

## Iron Bacteria in Well Water

Iron bacteria are small living organisms that naturally occur in soil, shallow groundwater, and surface waters. These bacteria combine iron (or manganese) and oxygen to form deposits of "rust," bacterial cells, and a slimy material that sticks the bacteria to well pipes, pumps, and plumbing fixtures.

## How to Detect Iron Bacteria

### Tastes and Odors

- Swampy, oily or petroleum, cucumber, sewage, rotten vegetation, or musty.
- May be more noticeable after the water has not been used for a while.

### Color

- Yellow, orange, red, or brown stains and colored water.
- Rainbow colored, oil-like sheen.

### Red Slimy Deposits

- Sticky rusty, yellow, brown, or grey slime.
- "Feathery" or filamentous growths (especially in standing water).

You can confirm that it is iron bacteria by having the water tested at a laboratory.

## Iron Bacteria May Help Other Organisms Grow

Iron bacteria are not known to cause disease. However, they can create conditions where other disease-causing organisms may grow. They can also affect how much water the well produces and may cause clogging issues.

To be safe, test the water for nitrate and coliform bacteria. Make sure the well is properly constructed, located, and maintained.

## Prevent Iron Bacteria

Iron bacteria are in most soils in Minnesota. Drilling, repair, or service work can also introduce iron bacteria into a well or water system. Here are some ways to prevent iron bacteria from entering your well:

- Only place disinfected water in a well for drilling, repair, or priming pumps. Never use water taken from a lake or pond.
- Make sure the well casing is capped, watertight, and extends at least one foot above ground.
- Avoid placing pumps, well pipes, and well equipment on the ground when doing repairs.
- Disinfect the well, pump, and plumbing after repairs.

## Treatment to Address Iron Bacteria

Some treatment techniques may remove or reduce iron bacteria. Eliminating iron bacteria can be difficult and expensive. Sometimes treatment techniques may only be partly effective. Contact a licensed well contractor or water treatment professional to determine the best approach for your situation.

### Physical Removal

Physical removal is usually the first step in very infected wells. A licensed well contractor will:

1. Remove and clean the pumping equipment.
2. Scrub the well casing with brushes.
3. The next step is usually chemical treatment.

## Chemical Treatment

This is the most common treatment technique for iron bacteria. There are three groups of chemicals people use for this:

- **Disinfectants** are the most common chemicals used to treat for iron bacteria. The most common disinfectant is household laundry bleach, which contains chlorine. Contact a licensed well contractor to disinfect your well, or use the instructions on the "Well Disinfection" webpage.
- **Surfactants** are detergent-like chemicals, such as phosphates. Surfactants are generally used with other chemical treatment. It is important to use a disinfectant (such as chlorine) if phosphates are used; bacteria may use phosphates as a food source. Only trained professionals should do a surfactants treatment.
- **Acids** can dissolve iron deposits, destroy bacteria, and loosen bacterial slime. Acids are typically part of a series of treatments involving chlorine and sometimes bases. Only trained professionals should do an acid treatment. Be very careful you properly use and dispose of these chemicals. Never mix acid and chlorine.

### Pasteurization

Pasteurization injects steam or hot water into the well to keep the well water temperature at 60 degrees Celsius (140 degrees Fahrenheit) for 30 minutes. Pasteurization can be effective but expensive.

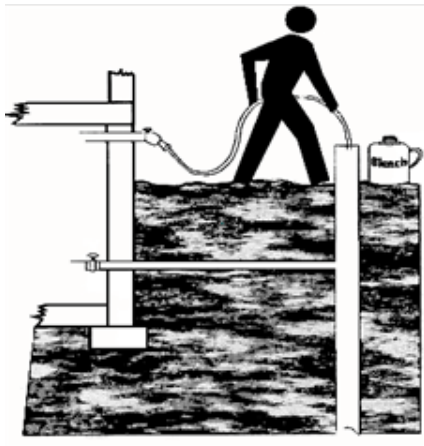
## Chlorine

Chlorine is cheap and easy to use, but it may not always get rid of iron bacteria. You may have to treat with chlorine more than once. Both the concentration of chlorine and how long the chlorine solution is in contact with the bacteria are important.

Some people have used continuous chlorine injection into the well, but the Minnesota Department of Health does not usually recommend this. The continuous chlorine injection may hide other bacterial contamination and cause corrosion problems.

## Shock Chlorination

"Shock" chlorination is the process of using a strong chlorine solution to disinfect the well and system. The chlorine concentration should be close to but not greater than 200 parts per million (ppm). A concentration greater than 200 ppm reduces how effective the disinfection is. Before adding the chlorine solution, the well should be pumped until clear or physically cleaned. See the "Well Disinfection" webpage.



## Resources

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

[Search for Accredited Laboratories](http://www.health.state.mn.us/labsearch)  
(www.health.state.mn.us/labsearch)

[Water Quality/Well Testing/Well Disinfection](http://www.health.state.mn.us/wellwater)  
(www.health.state.mn.us/wellwater)

[Well Disinfection](http://www.health.state.mn.us/communities/environment/water/wells/waterquality/disinfection.html)  
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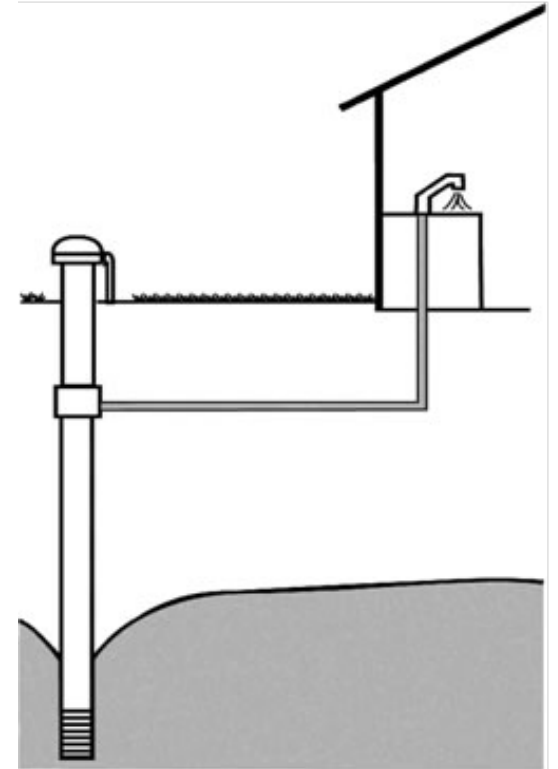
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