RED WATER FACT SHEET

Some Las Cruces water customers occasionally experience "red" water. It is a common water quality-related customer complaint, as it causes tap water with objectionable tastes, odors, and staining. Red water is due to naturally occurring iron and manganese found in our water supply. Our water is chlorinated to kill bacteria; however, even a tiny amount of chlorine can oxidize the iron and manganese in water and cause it to precipitate (settle out). The iron-manganese precipitate makes water reddish-brown.

Dissolved metals like iron and manganese have the tendency to oxidize and settle in water lines, especially when the water demand is low and water is moving very slowly. When an increase in water demand occurs, the settled minerals will move; this normally occurs in the summer when people are using more water.

To minimize red water, the City adds phosphate to water to keep iron in solution. At high temperatures, such as through the customer water heater, the phosphate loses effectiveness, and the iron can precipitate out. Also, metal piping in the customer's plumbing can be subject to corrosion, resulting in red water.

What are the health effects of iron and manganese in drinking water?

Iron and manganese are essential elements in human nutrition. Iron is an important component in our blood, helping with oxygen transport. Manganese is essential to some of the enzymes in our bodies. Studies show no adverse health effects associated with iron in drinking water. A rare exception is chronic iron overload, which results primarily from a genetic disorder. Some studies have found that excess manganese (>0.3 ppm) in drinking water can have neurological effects on children (decreased performance in school). However, manganese levels in the City of Las Cruces drinking water system are 100 times lower than that (Table 1).

Table 1. 2014 City of Las Cruces Iron and Manganese Concentrations

Sampling Locations	Concentration (ppm)	
	Iron	Manganese
SMCL	*0.2*	*0.05*
Distribution system	0.009–0.053	<0.002
Water tanks	0.009–0.213*	0–0.005
Source water	0.010–0.253**	0–0.007

*1 out of 12 tanks above 0.2 ppm
**2 out of 24 wells above 0.2 ppm
ppm = Parts per million
SMCL = EPA secondary maximum contaminant level

No known health effects occur at iron and manganese levels found in City of Las Cruces drinking water. This means that at the levels in the City water system, effects of iron and manganese are aesthetic (visual) and the water is safe to drink.

What are the aesthetic impacts of iron and manganese?

Table 2 summarizes the visual impacts of iron and manganese, and the concentrations where these impacts can be observed.

Table 2. Aesthetic Impacts of Iron and Manganese

Concentration (ppm)	Aesthetic Impact
Iron	
>0.3	Undesirable taste and odor
>0.3	Staining of laundry and plumbing
>0.2 [a]	Possible "iron bacteria" growth, resulting in slimy coating
Manganese	
>0.1	Undesirable taste
>0.1	Staining of laundry and plumbing
>0.02	Piping encrustation and formation of black precipitate

[a] If the system is not chlorinating

What can a water utility do about red water?

The U.S. Environmental Protection Agency (EPA) has developed secondary maximum contaminant levels (SMCLs) as guidelines for water utilities. SMCLs are based on aesthetic effects. It is recommended that water systems monitor SMCLs to meet EPA guidelines. If SMCLs are exceeded, it is possible that some of the aesthetic effects mentioned above may occur.

There are several options to control red water formation. Iron and manganese can be removed with water softeners or through an oxidation-filtration process, or iron and manganese can be kept in solution by adding phosphates.

What is Las Cruces Utilities Water Resources Section doing about red water?

The City of Las Cruces has several current practices to address red water formation:

- The City regularly measures iron and manganese levels for comparison to SMCLs.
- Food grade phosphate is added to the water system to keep the iron and manganese in a liquid form.
- A fire hydrant flushing procedure is used in affected areas when red water complaints are received. This method is used when multiple red water complaints are received in a specific area to minimize water loss.

Figure 1 provides a schematic of the treatment process used by the Water Department to ensure safe and good quality drinking water.

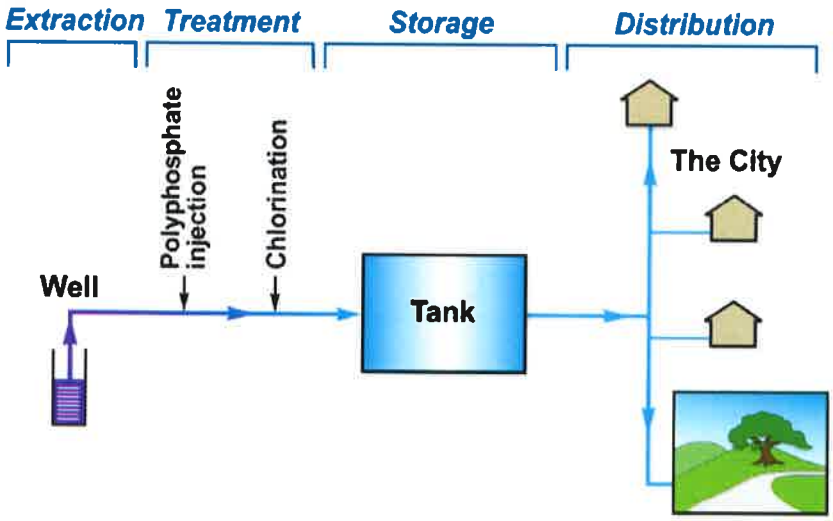
What should citizens do when they see red water?

Please notify Las Cruces Utilities Dispatch at (505) 526-0500 so we can arrange for the system to be flushed in your area. As soon as the flushing is complete, run your outside and/or cold water taps to clear red water from your own lines.

The water is safe to drink, but we recommend that you wait to do your laundry until the red water clears so that your clothing and other items in the washing machine are not discolored.

What can I do about red water in my house?

Homeowners can install a water softener (to remove dissolved iron and manganese) or particle filter (to remove occasional reddish-brown particles that settle out as water stands).



Polyphosphate injection keeps iron and manganese from settling out and causing red water. Chlorination kills any possible bacteria and viruses.

Figure 1. City of Las Cruces Water Treatment Process