



The drop on water

# Uranium

Uranium (U) is a naturally occurring radioactive element that exists in soil and rock throughout the world. Some areas of Nova Scotia have a greater potential for elevated uranium levels in drinking water. See Figure 1.

## Sources

Natural concentrations of uranium vary in Nova Scotia, depending on the type of minerals in the soil or bedrock. Wells most likely to have high levels of uranium are those in areas with granite, sandstone, and shale bedrock.

Naturally occurring uranium in groundwater comes from the dissolving of minerals that contain uranium. Elevated levels of uranium are more likely to be found in drilled wells that obtain their water through cracks and fractures in bedrock, than in dug wells or surface water supplies.

Some human activities are also sources of uranium – mill tailings, emissions from the nuclear industry, and the combustion of coal and other fuels.

## Maximum Acceptable Concentration for Drinking Water = 0.02 mg/L

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

The Canadian drinking water quality guideline for uranium is **0.02 milligrams per litre (mg/L)**.

## QUICK FACTS

- Naturally occurring uranium is likely to be found in groundwater in areas with granite, sandstone, and shale bedrock.
  - Uranium in drinking water has no taste, smell, or colour.
  - Uranium can only be detected through chemical testing.
  - The Canadian drinking water quality guideline for uranium is **0.02 mg/L**.
  - Exposure to uranium in drinking water can result in kidney damage.
  - Well water with uranium levels greater than **0.02 mg/L** should not be used for drinking, cooking, or teeth brushing. It may be used for bathing, handwashing, and dishwashing.
  - If uranium is present above **0.02 mg/L** in drinking water, consider alternative sources of water or water treatment options.
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## Health Risks

Uranium levels in drinking water above 0.02 mg/L can increase the risk of kidney damage.

The risk to human health is through ingestion only – drinking, cooking, teeth brushing. Well water with uranium levels greater than 0.02 mg/L may be used for bathing, handwashing, and dishwashing.

## Testing

Regularly test your well water for a standard suite of chemical parameters, including uranium. 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 uranium is present above 0.02 mg/L in the first test, get a second test to confirm the original results.

If uranium is confirmed to be present above 0.02 mg/L in the well water,

- Find an alternate source of water for drinking, cooking, and teeth brushing, such as bottled water or a dug well that has been tested and found to be safe.

or

- Treat your current source of water to reduce uranium levels.

## 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.



## Treatment

Uranium cannot be removed from water through boiling.

We recommend purchasing a treatment system that has been certified to meet the current NSF standards. 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).

Although there are currently no treatment units certified specifically for uranium reduction, effective treatment methods for reducing uranium levels in drinking water include

- activated alumina
- anion exchange
- distillation
- reverse osmosis

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).

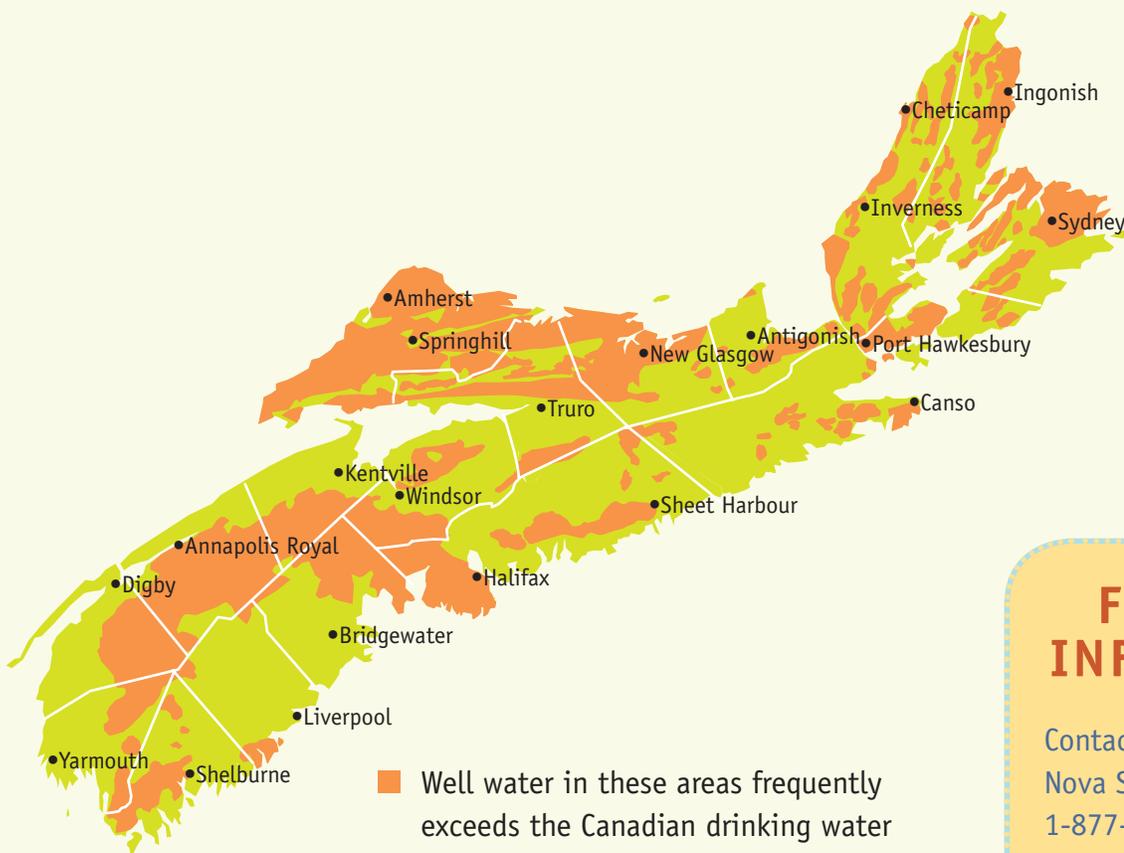
## Considerations for anion exchange method

Uranium is a negative ion (anion) in solution. When you use anion exchange treatment, the resin in the unit will remove certain anions more readily than others. Uranium is preferred over sulphate, arsenic, nitrate, nitrite, and fluoride. If you need to reduce the levels of these anions when uranium is present, the effectiveness of the unit may be reduced. The resin in the anion exchange unit may need to be regenerated more frequently. It is important that a detailed chemical analysis of your water be completed to determine if other substances are present that will affect treatment.

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**Figure 1**  
Areas in Nova Scotia with naturally occurring uranium in groundwater



■ Well water in these areas frequently exceeds the Canadian drinking water quality guideline for uranium.  
*Testing highly recommended.*

■ Well water in these areas is less likely to exceed the Canadian drinking water quality guideline for uranium.  
*Testing recommended.*

## 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/)

**NOVA SCOTIA**  
Environment