

Iron Bacteria

What You Need to Know

What are iron bacteria?

Iron bacteria are commonly cited as the culprit for any "slime" problems found in a well. Interestingly enough, though, only a very small percentage of the slime seen in wells and pipelines is actually iron bacteria (also referred to as iron oxidizing bacteria or by its proper name, *Gallionella*). Most of the slime formation found in wells is by naturally occurring soil bacteria, not iron bacteria.

What are signs that my water may have iron bacteria?

A professional water well contractor can check your well for physical signs of contamination, such as debris in the pipelines. Also, a laboratory can analyze the chemistry of your water. The specific chemistry of your well water may help identify problems and help determine treatment options. Here are features that might indicate problems (listed in order of what is most likely to indicate a specific problem, to least likely).

Your well might have incrustive (plugging) problems if:

- pH is greater than 7.0
- Calcium hardness is greater than 200 ppm
- Iron is greater than 1.0 ppm
- Manganese is greater than .02 ppm
- Sulfates are greater than 50 ppm
- Phosphates are greater than 1 ppm

Your well might have corrosive problems if:

- Total dissolved solids (TDS) are greater than 600 ppm
- Stray DC current on an electrical line*
- Stray DC current in the ground*
- pH is less than 7.0
- Dissolved oxygen is greater than 2 ppm
- Carbon dioxide is greater than 50 ppm
- Chlorides are greater than 500 ppm

*Can be measured by a local electric company that truly understands DC current or a pipeline company that understands corrosion potentials. One volt of DC current can dissolve up to 20 pounds of steel in a year.

What problems do iron bacteria cause?

The slime generated by iron bacteria isn't a health hazard, but it can do damage in other ways. Along with the unpleasant odor, it can corrode pipes and plumbing equipment, and clog pipes, screens, and other components of the well system. The slime can also hamper the effectiveness of the well system's water treatment components. It can overwhelm carbon filters, defeat bactericidal resins, and attack

or plug reverse osmosis membranes and cartridge filters. In certain conditions, the bacteria can grow quickly and leave the entire well system virtually useless in just a few months.

How can iron bacteria be avoided?

Iron bacteria can be a major nuisance, so the best protection is prevention. This means making sure that everything related to your home water system is disinfected. When having your well system installed, tested, or repaired, always use a professional contractor. During installation of the well, check that the pipe, pump, tools, and water used are disinfected.

What can be done to treat iron bacteria in water?

In order to remove iron bacteria from water, the chemical treatment must have the capability of penetrating the slime, removing the live bacteria, dissolving the decaying debris totally so the nutrient is gone, and removing everything from the well. That not only requires the proper chemistry but good development techniques, a monitoring process on the site to determine when the well is clean, and good removal pumping from the bottom of the well, once the project is complete.

All well components (e.g., pump, cable, etc.) should be thoroughly cleaned before placing back in the well.

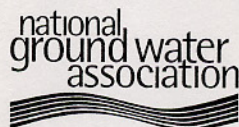
If a pipeline is more than 20 percent plugged, it should be cleaned. If pipelines are less than 20 percent plugged and if the well is cleaned properly, the counts of bacteria will be as in a normal aquifer, and eventually the pipeline will clean itself.

What is fungus?

Fungus is very slimy but much more of a stable mass than slime bacteria. It is often multicolored with red, black, white, and gray throughout the mass. It often smells like a sewer and the odor is quite offensive. This debris does not break down in acidic solutions.

Where can I get more information?

For more information on iron bacteria or well "sliming," contact your local water well contractor. Also, visit the Web site of the National Ground Water Association, www.ngwa.org, or its Web site created just for well owners, www.wellowner.org.



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