

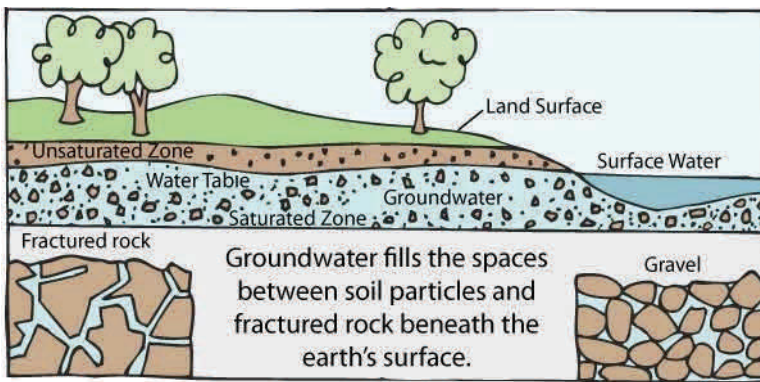
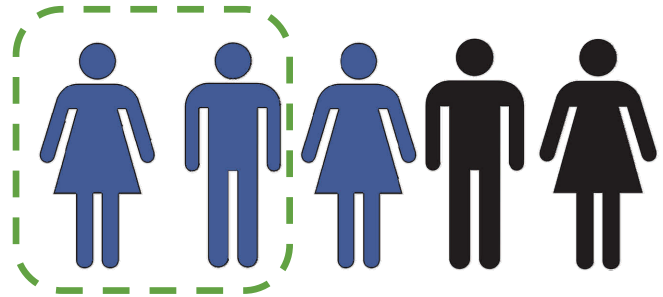
# Private Well Water Basics

## A Quick Guide for Local Health Agencies

### Understanding Groundwater

More than two-thirds of Wisconsin residents use groundwater as their drinking water source and more than 40% of residents rely on a private well for their drinking water.

**Local public health agencies can help private well owners by understanding the aquifers in their area and whether they are vulnerable to contamination.**

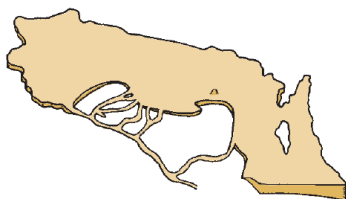


**Groundwater** is water that collects within the pores and cracks of the soil and rocks under the surface of the earth.

**Aquifers** are rock or soil formations that can store or transmit groundwater. Some aquifers are more likely to become contaminated than others. This likelihood (vulnerability) depends on depth, the presence of fractures, and other factors.

### Wisconsin's Aquifers

#### Sand and Gravel



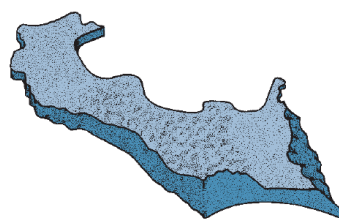
- Surface material covering most of the state.
- Highly susceptible to human-induced and naturally occurring contaminants.

#### Eastern Dolomite



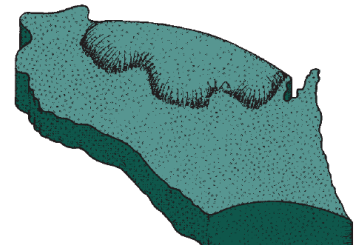
- Type of limestone found in the eastern part of the state.
- Shallow portions of this aquifer can be easily contaminated.

#### Sandstone and Dolomite



- Principal bedrock aquifer for a lot of the state.
- Can contain fractures that allow for contamination.

#### Crystalline Bedrock



- Rocks that underlie the entire state, but does not typically provide large quantities of water.
- Can contain fractures that allow for contamination.

### WISCONSIN DEPARTMENT OF HEALTH SERVICES

Division of Public Health | Bureau of Environmental and Occupational Health  
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Image credits:

The Groundwater Foundation, [www.groundwater.org](http://www.groundwater.org).  
Wisconsin Department of Natural Resources



## How Private Wells Work

A private well works by pumping water from the aquifer into a home.

Most wells consist of the following components:

- **Well casing:** tubing placed inside the well hole to maintain shape.
- **Well screen:** filtration material placed near the bottom of the well to stop rocks and soil from entering the well.
- **Pump:** a machine that moves water through the well by either suction (submersible pump) or pushing (jet pump).
- **Well cap:** a cover that is placed on the top of the casing to keep out water, bugs, animals, and other debris.
- **Pressure tank:** a storage container located in the house.



Wells can have a range of widths and depths. Typically, the deeper the well the better the water quality.

## Homeowners and Well Maintenance

Owning a well is like owning a private water utility company. Well owners are responsible for everything from keeping the well in good condition to monitoring water quality to fixing problems.

Some tips for maintaining a private well are to:

- Work with [licensed professionals](#).
- Make sure the ground slopes away from the well.
- Regularly check the condition of the well.
- Ensure the well cap is secure and in good condition (no cracks, holes, or other damage).
- Keep the area around the well clean and safe.
- Avoid damaging the well casing.
- Keep records for all well work and testing.

**Local public health agencies can help well owners stay safe by encouraging them to regularly inspect their wells, test their water, and address problems right away.**

Image credits:

United States Environmental Protection Agency

## Private Well Contamination

Contamination of private wells has been found throughout Wisconsin. **Many contaminants do not affect the color, smell, or taste of the water.** The only way to make sure a well is safe for drinking is to test regularly. While new wells are required to be tested for bacteria and nitrate, many private wells are not tested on a regular basis. The Wisconsin Department of Natural Resources (DNR) estimates that **only 10% of private well owners test their water regularly.**

### Help Residents Know their Water Quality

#### 1. Encourage regular well water testing.

Bacteria and nitrate should be measured every year by a [certified lab](#).

Other contaminants like arsenic should be measured at least once during ownership.

#### 2. Ensure a confirmation sample has been taken if levels are high.

If only one test has been conducted, a confirmation sample should be collected to confirm whether the initial result is accurate.

#### 3. Provide advice about appropriate water use.

Advice in the form of a [drinking water advisory letter](#) can be sent to the well owner and users.

#### 4. Recommend actions to reduce exposure if levels are high.

Recommendations may include using bottled water, installing a treatment system, or disinfecting the well depending on the contaminant.

### Common Contaminants in Wisconsin's groundwater

#### Nitrate

- High levels of nitrate are common across the state.

##### Test for nitrate:

- At least once a year.
- If water will be used by pregnant woman or infant.

##### If levels are above 10 mg/L:

- Women who are or may become pregnant and babies should not use the water for drinking or cooking.
- Everyone else should avoid continued use of the water for drinking and cooking.

#### Bacteria

Bacteria contamination are common across the state.

##### Test for bacteria:

- At least once a year.
- If water color, taste, or odor changes.

##### If bacteria are present:

- Do not drink the water.
- Do not use the water for cooking and preparing food.

#### Arsenic

High levels of arsenic are most common in northeastern Wisconsin, but can be found across the state.

##### Test for arsenic:

- At least once every five years.
- Once a year if well has had arsenic before or if in area with high arsenic.

##### If levels are above 10 µg/L:

- Do not drink the water.
- Do not use the water for cooking foods that require a lot of water (infant formula, soup, rice).

## Resources

Several state agencies work together to ensure safe groundwater and drinking water for the citizens of Wisconsin.



### DNR

#### Responsibilities

Preserve Wisconsin's natural resources by managing fish, wildlife, forests, parks, air, and water resources.



### DATCP

#### Responsibilities

Promote quality food, healthy plants and animals, sound use of land and water resources, and a fair marketplace.



### DSPS

#### Responsibilities

Ensure safe and competent practice of licensed professionals and sanitary conditions in



### DHS

#### Responsibilities

Protect and promote the health and safety of the people of Wisconsin.

### Groundwater Resources

- Sets minimum requirements for well [construction](#) and [abandonment](#).
- Establishes standards for [contaminants](#) in drinking water and groundwater.
- Offers [funds](#) to qualified homeowners to replace problem wells.

### Groundwater Resources

- Regulates [pesticide and fertilizer](#) use.
- Provides support for development of [nutrient management plans](#).
- Monitors [groundwater](#) for the presence of agricultural chemicals.

### Groundwater Resources

- Maintains a list of [certified water treatment devices](#).
- Regulates the installation of plumbing and [private on-site wastewater treatment \(septic\) systems](#).
- Provides [funds](#) to qualified owners to replace problem

### Groundwater Resources

- Provides health information on groundwater and drinking water [contaminants and hazards](#).
- Provides exposure and health information on [chemicals](#) that may be found during a site investigation.

## Additional Resources

The [United States Geological Survey](#) (USGS) has information about wells and groundwater contamination.

The Wisconsin Natural Resources magazine article, [Groundwater: Powering Wisconsin's Economy](#), has information on how groundwater is used in Wisconsin.

The [Wisconsin Geological and Natural History Survey](#) has details on the aquifers found in Wisconsin.

[Is the Grass Greener over Your Septic Systems](#) (DSPS) has details on how septic systems can impact groundwater.

## Questions?

Contact us at [dhsenvhealth@wi.gov](mailto:dhsenvhealth@wi.gov)