



The drop on water Corrosive Water

Corrosive water is water that reacts with and dissolves metal surfaces and materials.

Sources

The rock and soil type that groundwater is in contact with determines how naturally corrosive the water is.

Corrosive water can also be a result of natural or artificial contamination by acid rock drainage where sulphide minerals are exposed to weathering processes.

The corrosive properties of the water are also related to other water quality factors, such as temperature, total dissolved mineral content, calcium hardness, alkalinity, and pH of the water.

Some treatment processes, such as ion exchange (water softeners) and reverse osmosis, can increase the corrosiveness of water.

Health Risks

The primary health risk associated with corrosive water is through contact with metal plumbing materials. It may release metals present in plumbing materials, such as lead, cadmium, zinc, or copper, into drinking water.

Metal plumbing materials are more likely to corrode if the water has a low pH (is very acidic) or if the alkalinity (the ability of the water to stabilize the pH) is too low. Figure 1 shows the relationship between pH and alkalinity and how they are factors in determining whether water is corrosive, scale-forming, or neutral.

The concentration of metals in drinking water will also increase as the water sits, or stagnates, in the pipes when the water is not used for several hours, such as overnight or during working hours.

QUICK FACTS

- Corrosive water is water that reacts with and dissolves metal surfaces and materials.
- Corrosive water can be a result of natural or artificial processes.
- The primary health risk associated with corrosive water is that it may release metals present in plumbing materials, such as lead, cadmium, zinc, or copper, into drinking water.
- Metal plumbing materials are more likely to corrode if the water has a low pH or if the alkalinity is low.
- pH, alkalinity, lead, cadmium, zinc, and copper can be detected through laboratory testing.
- Exposure to lead or cadmium in drinking water can cause health risks. If lead or cadmium are present above the Canadian drinking water quality guideline in drinking water, consider water treatment options or alternative sources of water.

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Testing

Regularly test your well water for a standard suite of chemical and physical parameters, including pH, alkalinity, and a metal scan, including metals present in plumbing materials, such as lead, cadmium, zinc, and copper. Use an accredited water testing laboratory. Find a list of accredited water testing laboratories at 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, cadmium, zinc, or copper are present above the Canadian drinking water quality guideline, you must determine the source of the metals. Get a second test, taking a sample of water from the well before it enters the building. This will help determine whether the metals are present in the groundwater or the plumbing materials.

Lead and cadmium both pose health risks. Lead has acute health effects and affects children, infants, and unborn children more strongly, because their bodies absorb lead more readily than adults. If lead is present in your well water above the guideline limit, find an alternate source of water for drinking, cooking, and teeth brushing that has been tested and found to be safe, while you are waiting for your second lead test results. See our fact sheets on lead and cadmium for more information.

Zinc and copper are aesthetic parameters. Aesthetic parameters may impair the taste, smell, or colour of water. Zinc and copper do not pose serious health risks. See our fact sheets on zinc and copper for more information.

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.

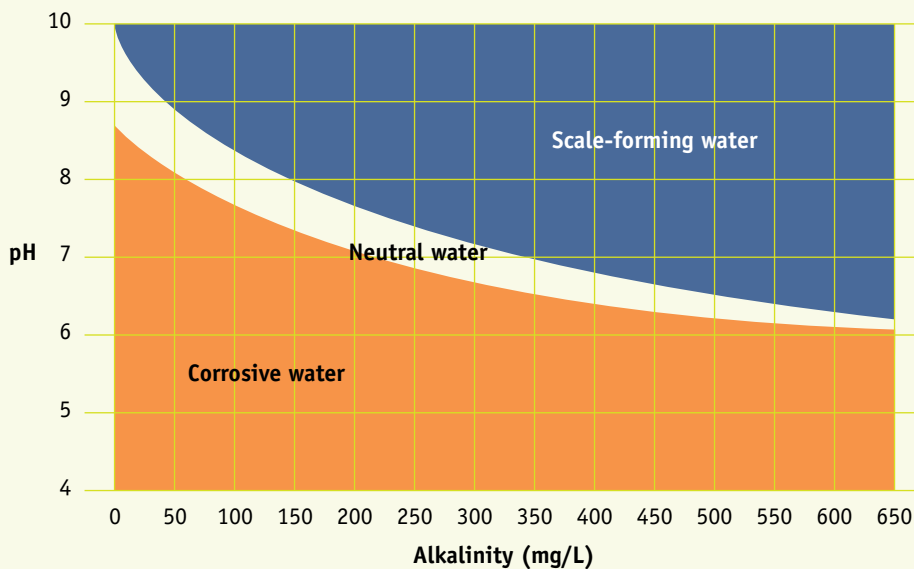
Regular testing alerts you to problems with your drinking water.



If the source of lead, cadmium, copper, or zinc is corrosion of plumbing materials, consider the following options:

- Remove the source.
- 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 sheet on pH).
- Use a treatment system to reduce lead, cadmium, zinc, or copper levels.
- Use alternative water sources, such as bottled water or another well that has been tested and found to be safe.

Figure 1
The relationship between pH, alkalinity, and water stability



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Treatment

Buy a treatment system that has been certified to meet the current NSF standards for the reduction of the specific metal. 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.

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.

FOR MORE INFORMATION

Contact

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

www.gov.ns.ca/nse/water/

