Arsenic & PRIVATE WELLS

What is arsenic?

Arsenic is a natural element found in certain types of rocks and soil. Both arsenic 3 and arsenic 5 can be found in groundwater. Arsenic 3 is more toxic and harder to remove. In the environment, arsenic can combine with other elements such as oxygen, chlorine, iron, and sulfur to form inorganic arsenic compounds.

How does arsenic get in my private well water?

Arsenic can get enter your private well from erosion of rocks underground. Arsenic can also enter groundwater from industrial and agricultural activities, such as mining and smelting operations, coal-fired power plants, and historical use of arsenic containing pesticides.

How can arsenic affect my health?

Arsenic is not considered an essential element, meaning your body does not require it. You can't see, smell, or taste arsenic. The U.S. Environmental Protection Agency has also determined that inorganic arsenic is a known carcinogen (cancer-causing substance).

Drinking high levels of arsenic over short periods can lead to:

- Nausea
- Vomiting
- · Irregular heartbeat
- · Muscle cramping or weakness

Drinking arsenic over long periods of time can lead to:

- Changes to pigment of skin
- Lack of muscle coordination and difficulty concentrating
- Small "corns" and "warts" on soles, palms, and torso



- Numbness or tingling in hands or feet
- Decreased red and white blood cell production
- · Liver and kidney damage

What level of arsenic should I be concerned about?

The U.S. Environmental Protection Agency developed a public drinking water standard of 10 micrograms of arsenic per liter of water (µg/L). Public drinking water standards are based on public health protection and cost of treatment/testing at large utilities. This standard was developed in 2001.

The **N.C. Department of Environmental Quality** adopted the same level in 2001 and validated it in 2011.

What if my arsenic levels are high?

Because it is hard to determine the type of arsenic (3 or 5) from a routine inorganic element panel, it is advisable that water with high levels of arsenic use a pretreatment method to effectively convert all forms of arsenic to arsenic 5. Installing a normal treatment system will then remove the arsenic from the water. Because arsenic removal can depend on other compounds found in your specific well water, a professional can further assist you with a pretreatment and treatment system tailored to your situation. You can also speak with an expert from the Occupational and Environmental Epidemiology department by calling (919) 870-4807.

Pretreatment Options:

- · Iron Oxidation Filter
- Manganese Dioxide Filter

Treatment systems that reduce the levels of arsenic in your well water include:

- Adsorptive Media (little waste water)
- · Ion Exchange (similar to water softener)
- Distillation (point of use, low output volume, high electric needs)
- Reverse Osmosis (small water output, large amount of wastewater)

You can also reduce your exposure by using bottled water or connecting to a public water supply, if possible.

How do I test for arsenic in my private well?

Use a certified lab to test your well water for manganese every two years, as part of the North Carolina Division of Public Health's (NC DPH) recommended inorganic panel screen. Contact the private well program at your county health department to assist you with getting your water tested. Pricing of testing varies from county to county.

Where is arsenic found in NC?

Arsenic is found at varying levels (0.001 - 8 mg/L) throughout North Carolina. 2.26% of wells sampled for arsenic in NC from 2018-2019 exceeded the federal/ state standard (0.01 mg/L). Yet, there are several areas in NC where at least 5% of wells sampled had detectable arsenic. See maps for areas with elevated levels of arsenic. Alexander, Anson, Dare, Montgomery, Stanly and Union counties typically have higher occurrences of detectable arsenic.

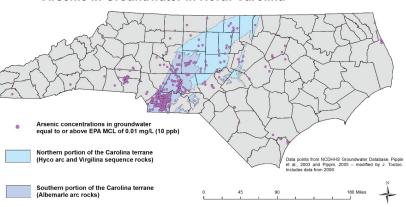
Where can I find more information about arsenic and my well?

Visit the NC Division of Public Health's Private Well and Health Program website: http://epi.publichealth.nc.gov/oee/programs/wellwater.html.

There you can find:

- Contacts for your county private well program
- Arsenic in well water maps
- · A guide for selecting a treatment system
- Other private well resources

Arsenic in Groundwater in North Carolina



You can also call the NC DPH's Private Well and Health Program at 919-707-5900.

Where did this information come from?

Agency for Toxic Substances & Disease Registry www.atsdr.cdc.gov/toxfaqs/tfacts2.pdf

U.S. Environmental Protection Agency

https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=60000E1E.txt

https://cfpub.epa.gov/safewater/arsenic/ arsenictradeshow/arsenic.cfm?action=Treatment

National Sanitation Foundation

www.nsf.org/consumer-resources/articles/contaminant-reduction-claims-guide

NC Department of Health and Human Services

https://epi.dph.ncdhhs.gov/oee/docs/ArsenicInfo.pdf

NC Department of Environmental Quality

https://deq.nc.gov/about/divisions/energy-mineralland-resources/north-carolina-geological-survey/ geologic-hazards/radon-arsenic

https://deq.nc.gov/about/divisions/water-resources/ water-quality-regional-operations/groundwaterprotection/ground-water-quality-monitoring/ private-well-water-quality

