

Selenium & PRIVATE WELLS

What is selenium?

Selenium is a natural element found in rocks deep underground and soil. In the environment, selenium is found joined to other elements like sulfur, silver, copper, lead, and nickel.

Selenium is used in the electronics industry and glass production. Selenium is also a part of pigments, paints, inks, rubber, nutritional supplements, and fungicides.

How does selenium get in my private well water?

Selenium can enter your private well water from erosion of rocks underground. Selenium can also enter groundwater from manufacturing activities.

If selenium is very soluble or easily dissolves in water, it is more likely to be found in well water. Alkaline water (water with high pH) can make selenium more soluble.

How can selenium affect my health?

Selenium is an essential element, meaning your body needs it in small quantities. Selenium is a part of some proteins involved in cell cycle regulation, immune surveillance, and cell death. However, drinking high levels of selenium may cause adverse health effects. You can't see or taste selenium. At very high levels selenium may cause well water to have a garlic odor.

Drinking high levels of selenium over short periods of time can lead to:

- Nausea
- Vomiting
- Diarrhea



Drinking selenium over long periods of time may lead to selenosis, a disease known for hair loss, brittle nails, and numbness of extremities.

What level of selenium should I be concerned about?

The **NC Department of Environmental Quality** developed a groundwater standard of **0.02 milligrams of selenium per liter of water (mg/L)**.

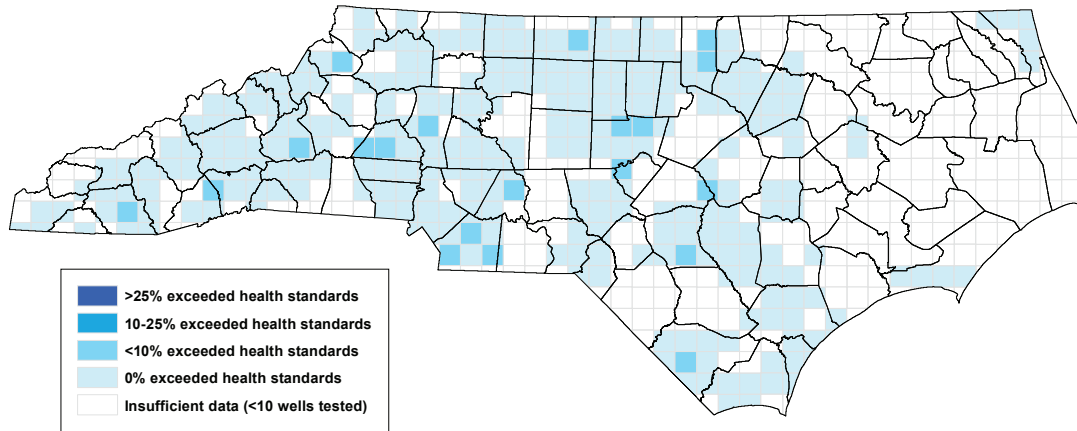
Ground water standards are developed to protect public health. This standard was developed in 2013.

The **US Environmental Protection Agency** developed a public drinking water standard of **0.05 mg/L** for selenium. Public drinking water standards are based on public health protection and cost of treatment/testing at large utilities. This standard was developed in 1992 and was validated in 2017.

How do I test for selenium in my private well?

Use a certified lab to test your well water for selenium every two years, as part of the 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.

Percent of Private Wells Tested
Exceeding State and Federal Standards for
Selenium, 2011-2013



What if my selenium levels are high?

You can install a treatment system to reduce the levels of selenium in your private well. Treatment systems that reduce the levels of selenium in your well water include:

- Anion Exchange
- Distillation
- Reverse osmosis

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

Where is selenium found in NC?

Selenium is found at low levels (0.005-0.155 mg/L) throughout NC. **Less than 1%** of wells sampled for selenium in NC from 2011 to 2013 exceeded state and/or federal standards. Yet, there are several areas in NC with at least 10% of wells exceeding state and/or federal standards. See map for areas with elevated selenium.

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

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

There you can find:

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

You can also call the 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/tfacts92.pdf

World Health Organization: www.who.int/water_sanitation_health/dwq/chemicals/selenium.pdf

National Sanitation Foundation: www.nsf.org/consumer-resources/what-is-nsf-certification/water-filters-treatment-certification/contaminant-reduction-claims-guide

Water Quality Association: www.wqa.org/Portals/0/Technical/Technical%20Fact%20Sheets/2015_Selenium.pdf

