Iron, Sulfur, and Manganese Bacteria in Water

Signs of Nuisance Bacteria

- Reddish-orange deposit in wells, streams and ponds.
- Red, orange, or black/ brown algal growth that may float on the waters surface.
- Foul odor or taste to water.
- Oil-like sheen on surface of water.

Will the Bacteria Make Me Sick?

- The growth of bacteria and algae generally pose no health risk.
- Algal growth may cause a bad taste in well water and/or odors.



What Are Iron Bacteria?



Because iron and bacteria are naturally present in soils and water, it can be found in wells, streams, and lakes. Iron bacteria are organisms that consume iron to survive and produce deposits of iron

and brownish-red slime, "biofilm" in the water. Iron Bacteria get their energy from the reduced iron present in the water and do not always need oxygen to survive. During the process of obtaining energy from iron, the bacteria can oxidize iron from ferrous iron (dissolves in water) to ferric



iron (does not dissolve in water) and a precipitate of ferric hydroxide is formed. The bacteria can also cause a sheen on the water's surface, which is often mistaken for oil. The two can be distinguished by poking at the sheen with a stick. If the sheen goes back together after removing the stick, the sheen is most likely from oil. If the sheen breaks apart into pieces, it is likely that iron bacteria are present.



Sulfur is *naturally occurring* and *does not easily* dissolve in water. Sulfur bacteria are often found in the presence of iron bacteria.



What Are Sulfur Bacteria?

Sulfur is also naturally occurring in soils and waters and certain bacteria can consume it for energy. Some algae break down sulfur anaerobically, meaning they do not need oxygen. This breakdown of sulfur results in a "rotten egg" smell from hydrogen sulfide. Algae that use oxygen to break down sulfur results in the growth of brownish-black algae in the water and can sometimes look like sewage. This bacteria and resulting algae is usually not harmful to your health, but can clog pumps and pipes, cause bad odors and taste to water, and can stain plumbing fixtures and laundry when present in well water. Most often, sulfur bacteria are present with iron bacteria.

What Are Manganese **Bacteria**?

Often found in the presence of sulfur bacteria and naturally occurring in the environment, manganese bacteria discolor water reddish-brown and can form rust-colored deposits, resulting in clogged pipes and infrastructure. Magnesium bacteria in well-water is sometimes called "black water".

Treatment

Treatment of water containing iron depends on the form(s) of the iron present, the chemistry of the water, and the type of well and water system.

- For wells, the best treatment option is pretreatment. All installed systems and parts should be disinfected to prevent infiltration of bacteria to the system.
- Water chemical analysis can be performed to determine what form of iron, sulfur or manganese are causing the problem so that proper treatment can be determined.
- Treatment methods include phosphate compounds, ion exchange water softeners, chemical oxidation or aeration and filtration, flushing of system, and disinfection with chlorine.

REV2: 11/27/2018

Sources:

"Iron and Iron Bacteria in Water". Edstrom Industries. 2203. Waterford, Wisconsin.

"Iron Bacteria, What You Need to Know". Nation Ground Water Association. 2003. www.NGWA.org.

"Iron Bacteria in Surface Water". New Hampshire Department of Environmental Services. 1997. www.des.state.nh.us/factsheets/bb/inc/18.html "Iron and Manganese in Household Water". Virginia Cooperative Extension. 2000. http://www.ext.vt.edu/pubs/housing/356-478/356-478.html "Iron and Sulfur Bacteria in Water Supplies". Nebraska Department of Health and Human Services. http://www.hhs.state.ne.us/enh/IronSulfurBacteria.pdf





Lake County **General Health District Public Health** vent. Promote. Protect



🕒 🗗 🛅 🛅