

DBP/Color Problem Solved for Village of Palm Springs, Florida

Client: Eckler Engineering

Location: 6MGD Main & 4MGD R.L. Pratt Water Treatment Plants, Village of Palm Springs, Florida

Background:

The Village of Palm Springs has two lime softening plants that utilize groundwater for their water source. Raw water for these plants is drawn from wells in the local surficial aquifer in Eastern Palm Beach County. This water source has high levels of color and dissolved organic carbon (DOC), which are not removed in the existing lime softening process. In the past, chlorine has been used to bleach out color from the treated water, but this practice was no longer acceptable under the Stage 1 EPA DBP Standards. This is a common problem with ground waters on the East Coast of Florida.

Eckler Engineering investigated pretreating the raw water with ozone and MIEX[®] resin to reduce color and DOC prior to disinfection so that 1/ the plants could be brought into compliance with the Stage 1 EPA DBP Standards, and 2/ water received by consumers would be aesthetically more pleasing. It was found that while ozone could reduce the color levels, very little DOC was removed and therefore high levels of DBPs would still be formed after final disinfection with chlorine.

- MIEX[®] resin reduced the raw water THMFP by 69% (from 167 to 51 µg/l) and reduced the HAAFP by 61% (from 94 to 37 µg/l) providing a comfortable safety margin below the EPA Standards (80 to 60 µg/l respectively).
- MIEX[®] treatment reduced raw water DOC by an average of 71% (from 11.8 to 3.4 mg/L), which allowed compliance with the EPA DBP standards
- MIEX[®] reduced the true color of the ground water by an average of 95% (from 27 to 1.3 Pt-Co units)

Full Scale Performance:

Following the trial at the Main WTP, MIEX[®] pretreatment systems were installed at both the Village of Palm Spring's Main (6MGD) and R.L. Pratt (4MGD) water treatment plants. These plants were started-up in January 2005 and are producing treated water equal or better in quality than was achieved during the trial. Distribution THM and HAA levels have been reduced to less than 25 and 20 µg/l respectively, providing a large comfort margin below the EPA limits.



Figure 1: R.L. Platt WTP (4 MGD) at the Village of Palm Springs, Florida.

DBP, DOC and Color Reductions:

MIEX[®] bench and pilot scale tests that showed very good removal of color, DOC and DBP Formation Potentials. A pilot plant trial conducted at the Main WTP during January/February, 2003 demonstrated that the following results could be achieved:



Figure 2: MIEX[®] treated water (L) compared to the raw water (R). The small beaker contains brine after regeneration of loaded resin

Additional downstream benefits identified on the full-scale plants have been a 50% reduction in treated water chlorine demand, a 25% reduction in lime required for the softening process and increased filter run times downstream.