

# THE CORPORATION OF THE TOWN OF COCHRANE

## NOTICE TO THE RESIDENTS OF COCHRANE

### HARD WATER UPDATE NOTICE #4

#### HARD WATER FACT SHEET

##### What You Need to Know

**Health Canada states that drinking hard water is safe and does not pose any health risks. In fact, the calcium and magnesium present in hard water can contribute to the recommended daily intake of these essential minerals. The Guidelines for Canadian Drinking Water Quality do not set limits for water hardness because it is considered more of an aesthetic and operational concern rather than a health issue.**

##### What is Hard Water?

Hard water is water that contains high levels of dissolved minerals, primarily calcium ( $\text{Ca}^{2+}$ ) and magnesium ( $\text{Mg}^{2+}$ ). These minerals are typically absorbed as water passes through rocks and soil, particularly limestone, chalk, or gypsum, which are rich in calcium and magnesium compounds. Hard water is characterized by its significant mineral content, including calcium carbonate, magnesium carbonate, and sometimes trace amounts of iron or other minerals. It often reacts with soap to form a scum, reducing soap's ability to lather effectively. Additionally, hard water can leave mineral deposits, or "scale," on plumbing fixtures, water heaters, and household appliances, reducing their efficiency and lifespan. Despite these challenges, many people appreciate the distinct taste of hard water due to its mineral content.

Hardness can be categorized as either temporary or permanent. Temporary hardness is caused by dissolved bicarbonate minerals, such as calcium bicarbonate and magnesium bicarbonate, and can be removed by boiling the water, which precipitates the minerals. Permanent hardness, on the other hand, is caused by non-bicarbonate salts like sulfates and chlorides, which cannot be removed by boiling.

Although hard water poses challenges such as increased energy use due to scaling in appliances, higher soap or detergent consumption, and potential clogging of pipes over time, it also provides essential minerals like calcium and magnesium that are beneficial for health. Many people even prefer the taste of hard water for this reason.

##### Hard Water or Soft Water?

The Town of Cochrane gets its water from a well system as opposed to obtaining surface water such as that from a lake or reservoir.

Water becomes "hard" as it travels through the ground and comes into contact with rocks and soil that contain minerals like calcium and magnesium. These minerals dissolve into the water, increasing its mineral content and leading to hardness. Rainwater, which starts as soft water with minimal dissolved solids, absorbs these minerals as it infiltrates through limestone, chalk, or gypsum rich areas. The longer the water interacts with these mineral-rich formations, the harder it becomes. Hardness can be temporary, caused by dissolved bicarbonates, which can be removed by boiling, or permanent, caused by sulfates and chlorides that remain dissolved regardless of temperature.

This differs from surface water, which typically has lower mineral content because it doesn't spend as much time in contact with underground rocks. Surface water sources, such as rivers, lakes, and reservoirs, are more directly influenced by precipitation and runoff, which often dilute mineral concentrations. As a result, surface water tends to be softer than groundwater, though this can vary depending on the geology of the surrounding area and the path of the water.

## Indications & Effects of Hard Water

Hard water interferes with almost every cleaning task from laundering and dishwashing to bathing and personal grooming. Clothes laundered in hard water may look dingy and feel harsh and scratchy. Dishes and glasses may be spotted when dry. Hard water may cause a film on glass shower doors, shower walls, bathtubs, sinks, faucets, etc. Hair washed in hard water may feel sticky and look dull. Water flow may be reduced by deposits in pipes.

## Health Concerns

In Ontario, water hardness is not directly regulated because it is considered a water quality characteristic rather than a health concern.

The Ministry of the Environment, Conservation and Parks (MECP) regulates drinking water quality under the Safe Drinking Water Act, 2002, which sets strict standards for contaminants in drinking water to ensure it is safe for consumption. While hardness is not a regulated parameter, the MECP provides guidelines for drinking water systems and may address water hardness indirectly if it impacts infrastructure or service delivery.

## How Does Cochrane Compare

In the water industry hardness is expressed in terms of milligrams per liter (mg/L) of Calcium Carbonate ( $\text{CaCO}_3$ ). In the following comparators, water hardness is categorized as follows:

Hardness (mg/L as Calcium Carbonate)	Category
0-60 mg/L	Soft
61-120mg/L	Moderately Hard
121-180 mg/L	Hard
Over 180 mg/L	Very Hard

Community	Hardness (mg/L as Calcium Carbonate)	Categorized
Cochrane	350 mg/L	Very Hard
Timmins	45.5 mg/L	Soft
Kapuskasing	80 mg/L	Moderately Hard
Iroquois Falls	81 mg/L	Moderately Hard
Waterloo Region	350 mg/L	Very Hard
Windsor	255 mg/L	Very Hard

## Hard Water Management

To address the issues caused by hard water, several treatment options are available. Water softeners use ion exchange to replace calcium and magnesium ions with sodium or potassium ions, effectively softening the water. Chemical additives, such as washing soda (sodium carbonate) and vinegar, can help in specific applications like laundry, while reverse osmosis filtration systems remove most dissolved minerals, producing softer water. By understanding the characteristics of hard water and employing appropriate solutions, its challenges can be effectively managed.

Hard water occurring in municipal water systems is managed in various ways. In the Town of Cochrane, the municipality uses a water softener as part of the water treatment process. Even with the use of the water softener, Cochrane's water is still considered hard at 130 mg/L - 140 mg/L. Other communities often encourage users to install their own water softeners combined with educational information on hard water management. Residents install ion-exchange water softeners in their homes to remove calcium and magnesium ions, softening the water and reducing scaling.

The typical equipment used for this purpose is the ion exchange water softener. Softening is accomplished with synthetic resin media by exchanging ions of calcium and magnesium that contribute to hardness with ions of sodium. Although this method of softening can produce water with zero hardness, it is important to understand the limitations of the process.

- ✓ Homes that use these devices show elevated levels of lead and copper from the plumbing systems due to the aggressive nature of the softened water.
- ✓ Ion exchange softeners increase the sodium content of the treated water and may be potentially harmful to persons that are on sodium-restricted diets. People should limit or restrict the amount of softened water they consume or use for food preparation.
- ✓ The softening process removes the chlorine residual from the water and may accelerate bacteria growth within the plumbing system.
- ✓ The disposal of spent brine solution and rinse water from softener regeneration is becoming a major problem and can impact wastewater treatment facilities and septic systems. Softener byproducts are corrosive to material they contact and possess varying toxic levels in relationship with the environment.

### For More information

Other information on hard water can be found at:

<https://www.mcgill.ca/oss/article/health-you-asked/you-asked-hard-water-dangerous-drink>

<https://www.healthline.com/health/hard-water-and-soft-water#safety>

### Important Note

The information provided in this fact sheet is for informational purposes only. The Town of Cochrane recommends that residents and interested parties conduct their own research to become fully informed about water hardness and its potential effects. Please note that the Town of Cochrane will not be held liable for any consequences resulting from the use of this information. For more detailed information, we encourage you to consult with the relevant regulatory bodies.

Regards,



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