

## IRON AND MANGANESE A PROBLEM?

By Russ Topp, Circuit Rider

Have you tried to site a well lately? If you have, you know how difficult it can be. I know of one system that had been drilling test wells for 10 years before finding sufficient water quality and quantity to fulfill their needs. It seems if you find the quantity of water your system requires, something with the initial water quality samples throws a wrench in the gears. Regulated contaminants can stop you in your tracks. Nitrates seem to always be an issue. Arsenic is a crap shoot. You might find what you think is a good well with little or no arsenic until you start pumping the production well, only to find the levels are going through the roof. Uranium is also a problem especially in the river valleys. VOC's, SOC's, IOC's....the list just keeps getting longer. Oh, and don't forget about the unregulated contaminants. Iron and manganese come to mind. Many systems are forced to deal with both of these problems.



Terry recording daily water usage

There are more iron and manganese water treatment plants in Nebraska than all other water treatments put together. If the iron and manganese levels are high enough, the only option is some type of filter plant. There seem to be a lot of water systems that are on the border line. The iron and manganese continually cause problems but the system just can't justify building a million dollar treatment plant. The Village of Malcolm falls into this category. Water in this area is scarce so you take what you can get. Malcolm's iron levels are 1.08 mg/L and manganese levels are .355 mg/L. Normally, you would like iron levels to be .3 mg/L or less and manganese levels to be .02 mg/L or less. As you can see these levels are a little higher than you would like. Iron and manganese can be a real public relations nightmare. Water main flushing stirs everything up. High levels can plug service lines and cause clothes to become dingy. Customers also complain about rotten egg odors. The village of Malcolm decided it was time to control this problem and asked Terry Davison, their certified operator to look into a solution. Terry



Chemical feed set up for iron and manganese control

contacted the Village's design engineer and it was decided to try to sequester the iron and manganese with poly-phosphates.

Poly-phosphates encapsulate the iron and manganese molecules to keep them from coming out of suspension. Plans were drawn up and submitted to the state engineers for approval. The estimated cost for the project was \$60,000.00. The design required chemical rooms to be built to house the poly-phosphate and chlorine. Fortunately, both well sites already had well houses large enough to build the chemical rooms inside the original buildings. Terry was looking for a winter project and decided he could save the Village a substantial amount of money by building the chemical rooms himself. The project was finished during the winter months. The chemical tanks and feed pumps were installed and the system was turned on line July 26<sup>th</sup>. The final cost of the project was \$23,500.00. Terry was receiving compliments about the water quality within 3 days after startup. The savings for the Village added up to \$36,500.00.

If your system is experiencing iron and manganese problems, it may be worth your while to have your engineer look into iron and manganese sequestering.

\*\*\*\*\*