



Agenda Memorandum

Contact:

Clif Custer

Subject:

Chloramine Disinfection Conversion

Summary:

Continued use of the North Water Plant well is believed to have a negative effect on the city's overall chlorine residual within water distribution. It is believed that this is due to an imbalance of chlorine and ammonia in the water system.

Background Information:

Richwood's water system is classified as a GUI according to TCEQ. GUI stands for Groundwater Under the Influence. "Influence" pertains to the influence of treated surface water within a Groundwater System. Richwood's wholesale provider of treated surface water utilizes chloramines for their disinfection process. Chloramines are a blend of chlorine and ammonia at a 4:1 ratio. This type of disinfectant is more robust and sustains a longer lasting chlorine residual within water distribution.

Richwood also inadvertently disinfects water with chloramines as Richwood experiences naturally occurring ammonia within the groundwater. The mixture of this naturally occurring ammonia with gaseous chlorine creates chloramines. Although Richwood makes chloramines that parallel BWA's treatment process, Richwood currently operates under a "Blending Exception" issued by TCEQ because our initial disinfection process comes by way of gaseous chlorine.

Coincidentally, Richwood Public Works has not yet had to consider adding additional ammonia to water during the operational cycles of wells 5 and 6 because the naturally occurring ammonia at those sites are sufficient supporting chlorine injection rates that result in chlorine dosages of 2.8 – 3.5ppm. With the addition of the NWP well Richwood experienced lower naturally occurring ammonia concentration than that of wells 5 and 6. The lower amounts of naturally occurring ammonia at the NWP well site is sufficient to dictate that chloramines are created, but not sufficient enough to result in a robust dosage to maintain a healthy residual within water distribution.

Chlorine molecules deplete at a faster rate than ammonia molecules. It is the assumption of Public Works that currently there is an imbalance of chlorine depletion between the water producing sites within the system due to retention time, pumping distance, and/or reaction with contaminants. It is believed that this depletion imbalance is leading to an abnormal ratio of chlorine to ammonia, which in turn is causing a fall-out of chlorine within the water distribution system.

Issue:

Inconsistencies within water disinfection might set Richwood up for failure when additional water producing sites are added to the water system. Lower overall chlorine residual such as what is experienced with the NWP remains in regular SCADA rotation results in a non-productive water system due to not being able to maintain a robust residual. In addition to this, when lower chlorine residuals are experienced, longer durations of flushing in the far reaches of the distribution system are required. This results in increased wasted water, chemical, and labor resulting in increased operating costs.

Fiscal Impact:

No fiscal impact currently.

Recommendation:

Additional research into the issue by utilizing the engineering services available to Richwood.