Nitrate

Nitrate is a compound that occurs naturally and also has many human-made sources. Nitrate is in some lakes, rivers, and groundwater in Minnesota. When nitrate is found in Minnesota groundwater, it is usually at very low concentrations. However, some groundwater has nitrate concentrations that present a health risk—especially for babies. You cannot taste, see, or smell nitrate in your water.

Safe Level

Drinking water with concentrations of nitrate (measured as nitrate-nitrogen) below 10 milligrams of nitrate per liter of water (mg/L) is considered safe for everyone in your family. 10 mg/L is the U.S. Environmental Protection Agency standard for nitrate in drinking water for public water supplies.

Health Risks

Consuming too much nitrate can affect how blood carries oxygen and can cause methemoglobinemia (also known as blue baby syndrome). Bottle-fed babies under six months old are at the highest risk of getting methemoglobinemia. Methemoglobinemia can cause skin to turn a bluish color and, left untreated, can result in serious illness or death.

The following conditions may also put people at higher risk of developing nitrate-induced methemoglobinemia: anemia, cardiovascular disease, lung disease, sepsis, glucose-6-phosphate-dehydrogenase deficiency, and some metabolic problems.

Prevent Contamination

- Keep nitrate sources away from your well. Sources may include fertilizer, septic systems, and animal waste.
- Construct your well in a safe spot. See the "Protecting Your Well" webpage for tips.
- Regularly inspect your well for damage. Contact a licensed well contractor if your well is damaged.

Test Your Well Water

Test for nitrate every other year.

You are responsible for keeping your well water safe and testing it as needed. MDH recommends you use an accredited laboratory to test your water. Contact an accredited laboratory to get sample containers and instructions, or ask your county environmental or public health services if they provide well testing services.

Well Testing, Results, and Options
(www.health.state.mn.us/welltesting)

MDH may recommend you test for additional contaminants based on where you live.

Address Contamination

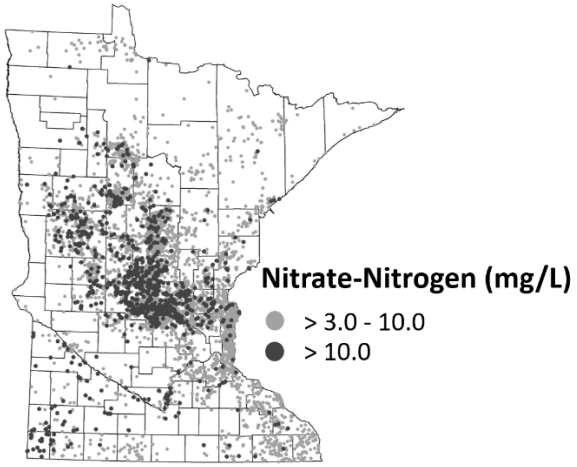
Drinking water with concentrations of nitrate above 10 mg/L can cause immediate health problems. If nitrate is detected in your water at concentrations above 10 mg/L, follow these steps:

- Get your drinking water from a safe alternative source, such as bottled water.
- Make sure babies under six months old do not drink the well water.
- Do not try to boil nitrate out of the water. Boiling will make nitrate more concentrated.
- Have a licensed well contractor inspect your well.
- Find and get rid of any potential sources of nitrate contamination. The "Protecting Your Well" webpage can help you identify sources to check.
- Home water treatment may be an option if you meet these three criteria:
  1. You took steps to reduce or eliminate all potential sources of nitrate on your property;
  2. A licensed well contractor inspected your well and completed any needed repairs; and
  3. No babies under six months old drink the water (a safety precaution in the event the water treatment fails).

  See the "Home Water Treatment" webpage or contact MDH for guidance.

Nitrate in Minnesota Water

About 4 percent of new wells have nitrate concentrations above 3 mg/L in Minnesota. While 3 mg/L is less than the EPA standard, it suggests human-made sources of nitrate have contaminated the water and the level could increase over time.



Nitrate-Nitrogen in New Private Wells (1991-2018)

The Minnesota Department of Agriculture Township Testing Program found that over 10 percent of the private wells sampled in some townships in southwestern, southeastern, central, and north-central Minnesota have nitrate levels above 10 mg/L. Learn more at Township Testing Program (www.mda.state.mn.us/township-testing-program).

Wells Vulnerable to Nitrate

- Shallow wells.
- Wells in sand aquifers.
- Dug wells with casings that are not watertight.
- Wells with damaged or leaking casing or fittings.

Resources

Protecting Your Well (www.health.state.mn.us/communities/environment/water/wells/construction/protect).

Licensed Well and Boring Contractor Directory (www.health.state.mn.us/lwcsearch).

Search for Accredited Laboratories (www.health.state.mn.us/labsearch).

Home Water Treatment (www.health.state.mn.us/communities/environment/water/factsheet/hometreatment.html).

MDH District Offices

625 North Robert Street
P.O. Box 64975
St. Paul, Minnesota 55164-0975
651-201-4600 or 800-383-9808
health.wells@state.mn.us
www.health.state.mn.us/wells

705 Fifth Street Northwest
Bemidji, Minnesota 56601
218-308-2100

11 East Superior Street
Duluth, Minnesota 55802
218-302-6166

1505 Pebble Lake Road
Fergus Falls, Minnesota 56537
218-332-5150

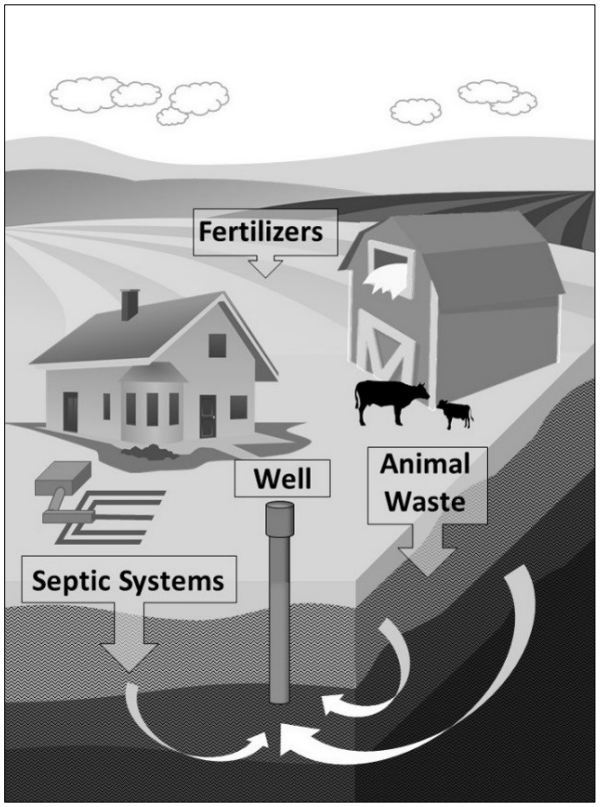
3333 West Division Street
St. Cloud, Minnesota 56301
320-223-7300

1400 East Lyon Street
Marshall, Minnesota 56258
507-476-4220

18 Wood Lake Drive Southeast
Rochester, Minnesota 55904
507-206-2700

To obtain this information in a different format, call 651-201-4600.
Printed on recycled paper.
origs\Nitrate in Well Water 07/30/2019R

Nitrate in Well Water



DEPARTMENT OF HEALTH

Well Management Section
Environmental Health Division