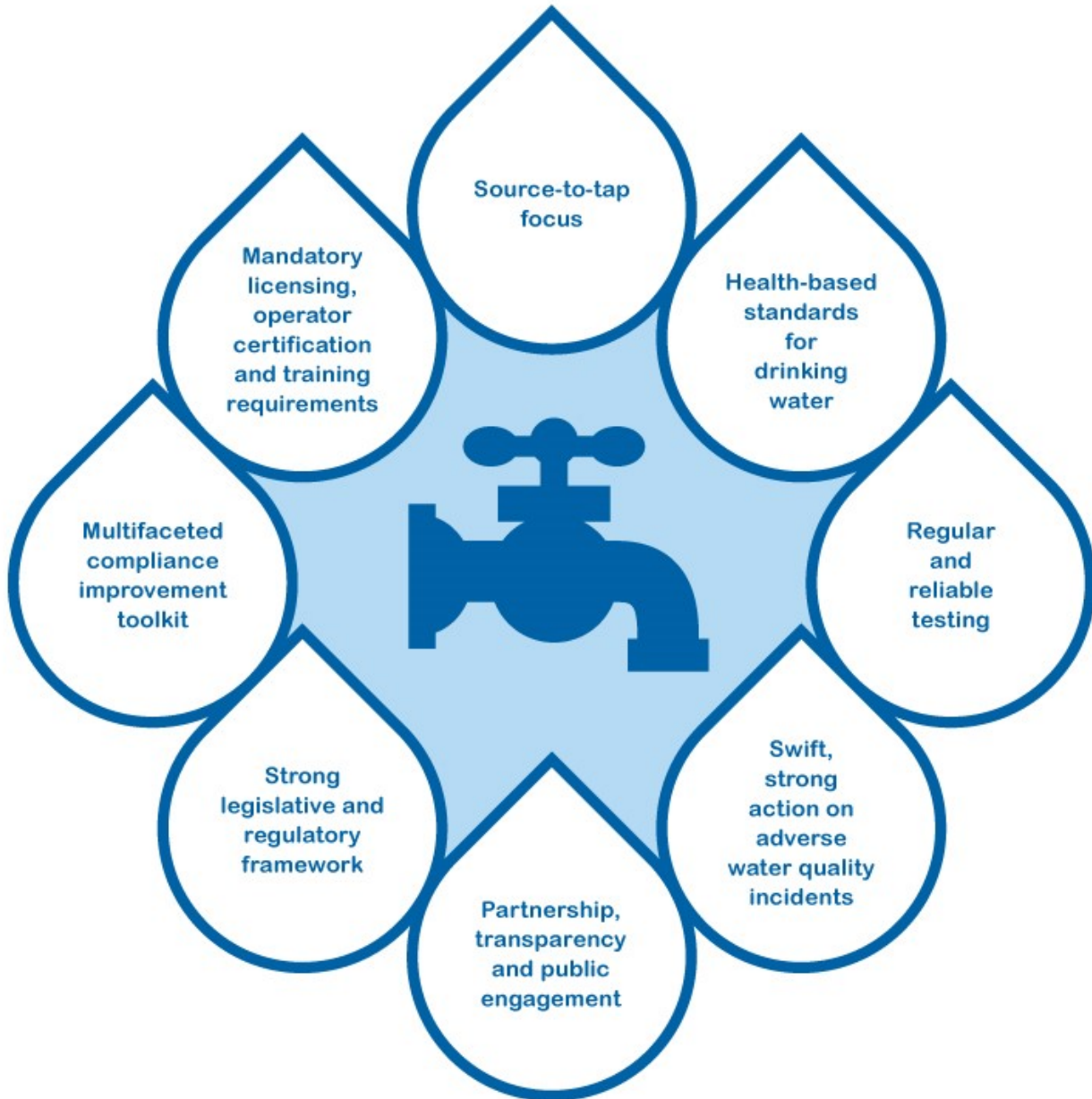
Protecting Ontario's drinking water

Ontario has a comprehensive multi-barrier framework to safeguard its drinking water from source to tap. It is a multi-faceted approach that:

- Helps prevent contamination
- Detects and solves water quality problems
- Enforces laws and regulations and

- Increases people's awareness of the importance of safe, high quality drinking water.

Ontario's drinking water protection framework



Ontario's multi-faceted approach

Ontario has an integrated system of procedures, processes and tools that collectively prevent or reduce the risk of contamination in drinking water, to protect public health.

The multiple barriers include:

- Source water protection to keep the raw water clean and sustainable, reducing the potential for contamination and depletion
- Treatment to remove and/or neutralize hazards
- Maintenance of the integrity of the distribution system to prevent recontamination after treatment
- Monitoring programs to detect and act on system problems that could impair drinking water safety and to verify the performance of system components and finished drinking water quality
- Effective management systems including automatic control systems, well-developed responses and operating practices that are the ultimate means for protecting the safety of drinking water systems
- Education and outreach to foster partnerships and raise awareness of drinking water issues.

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

A legislative and regulatory framework for protecting water

The *Safe Drinking Water Act, 2002* – an overview

The *Safe Drinking Water Act, 2002* (<https://www.ontario.ca/laws/statute/02s32>) provides a legislative framework for all municipal drinking water systems, as well as some non-municipal systems. The *Safe Drinking Water Act, 2002* provides a consistent set of provincewide standards and rules to help ensure access to safe, high quality, reliable drinking water.

The act recognizes the people of Ontario are entitled to expect their drinking water is safe. It provides for the protection of human health and prevents drinking water health hazards through the control and regulation of drinking water systems and drinking water testing. In a municipal context, a drinking water system includes all collection, treatment and storage facilities and distribution pipes usually up to customer property lines.

The *Safe Drinking Water Act* and its regulations specify requirements for:

- Drinking water systems

- System operations
- Water quality monitoring and reporting
- Testing services
- Certification of system operators and drinking water quality analysts and
- Quality standards and mechanisms for compliance and enforcement.

The *Clean Water Act, 2006* - an overview

The *Clean Water Act, 2006* (<https://www.ontario.ca/laws/statute/06c22>) provides a framework for protecting the raw water source for drinking water systems within source protection areas.

The act helps protect existing and future sources of drinking water through the implementation of locally developed source protection plans. These plans apply to all municipal residential drinking water systems in Ontario's 38 source protection areas. Many municipalities are responsible for implementing mandatory policies in these plans. Failure to implement these policies could put your drinking water systems at risk.

Asset Management Planning for Municipal Infrastructure, Ontario Regulation 588/17

The information found in this guide should be considered in tandem with the *Asset Management Planning for Municipal Infrastructure, Ontario Regulation 588/17* (<https://www.ontario.ca/laws/regulation/r17588>), under the *Infrastructure for Jobs and Prosperity Act, 2015*. Further information can be found throughout this guide and at the municipal asset management planning (<https://www.ontario.ca/page/municipal-asset-management-planning>) page.

The big picture

There are approximately 660 municipal residential drinking water systems registered with the Ministry of the Environment, Conservation and Parks that supply drinking water to more than 80% of the homes in Ontario. In recent testing, more than 518,000 drinking water test results were submitted to the Ministry of the Environment, Conservation and Parks by laboratories licensed to perform these tests for municipal

drinking water systems. Over 99% of these drinking water tests met the province's health-based drinking water quality standards.

(Source: Ontario Ministry of the Environment, Conservation and Parks, 2018, 2017-18 Chief Drinking Water Inspector Annual Report)

Key sections of the *Safe Drinking Water Act, 2002* for municipal councillors

Section 11: Duties of owners and operating authorities

Section 11 of the *Safe Drinking Water Act, 2002*

(<https://www.ontario.ca/laws/statute/02s32#BK13>) describes the legal responsibilities of owners and operating authorities of regulated drinking water systems. It is important for you to understand the scope of your municipality or operating authority's day-to-day responsibilities.

Owners and operating authorities are responsible for ensuring their drinking water systems:

- Provide water that meets all prescribed drinking water quality standards
- Operate in accordance with the act and its regulations, and are kept in a fit state of repair
- Are appropriately staffed and supervised by qualified persons
- Comply with all sampling, testing and monitoring requirements
- Meet all reporting requirements.

The "owner" of a municipal drinking water system under the *Safe Drinking Water Act, 2002* and the "operating authority"

- The "owner" of a municipal drinking water system is often the municipality as a corporate entity. Members of municipal councils and municipal officials who provide oversight to this corporate entity also provide oversight or exercise decision-making authority in respect of the drinking water systems the corporate entity owns. They are responsible for having policies, management tools and processes in place so that the municipality meets all its legislative and regulatory requirements under the *Safe Drinking Water Act, 2002*.

- The “operating authority” of a municipal drinking water system is the person or entity that is given responsibility by the owner for the day-to-day operations of the drinking water system, its management, maintenance or alteration. A municipality may take on this operational role through its own staff or it may choose to contract it out to a third party (e.g. by hiring an accredited operating authority). **The statutory standard of care continues to apply to municipalities that contract out this role to a third party.**

Examples of actions required of owners and operating authorities under Section 11:

- Sampling and testing of drinking water with a frequency appropriate to the type, size and users of the system in accordance with the act and corresponding regulations
- Using an accredited and licensed laboratory for drinking water testing services
- Reporting of adverse test results that exceed any of the standards in the *Ontario Drinking Water Quality Standards regulation*, both verbally and in writing, to the local medical officer of health and Ministry of the Environment, Conservation and Parks
- Obtaining a drinking water licence for a municipal residential drinking water system from the Ministry of the Environment, Conservation and Parks
- Ensuring the drinking water system is operated by an accredited operating authority at all times
- Ensuring you are not using water from a well or intake that’s not included in a source protection plan if your licence requires an approved source protection plan be in place before water is provided to the public
- Hiring certified operators or trained persons appropriate to the class of the system
- Preparing an annual report to inform the public on the state of the municipality’s drinking water and the system providing it, and an annual summary report for the owners of the drinking water system

Section 19: Your duty and liability – statutory standard of care

“Given that the safety of drinking water is essential for public health, those who discharge the oversight responsibilities of the municipality should be held to a statutory standard of care.”

Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

This is one of the many important recommendations that came out of the Walkerton Inquiry reports

(http://www.archives.gov.on.ca/en/e_records/walkerton/report2/index.html) in 2002.

Section 19 of the *Safe Drinking Water Act, 2002* responds directly to this recommendation.

Section 19 of the act expressly extends legal responsibility to people with decision-making authority over municipal drinking water systems and those who oversee the accredited operating authority for the system. It requires that they exercise the level of care, diligence and skill with regard to a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation and that they exercise this due diligence honestly, competently and with integrity.

Meeting your statutory standard of care responsibilities

Meeting the statutory standard of care is the responsibility of:

- The owner of the municipal drinking water system
- If the system is owned by a municipality, every person who oversees the accredited operating authority or exercises decision-making authority over the system – potentially including but not limited to members of municipal councils and other senior municipal officials.
- If the municipal drinking water system is owned by a corporation other than a municipality, every officer and director of the corporation.

Members of municipal council and municipal officials with decision-making authority over the drinking water system and oversight responsibilities over the accredited operating authority need to understand that they are potentially personally liable,

even if the drinking water system is operated by a corporate entity other than the municipality.

Section 14 (3) of the Safe Drinking Water Act, 2002

(<https://www.ontario.ca/laws/statute/02s32#BK16>) specifically notes that an owner is not relieved of their duty to comply with Section 19, even if there is an agreement to delegate the operations of the drinking water system to someone else.

The owner is still obligated to ensure the operating authority is carrying out its responsibilities according to the act and in cases where it is not, to take reasonable steps to ensure it does.

Examples of actions required of owners under Section 14 (3):

- Be aware of the established procedure for communication with the operating authority, including how information is expected to be shared with municipal councillors, and assessing the effectiveness of this procedure
- Hold regular meetings with the operating authority, especially in cases where there may be reason to believe the operating authority is not carrying out its responsibilities.

Since Ontario municipalities manage and govern municipal drinking water systems in a variety of ways, the people who are subject to the statutory standard of care within their corporation will also vary across the province, and would depend on specific facts related to individual situations.

Below is the full text of Section 19, *Safe Drinking Water Act, 2002*

(<https://www.ontario.ca/laws/statute/02s32#BK22A>)

19. (1) Each of the persons listed in subsection (2) shall,

(a) exercise the level of care, diligence and skill in respect of a municipal drinking-water system that a reasonably prudent person would be expected to exercise in a similar situation; and

(b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. 2002, c. 32, s. 19 (1).

Same

(2) The following are the persons listed for the purposes of subsection (1):

1. The owner of the municipal drinking water system.
2. If the municipal drinking-water system is owned by a corporation other than a municipality, every officer and director of the corporation.
3. If the system is owned by a municipality, every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system. 2002, c. 32, s. 19 (2).

Offence

(3) Every person under a duty described in subsection (1) who fails to carry out that duty is guilty of an offence. 2002, c. 32, s. 19 (3).

Same

(4) A person may be convicted of an offence under this section in respect of a municipal drinking-water system whether or not the owner of the system is prosecuted or convicted. 2002, c. 32, s. 19 (4)

Reliance on experts

(5) A person shall not be considered to have failed to carry out a duty described in subsection (1) in any circumstance in which the person relies in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report. 2002, c. 32, s. 19 (5).

Maintaining an appropriate level of care

Standard of care is a well-known concept within Ontario legislation.

For example, the *Business Corporations Act* requires that every director and officer of a corporation act honestly and in good faith with a view to the best interests of the corporation and exercise the care, diligence and skill that a reasonably prudent person would in comparable circumstances.

Statutory standards of care address the need to provide diligent oversight. What is considered to be an appropriate level of care will vary from one situation to another. As a municipal councillor, it is important to educate yourself about the requirements

of Section 19 of the *Safe Drinking Water Act, 2002*

(<https://www.ontario.ca/laws/statute/02s32#BK22>) and to gain an understanding of the operation of drinking water systems in your community for the purposes of meeting the standard of care requirements.

Every person to whom the *Safe Drinking Water Act, 2002* standard of care applies is expected to exercise the same level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation. They must also act honestly, competently, and with integrity, with a view to ensuring the protection and safety of users of the municipal drinking water system.

You are not expected to be an expert in the areas of drinking water treatment and distribution. Section 19 of the *Safe Drinking Water Act, 2002* allows for a person to rely in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report.

Enforcing the statutory standard of care

If you are a municipal councillor or official who oversees or makes decisions about drinking water systems, it is important to be aware that not meeting your statutory standard of care responsibilities under Section 19 of the *Safe Drinking Water Act, 2002* comes with serious potential consequences. The duty applies generally to any person who exercises decision-making authority over a municipal drinking water system or who oversees the accredited operating authority of such a system.

Provincial officers may lay a provincial offence charge against a person to whom the standard applies. If a prosecution is commenced and a court determines a person has failed to carry out the duty imposed by Section 19, the person could be penalized. The potential penalties include maximum fines of up to \$4 million for a first conviction and imprisonment for up to five years less a day. Actual penalties would be decided by the courts depending on the severity and consequences of the offence.

Some questions and answers on the *Safe Drinking Water Act, 2002* statutory standard of care

If drinking water operations are contracted out, am I still responsible for the statutory standard of care?

This question must be answered on a case-by-case basis. If you oversee the accredited operating authority or exercise decision-making authority with respect to the drinking water system, you remain responsible for meeting the standard of care even though your municipality has contracted out operations to an operating authority. Depending on the specifics of how your municipal drinking water system is owned and managed, others may be held to the standard of care.

If something goes wrong, will I be held responsible?

The standard of care related to drinking water is intended to ensure that relevant decision makers are doing their due diligence to protect public health when making decisions about drinking water systems and providing oversight of the accredited operating authority. If something goes wrong, the specific circumstances and your actions - what you did or did not do, what questions you asked, what steps were taken to address identified risks or problems with your drinking water system - will all be important in determining whether you met your standard of care and whether you should be held responsible.

What can happen to someone who breaches the standard of care?

Safe drinking water is essential for public health. The standard of care is aimed at ensuring that people with oversight and decision-making roles regarding municipal drinking water systems take responsible action to protect drinking water and human health.

If the standard of care applies to you, and your actions fall below it, you could face significant penalties including fines and imprisonment.

Who determines if the standard of care has been breached?

When an incident occurs that may constitute a breach of the standard of care, the Ministry of the Environment, Conservation and Parks will initiate a response that may include an investigation and gathering of evidence to determine if charges should be laid. In a case where charges are laid, it is up to the courts to determine if an offence has been committed and if penalties or fines will be imposed. This procedure is followed for any potentially serious breach of Ministry of the Environment, Conservation and Parks' statutes.

Actions you can take

The following are some actions you can take to be better informed about your drinking water oversight responsibilities. Look for more of these suggested “actions you can take” sections throughout this guide.

- Consider taking the standard of care training offered by the Walkerton Clean Water Centre. Get course details and session offerings at the Walkerton Clean Water Centre website (<http://www.wcwc.ca/>) or by phoning toll free 1-866-515-0550.
- Discuss the safety of your community’s drinking water with local resources (e.g., your public health unit, conservation authorities, source protection committees).
- Get involved in associations (e.g., Ontario Municipal Water Association and Ontario Water Works Association) to build your knowledge and further demonstrate your commitment to water.
- Review the reports of the Walkerton Inquiry, specifically sections related to municipal government (Chapter 7 in Part One (http://www.archives.gov.on.ca/en/e_records/walkerton/report1/pdf/WI_Chapter_07.pdf) , Chapter 10 (http://www.archives.gov.on.ca/en/e_records/walkerton/report2/pdf/Chapter_10.pdf) and Chapter 11 (http://www.archives.gov.on.ca/en/e_records/walkerton/report2/pdf/Chapter_11.pdf) in Part Two).
- Find out if your municipality has legal requirements under the local source protection plan and if so, how they are being met.
- Become further acquainted with provincial drinking water legislation and regulations, available on the Ontario e-Laws website (<https://www.ontario.ca/laws>) .

What you should ask

When decisions relating to drinking water come before your council, you want to understand impacts on your community and public health. While every situation will be different, the following are some preliminary questions you might want to ask:

- Are there any areas of risk, e.g., public health, that council needs to address?
- What checks and balances are in place to ensure the continued safety of our drinking water?
- Are we meeting our legislative and regulatory requirements?

- What is the public health impact or long-term cost of deferring this decision?
- Will this decision affect our drinking water sources or create new risks to drinking water sources?
- How will this decision impact our community's demand for water?
- How are we managing our drinking water system? Do we have an asset management plan for our water infrastructure?
- Are we planning to expand or create new drinking water systems? If so, are we conducting source protection planning for these systems?
- Are there any emerging issues related to our drinking water that council should be aware of?
- Are we prepared for severe weather events which can impact the quality of our drinking water?
- If there is a drinking water emergency, what is our emergency management plan? What is the role of council in a drinking water emergency?
- Have staff taken required training and upgrading?

Check your knowledge

Ask yourself these questions to check your current level of knowledge about your drinking water system and oversight responsibilities:

- Have I had a tour of our drinking water facility?
- Am I familiar with our municipal drinking water systems including the:
 - a. water source?
 - b. physical condition of major infrastructure?
 - c. background and experience of senior staff? and
 - d. permits, licences and approvals granted for ownership and operation of the facilities?
- Am I acquainted with the drinking water legislation and regulations?
- Do I know basic information about drinking water safety and the operation of water works facilities?

- Do I know how to set the overall policy direction for the municipal drinking water system?
- Do I understand the different roles and responsibilities of those who have decision-making authority – municipal councillors, senior management, other municipal officials?
- Am I aware of the risks currently facing our water sources, drinking water facilities and infrastructure? What are the plans to address these risks?
- If there is an emergency with the drinking water system, what procedures are followed? How will I be notified? How will the public be notified?
- How do we manage potential impacts to water quality following storms?
- Am I aware of my municipality's responsibilities in implementing our source protection plan?
- How and when do I ask for annual reports on the drinking water system from senior management?
- What should I look for in the annual report? What questions must it answer?
- Do I know that appropriate steps are being taken to resolve any issues? Do I know when outside expertise is needed?
- Are our drinking water systems periodically audited? How often? What should I do when I receive audit results for consideration?
- Do I know if our drinking water systems are financially sustainable for the future? Are there financial plans in place?
- Are the products and equipment used in our water treatment plants energy efficient?
- Am I familiar with the process and requirements for keeping our municipal drinking water licence valid?

If there are any questions you can't answer, review them with municipal staff who are familiar with drinking water requirements.

Overview of drinking water management topics

Organizational and governance models

Many different management and operating models are available for municipal consideration. Currently, most water services in Ontario are provided through municipal departments, with oversight provided directly by municipal councils.

Some municipalities hire external contractors to operate their drinking water system, whereas others own and operate their systems.

Regional municipalities have upper-tier and lower-tier governance structures, with the lower-tier municipalities often owning and operating their own drinking water systems. There are also models for area water systems in Ontario in which systems cross municipal boundaries. These systems are governed by boards representing their municipal owners.

Municipalities may also create:

- Municipal Service Boards whose members are appointed by council and could include council members, private citizens or both
- Corporations for water utilities, similar to those for natural gas or electricity distribution

“The purpose of the quality management approach in the context of drinking water is to protect public health by achieving consistent good practice in managing and operating a water system.”

“It is fundamental for municipalities to have a management and operating structure for their water system that enables them to provide safe water. I am making two important recommendations to assist in this regard. First, I recommend that municipalities be required to have an agency...to operate their systems. The agency should be accredited...The municipality must also submit an operational plan to the Ministry of the Environment for their

water system(s). Second, I recommend that those responsible for exercising the municipality's oversight responsibilities be held to a statutory standard duty of care. I note that, for municipalities, the first recommendation will be a significant step in satisfying the second."

Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

My municipality is considering either a Municipal Service Board or a Municipal Services Corporation model to govern our drinking water functions. Would Section 19 of the *Safe Drinking Water Act, 2002*, still apply to these alternative ownership models?

Yes. The standard of care provision in the act would continue to apply in either the Municipal Service Board or the Municipal Services Corporation model since the standard applies to municipal drinking water systems owned by either a municipality or other corporation.

Municipal licensing: helping you protect your drinking water

In Ontario, all municipal drinking water systems that provide water to residences in a community must have a licence from the Ministry of the Environment, Conservation and Parks. The ministry's Municipal Drinking Water Licensing Program requires owners and operating authorities of drinking water systems to incorporate the concepts of quality management into system operation and management.

Licences are valid for a five year period and must be renewed.

For a drinking water system to receive or renew its licence, the owner and operating authority must have in place:

- Drinking water works permit
- Accepted operational plan (see next section for more details)
- Accredited operating authority

- Financial plan
- Permit to take water.

If your system is located in a source protection area, you should be aware of the requirements of your local plan and its implications for your drinking water system. For example, ensure the applicable source protection plan is updated and approved where:

- A new well or intake is established for a municipal residential drinking water system within a source protection area (e.g., a well or intake is being established and is not part of an existing system), or
- Certain changes are made to an existing municipal residential drinking water system (e.g., a new well or intake is being added to an existing system or your municipality is planning to take more water from an existing well or intake).

Any licence issued for these wells or intakes will prohibit your system from supplying users with water from certain new or altered systems before they are protected by an approved source protection plan.

The operational plan and you – setting an overall policy

The operational plan sets out a framework to develop a Quality Management System that is specific and relevant to your drinking water system.

Part of your drinking water system's operational plan will document a Quality Management System policy. This policy is the backbone of the Quality Management System. The policy must include commitments to:

- Maintain and continually improve the Quality Management System
- Provide safe drinking water to the consumer
- Comply with applicable legislation and regulations.

Your operating authority must get the owner's written endorsement of the drinking water system's operational plan, including a Quality Management System policy. As a municipal councillor, your council may be asked to endorse the policy and its commitments. If your municipality has already completed this policy endorsement step, obtain a copy from your municipal staff.

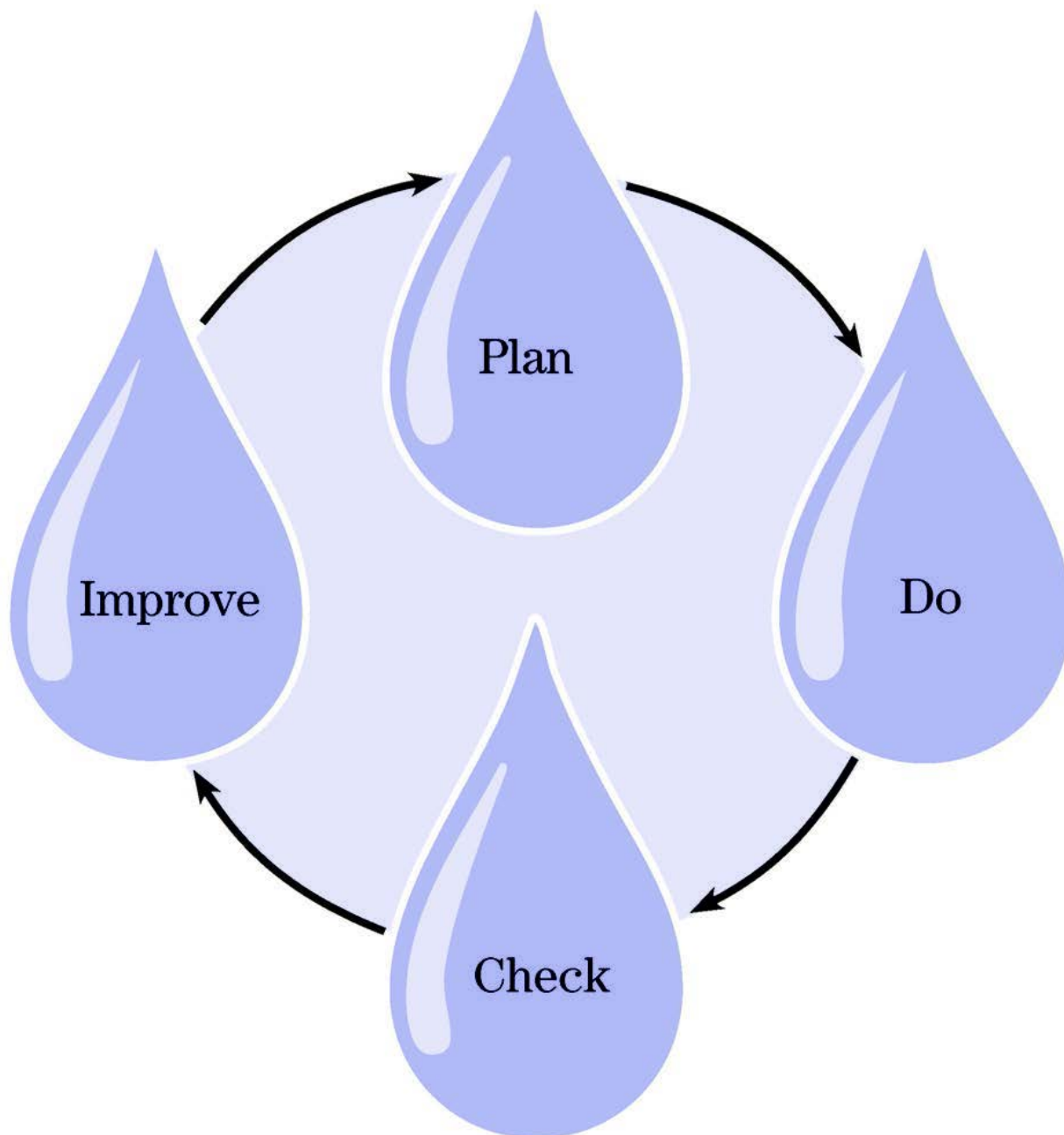
In addition to the Quality Management System policy, the operational plan will also include:

- Basic key information about every drinking water system your municipality owns
- A process for ongoing risk assessment
- A description of organizational structures (roles, responsibilities, authority)
- A procedure for an annual review of the adequacy of the infrastructure needed to operate and maintain the drinking water system, plus a commitment for the operating authority to communicate review findings to you
- A procedure for sharing sampling, testing and monitoring reports about the safety of your drinking water
- An outline of the system owner's responsibilities during emergency situations
- A commitment to continual improvement through corrective action
- A procedure for conducting a management review every 12 months which evaluates the suitability, adequacy and effectiveness of the Quality Management System against the requirements of the Drinking Water Quality Management Standard

(http://www.downloads.ene.gov.on.ca/envision/env_reg/er/documents/2017/012-5530_FinalStandard.pdf) and how to report the results of this review, including identified deficiencies, and decision and action items.

The Drinking Water Quality Management Standard is the standard upon which drinking water system operational plans are developed and operating authorities are accredited. The requirements of the Drinking Water Quality Management Standard, when implemented, will assist owners and operating authorities of municipal drinking water systems to develop sound operational procedures and controls.

Drinking Water Quality Management Standard



The Drinking Water Quality Management Standard is based on a “plan, do, check and improve” methodology which is similar to that found in some international standards. “Plan” requirements of the standard typically specify policies and procedures that must be documented in the operational plans for the drinking water system. “Do” requirements specify the policies and procedures that must be implemented. “Check” and “Improve” requirements of the standard are reflected in requirements to conduct internal audits and management reviews.

Example of a Quality Management System policy

The following is an example of a Quality Management System policy for the Westhill Water Supply and Distribution System. The sample Quality Management System

policy below is about a fictional town (i.e. Westhill) and is presented for illustration purposes:

The Municipality of the Town of Westhill owns, maintains and operates the Westhill Water Supply and Distribution System.

The Town of Westhill is committed to:

1. Ensuring a consistent supply of safe, high quality drinking water
2. Maintaining and continuously improving its quality management system, and
3. Meeting or surpassing applicable regulations and legislation

(Source: Ontario Ministry of the Environment, 2007, Implementing Quality Management: A Guide for Ontario's Drinking Water Systems)

Actions you can take

- Ask your operating authority to speak to your municipal council about your operational plan.
- Consider and act on any advice (including compliance issues and action items) identified during the annual management review process.
- Review the Quality Management System policy in your operational plan and its commitments.
- Ask your operating authority to show how it is meeting these commitments.

Drinking water system reports and inspections: What they tell you about your drinking water system

Municipal reports

An owner of a drinking water system is required to ensure that an annual summary report is presented to the members of council or local services board. Summary reports must be produced by March 31 of each year to cover the preceding calendar year.

The summary report must include:

- A list of any requirements of the *Safe Drinking Water Act, 2002*, the regulations, the system's approval, drinking water works permit, municipal drinking water licence and any order that the system failed to meet during the time period, plus the duration of the failure
- A description of measures taken to correct each failure
- A comparison of the system's capability with the quantities and flow rates of water supplied the preceding year to help assess existing and planned uses.

Municipalities are also required to provide details about each residential drinking water system in an annual report to consumers. This annual report must be completed by February 28 each year and include a:

- Brief description of the drinking water system including chemicals used
- Summary of the results of any required testing
- Summary of any adverse test results required to be reported to the Ministry of the Environment, Conservation and Parks
- Description of any corrective actions taken
- Description of any major expenses incurred to install, repair or replace required equipment.

Actions you can take

- Obtain and thoroughly review copies of the most recent annual and summary reports.
- Ask for explanations of any information you don't understand.
- Consider, act on and correct any deficiencies noted in the reports.

Ministry of the Environment, Conservation and Parks inspections

Every municipal residential drinking water system is inspected at least once a year by the Ministry of the Environment, Conservation and Parks. An inspection includes the review of a system's source, treatment and distribution components, as well as water quality monitoring results and procedures to evaluate system management and operations.

The Ministry of the Environment, Conservation and Parks prepares an inspection report that highlights any areas of non-compliance and what actions are required to correct them. The report also includes an inspection rating out of 100% to help you compare your system's current and past performance, and identify areas for improvement. An inspection rating that is less than 100% does not necessarily mean your municipality's drinking water is unsafe. It does mean there may be opportunity for improvement in operational or administrative areas.

What happens if the Ministry of the Environment, Conservation and Parks identifies non-compliance issues as part of its annual inspection

Inspection ratings for municipalities in Ontario have been excellent and have remained relatively consistent for many years. The ministry continues to work with owners and operators of systems with inspection ratings below 100% to help them gain a better understanding of their obligations and responsibilities so they can improve the performance of their systems. In appropriate circumstances, an inspector may issue a Provincial Officer's Order that requires a person who owns, manages or has control of the system to take certain actions by a specific deadline, or the inspector may refer an incident to the ministry's Investigation and Enforcement Branch.

Actions you can take

- Review your annual inspection results and ask questions if there is any indication of declining quality.
- Clarify any technical terms.
- Review your system's standing in the ratings reported in the Chief Drinking Water Inspector's Annual Report (<https://www.ontario.ca/page/2017-2018-chief-drinking-water-inspector-annual-report>). If your rating is less than 100%, ask why.
- Consider, act on and correct any compliance issues highlighted in the inspection.

Managing risks to drinking water

Conducting a risk assessment is a key component of your drinking water system's operational plan. By performing a risk assessment, your operating authority will assess:

- Existing or potential hazardous events facing your drinking water system, e.g., rail car derailment, algal blooms, water main breaks
- Consequences for drinking water if a hazardous event occurs, e.g., biological/chemical contamination of source water, possible biological/chemical contamination due to loss of supply/low pressure
- Necessary measures or response measures for each hazardous event (these measures may already be in place through such barriers as source protection or treatment processes)
- Ranking of each event according to its likelihood of occurring and the consequences or severity of the results.

In some cases, the operating authority may identify measures to address hazardous events which will call for improvements that require long-term planning. These types of decisions will often involve council approval. As a councillor, you should take time to understand the underlying risks associated with these decisions, their potential likelihood and impacts to public health.

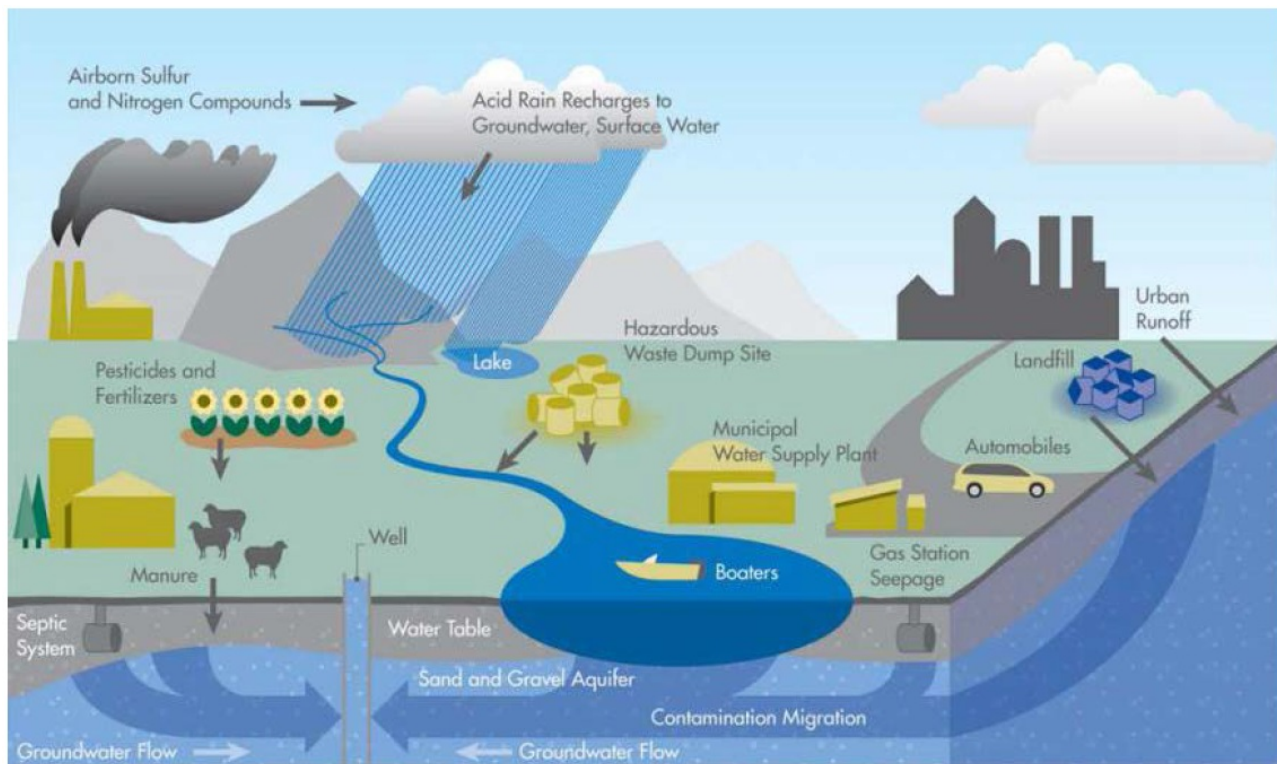
In other cases, the operating authority may identify risks that are outside of their control. For these, it may be appropriate to develop contingency or emergency response procedures.

In addition to risks assessed by your operating authority, if your municipality is located in a source protection area, your local source protection authorities perform detailed, science-based risk assessments of municipal drinking water sources within source protection areas. These form part of the local source protection plan(s) that affect your municipality.

By ensuring your municipality is fulfilling policies in your source protection plan(s), you can demonstrate how your community is mitigating risks to your drinking water.

Visit the Source Protection Information Atlas (<https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US>) on Ontario.ca to learn more.

Human activities affecting source water



(Source: Pollution Probe, 2006, The Source Water Protection Primer)

More on hazardous events and hazards to drinking water

Hazardous events can be natural or technological in origin, or result from human activities. Natural events include floods, ice storms, drought and spring run-off. Technological events could include equipment failure or a power outage. Human activities that could lead to a drinking water risk include vandalism, terrorism, chemical spills and construction accidents.

The four different types of hazards that may affect drinking water are biological, chemical, physical and radiological:

Biological hazards:

- Include bacterial, viral and parasitic organisms, such as *E.coli*, *Giardia* and Cryptosporidium
- Are considered the most significant drinking water health risk because effects are acute; can cause illness within hours
- Are commonly associated with fecal wastes from humans or animals, or occur naturally in the environment

Chemical hazards:

- Include toxic spills, heavy metals, dissolved gases like radon, pesticides, nitrates, sodium, and lead
- Can come from source water or occur in the treatment and distribution system

Physical hazards:

- Include suspended particles and sediments that can carry microbiological hazards and interfere with disinfection process
- Can result from contamination and/or poor procedures at different points in the delivery of water to the consumer.

Radiological hazards:

- Can be naturally occurring chemicals such as radon or uranium; most frequently occur in groundwater in low quantities
- May arise from man-made or natural sources.

Planning for your drinking water system

It is important to understand that drinking water assets are part of the broader network of municipal infrastructure assets. Municipalities must conduct integrated financial planning that considers the drinking water system as well as other municipal assets. Undertaking financial planning in this way can help municipalities prioritize investments across their asset portfolio and achieve efficiencies, for example, by aligning drinking water and road construction, where possible, to save on disruption costs.

The province requires municipalities to prepare asset management plans for all infrastructure assets as defined in the Asset Management Planning for Municipal Infrastructure regulation (<https://www.ontario.ca/laws/regulation/r17588>), *Ontario Regulation 588/17* (<https://www.ontario.ca/laws/regulation/r17588>), under the *Infrastructure for Jobs and Prosperity Act, 2015* (<https://www.ontario.ca/laws/statute/15i15>). This regulation, which is being phased in over a six year period (2019-2024), requires municipalities to discuss a process for aligning their asset management planning with their water financial plans prepared under the *Safe Drinking Water Act, 2002*.

Ontario Regulation 588/17 can also provide a useful methodology for understanding the services your drinking water system provides. It includes prescribed metrics for determining current and proposed levels of service as well as the costs associated with those levels of service.

Having a sustainable drinking water system is necessary to meet the demand for safe drinking water. Machinery, equipment and structures used to produce and provide safe drinking water must be in place, maintained and improved when necessary.

Your operating authority is required to:

- Document a procedure for conducting an annual review of your drinking water system in accordance with the Drinking Water Quality Management Standard (http://www.downloads.ene.gov.on.ca/envision/env_reg/er/documents/2017/012-5530_FinalStandard.pdf)
- Provide a summary of the programs in place and related lifecycle activities that will be undertaken to maintain, rehabilitate and review the drinking water system in accordance with the Drinking Water Quality Management Standard (http://www.downloads.ene.gov.on.ca/envision/env_reg/er/documents/2017/012-5530_FinalStandard.pdf)
- Consider the risks and related impacts climate change and other factors have on the drinking water system
- Monitor the effectiveness of its maintenance program
- Report findings to the drinking water system owner after the annual review.

Depending on the structure of — and relationship between — the owner of the drinking water system and its operating authority, this information can be communicated through such means as a report to council, the municipal budget, or at planning or other management meetings. The municipality could also use this information as part of its asset management planning program under *Ontario Regulation 588/17*.

Maintenance activities can be either planned or unplanned:

- Planned maintenance includes scheduled or proactive activities needed to maintain or improve infrastructure elements, e.g., equipment maintenance, main replacements. They are done to reduce the risk of an unplanned failure.

- Unplanned maintenance includes reactive activities, e.g., to deal with main breaks, pump failures. They can draw heavily on resources and adversely affect drinking water quality.

By establishing planned programs for maintenance, rehabilitation and renewal, the operating authority can save time and costs and increase public confidence in drinking water.

Most drinking water systems will have plans in place to address considerations such as main rehabilitation, upgrades and replacement, water treatment and storage due to increased projected demands and risks including climate change and its associated impacts. Such matters should be considered in light of asset management planning requirements under *Ontario Regulation 588/17*. These types of system maintenance requirements are usually tied to the capital budgets of the operating authority and/or the owner of the drinking water system.

Actions you can take

- Find out what maintenance, rehabilitation and renewal plans are in place for your drinking water system.
- Ask your operating authority to present the findings of its annual infrastructure review to you and council.

Sustainable financial planning for drinking water systems

Achieving financial sustainability of Ontario's municipal drinking water systems is a long-term goal. Financial sustainability is needed to ensure the people of Ontario continue to enjoy clean and safe drinking water and environmental protection is maintained.

To receive or renew a municipal drinking water licence for your drinking water system, your municipality needs to prepare a financial plan as per the *Financial Plans regulation, Ontario Regulation 453/07* (<https://www.ontario.ca/laws/regulation/070453>), under the *Safe Drinking Water Act, 2002*. Municipal councils have ultimate responsibility for approving any financial plans prepared for the ongoing management of their drinking water systems. Financial plans are living documents and should be updated and reviewed as new information becomes available. You

have an important role to play in ensuring that appropriate resources are allocated for the preparation and maintenance of these plans.

The following are some key principles for developing a financial plan:

- Ongoing public engagement and transparency can build support for – and confidence in – the financial plan and the drinking water system.
- An integrated approach to planning among water, wastewater and storm water systems is desirable given the inherent relationship among these services.
- Revenues collected to provide water and wastewater services should ultimately be used to meet the needs of those services.
- Lifecycle planning with mid-course corrections should be the standard approach as opposed to planning over the short-term or not planning at all.
- Financial plans benefit from the close collaboration of various groups including engineers, accountants, auditors, utility staff and municipal council.

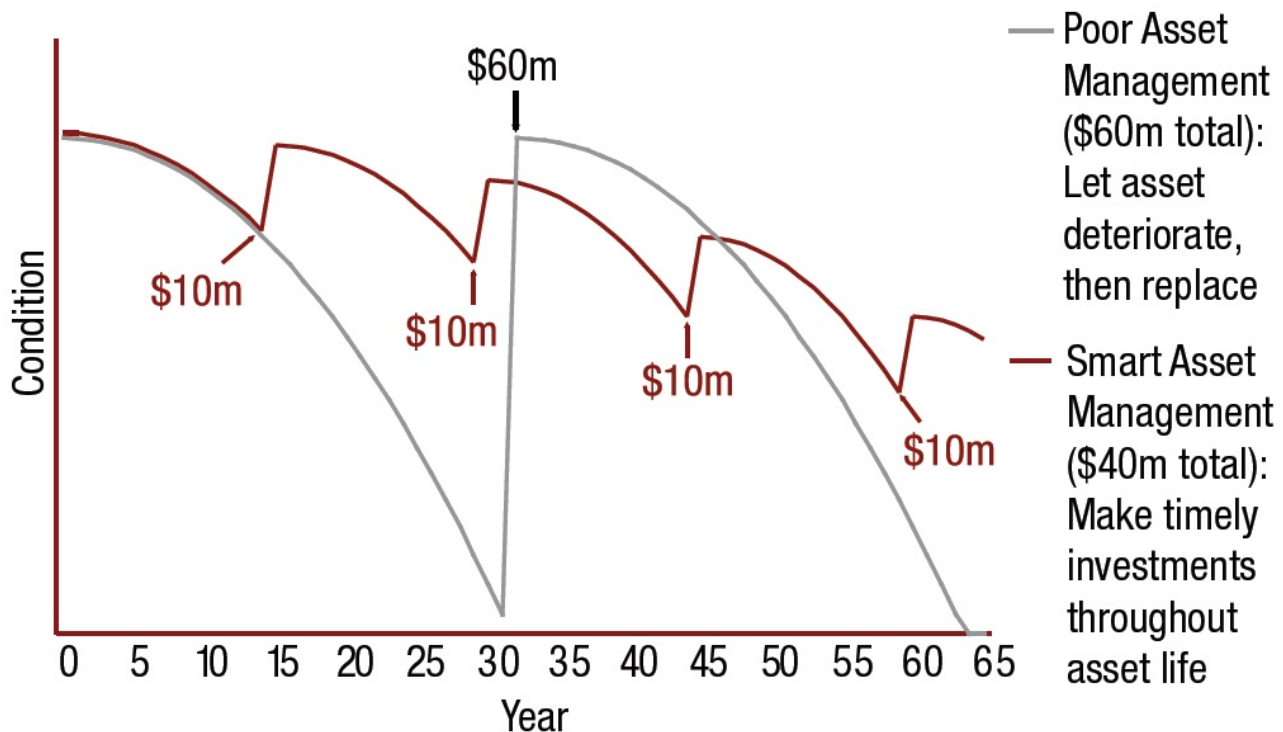
Financial plans for drinking water systems are required to forecast costs over a minimum period of six years as per *Ontario Regulation 453/07* under the *Safe Drinking Water Act, 2002*. In accordance with the asset management regulation, *Ontario Regulation 588/17*, municipalities are also required to identify lifecycle activities that would need to be undertaken to achieve proposed levels of service for drinking water systems and other assets they own or are included on their consolidated financial statements over a 10 year period.

Given these considerations, as a councillor, it is important for you to consider your municipality's drinking water financial plan and asset management plan simultaneously.

There are many different costs, both capital and operating, associated with planning, building, operating and maintaining drinking water systems. This includes costs that reflect outputs not attributable to the provision of water such as fire protection services, or the management of waste by-products from drinking water operations.

A sustainable system is one where there are sufficient funds available to adequately cover the full range of current operating costs, maintain and repair the system's existing asset base, replace assets when appropriate, fund future growth and enhancements to services, and account for inflation and changes in technology.

Timely renewal investments save money



(Source: Adapted from Ontario Ministry of Infrastructure, 2012, Building Together: Guide for Municipal Asset Management Planning)

“Municipalities need to ensure that their water systems are adequately financed. Over the long term, safety depends on stable and adequate financing to maintain the water system infrastructure and its operational capacity to supply high-quality water consistently.”

Justice Dennis O'Connor, 2002, Report of the Walkerton Inquiry

Water audits and accounting for water losses

An important tool in understanding the condition of your drinking water system assets is a water audit. This is the process of estimating where all of the water entering the distribution system ends up. One of the things a water audit will reveal is

how much water is being lost to leaks from water mains and service connections.

Leaks are a concern as they can:

- Signal deteriorating water main conditions and be a precursor to more breakages
- Be a source of bacterial contamination
- Result in additional costs for pumping and treating water that is not ultimately delivered to consumers
- Damage other infrastructure such as roads and sewers.

(Source: Ontario Ministry of the Environment, 2007, Towards Financially Sustainable Drinking-Water and Wastewater Systems)

The big picture

According to Statistics Canada, 13.5% of water produced at municipal water treatment facilities in Ontario is lost, mainly due to leaks in the distribution system. Other sources estimate this figure is as high as 30 to 40%.

(Source: Ministry of the Environment, Conservation and Parks calculations based on Statistics Canada, Table 153-0127 from Survey of Drinking Water Plants, 2015)

Communicating with your operating authority

Within the operational plan, your operating authority is required to have a procedure for communicating with the owner of the drinking water system, its personnel, suppliers and the public. You should be familiar with how communication about drinking water takes place. The procedure for communicating with the owner may be as simple as indicating the status of the implementation of the Quality Management System and its effectiveness during scheduled meetings, such as council meetings. Communication with the public may include posting information on a publicly accessible website or through billing inserts.

As noted previously, your council may be asked to provide a written endorsement of the system's operational plan. Depending on the nature of your system's management structure, the operating authority may also involve the owner in other areas of the Quality Management System such as risk assessment, management review or infrastructure.

Actions you can take

- Determine when and how your operating authority will communicate with you as an owner.
- Find out what information is made available to the public and how.

Emergency planning for drinking water

Ontario requires municipalities to develop, implement, and maintain emergency management programs based on a risk management approach and include activities in the five core components of emergency management: prevention, mitigation, preparedness, response, and recovery. Under the *Emergency Management and Civil Protection Act*, your municipality will already have an Emergency Response Plan for a wide range of potential scenarios. Some of these scenarios may involve drinking water and may link to planning done as part of the Quality Management System to document procedures to maintain a state of emergency preparedness.

Emergency preparedness means identifying what could happen in your system to cause an emergency and having processes and procedures in place to prepare for and respond to those emergencies. Some elements of an emergency response plan include communications, training, testing, responsibilities and contact information.

In a drinking water context, emergencies can happen as the result of a variety of natural and human-caused events such as severe weather, major power outages, spills, infrastructure failure, pandemics and deliberate acts of vandalism or terrorism. Potential emergencies can be identified through hazards identified in the risk assessment, Ministry of the Environment, Conservation and Parks inspections, source protection plans, corporate audits, insurance company reviews, and records of past emergencies.

An element of the Quality Management System emergency procedures is to clearly document the roles and responsibilities of the owner and operating authority during each emergency. For example, in an emergency, your clerk-treasurer may be assigned the responsibility of seeking resource authorization from council and act as chief liaison with council and the mayor.

The Quality Management System also requires that clear direction be established for communicating with the system owner and others during an emergency. Planning

beforehand how those in charge will talk to each other and the media can avoid complications during an emergency.

Preparing also means training and testing. The best emergency response procedures are ineffective if personnel are not properly trained on what to do and the procedures are not tested. All personnel working within the drinking water system need to know what to do in an emergency, especially those with special response roles. Common forms of testing and training include orientation and education sessions, table-top exercises, walk-through drills, functional drills or full-scale exercises.

Utilities helping utilities

A number of Ontario municipalities and utility sector associations joined together to establish the Ontario Water/Wastewater Agency Response Network.

A provincewide network of “utilities helping utilities,” the Ontario Water/Wastewater Agency Response Network supports and promotes provincewide emergency preparedness, disaster response, and mutual aid and assistance for public and private water and wastewater utilities.

Learn how your municipality can become part of this growing network at the Ontario Water/Wastewater Agency Response Network website (<http://www.onwarn.org/default.aspx>).

Actions you can take

- Ask your operating authority to review the drinking water emergency plan with council and to explain what responsibilities have been assigned to the owner.
- Know who will be the spokesperson during a drinking water emergency.
- Ensure critical staff have taken necessary training on emergency procedures and have participated in testing.

How adverse drinking water incidents, boil water advisories and drinking water advisories are different

An adverse water quality incident indicates that a drinking water standard has been exceeded or a problem has arisen within a drinking water system. Adverse water quality incidents are an important component of the drinking water protection

framework. The report of an adverse water quality incident does not in itself indicate that drinking water is unsafe or that the statutory standard of care has not been met, but rather that an incident has occurred and corrective actions must be taken to protect the public. In some cases, these corrective actions may include a boil water advisory or a drinking water advisory.

The local medical officer of health in Ontario's public health units is responsible for issuing boil water advisories and drinking water advisories when necessary.

A boil water advisory is issued when a condition exists with a drinking water supply that may result in a health risk and the condition can be corrected by boiling the water or by disinfection. An example is the presence of bacteria in the water supply such as *E. coli*.

A drinking water advisory is issued when a drinking water supply is affected by a condition that cannot be corrected by boiling the water or by disinfection. An example is the presence of chemical contaminants.

In both cases, the local medical officer of health will direct the system owner to inform users of the advisory, through means such as door-to-door notification, public posting of notices and local media outlets, to boil water and/or use an alternate water supply until further notice. An advisory will be lifted only after the local medical officer of health is satisfied that corrective actions were taken and the situation is remedied.

What drinking water system operators do, what certification requirements they must meet and why you need to plan

Ontario has established requirements for the training and certification of drinking water system operators, as set out in the *Certification of Drinking Water System Operators and Water Quality Analysts (Ontario Regulation 128/04)* (<https://www.ontario.ca/laws/regulation/040128>) under the *Safe Drinking Water Act, 2002*.

Municipal residential drinking water systems are required to use certified operators to perform all operational work.

Drinking water system operators play a vital operational role in providing safe drinking water to your community. The responsibilities of an operator may include:

- Checking, adjusting and operating equipment such as pumps, meters, filters, analyzers, and electrical systems, and having replacement parts on-site for critical repairs
- Determining chemical dosages and keeping chemical feed equipment appropriately filled with chemicals, adjusted and operating properly
- Maintaining operating records and submitting operating reports to the system's operating authority/owner and the province
- Ordering and maintaining a stock of parts, chemicals and supplies
- Collecting and submitting water samples as required by regulation (This usually involves taking samples from a number of key locations and transporting them to a licensed and accredited laboratory.)
- Explaining and recommending to the operating authority/owner any major repairs, replacements or improvements that should be made to the plant and/or distribution system
- Being the on-site contact to respond to emergency events and adjust plant operation to ensure public health and safety.

Drinking water operators in Ontario must be certified and trained according to the type and complexity (class) of the drinking water system they operate. Operators are required to go through rigorous training, write examinations, and meet mandatory continuing education requirements to renew and maintain their certification. A certificate is valid for three years. To renew their certificate, operators must complete 20 to 50 hours of mandatory training per year on subjects related to the duties of a water system operator. Continuing education helps operators steadily improve their knowledge and skills throughout their careers. Owners and operating authorities are responsible for ensuring drinking water systems are appropriately staffed and supervised by qualified persons.

Actions you can take

- Confirm that an overall responsible operator has been designated and that procedures are in place to ensure all required staff and contractors are certified and have received the required training.
- Check to see if drinking water operator succession planning is being done and that measures are taken to address any current or anticipated challenges to

recruiting skilled employees.

- Ensure your municipality or operating authority has contingency plans in place for situations where your certified operators may not be available to work (e.g., labour disputes, illnesses, vacancies) and, if activated, confirm these contingency plans have been, where required, approved by the Ministry of the Environment, Conservation and Parks and are functioning effectively.

Water conservation

Creating and implementing water conservation measures helps to reduce water and energy consumption, lower long-term infrastructure costs, increase water sustainability and protect the environment.

It is estimated that every additional litre of water capacity costs roughly four dollars for expanded water and wastewater infrastructure. Many municipalities in Ontario are realizing significant savings from water conservation measures.

The cost of energy to pump, distribute and treat water and wastewater is a significant expense for most Ontario municipalities. Saving water saves money, energy and reduces greenhouse gas emissions. Better water management has the potential to be one of the most cost-effective energy reduction strategies for Ontario's municipalities.

(Source: Ontario Ministry of the Environment and the Ontario Ministry of Natural Resources, 2009, Safeguarding and Sustaining Ontario's Water Resources for Future Generations)

Water conservation facts

- In Ontario, the average residential water use is about 201 litres of water per person per day, which is significantly more than countries with similar standards of living such as Germany, the United Kingdom and the Netherlands.
- In 2011, Ontario municipal water and wastewater systems accounted for 38% of reported municipal energy consumption and 32% of reported municipal greenhouse gas emissions.
- Surveys have consistently shown that as the percentage of metered homes in a community increases, water use per capita decreases. In Ontario, the average daily residential consumption per capita in municipalities that charge a flat rate or

assessed rate for water is 37% higher than in municipalities that have volume-based charges (i.e., meters).

(Sources:

- Statistics Canada, Table 153-0127 from Survey of Drinking Water Plants, 2015
 - Environmental Commissioner of Ontario, Every Drop Counts: Reducing the Energy and Climate Footprint of Ontario's Water Use, 2017
 - Ontario Sewer & Watermain Construction Association, Bringing Sustainability to Ontario's Water Systems, 2016)
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Learn more about drinking water

Source of water

Ontario's drinking water comes from surface water or groundwater. It is important to know the source of your community's water as it will determine the:

- Kind of treatment and disinfection your drinking water system must have
- Equipment needed to access and distribute your water
- Types of risks your drinking water may face, and
- Planning for your water supplies for the future.

Surface water

Surface water for public use is taken from rivers, lakes or reservoirs which are replenished by rain and snow. Surface water is more susceptible to contamination for the following reasons:

Rivers

may flow through farmland, industrial areas, sewage discharge zones and other areas which may cause harmful contamination and/or affect taste, odour, clarity and colour. River water quality will vary throughout the year.

Lakes and reservoirs

usually have better water quality than rivers. Suspended contaminants will 'settle out' in lakes. However, lakes and reservoirs are subject to plant and algae growth, which

can give lake water unpleasant taste or odour. Human activities (power boats, feed-lots, etc.) are also a threat. In addition, lakes are often fed by rivers which carry contaminants.

Groundwater

Groundwater (defined as 'water that occurs beneath the surface of the Earth') can be found in most parts of Ontario. It gathers in aquifers, the layers of sand, gravel and rock through which water seeps from the surface.

Sand and gravel aquifers are usually the most suitable for public water systems because water is more plentiful. Among rock aquifers, sandstone is often porous and can be a good source of groundwater. Limestone is not porous but may have cracks and cavities through which water can move and also provide a water supply.

Groundwater under direct influence

In addition to groundwater and surface water, there is a third source of water known as 'groundwater under the direct influence of surface water'.

An aquifer supplied by groundwater under the direct influence of surface water is viewed in the same category as surface water and has the same treatment and disinfection requirements.

(Source: Ontario Ministry of the Environment, 2007, "Drinking Water 101" course materials)

Source protection in Ontario

Protecting our sources of drinking water is the purpose of the *Clean Water Act, 2006* and the first component of Ontario's multi-faceted approach to providing safe, clean, available drinking water. Water is also protected in Ontario through the *Ontario Water Resources Act* (<https://www.ontario.ca/laws/statute/90o40>) and the *Environmental Protection Act* (<https://www.ontario.ca/laws/statute/90e19>).

The source protection program in Ontario has identified vulnerable areas around municipal drinking water systems, through a science-based process. Under the program, local source protection committees, which include municipalities and others, have identified risks to sources of municipal drinking water and developed

plans to address those risks. Implementation of the plans is an ongoing responsibility to ensure sources of municipal drinking water are protected.

Municipalities have a significant role in implementing source protection plans. For example, municipalities have appointed risk management officials and inspectors to negotiate risk management plans with landowners or businesses to ensure actions are taken to protect municipal drinking water.

Source protection plans may also require that municipalities prohibit certain land uses through their land use planning decisions. Municipalities will need to include policies in their official plan, and will have implemented appropriate zoning by-laws to comply with these policies. Plans may also require municipalities to take other specific actions to protect sources of drinking water, for example, implement education and outreach programs, spills response actions, and develop and implement road salt management plans.

In addition, municipal drinking water systems in source protection areas may be subject to the *Municipal Residential Drinking Water Systems in Source Protection Areas regulation (Ontario Regulation 205/18)* (<https://www.ontario.ca/laws/regulation/r18205>) under the *Safe Drinking Water Act, 2002*. The regulation applies where the owner plans to establish a new drinking water system (e.g., establish new wells or a surface water intake in a new source of drinking water) or to make certain alterations to an existing drinking water system (e.g., add wells to an existing wellfield or alter an existing intake and draw water from a larger area).

Under this regulation, municipalities are now responsible for ensuring certain work under the *Clean Water Act, 2006* is completed before they can apply for the requisite drinking water works permit and licence to authorize certain new or altered drinking water systems. In addition, conditions will be added to the licence or drinking water works permit that prohibit the municipality from providing water to the public from a new or altered drinking water source until the local source protection plan has been approved by the Minister of the Environment, Conservation and Parks.

Learn more about source protection by visiting the ministry's Source Protection Information Atlas

(<https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US>) .

Actions you can take

- Review the source protection plan for your area and find out what actions are being taken to protect your drinking water sources.
- If you require and must appoint a risk management official and risk management inspectors to implement Part IV policies (<https://www.ontario.ca/laws/statute/06c22#BK49>) (tools under the *Clean Water Act, 2006*), ensure they meet the prescribed qualifications set out in the *General regulation Ontario Regulation 287/07* (<https://www.ontario.ca/laws/regulation/070287>) under the *Clean Water Act, 2006*. This requires that the individual take and pass two courses offered by the Ministry of the Environment, Conservation and Parks.
- Municipalities in some source protection areas have agreements with their local conservation authority or another municipality to enforce Part IV of the *Clean Water Act, 2006* (they have delegated this responsibility). In such a case, the responsibility for appointing risk management officials and inspectors would be done by the source protection authority, which in most cases is a conservation authority. Municipalities that have delegated this responsibility to a conservation authority or another municipality should ensure these responsibilities are being carried out.
- Discuss plans to establish or expand drinking water systems early in the planning process.
- If your system is not in a source protection area:
 - Learn about your municipality's authority to protect your drinking water sources e.g., through land use planning, the provincial policy statement, the *Planning Act, 1990, Municipal Act, 2001* and septic inspection programs under the Building Code.
 - Find out if your municipality has information on the vulnerability of your drinking water systems. This information can help you protect drinking water sources.

Drinking water treatment processes

Treatment processes reduce or eliminate the potential for the presence of pathogens (organisms that can cause illness) in drinking water and are used to ensure your drinking water meets provincial standards. Different water sources necessitate

different levels and methods of treatment to ensure safe, clean water is provided to consumers.

In Ontario, all municipal drinking water systems must have a disinfection process in place and all water must be disinfected before it is supplied to the public. The most widely used disinfectant is chlorine, which is a low-cost powerful disinfectant which continues disinfecting as water passes through the distribution system.

Drinking water systems using surface water or groundwater that is under the direct influence of surface water must also provide a filtration process ahead of the disinfection.

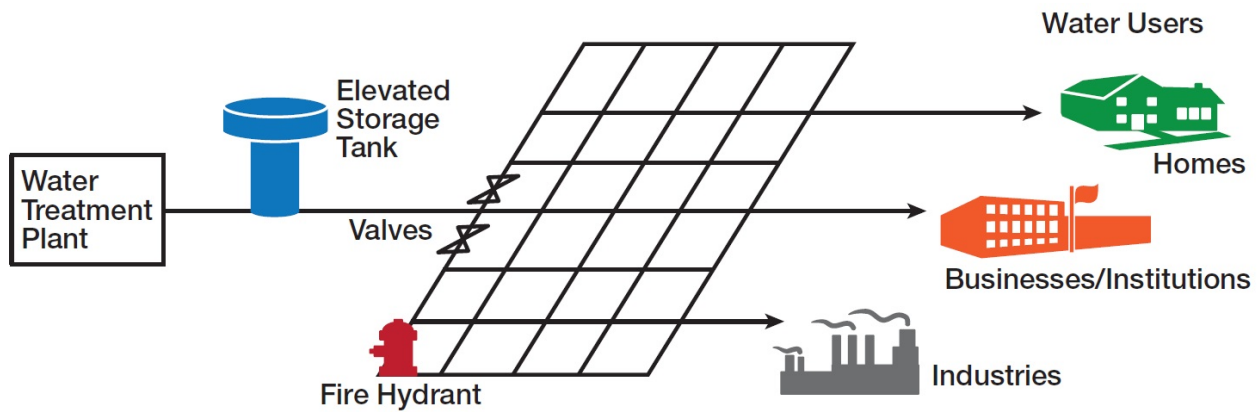
Some municipalities use certain treatment processes to address aesthetic problems with drinking water, such as taste and odour issues, that do not pose a risk to public health but which consumers find objectionable, or to address specific issues that are more local in nature, like zebra mussel control.

With climate change, communities across the province are experiencing more frequent and severe weather events. When these events happen, rain water can enter the sewage collection system, causing bypasses and overflows of raw or partially treated sewage into lakes and rivers. There can be potential impacts to water quality following storms, bypasses, and overflows.

When a bypass or overflow happens, municipalities are required to notify both the Ministry of the Environment, Conservation and Parks and the local medical officer of health. Municipalities should have a treatment process in place that takes into account these severe weather events.

Water distribution

The water distribution system is the network of pipes, valves, fire hydrants, storage tanks, reservoirs and pumping stations that carry water to customers. Municipalities that get their treated water from a treatment facility in another municipality and only have a distribution system are still required to exercise due diligence and oversight. Clean, treated drinking water can become contaminated through a poorly maintained distribution system. System owners are required to maintain a consistent level of disinfectant throughout the distribution system to act as a barrier against contamination.



Legal disclaimer

This guide is for information only and is not a substitute for legal or other professional advice in connection with any particular matter. It deals with complicated matters in a summarized fashion and some details may not be included. Municipalities and councillors are responsible for making local decisions in compliance with applicable laws. The content of the guide is based on existing legislation which is subject to change. Users should verify all legal and other information referred to in the guide and are solely responsible for any use or application of the guide.

For further information

To learn more about drinking water, visit these websites:

Conservation Ontario (<https://conservationontario.ca/>) — The website of Conservation Ontario, a non-profit association representing Ontario's conservation authorities, which contains information on managing Ontario's water resources.

e-Laws website (<https://www.ontario.ca/laws>) — The Ontario Government website providing access to provincial laws and regulations.

Ontario Clean Water Agency website (<http://www.ocwa.ca/>) — The website of the Ontario Clean Water Agency, an agency of the Ontario Government, which includes information on water and sewage works and related services provided by the Agency.

[Ontario.ca/drinkingwater](https://www.ontario.ca/drinkingwater) (<https://www.ontario.ca/drinkingwater>) — The Government of Ontario's webpage offering a single point of access to information on drinking water and drinking water services in Ontario.

Ontario Municipal Water Association website (<http://www.omwa.org/>) — The website of the Ontario Municipal Water Association.

Ontario Water Works Association website (<http://www.owwa.com/>) — The website of the Ontario Water Works Association, a section of the American Water Works Association (American Water Works Association website (<http://www.awwa.org>)).

Source Protection Information Atlas

(<https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US>) — This site will show where vulnerable areas are in a municipality related to their sources of drinking water. Follow the link to the source protection plans to learn more about what activities are prohibited or need to be managed in your municipality.

Walkerton Clean Water Centre website (<http://www.wcwc.ca/>) — The website of the Walkerton Clean Water Centre, an agency of the Ontario Government, which provides information on available training and education offered by the Centre, especially to those serving small and remote communities.

For more information or answers to general questions, call the Ministry of the Environment, Conservation and Parks at 1-800-565-4923

Email: drinking.water@ontario.ca (<mailto:drinking.water@ontario.ca>)

www.ontario.ca/drinkingwater (<https://www.ontario.ca/drinkingwater>)

Glossary

The following is a list of drinking water related terms and phrases you may come across when carrying out your oversight responsibilities. Where this glossary indicates that a term is defined in legislation (e.g. the *Safe Drinking Water Act, 2002* or regulations under the act), always consult the relevant legislation to ensure accuracy. Also, note the disclaimer in this guide.

A

Accreditation body

a person designated or established as an accreditation body under Part IV or Part VII of the *Safe Drinking Water Act, 2002*.
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Accredited operating authority

a defined term under the *Safe Drinking Water Act, 2002* meaning an operating authority accredited under Part IV of the *Safe Drinking Water Act, 2002*.
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Adverse water quality incident

an event in which an adverse drinking water test result triggers a process of notification and corrective measures

Aquifer

a layer of soil, sand, gravel or rock that contains groundwater.

Asset management planning

is the process of making the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The objective is to maximize benefits, manage risks, and provide satisfactory levels of service to the public in a sustainable manner.

Audit

a systematic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a quality management system conforms to the requirements of the Drinking Water Quality Management Standard.

B

Backflow preventer

a mechanical device for a water supply pipe to prevent the backflow of water into the water supply system from the service connections.

Boil water advisory

notice issued by local medical officer of health to advise the community to boil or disinfect water before consumption. It is designed to make water safe to drink when there is a health risk through contamination that can be corrected by boiling or disinfecting the water.

C

Chemically assisted filtration

a water treatment process that uses chemicals, such as alum, as a coagulant to bind small particles together into larger particles that are then easily filtered out when the water passes through sand beds or other filters.

Chlorine residual

the concentration of chlorine remaining in the chlorinated water at the end of a given contact time that is available to continue to disinfect. Measured as free chlorine, combined chlorine and total chlorine.

Clarification/sedimentation

removal of suspended solids prior to filtration. In Ontario, the most common method of clarification used is sedimentation - or allowing suspended material to settle using gravity.

Coagulation

a chemical process that causes smaller particles to bind together and form larger particles. The process is used to improve the removal of particles through sedimentation and filtration in the drinking-water treatment process.

Colony counts

a scientific measure that identifies the number of bacteria, yeast or moulds that are capable of forming colonies.

Conservation authorities

local watershed management agencies that deliver services and programs that protect and manage water and other natural resources in partnership with government, landowners and other organizations. Consult the Conservation Ontario website (<http://conservationontario.ca/>) for additional information.

Contaminant

a defined term under the *Ontario Environmental Protection Act*, meaning any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that causes or may cause an adverse effect.

Cross-connection

the physical connection of a safe or potable water supply with another water supply of unknown or contaminated quality such that the potable water could be contaminated or polluted.

Cryptosporidium

a single-celled protozoan parasite found in the intestinal tract of many animals. If the animal waste containing *Cryptosporidium* contaminates drinking water, it may cause gastrointestinal disease in humans.

D

Designated facility

a defined term in the *Drinking Water Systems regulation (Ontario Regulation 170/03)* under the *Safe Drinking Water Act, 2002*. Generally speaking, designated facilities are facilities that serve people who are potentially more susceptible to illness if they drink water that is of poor quality. These facilities include schools, universities and colleges, children and youth care facilities.

Disinfection

usually the addition of chlorine to raw or filtered water to remove or inactivate human pathogens such as viruses, bacteria or protozoa in water, or for the purpose of maintaining a consistent level of chlorine in a drinking-water distribution system.

Drinking water

a defined term under the *Safe Drinking Water Act, 2002*, meaning (a) water intended for human consumption, or (b) water that is required by an Act, regulation, order, municipal by-law or other document issued under the authority of an Act to be “potable” or to “meet or exceed the requirements of the prescribed drinking water quality standards.”

Drinking water advisory

notice issued by a local medical officer of health when a drinking water problem cannot be corrected simply by boiling the water or through disinfection. Under a drinking water advisory, consumers are advised to use another source of drinking water until further notice.

Drinking water system

a defined term under the *Safe Drinking Water Act, 2002*, meaning a system of works, excluding plumbing, that is established for the purpose of providing users of the system with drinking water and includes,

- (a) any thing used for the collection, production, treatment, storage, supply or distribution of water
- (b) any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the treatment system, and
- (c) a well or intake that serves as the source or entry point of raw water supply for the system.

Drinking Water Quality Management Standard

The Drinking Water Quality Management Standard is a made-in-Ontario standard that sets out a framework for the operating authority and the owner of a drinking water system to develop a quality management system that is relevant and appropriate for their specific system. Operating authorities are accredited if they can demonstrate that they meet the requirements of the Drinking Water Quality Management Standard through third-party verification.

Drinking water quality standards

standards prescribed by -the *Ontario Drinking Water Quality Standards regulation (Ontario Regulation 169/03)* under the *Safe Drinking Water Act, 2002*, for microbiological, chemical and radiological parameters which, when above certain concentrations, have known or suspected adverse health effects and require corrective action.

Drinking water works permit

a permit issued under Part V of the *Safe Drinking Water Act, 2002* to authorize the establishment or alteration of a municipal drinking water system.

E

***E. coli* (Escherichia coli)**

a species of bacteria naturally present in the intestines of humans and animals. If animal or human waste containing *E. coli* contaminates drinking water, it may cause gastrointestinal disease in humans. Most types of *E. coli* are harmless, but some active strains, especially O157:H7, produce harmful toxins and can cause severe illness.

Exceedance

violation of a limit for a contaminant as prescribed in the *Ontario Drinking Water Quality Standards Regulation (Ontario Regulation 169/03)* under the *Safe Drinking Water Act, 2002*.

F

Filtration

removes particles from the water that were not removed during clarification by passing the water through a granular or media filter that retains all or most of the solids on or within itself, and removes pathogens prior to disinfection.

G

Giardia

protozoa, usually non-pathogenic, that may be parasitic in the intestines of vertebrates including humans and most domestic animals. If animal waste containing Giardia contaminates drinking water, it may cause gastrointestinal disease in humans.

H

Hazard

a source of danger; a characteristic that may cause drinking water to be unsafe for human consumption.

Heterotrophic plate count (HPC)

Heterotrophic plate count is a microbiological test that gives an indication of general bacterial population. Heterotrophic plate count results are not an indicator of water safety and should not be used as an indicator of potential adverse human health effects. This is a routine test to monitor water plant operations and assure treatment is working properly.

L

Laboratory

a defined term under the *Safe Drinking Water Act, 2002*. It means a place where drinking water tests are or will be conducted. In Ontario, laboratories must be

accredited and licensed for each type of drinking water test they perform. Laboratories may conduct other types of tests as well.

M

Medical officer of health

a defined term under the *Safe Drinking Water Act, 2002*, meaning with reference to a drinking water system, the medical officer of health for the health unit in which the system is located; if none exists, authority resides with the chief medical officer of health.

Microbiological organism

an organism so small that it cannot be seen without a microscope, including bacteria, protozoa, fungi, viruses and algae.

Municipal Drinking Water Licence

a licence issued under Part V of the *Safe Drinking Water Act, 2002* permitting the operation of a municipal drinking water system. The licence outlines specific operational parameters for the system including rated capacity, maximum flow rates and sampling, testing and monitoring requirements.

Municipal drinking water system

a defined term under the *Safe Drinking Water Act, 2002*. It means a drinking water system or part of a drinking water system:

- that is owned by a municipality or by a municipal service board established under the *Municipal Act, 2001* or by a city board established under the *City of Toronto Act, 2006*
- that is owned by a corporation established under sections 9, 10 and 11 of the *Municipal Act, 2001* in accordance with section 203 of that act or under sections 7 and 8 of the *City of Toronto Act, 2006* in accordance with sections 148 and 154 of that act
- from which a municipality obtains or will obtain water under the terms of a contract between the municipality and the owner of the system, or
- that is in a prescribed class

O

Operating authority

a defined term under the *Safe Drinking Water Act, 2002*. It means in respect of a drinking water system, the person or entity that is given responsibility by the owner for the operation, management, maintenance or alteration of the system.

Operational plan

a defined term under the *Safe Drinking Water Act, 2002*. It means, in respect of a drinking water system, the operational plans required under the SDWA. These include the Quality Management System for a drinking water system.

Operator

a term defined in *Ontario Regulation 128/04* (<https://www.ontario.ca/laws/regulation/040128>), the *Certification of Drinking Water System Operators and Water Quality Analysts* regulation under the *Safe Drinking Water Act, 2002*. This is a person who conducts operational checks; who adjusts, tests, evaluates a process that controls the effectiveness or efficiency of a subsystem, or directs the flow, pressure or quality of the water within the subsystem. Certified operators must hold a valid operator's certificate.

Operator-in-charge

a term defined in *Ontario Regulation 128/04*, the *Certification of Drinking Water System Operators and Water Quality Analysts* regulation under the *Safe Drinking Water Act, 2002*. Designated by the owner or operating authority, the operator-in-charge can direct other operators, set operational parameters in the subsystem, and has the authority to make operational decisions.

Operator-in-training

a term defined in *Ontario Regulation 128/04*, the *Certification of Drinking Water System Operators and Water Quality Analysts* regulation under the *Safe Drinking Water Act, 2002*. These are new operators who can operate a drinking water system if they hold an appropriate certificate and if the subsystem has an appropriately certified overall responsible operator. An operator-in-training cannot be designated as an overall responsible operator or an operator-in-charge.

Overall responsible operator

a term defined in *Ontario Regulation 128/04*, the *Certification of Drinking Water System Operators and Water Quality Analysts* regulation under the *Safe Drinking Water Act, 2002*. Designated by the owner or operating authority, the overall responsible operator has overall operational responsibility for the municipal residential subsystem and must have an operator's certificate that is the same type and same classification as (or higher than) the subsystem.

Owner

a defined term under the *Safe Drinking Water Act, 2002*. It includes, in respect of a drinking water system, every person who is a legal or beneficial owner of all or part of the system, but does not include the Ontario Clean Water Agency or any of its predecessors where the Ontario Clean Water Agency or predecessor is registered on title as the owner of the system.

P

Pathogen

an organism that causes disease in another organism.

Permit to Take Water

a permit issued under the *Ontario Water Resources Act*, required of any person who takes over 50,000 litres of water on any day from any source.

Potable water

Water that, at a minimum, meets the requirements prescribed by the *Drinking Water Quality Standards regulation (Ontario Regulation 169/03)*, as provided by Section 11 of the *Safe Drinking Water Act, 2002*. Other common understandings include: water of sufficiently high quality that it can be consumed or used without risk of immediate or long-term harm; water that is safe to drink.

Protozoa

a very diverse group comprising some 50,000 organisms that consist of one cell. Most are able to move on their own. Some are a health concern in drinking water. (See *Giardia* and *Cryptosporidium*)

Provincial Officer Order

an order issued by a Ministry of the Environment, Conservation and Parks provincial officer to any person who contravenes an act administered by the Ministry of the Environment, Conservation and Parks.

R

Raw water

a defined term under the *Safe Drinking Water Act, 2002*. Generally, it means surface or groundwater that is available as a source of drinking water but has not received any treatment. As defined in the *Safe Drinking Water Act, 2002*, it also means untreated water in a drinking water system or in plumbing.

Renewal/rehabilitation

Significant repairs designed to extend the life of drinking water infrastructure.

Risk

is the probability of identified hazards causing harm, including the magnitude of that harm or the consequences.

Risk assessment

is an orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluating their significance.

Risk management official or inspector

Municipally-appointed officials responsible for administering and enforcing certain policies set out in a source protection plan under Ontario's *Clean Water Act, 2006*. Duties include reviewing development applications within vulnerable areas to ensure compliance with plan policies and the protection of municipal drinking water sources; negotiating and enforcing risk management plans to manage significant drinking water threats; and enforcing prohibition policies within vulnerable areas.

Municipalities that have enforcement authority under Part IV of the *Clean Water Act, 2006* may enter into agreements to delegate this responsibility to another municipality or to a conservation authority. In many source protection areas, delegation agreements are in effect and the conservation authority or another

municipality is the enforcement body under Part IV or Part VII and is responsible for appointing risk management officials and risk management inspectors.

S

Source protection plan

a defined term under the *Clean Water Act, 2006*, meaning a plan prepared for the purposes of that act. The plan includes a list of policies to address existing and future sources of municipal drinking water by protecting them from contamination and overuse.

Source water

untreated water in streams, rivers, lakes or underground aquifers which is used for the supply of raw water for drinking water systems.

Source water protection

action taken to address risks to the quality and quantity of source water. Source water protection under Ontario's *Clean Water Act, 2006* helps ensure public health through developing and implementing local plans to address land use activities that can pollute or deplete municipal drinking water sources.

T

Total coliform bacteria

a group of waterborne bacteria consisting of three main sub-groups with common characteristics that is used as an indicator of water quality. The presence of total coliform bacteria in water leaving a treatment plant, or in any treated water immediately after treatment, could indicate inadequate treatment and possible water contamination.

Treatment system

a defined term under the *Safe Drinking Water Act, 2002*, and means any part of a drinking water system that is used in relation to the treatment of water, and includes:

- any thing that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing
- any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system
- a well or intake that serves as the source or entry point of raw water supply for the system.

Turbidity

a visible haze or cloudiness in water caused by the presence of suspended matter, resulting in the scattering or absorption of light. The cloudier the water, the greater the turbidity.

W

Walkerton Inquiry

the public commission of inquiry, led by the Honourable Justice Dennis O'Connor, into the events that occurred in May 2000 when the water supply in the Ontario town of Walkerton became contaminated with a strain of *E.coli* bacteria.

Waterborne illness

a disease transmitted through the ingestion of contaminated water. Water acts as a passive carrier of the infectious agent, chemical or waterborne pathogen.

Water quality analyst

a term defined or referred to in *Ontario Regulation 128/04, the Certification of Drinking Water System Operators and Water Quality Analysts* regulation under the *Safe Drinking Water Act, 2002*. This is a person who is trained and certified to conduct operational tests, such as chlorine residual or turbidity tests, within a drinking water system.

Watershed

a region or area bounded peripherally by a divide and draining into a particular watercourse or body of water.

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Sources

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