

# FAQs about water color

One of the more common complaints received by water systems is “discolored water”. This section explains why discolored water is normal; why the water is still safe; and how the Utility Department investigates whether the cause is in our water mains or in the customer's private lines. Some tips are included to deal with color problems.

## ***MY WATER IS WHITE, IS THIS SAFE TO DRINK?***

Occasionally customers run a glass of water from the faucet and it is white; this is simply microbubbles of air. Leave the glass of water on the counter for a minute and you will see the water return to clear as the bubbles rise and dissipate.

## ***WHAT CAUSES THE WATER TO BE DISCOLORED (BROWN OR YELLOWISH)?***

**In general, there are two causes of discoloration. (1)** either it is coming from the customer's private water lines, or **(2)** it is coming from the city's water mains. Investigating the location of the problem is key.

**Investigating a color complaint.** Whenever we receive a complaint about discolored water we will first check if there are other customer's nearby with the same problem. If it is just one customer then the problem is likely in the customer's private water lines. We can physically confirm this by pulling out the water meter and checking the water color coming from our mains before it gets to the customer's pipes. If the water is clear at the meter then the problem is in the private lines.

- **The top three reasons water becomes discolored in a customer's private lines are: (1)** the customer's plumbing is made of galvanized (steel) pipes which are rusting on the inside. **(2)** the customer's hot water heater is rusting, or has not been flushed for several months, and **(3)** naturally occurring sediment, iron and manganese has built up in the customer's lines and it was stirred up by heavy usage in or around the home. While we cannot work on a customer's private water lines, we can often offer tips to help diagnose where the problem may be.
- **Water can also become discolored in the city's water mains.** This can happen when heavy usage in an area stirs up naturally occurring sediment, iron and manganese in the city's lines. The water in our system comes from groundwater wells which pull in water at hundreds of gallons per minute, so some sediment (fine-grained mud/clay) will also get pulled into the system. This is true for any system using groundwater wells.

Naturally occurring iron and manganese is also in our local groundwater. Once in the system, most of it is filtered out or settles in the bottom of our storage tanks. The tanks are regularly cleaned; however, some sediment/iron/manganese still makes it into in the water mains and then into the customer's private water lines. Most of the time the water in our mains moves so slow that the particles settle onto the inside lining of the mains. The particles will sit in the mains until high water use causes the water to flow so fast that it stirs up the particles. When this happens many customers in the same area can have discolored water. **Examples of this are:** when the Fire Department fills equipment or tests a fire hydrant; or when someone nearby fills a pool/pond or irrigates a large pasture, etc.

**OK, BUT IS IT SAFE TO DRINK?** Yes, it is safe. All the sediment or iron/manganese has been continuously disinfected by chlorine, and there is always a minimal amount of chlorine kept in the system at all times. Consuming water with iron and manganese does not have any health impacts. So, while the water may be discolored it is still safe to use or drink.

**BUT WHAT IF I STILL DON'T WANT TO DRINK IT?**

It is natural that users do not want to drink discolored water, so here are a few options:

- You can fill a clear container and allow the water to settle/clear and then use the water off the top of the container
- You can use a simple filter at your drinking water tap (reverse osmosis is not necessary)
- You can flush the discolored water from the house. The location to flush will vary depending on how your plumbing is connected. Typical flushing tips are to fill an upstairs bathtub (with cold water) and to open an outside faucet on the far side of the house.
- If the colored water came from the city's water mains and you need to flush it out of your home.

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Does your well water cause pink, red, brown, black, or blue stains to appear on your fixtures or appliances?

Unightly stains can show up on fixtures, appliances, or when washing laundry as well as your hair. These stains show up generally as pink, rust or reddish, black colored, dark brown, and green stains.

**Pink stains** that appear in the toilet are not uncommon on well water or city water that is low in chlorine. However, this is not caused by the water itself, rather it is caused by airborne bacteria. Keep the toilet cleaned often with a small amount of bleach to eliminate this problem.

**Red or rust stains:** Iron is one of the most common elements in the Earth's crust and is found ground waters worldwide. The maximal contaminant level (MCL) established by USEPA guidelines is 0.3 parts per million, also known as 0.3 milligrams per liter of water. When it comes to concentrations higher than 0.3 ppm, iron in well water can cause staining of fixtures and clothes, and give the water a bitter or rusty taste.

Iron is usually found in a dissolved (clear with no color) state in well water, and the water may appear crystal clear whenever first used. After exposure to oxygen, or after the addition of oxidants (such as chlorine bleach or hydrogen peroxide), this ferrous iron will be oxidized ("rusted") to the ferric form to form insoluble particles. The well water then looks reddish, orange colored or even yellow, or in the situation with manganese, black or brown. This may happen in toilet flush tanks and inside your clothes washer or even dish washer. An iron analysis will tell you if this is the cause of the stain and just how much iron is in the well water.

**Light brown or tea-colored stains:** Usually caused by manganese. Manganese is also a common component in the Earth's crust and is also found in many ground waters. Manganese is not generally regarded as toxic,

however some research has shown it causes stomach upset and diarrhea when it comes to levels over 0.05 ppm. The maximum contaminant level (MCL) set by EPA standards is 0.05 parts per million, at times labelled as 0.05 mg per litre (mg/L) or 50 micrograms per liter (ug/L).

In concentrations higher than 0.05 parts per million, manganese in water can cause discoloration of sinks as well as clothing, and give a sour, asphaltic or greasy flavor to water. Manganese is frequently found in a dissolved form in waters, and the water may appear clear when first used. After exposure to air, or following the addition of oxidants (including chlorine bleach or ozone), the clear manganese will be oxidized ("rusted") to produce solid particles of manganese oxide. The well water then can look, dark brown, or black while having an oily surface or appearance. This can happen in toilet flush tanks and in the washing machine or dishwasher.

Tannins found in water by organic material from decaying plant life can also leave tea-colored staining and light brownish streaks in your washing. Have the water tested for tannins as well as iron and manganese.

**Black staining:** This can be brought on by iron sulfides that are formed through the combining iron and sulfates in water. This is most typical in water that has a strong sulfur smell. This can also be caused by manganese and/or manganese sulfides. Analyze for iron, manganese, sulfates, and hydrogen sulfide to determine the cause of dark-colored staining. High concentration of manganese also causes black deposits and staining.

**Blue staining:** It begins with blue staining on your fixtures and tubs. You may notice laundry washing spotted with light blue, and the drinking water may have a bitter taste. Eventually the copper pipe corrodes and then you begin to see pinhole leaks. These problems are caused by your copper pipes corroding.

Copper water pipe deterioration is often caused by water that is lower on the pH scale, which means acid well water. It may also be brought on by water which is high in pH and total dissolved solids. These complications can be easily fixed only if you can correctly determine what the water chemistry is first. To identify this problem, analyze for pH, alkalinity, hardness, total dissolved solids, and copper. Once you have these numbers a Langelier Saturation Index, or LSI calculation can be carried out, and help identify if the water is corrosive.