

Arsenic in Drinking Water

JUNE 2023 REVIEW

Arsenic occurs naturally in rocks and soil across Minnesota. Small amounts can dissolve into groundwater that may be used for drinking water. Drinking water with arsenic in it can increase your risk of cancer and other serious health effects. It is important to know how much arsenic is in your drinking water and how you can reduce your exposure.

Health effects

Drinking water with low levels of arsenic over a long time is associated with an increased risk of cancers of the bladder, kidneys, lungs, liver, and other organs. Exposure to arsenic can also contribute to cardiovascular and respiratory disease, diabetes, reduced immune function, neurological delays in children and impairment in adults, skin lesions, skin discoloration, and the development of skin cancer.

Health impacts of arsenic may not occur right away and can develop after many years, especially if you are in contact with arsenic at a low level over a long time.

How to protect yourself and your family

The Environmental Protection Agency (EPA) federal drinking water standard for arsenic in drinking water is 10 micrograms per liter ($\mu\text{g}/\text{L}$).^{*} This standard is based on health effects including risk of cancer and takes into account the cost for a public water supply to add treatment. For chemicals that can cause cancer, like arsenic, the EPA sets health risk goals of 0 $\mu\text{g}/\text{L}$ in drinking water. These goals do not consider the cost of water treatment to reach that level of arsenic in drinking water. Any reduction in arsenic levels makes a difference; the financial costs you are willing to invest is a personal decision.

^{*}One microgram per liter ($\mu\text{g}/\text{L}$) is the same as 1 part per billion (ppb).

If you have a private well

The Minnesota Department of Health (MDH) recommends that every well be tested for arsenic at least once. When a new well is drilled, the well contractor will test for arsenic and share the results with you and MDH. Test results taken when a new well is constructed may not accurately measure long-term arsenic concentrations. You may want to re-test your well for arsenic six months or more after the well is drilled. Owners of existing wells are responsible for testing their drinking water for arsenic. You can find certified laboratories that test for arsenic through the [Environmental Laboratory Accreditation Program](#). You can also contact your county to see if they have any programs to make testing your water easier.

- If arsenic is not detected in your well water at least once, your water is unlikely to have arsenic in the future.

- If arsenic is detected in your private well water at any level, consider retesting your well water to confirm the result and installing a treatment unit or using a different drinking water source in the meantime.

Drinking water with even small amounts of arsenic over many years increases the risk of diseases such as cancer. MDH recommends you consider treatment for arsenic if any amount is detected. MDH strongly recommends you take action especially if arsenic levels are above 10 µg/L. Learn more about treatment options, pros and cons, and general costs at the [Home Water Treatment](#) webpage. A private water treatment company can help you select the best option for your household.

If you are on a public water system

The EPA has a federal drinking water standard of 10 µg/L for public water systems serving places where people live, work, go to school, and receive childcare. These systems take action to reduce arsenic if levels exceed the standard.

You can find the level of arsenic in a community water system (serving your home) by reading their water quality report (also known as a Consumer Confidence Report [CCR]). You can call your public water system to get a paper copy of your CCR or find it online at [Find Your Local CCR](#).

If you want to take additional steps to reduce your exposure to arsenic in drinking water, you can use a home water treatment system. For more information on home water treatment, visit [Home Water Treatment](#).

Noncommunity water systems serving schools, offices, factories, and childcare facilities test for arsenic. You can contact your noncommunity system to find the level of arsenic detected in the water. Noncommunity water systems serving restaurants, resorts, and campgrounds are not required to test for arsenic.

Reducing other contact with arsenic

You may come into contact with arsenic in ways other than drinking water. Reduce your contact with arsenic by following the tips below:

- Do not burn wood that is or may be treated with arsenic. Throw away arsenic-treated wood in the trash with other solid waste. Do not burn wood if you do not know if it has been treated with arsenic.
- Review the ingredient list of health remedies (especially folk remedies) and medications. Some health remedies and medications may contain arsenic.
- Seal decks or other wood structures treated with arsenic when the finish becomes worn or degraded.
- Wash hands after playing or working on play structures or decks that have arsenic-treated wood.

- Wash and peel vegetables grown in soil, especially in urban gardens.
- Follow tips for reducing arsenic exposure from rice, juice, and other foods. Learn more at [What You Can Do to Limit Exposure to Arsenic](#).
- Check old pesticides and soil supplements to see if they contain arsenic. If you are not sure, do not use them.

Background information

Arsenic occurs naturally in soil and rock. Arsenic from soil and rock can dissolve into groundwater and enter drinking water wells. For most people, food and water are the biggest sources of exposure to arsenic. There are two forms of arsenic:

- Inorganic arsenic is formed when arsenic combines with metals and elements other than carbon. Inorganic arsenic is the type found in contaminated drinking water and is the more harmful type of arsenic. This type of arsenic is also found in rice, cereal grains, and other foods.
- Organic arsenic is formed when arsenic combines with carbon. It is the more common type of arsenic found in food. It is common in fish and shellfish and is less harmful to health than inorganic arsenic.

Some arsenic in the environment comes from human activity. Arsenic was an ingredient in some pesticides; was used as a wood preservative for wood foundations, decks, and children's outdoor play structures; and is still used as a preservative for some wood products.

Arsenic in Minnesota's water

Arsenic can be found in groundwater throughout Minnesota but is more likely in some areas than others.

Arsenic has been detected in approximately 49 percent of newly constructed private wells since 2008. About 10 percent of private wells in Minnesota have arsenic levels higher than the EPA standard of 10 µg/L. Arsenic levels can vary between wells, even within a small area. For example, some wells have levels as high as 350 µg/L; but most results are below 50 µg/L. You can see a map of arsenic levels in private wells on the [MN Public Health Data Access Portal](#).

Some public water systems have detected arsenic levels above the EPA standard. When a system that serves homes, schools, offices, factories, or childcare facilities detects arsenic levels above the standard, MDH works with the system to reduce the level to below the EPA standard.

What MDH is doing

MDH regulates public water systems by:

- Approving public water systems' treatment plans.
- Enforcing the [Safe Drinking Water Act](#).

- Testing public water supplies.

MDH regulates private and public wells through:

- Establishing and enforcing [Laws and Rules](#) for proper [Construction of Wells and Borings](#) and [Sealing of Wells and Borings](#).
- Providing guidance for private well owners on [Water Quality/Well Testing/Well Disinfection](#).
- Using Clean Water Funds to conduct a [Private Well Protection Arsenic Study](#) to better understand how water sampling methods and timing impact arsenic test results.

What other groups are doing

- [U.S. Environmental Protection Agency: Drinking Water Arsenic Rule History \(https://www.epa.gov/dwreginfo/drinking-water-arsenic-rule-history\)](https://www.epa.gov/dwreginfo/drinking-water-arsenic-rule-history)
- [Agency for Toxic Substances and Disease Registry \(ATSDR\): Arsenic \(https://www.atsdr.cdc.gov/interactionprofiles/ip04.html\)](https://www.atsdr.cdc.gov/interactionprofiles/ip04.html)
- [Dartmouth University: Arsenic and You \(http://www.dartmouth.edu/~arsenicandyou/\)](http://www.dartmouth.edu/~arsenicandyou/)
- [World Health Organization: Arsenic \(https://www.who.int/news-room/fact-sheets/detail/arsenic\)](https://www.who.int/news-room/fact-sheets/detail/arsenic)

Resources

- [Environmental Laboratory Accreditation Program \(https://eldo.web.health.state.mn.us/public/accreditedlabs/labsearch.seam\)](https://eldo.web.health.state.mn.us/public/accreditedlabs/labsearch.seam)
- [Home Water Treatment \(https://www.health.state.mn.us/communities/environment/water/factsheet/hometreatment.html\)](https://www.health.state.mn.us/communities/environment/water/factsheet/hometreatment.html)
- [Find Your Local CCR \(https://ofmpub.epa.gov/apex/safewater/f?p=136:102:::\)](https://ofmpub.epa.gov/apex/safewater/f?p=136:102:::)
- [What You Can Do to Limit Exposure to Arsenic \(https://www.fda.gov/food/environmental-contaminants-food/what-you-can-do-limit-exposure-arsenic\)](https://www.fda.gov/food/environmental-contaminants-food/what-you-can-do-limit-exposure-arsenic)
- [MN Public Health Data Access Portal \(https://mndatamaps.web.health.state.mn.us/interactive/wells.html\)](https://mndatamaps.web.health.state.mn.us/interactive/wells.html)
- [Safe Drinking Water Act \(https://www.epa.gov/dwstandardsregulations/background-drinking-water-standards-safe-drinking-water-act-sdwa\)](https://www.epa.gov/dwstandardsregulations/background-drinking-water-standards-safe-drinking-water-act-sdwa)
- [Laws and Rules \(https://www.health.state.mn.us/communities/environment/water/wells/rules/index.html\)](https://www.health.state.mn.us/communities/environment/water/wells/rules/index.html)
- [Construction of Wells and Borings \(https://www.health.state.mn.us/communities/environment/water/wells/construction/index.html\)](https://www.health.state.mn.us/communities/environment/water/wells/construction/index.html)

ARSENIC IN DRINKING WATER

- [Sealing of Wells and Borings](https://www.health.state.mn.us/communities/environment/water/wells/sealing/index.html)
(<https://www.health.state.mn.us/communities/environment/water/wells/sealing/index.html>)
- [Water Quality/Well Testing/Well Disinfection](https://www.health.state.mn.us/communities/environment/water/wells/waterquality/index.html)
(<https://www.health.state.mn.us/communities/environment/water/wells/waterquality/index.html>)
- [Private Well Protection Arsenic Study](https://www.health.state.mn.us/communities/environment/water/cwf/arsenic.html)
(<https://www.health.state.mn.us/communities/environment/water/cwf/arsenic.html>)

Minnesota Department of Health
Drinking Water Protection
651-201-4700
health.drinkingwater@state.mn.us
www.health.state.mn.us

08/29/2023R

To obtain this information in a different format, call: 651-201-4700.