

## Nitrate at Transient Non-Community Water Systems

### What is nitrate?

Nitrate is a compound made up of nitrogen and oxygen. Nitrate is an essential nutrient for plant growth and occurs in plants at varying concentrations. It is naturally found in groundwater at low levels. Higher levels of nitrate may be found near farm fields, barnyards, feedlots, septic tanks, septic fields/mounds, municipal wastewater treatment systems or “sludge” spreading sites. Wells located near these land use activities may produce drinking water with elevated concentrations of nitrate.

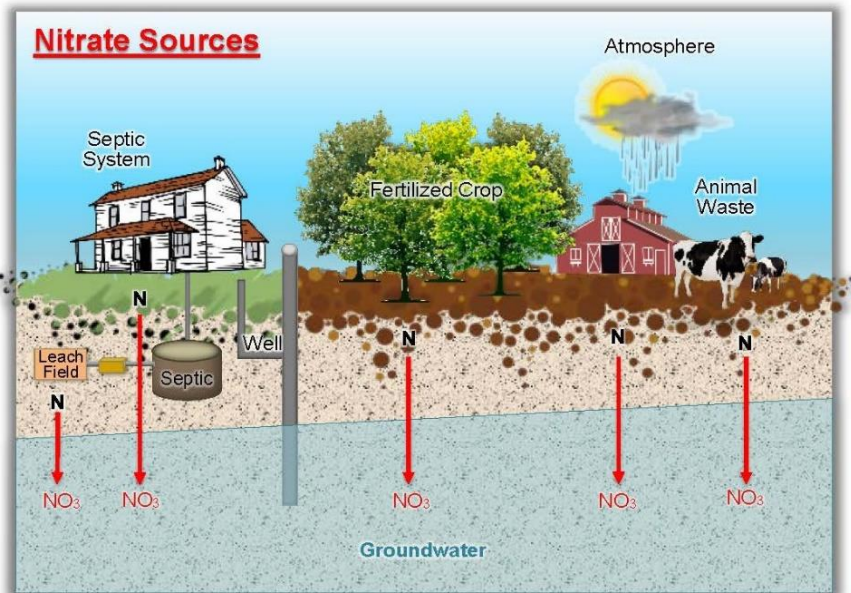


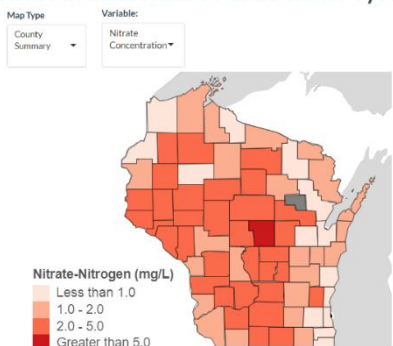
Figure 1 - Nitrate Sources – Reprinted with permission from <https://www.waterboards.ca.gov/centralvalley/>

### Why should I be concerned?

Nitrate poses a significant health risk in drinking water at concentrations of 10 milligrams per liter (mg/L) and above. In infants under 6 months of age ingestion of nitrate can reduce the blood's ability to carry oxygen. This may result in an infant's skin turning to a bluish or gray color. In more serious cases the infant may experience weakness, increased heart rate, fatigue and dizziness. Some scientific studies have found a link between exposure to high nitrate levels in drinking water during the first weeks of pregnancy and neural tube defects (a type of birth defect). Consuming high levels of nitrate in drinking water may also increase the risk of thyroid disease, and certain types of cancer.

### What levels of nitrate are found in Wisconsin public wells?

#### Nitrate in Wisconsin's Public Water Systems



For information on nitrate trends in drinking water in Wisconsin public water systems [click here](#).

Figure 2 - Nitrate in Wisconsin's Public Water Systems - Center for Watershed Science and Education, UWSP

## Monitoring for nitrate



Figure 3 - Nitrate sample kit



Figure 4 - Nitrate Sampling

Due to the acute health risks associated with nitrate in drinking water, all public water systems, including transient non-community (TN) systems, are required to sample for nitrate at least annually. Nitrate samples should be taken from the entry point to the distribution system (the first available tap after treatment). If the water system does not have any treatment (sediment filter, water softener, etc.), the sample can be taken at the well sample tap near the pressure tank.

[Click here](#) for nitrate sample site information.

[Click here](#) for nitrate sample collection directions.

## What happens if a TN facility has a high nitrate result?

If the results of the nitrate sample are reported by the laboratory to have a concentration of 10 mg/L or above, a confirmation or check sample is required. In contracted counties, this sample will be taken by the contract county staff. If your facility performs its own sampling, you will be contacted by the DNR staff and a sample kit with bottle and lab slip will be sent to your facility. If the confirmation sample cannot be taken within 24 hours of notification, a tier 1 Public Notice template will be provided by DNR staff and must be posted at the facility. The water supplier must take the confirmation sample as soon as possible, but no later than 2 weeks after notification of the results of the first sample.

[Click here](#) for a sample public notice.

<b>Drinking Water Warning</b>	
<b>Babies or females who are or may become pregnant should not drink SYSTEM NAME water because of nitrate levels</b>	
<p>We are required to monitor your drinking water for nitrate on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. A water sample collected on 8/18/11 indicated the presence of nitrate in excess of the 10 mg/L Maximum Contaminant Level (MCL) in your drinking water. We were required to take a confirmation sample within 24 hours. We did not complete confirmation monitoring within 24 hours and therefore cannot be sure of the quality of your drinking water during that time.</p>	
<p><b>What precautions should be taken at this time?</b></p> <ul style="list-style-type: none"> <li>• <b>DO NOT GIVE THE WATER TO INFANTS.</b> Infants younger than six months of age who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. Blue baby syndrome is indicated by blueness of the skin. Symptoms in infants can develop rapidly, with health deteriorating over a period of days. If symptoms occur, seek medical attention immediately.</li> <li>• <b>FEMALES WHO ARE OR MAY BECOME PREGNANT SHOULD NOT CONSUME THIS WATER.</b> (Consumption means drinking the water or eating foods prepared with the water, such as soups, juices, and coffee.) There is some evidence of an association between exposure to high nitrate levels in drinking water during the first weeks of pregnancy and certain birth defects.</li> <li>• <b>DO NOT PREPARE BABY FORMULA, JUICE or DRINKS</b> for infants under six months with this tap water.</li> <li>• <b>DO NOT BOIL THE WATER.</b> Boiling, freezing, filtering, or letting water stand does not reduce the nitrate level. Excessive boiling can make the nitrates more concentrated, because nitrates remain behind when the water evaporates.</li> <li>• <b>USE BOTTLED WATER</b> or water from another source KNOWN TO BE SAFE.</li> </ul>	
<p><b>What does this mean?</b> Persons older than six months and anyone who is not or may not become pregnant can drink this water occasionally without harm. Nitrate is found in many natural and processed foods. However, nitrate is an acute hazard for infants because they don't digest nitrate like adults, causing a lack of oxygen in their blood. The Wisconsin Department of Health Services recommends people of all ages avoid long-term consumption of water that has a nitrate level greater than 10 milligrams per liter (mg/L).</p>	
<p>Nitrate in drinking water can come from natural, industrial, or agricultural sources (including septic systems, fertilizers, and run-off). Levels of nitrate in drinking water can vary throughout the year.</p>	
<p><b>What is being done to correct the problem?</b></p> <p>Corrective action(s) taken: _____</p>	
<p>We are working to resolve this problem as soon as possible. We'll let you know when the amount of nitrate is again below the limit.</p>	
<p><b>If you have questions regarding the safety of our drinking water, please contact:</b></p> <p>Name of Responsible Person: _____ Area Code-Telephone Number: _____</p> <p>Street Address: _____ City: _____ State: _____ Zip: _____</p>	
<p>I certify that the information and statements contained in this public notice are true and correct and have been provided to consumers in accordance with the delivery, content, format, and deadline requirements in Subchapter VII of CHAPTER 809, Wis. Adm. Code.</p> <p><input checked="" type="checkbox"/> X _____ Date: _____</p> <p style="text-align: right;">Signature _____ Date _____</p>	
<p><small>Tier 1 Notice</small></p>	

Figure 5 - Public notice after initial sample > 10 mg/L

## Nitrate Maximum Contaminant Level (MCL) violations and continuous posting

The results of the original sample and the check sample are averaged to determine compliance. If the average of the two samples is above 10 mg/L, the facility will have a nitrate MCL violation and must post Public Notices at all water outlets.

[Click here](#) for a nitrate placard.

[Click here](#) for a sample nitrate post notice.

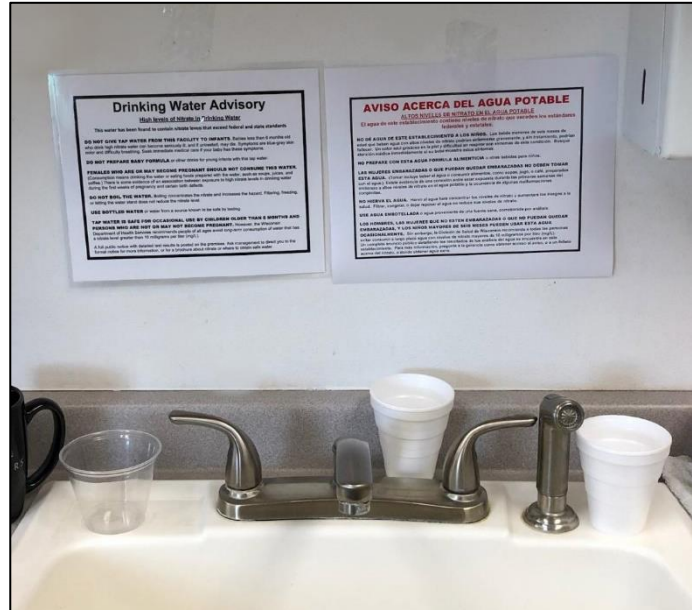


Figure 6 - Nitrate placard posted at sink

The department may allow a TN water system to continue to use water with nitrate levels above 10 mg/L, but not exceeding 20 mg/L according to section NR 809.11(3), Wis. Adm. Code while a facility is connecting to a safe water source or constructing a safe water source. The following conditions must be demonstrated to the satisfaction of the department for a TN public water system to continue to serve this water.

1. Such water will not be available to children under 6 months of age or any female who is or may become pregnant.
2. There will be continuous posting at all water outlets of the fact that nitrate levels exceed 10 mg/L and the potential health effects of exposure. In restaurants and taverns where tap water is served, a notice shall be posted at each table or in menus.
3. Local and state public health authorities will be notified annually of nitrate levels that exceed 10 mg/L.
4. A supply of low nitrate (containing less than 10 mg/L nitrate), bacteriologically safe drinking water shall be provided for any female who is or may become pregnant and infants under 6 months of age.
5. No adverse health effects will result. The Department has been advised by the Wisconsin Department of Health Services that there is evidence of an association between exposure to high nitrate levels in drinking water during the first weeks of pregnancy and certain birth defects. Females who are or may become pregnant should not consume this water.

## Plans to require compliance with the nitrate standard

On April 1, 2023, the department implemented a three-year process to discontinue department discretion of allowing TN systems to operate under certain provisions with reported nitrate concentrations between 10 and 20 mg/L. This was in response to the most recent health effect data and to a request by the US EPA. Systems currently on continuing operation will have until April 1, 2026, to evaluate their options to comply with the MCL. The DNR will be available throughout the process to assist systems in evaluating options to return to compliance. Systems with new MCL exceedances for nitrate will work with DNR staff to return to compliance in a shorter timeframe.

## Nitrate over 20 mg/L

If nitrate is reported to be equal or greater than 20 mg/L, the facility must immediately post a DO NOT DRINK water advisory and take a check sample as soon as possible. The results of the original sample and the check sample will be averaged, and if it is greater than 20 mg/L, the facility must take immediate actions to address the nitrate violation. Actions include providing an alternative safe source of water to all consumers of water within 24 hours of receiving the results and taking actions to return to compliance with the nitrate standard. The nitrate sampling schedule will increase to quarterly sampling. This increased monitoring schedule will be required until nitrate results are reliably and consistently below the nitrate MCL, with at least four consecutive quarterly samples below 10 mg/L.

[Click here](#) for an example of the nitrate public notice required when a sample is reported to be greater than 20 mg/L nitrate.

<b>Drinking Water Warning</b>	
<b>System Name</b> water contains high levels of nitrate	
<b>DO NOT DRINK THE TAP WATER</b>	
Water at this establishment contains nitrate exceeding 10.0 milligrams per liter (10 mg/L) the maximum contaminant level (MCL) allowed. A sample collected on <b>Date</b> had a concentration of <b>Result mg/L</b> and a sample collected on <b>Date</b> had a concentration of <b>Result mg/L</b> resulting in an average concentration of <b>Average mg/L</b> . This is a violation of State and Federal Safe Drinking Water Regulations.	
<b>What precautions should be taken at this time?</b>	
<b>DO NOT DRINK THE TAP WATER - USE ONLY BOTTLED WATER.</b> Bottled water should be used for all drinking (including baby formula and juice), making ice, brushing teeth, and food preparation.	
<b>DO NOT TRY TO TREAT THE WATER.</b> Boiling, freezing, filtering, adding chlorine or other disinfectants, or letting water stand will not make the water safe to use.	
<b>What are the symptoms associated with the exposure to high levels of nitrate?</b>	
Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. Blue baby syndrome is indicated by blue grey skin. Symptoms develop rapidly, with health deteriorating over several days. If these symptoms occur, seek medical attention immediately.	
Females who are or may become pregnant should not consume this water. (Consumption means drinking the water or eating foods prepared with the water, such as soups, juices, and coffee.) There is some evidence of an association between exposure to high nitrate levels in drinking water during the first weeks of pregnancy and certain birth defects.	
<b>What does this mean?</b>	
Water from this facility can be used for washing and cleaning laundry and dishes. People of all ages are urged to avoid consumption of high nitrate water.	
Nitrate in well water comes from groundwater contaminated by fertilizer, manure, seepage from septic systems or stormwater run-off.	
<b>What is being done to correct the problem?</b>	
We are evaluating the following options to meet the State and Federal Nitrate standards by <b>Enter date compliance must be achieved:</b>	
Corrective action(s) taken: _____	
As a precautionary measure, you should use bottled water until we inform you that our sampling shows that the high levels of nitrate are not present. We are working to resolve this problem as soon as possible.	
<b>If you have questions regarding the safety of our drinking water, please contact:</b>	
Name of Responsible Person _____	Area Code-Telephone Number _____
Street Address _____	City _____ State _____ Zip _____
I certify that the information and statements contained in this public notice are true and correct and have been provided to consumers in accordance with the delivery, content, format, and deadline requirements in Subchapter VII of ch. NR 809, Wis. Adm. Code.	
<input checked="" type="checkbox"/> _____	Signature _____ Date _____

Figure 7 - Public Notice for > 20 mg/L

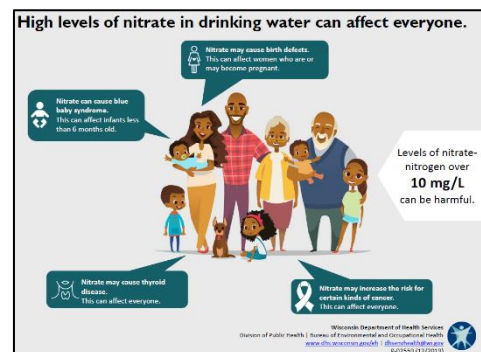
## How can a TN water system return to compliance?

TN public water systems that have an ongoing nitrate MCL exceedance should consider options for returning to compliance. These options might include constructing a replacement well, reconstructing an existing well, connecting to a neighboring well or water supply that is properly constructed and provides safe water, or installing treatment.

Department staff can assist in evaluating options. The first step should be to evaluate the feasibility of drilling a new well or connecting to another public water system with safe drinking water. Local geology, well construction reports and nitrate levels in nearby wells may help determine what casing requirements and well depth would most likely supply water below the nitrate MCL at a specific location. Treatment for a primary drinking water contaminant can only be considered after it's been determined that other options are not feasible. Any treatment installed must be approved by the Department and by the Department of Safety and Professional Services. System owners that install treatment without approval may be subject to additional corrective actions and escalated enforcement actions.

## Additional Nitrate Information

- WI DNR - Nitrate in Drinking Water  
[Click here](#)
- WI DHS - Nitrate in Private Wells [Exit DNR]  
[Click here](#)



For more information regarding Transient Non-community Public Drinking Water, please visit our website <https://dnr.wisconsin.gov/topic/DrinkingWater/TNownerOperator.html> or contact the DNR Service Center Desk for assistance at (888) 936-7463