



ORANGE SLIME, OILY SHEEN, & WHAT THEY MEAN: IRON-OXIDIZING BACTERIA IN MONTGOMERY PARKS

Why am I seeing an orange color in the water?

- Colorful substances in the water can indicate the presence of bacteria. Certain types of bacteria that live in aquatic environments utilize minerals to obtain energy and may produce a colorful byproduct as part of this process. The orange color commonly seen in our streams is produced by iron-oxidizing bacteria.
- Signs of iron-oxidizing bacteria include “fluffy-looking” flocculant that is orange or rust-colored, a slimy sludge, or a bright orange film appearing on the surface of the water. The flocculant may also be accompanied by an oily-looking sheen (biofilm) on top of the water.
- Orange-colored water can also be attributed to pollution resulting from the corrosion of metal, dumping of paint or orange-colored chemicals into a stream or storm drain, or acid mine drainage (which does not occur in Montgomery County).

What are iron-oxidizing bacteria?

- Iron-oxidizing bacteria are naturally occurring micro-organisms that live in both soil and water.
- As part of a process to obtain energy, the bacteria convert dissolved iron in their environment from a water-soluble form (ferrous iron, Fe^{2+}) to an insoluble form (ferric iron, Fe^{3+}).
- This oxidation process results in the release of a rusty orange color into the water.

Where am I most likely to see signs of iron-oxidizing bacteria in the environment?

- The presence and signs of iron-oxidizing bacteria are particularly prevalent in iron-rich groundwater and the still or slow-moving water of streams and wetlands. They may also be found accumulating in pipe outfalls.
- Flocculant or a surface sheen may remain present for an extended period of time and is particularly obvious in summer when stream baseflow and water depths are at their lowest.
- Increased water flow and volume, such as those occurring after heavy rains, tend to dissipate the presence of the orange flocculant.



Orange flocculant accumulating in an outfall. Photo by Geoffrey Mason.

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Are the iron-oxidizing bacteria and the orange flocculant they produce harmful?

- The presence of the orange flocculant is not a sign that the water is polluted. Iron-oxidizing bacteria are naturally occurring and can be present in a range of conditions from highly impaired to our most pristine waters.
- The bacteria are considered harmless to humans, wildlife, and aquatic species. Insoluble forms of iron, like rust (iron oxide) and what is produced by iron-oxidizing bacteria, are not considered toxic.
- Areas where there is a high concentration of iron-oxidizing bacteria may look unappealing, but this is not a health hazard.



Orange flocculant produced by iron-oxidizing bacteria. Photo by Rachel Gauza.

If I see an oily sheen, how do I know whether it's due to bacteria or oil?

- The appearance of an oily sheen on the surface of the water can occur when iron-oxidizing bacteria is present. This biofilm is also harmless but looks very similar to petroleum oil.
- Determining whether a sheen is from oil or produced by bacteria is simple! Drop a pebble or run a stick through the sheen:
- A bacterial sheen should break apart, and stay separated, as seen in the photo below. View a video of the "stick test" here: mocoparks.org/StreamScene-IronOx
- An oil sheen swirls and reforms and is indicative of potential petroleum pollution.



The sheen from iron-oxidizing bacteria remains broken when disturbed with a stick. Try the "stick test" yourself! Photo by Megan Bolcar.



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What do I do if I find iron-oxidizing bacteria in a stream?

- Nothing! The bacteria are naturally occurring and pose no hazards to human health or the aquatic ecosystem.
- However, if you see something unusual in one of our parks, contact **Montgomery Parks' Public Information & Customer Service Office:**
 - Call **301-495-2595**
 - Email info@montgomeryparks.org
 - Visit montgomeryparks.org/report-a-problem/



culvert. Photo by Rachel Gauza.

Where can I find more information?

- Fairfax County Department of Public Works and Environmental Services: [What's That Stuff in the Stream?](#)
- Georgia Adopt-A-Stream: [What is Iron Bacteria?](#)
- Marin County Stormwater Pollution Prevention Program: [Why is My Creek Orange? The Story of Iron-Oxidizing Bacteria](#)
- New Hampshire Department of Environmental Services: [Iron Bacteria in Surface Water](#)
- City of Austin Watershed Protection Department: [Common Water Quality Complaints Color Guide](#)
- US Geological Survey: [What's the Red in the Water?](#)