

Arsenic in drinking water

Arsenic exists naturally in rocks in the earth's crust. It also exists in some drinking water supplies and wells. Drinking water containing arsenic can have serious short term and long-term health effects.

How does arsenic get into drinking water?

Arsenic can get into drinking water from natural deposits or runoff from agriculture, mining and industrial processes.

In B.C., natural minerals are the most common sources of arsenic in drinking water.

The amount of arsenic in groundwater supplies like wells is usually higher than in surface water supplies such as lakes, streams and rivers.

What are the health effects of arsenic exposure?

Short to medium term exposure to very high levels of arsenic in drinking water over days or weeks can lead to arsenic poisoning.

Exposure to high levels of arsenic may cause nausea, vomiting, diarrhea, confusion, hallucinations, impaired memory and mood swings, and impaired nerve function. Impaired nerve function may cause a 'pins and needles' sensation or numbness and burning in hands and feet.

Arsenic can also cause skin changes like white lines or bands appearing on fingernails or toenails. Skin may also excessively thicken, mostly on hands or the bottom of feet with wart-like or corn-like growths. Other symptoms can include skin flushing and rashes.

As children tend to drink more water per unit of body weight than adults, they may have more exposure to arsenic in drinking water. As a result, children may be at greater risk of illness when higher levels of arsenic are present.

Long-term **exposure to even relatively low amounts of arsenic** in drinking water over years or decades can increase your risk of developing certain cancers, including lung, bladder, liver, skin and kidney cancers.

The risk of cancer is the reason for developing the Canadian guideline for arsenic in drinking water. For more information on the Guidelines for Canadian Drinking Water Quality, visit www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-arsenic.html.

What amount of arsenic causes health effects?

Health Canada has set a Maximum Acceptable Concentration (MAC) of 10 micrograms per litre for arsenic in drinking water. This amount reports as 10 µg/L or as 0.010 milligrams per litre (mg/L).

This level was set based on how feasible it is to treat water to this level. This amount still imposes a higher risk than the level considered minor. For this reason, consider taking precautions with your drinking water even if the arsenic levels are slightly below the guideline. Data collected in Canada show that levels of arsenic in drinking water are usually less than 0.005 mg/L, but concentrations may be higher in some areas.

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

Public drinking water systems are monitored regularly. In drinking water, arsenic has no odour or taste. Only a chemical test can detect the presence of arsenic.

Most private wells do not have routine testing for water quality or contaminants. Any well may

contain arsenic or other contaminants. It is the well owner's responsibility to test the water for arsenic. Test your private wells regularly for water quality.

For more information about private well water testing, please visit [HealthLinkBC File #05b Well water testing](#).

Contact your local public health unit or environmental health officer for more information on the testing process in B.C.

What can I do if there is arsenic in my drinking water?

Water with arsenic is only a concern if you use it for drinking or preparing food or if it is present in water you use to brush your teeth.

There are no known health concerns from hand washing, bathing, swimming or washing clothing in water with arsenic.

If an initial test detects arsenic, even at levels below the guideline, it is important to have a second test done to confirm the results. If your water tests positive for arsenic above the recommended level, use another source for drinking water or treat the current source.

Arsenic can be present in two forms: trivalent [As(III)] and pentavalent [As(V)]. Most treatment options are only effective for pentavalent arsenic, so you may need pre-treatment of the water.

Boiling water may **increase** the concentration of arsenic and should not be done for the purpose of removing it.

There are several treatment devices and options to remove arsenic, including reverse osmosis filters, distillation and some specialized media filters. Chlorination and mechanical filters do not remove arsenic from water.

There is no regulatory control over treatment devices for private homes. Owners must be careful and select an appropriate treatment

device. The device should be certified for the removal of arsenic. For a list of filters and systems certified for arsenic, visit www.nsf.org/knowledge-library/faq-water.

Consider getting a certified treatment device from an organization that is Standards Council of Canada (SCC) accredited. The treatment device should meet the following standards:

- NSF/ANSI Standard 62 on drinking water distillation and adsorption systems
- Standard 58 on reverse osmosis drinking water treatment systems
- Standard 53 on drinking water treatment units with specific designation for the water quality parameters you are trying to remove (arsenic)

Certification assures that a device works as the manufacturer or distributor claims. Find an up-to-date list of accredited organizations by visiting the Standards Council of Canada at: <https://scc-ccn.ca/search/accredited-organizations>.

For more information on drinking water and treatment options, contact your local environmental health officer.

For more information

For more information about arsenic and drinking water, visit:

- B.C. Ministry of Environment: Ambient Water Quality Guidelines for Arsenic
www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/bc_env_arsenic_waterqualityguideline_oerview.pdf (PDF, 102KB)
- Health Canada: Arsenic in Drinking Water
www.canada.ca/en/health-canada/services/healthy-living/your-health/environment/arsenic-drinking-water.html

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