



The drop on water

# Lead

Lead (Pb) is a naturally occurring element. The main source of lead in drinking water is through contact with plumbing materials with lead components.

## Sources

Lead is naturally found in bedrock ore, but rarely found in source water. The main source of lead in drinking water is through corrosion of plumbing materials with lead components, such as pipes, solder, faucets, fittings, and older galvanized well liners.

The amount of lead dissolved into drinking water depends on factors such as pH, alkalinity, water temperature, water hardness, length of piping, and the amount of time water is left in pipes.

## Maximum Acceptable Concentration for Drinking Water = 0.01 mg/L

In water, dissolved lead has no taste, smell, or colour. It can only be detected through a chemical test.

The Canadian drinking water quality guideline for lead is **0.01 milligrams per litre (mg/L)**.

## QUICK FACTS

- The main source of lead in drinking water is through corrosion of plumbing materials.
- Lead in drinking water has no taste, smell, or colour.
- Lead can only be detected through chemical testing.
- The Canadian drinking water quality guideline for lead is **0.01 mg/L**.
- Exposure to lead in drinking water can cause damage to the brain and nervous system, behaviour problems and learning disabilities, delays in development, and hearing disorders.
- Well water with lead levels greater than **0.01 mg/L** should not be used for drinking, cooking, or teeth brushing. It may be used for bathing, handwashing, and dishwashing.
- If lead is present above **0.01 mg/L** in drinking water, consider water treatment options or alternative sources of water.

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## Health Risks

Lead in drinking water can cause a variety of adverse health effects. Children, infants, and unborn children are more strongly affected by exposure to lead because their bodies absorb lead more readily than adults. Children's brains and nervous systems are also more sensitive to the effects of lead.

Children exposed to lead levels above 0.01 mg/L can suffer from

- damage to the brain and nervous system
- behaviour and learning disabilities
- delays in physical and mental development
- hearing disorders

Health effects for adults exposed to lead levels above 0.01 mg/L may include

- increased blood pressure
- kidney damage
- anaemia
- digestive problems
- nerve disorders
- memory loss
- muscle and joint pain
- fatigue
- irritability
- headaches

The risk to human health is through ingestion only – drinking, cooking, teeth brushing. Well water with lead levels greater than 0.01 mg/L may be used for bathing, handwashing, and dishwashing.



## Testing

Regularly test your well water for a standard suite of chemical parameters, including lead. Use an accredited water testing laboratory. Find a list of accredited water testing laboratories at [www.gov.ns.ca/nse/water/waterlabs.asp](http://www.gov.ns.ca/nse/water/waterlabs.asp) or see the Yellow Pages under “laboratories.”

Get the special sampling bottles and instructions on proper sampling from the laboratory.

The cost of analyzing water samples can range from \$15 for a single parameter to \$230 for a full suite of chemical parameters. The cost can vary depending on the lab and the number of parameters being tested.

## Solutions

If lead is present above 0.01 mg/L in the first test, you must determine the source of the lead. Get a second test, taking a sample of water from the well before it enters the building. This will help determine whether the lead is present in the groundwater or the plumbing materials. While you are waiting for your test results, find an alternate source of water for drinking, cooking, and teeth brushing that has been tested and found to be safe.

If the source of lead is corrosion of lead-containing plumbing materials, consider the following options:

- Remove the source of lead.
- Flush faucets until the water runs as cold as possible before using the water for drinking, cooking, or teeth brushing.
- Avoid using hot tap water for drinking, cooking, or making baby formula.
- Adjust pH so water is less corrosive (for more information, see our fact sheets on pH and corrosive water).
- Use a treatment system, to reduce lead levels.
- Use alternative water sources, such as bottled water or another well that has been tested and found to be safe.

## REGULAR TESTING

Homeowners are responsible for monitoring the quality of their well water:

- Test for bacterial quality every 6 months.
- Test for chemical quality every 2 years.
- Test more often if you notice changes in physical qualities – taste, smell, or colour.

Regular testing alerts you to problems with your drinking water.

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## Treatment

Lead cannot be removed from water through boiling. Boiling water may increase the concentration of lead.

If the groundwater is found to have high levels of lead before entering the home, flushing the faucet will not be effective. Consider the following treatment systems to reduce lead levels:

- cation exchange
- distillation
- reverse osmosis
- water filters with certification NSF Standard No. 53 for reduction of lead

Buy a treatment system that has been certified to meet the current NSF standards for lead reduction. NSF International is a not-for-profit, non-governmental organization that sets health and safety standards for manufacturers in 80 countries. See its website at [www.nsf.org](http://www.nsf.org).

Once installed, re-test your water to ensure the treatment system is working properly. Maintain the system according to the manufacturer's instructions to ensure a continued supply of safe drinking water.

For more information on water treatment, see our publications *Water Treatment Options* and *Maintaining Your Water Treatment*, part of the *Your Well Water* booklet series at [www.gov.ns.ca/nse/water/privatewells.asp](http://www.gov.ns.ca/nse/water/privatewells.asp).

## Considerations for cation exchange (water softener)

If the pH of water is below 7, cation exchange generally removes lead. If the pH of water is above 7, lead may be in a form which cannot be readily removed using cation exchange. This may affect the efficiency of your water treatment unit.

## FOR MORE INFORMATION

Contact

Nova Scotia Environment at  
1-877-9ENVIRO  
or 1-877-936-8476

[www.gov.ns.ca/nse/water/](http://www.gov.ns.ca/nse/water/)

  
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