

Dell City EDR System Improvements

HIGHLIGHTS

Conversion from an older electro dialysis unit to a newer EDR process to treat high calcium carbonate and calcium sulfate well water.

EDR allows reasonable water recovery without chemical dosing.

Finished water from the EDR unit showed a sulfate concentration reduction of approximately 82%.

The small community of Dell City (population 570) is located in West Texas about 90 miles east of El Paso, near the Guadalupe Mountains. The water supply is from wells in a limestone formation and is, therefore, very high in calcium carbonate and calcium sulfate hardness. The TDS concentration of the well water may range from about 1,200 parts per million (ppm) to over 3,000 ppm.

Because of their high hardness well water, Dell City became interested early on in the then very new TDS reduction process called electro dialysis (ED). This process was developed in the late 1940s and early 1950s by Ionics Incorporated of Watertown, Massachusetts. Upon hearing of this new TDS reduction process, the mayor and city council of Dell City decided to install one of these ED units in 1967. When Ionics later developed a significant improvement to the ED process, involving polarity reversal and flow stream switching, called electro dialysis reversal (EDR), Dell City replaced their unidirectional ED plant with a new EDR polarity reversal plant in 1976. This new Dell City EDR plant was one of the first municipal TDS reduction plants of this type installed in this country. By 1995, this existing EDR plant had become worn out and become technically obsolete, and required replacement.



The new EDR facility was started up in 1996 with excellent results.

Dell City retained Carollo to provide design specifications, and construction supervision for the installation of a new and more modern EDR plant. Ionics Incorporated again furnished the new EDR equipment, and also served as general contractor under a negotiated contract with Dell City.

The EDR plant replacement at Dell City was funded by a \$400,000 grant from the Texas Department of Housing and Community Affairs (TDHCA) under the Texas Community Development Program (TCDP).

The new EDR facility was started up in September 1996 with excellent results. The one-year warranty inspection walk-through in September 1997 found the new EDR equipment in excellent, near-new condition. Water samples taken in December 1997 showed that the finished water from the EDR unit had a TDS of 355 parts per million (ppm). The sulfate concentration in the finished water was about 100 ppm, versus about 560 ppm in the raw well water.