

Ministry of Health

Small Drinking Water Systems under the *Health Protection and Promotion Act*

Responding to Adverse Events

Working Together to Safeguard our Health

This fact sheet provides basic information. It must not take the place of medical advice, diagnosis or treatment. Talk to a health care professional about any health concerns you have, and before you make any changes to your diet, lifestyle or treatment.

Small drinking water systems in Ontario

The Ministry of Health has oversight of small drinking water systems in Ontario. This fact sheet is to help you become familiar with Ontario's small drinking water system legislation, Ontario Regulation 319/08 (Small Drinking Water Systems) made under the *Health Protection and Promotion Act*. Under this law, you are required to provide users with safe drinking water at all times.

What is an adverse event and how do I respond?

When something goes wrong with your small drinking water system, the event may be referred to as either an adverse observation or an adverse test result, and specific notification requirements and corrective actions will be required.

The regulation provides the initial directions with regard to the appropriate response, which may include actions such as:

- Notifying the users of the small drinking water system;
 - Taking necessary steps to correct the problems; and
 - Notifying the local medical officer of health in the health unit where you operate your small drinking water system.
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To find out more about the regulatory requirements for your small drinking water systems, contact the local public health unit to consult with a public health inspector or obtain fact sheets or other information.

What is an adverse observation?

An adverse observation means that you or an employee of the small drinking water system for which you are responsible observed an event (other than an adverse test result) that suggests the system may not be providing water that is safe for the users to drink.

An adverse observation may include, but is not limited to:

Inadequate filtration of the water entering the system

Turbidity (cloudiness) is an indication of how heavily contaminated the water is. Therefore, if turbidity is seen, the existing treatment system may not be providing adequate disinfection and may require adjustment of the chemical levels or other action.

Low disinfection levels in the distribution system

Proper disinfection levels throughout your distribution system will prevent build-up of biofilm. If biofilm builds up, it can reduce the effectiveness of the disinfectant used to protect the water from the growth or re-growth of micro-organisms.

Contamination of the small drinking water system due to the possibility of back siphonage

If there is a cross connection in the piping of your small drinking water system, during low pressure situations, the drinking water may become contaminated with wastewater or other untreated water.

For example: During low pressure situations, a hose left in a sink of dirty water could siphon into the drinking water system. You should become familiar with these types of situations and prevent them from occurring.

Installation of a backflow prevention device is a good safeguard. Check with your local building department to determine if these devices are required under local bylaws.

Following a site-specific risk assessment, the public health inspector will issue a directive for each small drinking water system, which may include a requirement to install a backflow prevention device where warranted.

What is an adverse test result?

An adverse test result means a drinking water test result that shows any of the following outcomes that differ from Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards) made under the Safe Drinking Water Act, 2002 or from the directive issued to the small drinking water system.

An adverse test result may include, but is not limited to:

Laboratory testing

Microbiological parameters

Under the small drinking water systems regulations, owners and operators are required to ensure that at least one sample is taken every three months for *Escherichia coli* (E. coli) and total coliforms and submitted for testing to a laboratory licensed or approved by the Ministry of the Environment, Conservation and Parks.

The presence of these organisms is an indication of recent fecal contamination or entry of surface water and a warning that there is a risk to the health of users of your small drinking water system.

Chemical or radionuclide parameters

Sometimes there may be high concentrations of chemicals (nitrate or lead) or radionuclide (uranium or radon) parameters in your source water. These may occur naturally or as a result of an accident such as a spill.

The public health inspector may include requirements in the directive for specific chemical or radionuclide testing based on the site-specific risk assessment.

Non-laboratory checks

Disinfection residuals

Where the system is required to provide secondary disinfection, the test results should be in accordance with the type of disinfection that is used. The use of chemical disinfection will inactivate bacteria present in the water and prevent any re-growth of bacteria or biofilm during storage.

Free chlorine residual

If the system is chlorinated, the free available chlorine concentration must be at or above 0.05 milligrams per litre collected from plumbing or the distribution system.

Combined chlorine residual

If the system is disinfected by chloramination, you must maintain the combined chlorine residual concentration of at least 0.25 milligrams per litre in the distribution system.

Who should I notify of any adverse test results or observations?

Small drinking water system operators are required to immediately report to the local medical officer of health every adverse observation or test result that would indicate the system may not be providing safe water.

The immediate notice to the local medical officer of health must be done by speaking in person or by phone with the local medical officer of health, their office, or the after hours on-call person. A follow-up written notice within 24 hours must also be sent to the local medical officer of health.

Both the immediate report and the 24-hour written notice must specify the adverse result or observation, the actions being taken in response, and whether any required corrective action (specified in the regulations) is being taken.

General corrective actions

In addition to the above general notification requirements, the small drinking water system regulations also include corrective actions and notification requirements according to the specific adverse result or observation in question.

Some examples are as follows:

Presence of E. coli

- Immediately notify all users of the drinking water system to use an alternate source of drinking water or, if none is available, to bring their water to a rapid, rolling boil for at least one minute before use.
- Immediately resample and test.
- **If your small drinking water system uses chlorine**, immediately increase the chlorine dose and flush the system to ensure there is adequate chlorine residual. Maintain the residual until two consecutive water samples taken 24 - 48 hours are free of E. coli.
- **If your small drinking water system does not use chlorine** immediately follow the steps for temporary disinfection of the system as required by the local medical officer of health (consistent with the *Procedure for Corrective Action for Systems that are not Currently Using Chlorine*).

Presence of total coliforms

- Resample and test as soon as possible.
- **If your small drinking water system uses chlorine** and total coliforms are still detected upon resampling, immediately increase the chlorine dose and flush the system to ensure there is adequate chlorine residual. Maintain the residual until two consecutive water samples taken 24-48 hours apart are free of total coliforms.
- **If your small drinking water system does not use chlorine**, immediately follow the steps for temporary disinfection of the system as required by the local medical officer of health (consistent with the *Procedure for Corrective Action for Systems that are not Currently Using Chlorine*).

Improper disinfection

- Immediately restore the disinfection.
- Immediately notify and instruct all users of the drinking water system to use an alternate source of drinking water or, if none is available, to bring their water to a rapid, rolling boil for at least one minute before use.
- Immediately notify the local medical officer of health

Other Adverse Events

When an adverse event is not a result of bacterial contamination, you may need to apply different corrective measures than those listed above. Some adverse events may be caused by any of the following:

- Chemical spill that enters the source water that supplies your small drinking water system (e.g., diesel or other petroleum-based products).
- Agricultural products that enter your small drinking water system source either from run-off or by leaching into the aquifer that supplies your small drinking water system.
- Broken pipes or water mains that become contaminated.
- Naturally occurring chemical or radiological agents such as nitrate, lead or uranium.

At such times, you must notify your local public health unit and follow any steps required by the local medical officer of health or public health inspector to resolve the problem.

Instructions from the medical officer of health

In addition to the specific regulatory requirements for responding to adverse observations and adverse test results, the local medical officer of health or public health inspector in the health unit where you operate your small drinking water system may issue additional requirements to correct the problem. You must take such steps as are required by the local medical officer of health or public health inspector.

Resolution

Once you have taken the necessary steps to remedy the problem that caused the adverse test result or observation, you must provide a written notice to the local medical officer of health summarizing:

- Actions that were taken to correct the issue; and
- The results that were achieved.

Remember, if you are uncertain of what actions to take, immediately contact the local public health unit and speak with a public health inspector.

Where can I find additional information?

Please remember...

This fact sheet is only a summary of your responsibilities as the owner or operator of a small drinking water system and is not a substitute for legal advice.

For a more complete understanding of your legal responsibilities as an owner or operator, refer to Ontario Regulation 319/08 (Small Drinking Water System) or any directives issued on your system.

In addition, you should become familiar with the procedure documents produced to help you efficiently operate a small drinking water system:

- Procedure for Disinfection of Drinking Water in Ontario:
www.ontario.ca/page/procedure-disinfection-drinking-water-ontario
- *Procedure for Corrective Action for Small Drinking Water Systems that are Not Currently Using Chlorine* [Consult your local public health unit for this resource.]

You may also find additional information on the following Ontario ministry websites:

Acts and Regulations: www.e-laws.gov.on.ca/index.html

- Ontario Regulation 319/08: www.ontario.ca/laws/regulation/080319

Ministry of Health: <http://www.health.gov.on.ca/en/>

- Current list of local public health units:
www.health.gov.on.ca/en/common/system/services/phu/locations.aspx

Ministry of the Environment, Conservation and Parks:

www.ontario.ca/page/ministry-environment-conservation-parks

- Current list of licensed laboratories: www.ontario.ca/page/list-licensed-laboratories

Ministry of Agriculture, Food and Rural Affairs: www.omafra.gov.on.ca/english/