

## Total Iron Fact Sheet

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### What is Iron?

Iron is a white metallic element, and is the fourth most abundant element in the earth's crust. Pure iron metal is very reactive and corrodes rapidly when exposed to air. When iron is underground, the oxygen levels are typically low so the iron in ground water is dissolved and invisible. However, when water reaches the surface and contacts air, the iron undergoes a chemical reaction that converts it to solid red rust particles. For this reason, iron is very uncommon in surface water but quite common in ground water. Corrosion of metal pipes is also sometimes a source of iron in drinking water.

### Problems with Iron

Iron is an essential nutrient in the human diet and does not pose any health risks. In fact, inadequate dietary iron can lead to anemia, a deficiency in the oxygen carrying components of blood. However, high concentrations of iron in water supplies can cause sediment problems in plumbing, metallic taste, and aesthetic problems with red staining of fixtures and laundry. For this reason, the Environmental Protection Agency (EPA) has set a secondary standard for iron of 0.3 mg/L. The standard only applies to public water supplies but is a useful guide for private well owners.

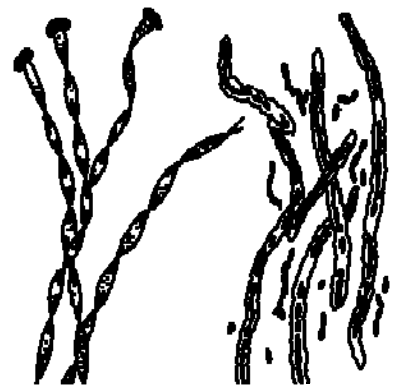


Iron and manganese cause similar problems in water supplies. When excess iron or manganese is present, it is usually apparent by the red/orange or brown/black staining the minerals cause.

### Iron Bacteria

Another nuisance that can arise with high iron concentrations is iron bacteria. These bacteria use iron as an energy source and while they do not cause disease, they can cause gelatinous growths that clog pipes, are unattractive, and smell bad. Iron bacteria can be difficult to control effectively if they have colonized the aquifer around a well but shock chlorination works in some cases. For instructions on shock chlorinating a well, see the WELL EDUCATED "**Coliform and E. coli Bacteria Fact Sheet**" available on the MSU Extension Water Quality webpage referenced below.

### Iron Bacteria



### Treating for Iron

When high iron concentrations are troublesome, the problems tend to show-up in multiple places in the house (washing machines, showers, toilets, and kitchen sinks). For this reason the most common type of treatment is a "point of entry" system which treats all the water entering the house. There are a number of options including sequestration by phosphate feeders, ion-exchange, oxidation filters, chlorinator-and-filter units and oxidation by aeration followed by filtration.

### Additional Resources:

**MSU Extension Water Quality, WELL EDUCATED Resources**

<http://waterquality.montana.edu/docs/homeowners.shtml>

**Household Drinking Water Protection and Treatment; MSU Extension Service**

<http://waterquality.montana.edu/docs/homeowners.shtml> (listed under "Drinking Water")