

Nitrate, Nitrite & PRIVATE WELLS



What is nitrate and nitrite?

Nitrate and nitrite are nitrogen compounds, with nitrogen, a natural gas, bound to oxygen. Nitrate and nitrite are found in water, air, soil, and rocks deep underground.

Nitrate and nitrite are used to preserve food, in medical drugs and to produce ammunition and explosives. Nitrate is used in most inorganic fertilizers.

How does nitrate and nitrite get in my private well water?

Nitrate and nitrite can enter your private well water from erosion of rocks underground and leaching from soil into groundwater. Rain may wash out nitrate and nitrite from animal waste and nitrogen containing fertilizers at the surface to groundwater.

How can nitrate and nitrite affect my health?

Nitrate and nitrite are sources of nitrogen for your body. Nitrogen is a major part of proteins and deoxyribonucleic acid (DNA). However, drinking high levels of nitrate and nitrite may cause adverse health effects. You can't smell, taste or see nitrate or nitrite.

Drinking high levels of nitrate and nitrite can lead to decreased oxygen transport throughout the body.

This may cause:

- Decreased blood pressure
- Increased heart rate
- Headaches
- Vomiting
- Stomach cramps

Pregnant women and infants less than six months of age are very sensitive to nitrate and nitrite toxicity.

What level of nitrate and nitrite should I be concerned about?

The **NC Department of Environmental Quality** developed a groundwater standard of **10 milligrams of nitrate per liter of water (mg/L)** and **1.0 milligram of nitrite 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** used the same values for public drinking water standards. Public drinking water standards are based on public health protection and cost of treatment/testing at large utilities. These standards were developed in 1992 and validated in 2017.

How do I test for nitrate and nitrite in my private well?

Use a certified lab to test your well water for nitrate and nitrite 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.

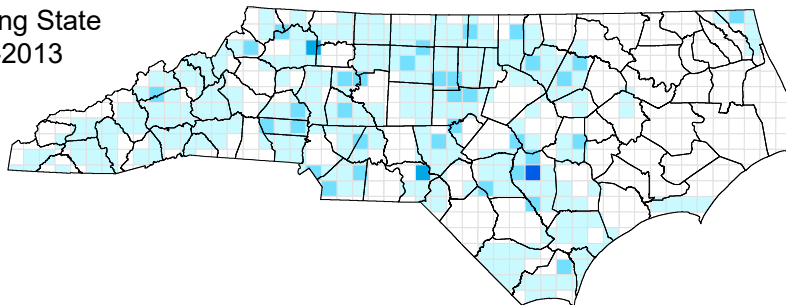
What if my nitrate and nitrite levels are high?

If there are infants or pregnant women at the residence, you can install a treatment system to reduce the levels of nitrate and nitrite in your private well. Treatment systems that reduce the levels of nitrate and nitrite in your well water include:

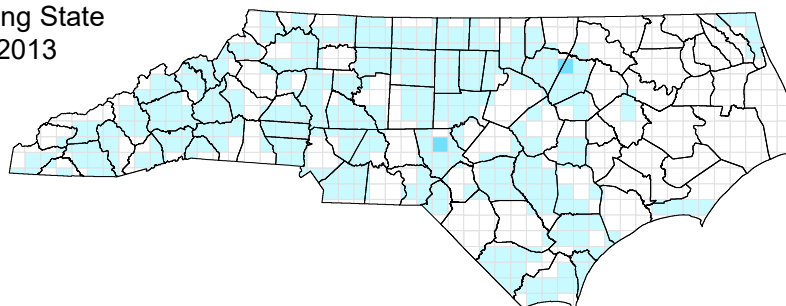
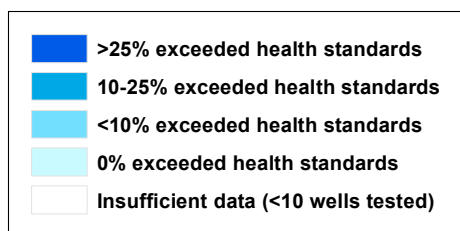
- Anion exchange
- Distillation
- Reverse osmosis

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

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



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



Where are nitrate and nitrite found in NC?

Nitrate is found at varying levels (1-97 mg/L) throughout NC. **Less than 1%** of wells sampled for nitrate in NC from 2011 to 2013 exceeded state and federal standards. Yet, there are several areas in NC with at least 10% of the wells exceeding state and federal standards. See map for areas with elevated nitrate.

Nitrite is found at varying levels (0.1-2.1 mg/L) throughout NC. **Less than 1%** of wells sampled for nitrite in NC from 2011 to 2013 exceeded state and federal standards. Yet, there are several areas in NC with at least 10% of the wells exceeding state and federal standards. See map for areas with elevated nitrite.

Where can I find more information about nitrate and nitrite and my well?

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

There you can find:

- Contacts for your county private well program
- Nitrate and nitrite 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/tfacts204.pdf

World Health Organization: www.who.int/water_sanitation_health/dwq/chemicals/nitratenitrite2ndadd.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/2014_NitrateNitrite.pdf

