ROCKY MOUNTAIN MUNICIPALITY

REMOVAL OF DISINFECTION BY-PRODUCT (DBP) PRECURSORS WITH CHLORINE DIOXIDE

The Challenge

This municipality disinfects 1-1.5 million gallons per day of drinking water, and is currently transitioning from a small system serving <10,000 people to a large system serving >10,000 people. Chlorine gas was used as the primary disinfectant for the raw water entering the plant. THM’s levels consistently averaged 64 µg/L, the trigger limit for disinfection profiling. HAAS’s averaged 48 µg/L, and TOC reduction was consistently between zero and the required removal rate of 25%. Reducing the levels of THM’s, HAAS’s and TOC and meeting compliance standards for both the EPA DBP Phase II Rules and the EPA LT2 Enhanced Surface Water Treatment Rule prompted the municipality to consider different pre-oxidants and alternative disinfectants.

Action Steps

A complete survey of the system was conducted to evaluate water quality and other factors such as consumption rate, maintenance, economics and compliance goals. A recommendation was made to the municipality to treat the raw water with chlorine dioxide at an initial feed rate of 0.2 mg/L. This dose rate was gradually increased after eight weeks to 0.8 mg/L until a trace amount of chlorine dioxide was measured in the clear well. As the dose rate of chlorine dioxide was increased an improvement in water quality was expected allowing for a reduction in the dose rate of the primary disinfectant chlorine gas.

The Solution

Chlorine dioxide effectively lowered THM and HAA5 levels by 30% over the same period a year ago. TOC levels have consistently been reduced by 25% or more using the new process which includes enhanced coagulation. The applied chlorine dose rates have also been reduced from 3.4 mg/L to 1.8 mg/L during the same month in consecutive years.

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