

Information about Roily/Discolored Water

Why does this happen?

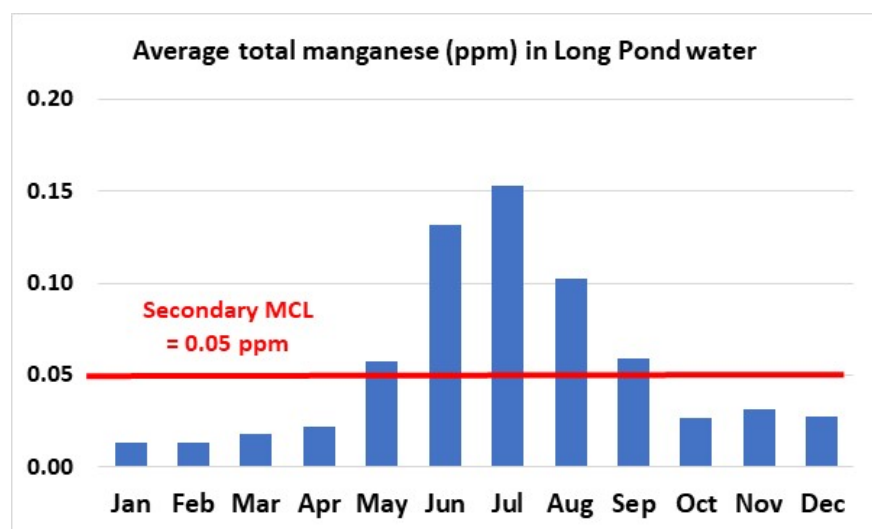
Roily or discolored water can come from an unusual or sudden acceleration of the flow of water through the pipes such as when a hydrant is opened. Water main breaks and excessive demand during hot spells can also cause dirty water. Sediment that has settled in pipes may be stirred up and material bound to pipe surfaces may detach and be transported with the water flow, resulting in particles and/or color. Significant disturbances create more discoloration. Corrosion of galvanized service lines and household plumbing systems can also discolor water.

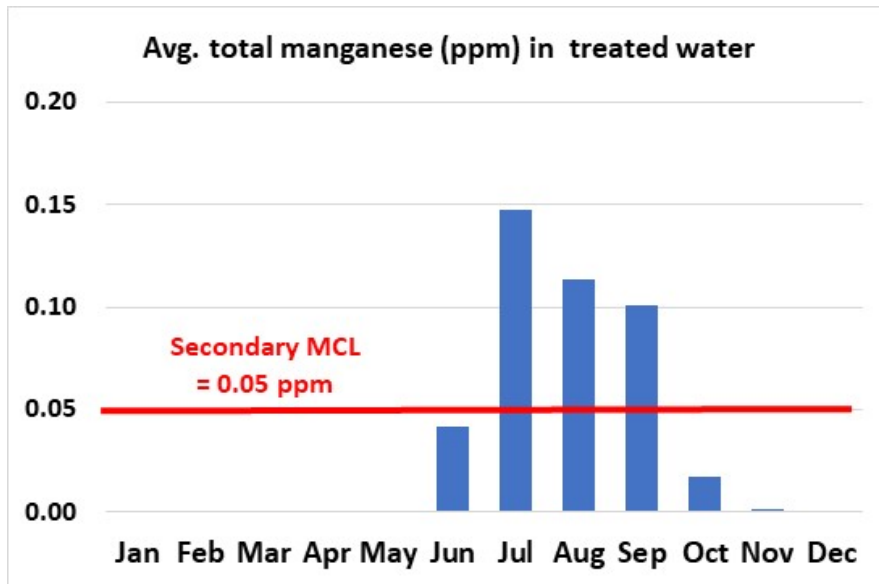
The episodes of yellow or brown colored water typically come from manganese present in the Long Pond source water. This has happened in warmer weather during four of the past five years (2018, 2020, 2021, and 2022, but not in 2019).

Manganese release from lake sediments is primarily controlled by dissolved oxygen levels in the water. Anoxic conditions (no oxygen) cause particulate manganese to dissolve and be released from sediments into the water column, where it can then enter the intake and treatment plant. Dissolved manganese is colorless, but once it reacts with chlorine (used as a microbial disinfectant) it forms a precipitate that causes color in the water ranging from light yellow to dark brown to grey or black, and leaves a black or grey residue on plumbing surfaces.

The seasonal trend of manganese occurrence is shown in the two plots below. The first plot presents monthly averages of total manganese concentrations in the Long Pond Source water, where low levels are detected during the winter months and high levels during warmer months.

The second plot shows that the current treatment plant removes low levels of manganese, as manganese has basically not been detected in the treated water during November through May. Manganese levels in May through September have been high enough at times to cause visible color (above the Secondary Maximum Contaminant Level).





Is it safe to drink?

Yes. Water is processed through a slow sand filter and disinfected with chlorine before entering the distribution system. The manganese levels observed are below the applicable MassDEP and USEPA health advisory levels. There is no bacteria and the water is safe to drink.

What about iron?

The colored water episodes ARE NOT caused by iron coming from rusting pipes. The measured iron concentrations have been low and iron is often not even detected in Housatonic’s samples having the most color. The system’s pipes may be old but by all indications are in good condition. The rate of main breaks is very low, indicating strong pipes. And the amount of lost water (unaccounted for water) is also much lower than industry averages, indicating few leaks.

Can these pipes be cleaned?

Our annual hydrant flushing program occurs in the spring and purges much of the sediment out of our 17 miles of water mains.

How long will discolored water last?

For flow disturbances it is difficult to estimate how long bouts of roily water will last or determine what parts of town will be affected. Variables such as location, duration and volume of water disturbed affect how long it will last.

In terms of the yellow/brown discoloration caused by manganese, that will occur whenever the level of manganese in Long Pond reaches high levels. The existing treatment plant was not designed to remove manganese, and so there is no way to control the manganese until a new treatment system is installed.

Typical drinking water conditions (pH and reduction/oxidation potential) are in the range in which manganese can readily cycle between soluble and insoluble forms, which can explain in part why water colored by manganese can seem to appear and disappear in a distribution system. Also, more color can appear as dissolved manganese reacts with chlorine over time in the distribution system.

What is the water company doing about the color caused by manganese?

The water company is currently going through the MassDEP approval process to install a GreensandPlus filtration system that our pilot testing from September 2022 has shown to be totally effective at removing the manganese.