



Barium in Drinking Water

Barium is a metal found as a trace element in rocks. Barium most commonly exists in compounds such as sulphates and carbonates. Barium compounds are used in glass-making, paper making, electronic, and textile industries, as an additive in pharmaceuticals and cosmetics, oil and gas well drilling, as well as in the manufacturing of plastics and rubber. It may be found in some drinking water supplies. Exposure to high levels of barium can cause adverse health effects.

People may be exposed to barium in food (ex: milk, potatoes, flour, cereals and nuts) and drinking water. Exposure can also occur through inhalation of ambient air containing industrial emissions such as waste incineration, and when coal and diesel oil are burned.

How does barium get into my water?

Barium can enter the raw groundwater supplies from naturally occurring environmental deposits when the water is acidic. Barium may also end up in water supplies due to the discharge of industrial wastes.

How can barium affect my health?

High barium concentrations in drinking water lead to elevated blood pressure, stomach irritation, muscle weakness, damage to the liver, kidney, heart, and spleen.

Soluble barium salts at high concentrations can be acutely toxic, however, these high concentrations are not found in drinking water. Ingesting lower concentrations of barium salts over a long period of time can lead to temporary paralysis or muscle weakness.

There has been no evidence suggesting barium causes cancer.

What is the Maximum Acceptable Concentration for barium in drinking water?

The *Guidelines for Canadian Drinking Water Quality* established by Health Canada has set the maximum acceptable concentration (MAC) of barium in drinking water at 2.0 milligrams per litre (mg/L). The drinking water guideline is based on the potential health effects of long term exposure to high concentrations of barium.

How do I know if there is barium in my drinking water?

As barium is both tasteless and odourless, you won't be able to tell if it is in your drinking water. Private water supplies can be tested by an accredited laboratory to determine barium levels. All public water supplies are regularly tested for barium.

What if there are high levels of barium in my drinking water?

Boiling water with elevated barium levels will not make the water safe. An alternate safe water source, or water treated with an appropriate treatment device should be used for drinking, cooking, making juice, drinks, ice or infant formula, brushing teeth or soaking dentures, washing fruits and vegetables, and making soup, tea or coffee. Water with elevated barium levels may still be used for handwashing, washing dishes, bathing, and laundry.

If high concentrations of barium are found in your drinking water:

- Look for an alternate water source with low barium concentrations. Where possible, connect to a public water distribution system.
- Install an in-home water treatment device that can reduce the level of barium. Look for treatment devices that have been certified by an accredited certification organization as meeting the appropriate NSF International (NSF)/American National Standards Institute (ANSI) drinking water treatment unit standards for removing barium.
 - Distillation systems (NSF/ANSI standard 62)
 - Cation exchange water softener (NSF/ANSI standard 44)
 - Reverse osmosis drinking water treatment systems (NSF/ANSI standard 58)

After the system is installed, have the treated water tested for barium at a private accredited lab to make sure your system is working properly. Monitor and maintain your water treatment equipment according to manufacturer instructions.

If you are concerned about health risks from the consumption of water containing barium, please contact your doctor.

For more information about barium in drinking water, contact your local Environmental Health Officer.

Environmental Public Health Services
First Nations and Inuit Health Branch, Alberta Region
Edmonton Phone: (780) 495-2712
Calgary Phone: (403) 299-3939