



# 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,  $\text{Fe}^{2+}$ ) to an insoluble form (ferric iron,  $\text{Fe}^{3+}$ ).
- 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](http://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](mailto:info@montgomeryparks.org)
  - Visit [montgomeryparks.org/report-a-problem/](http://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?