Oil Report: Water Conference spotlights produced water treatment pilot efforts
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Recycling produced water for future completions projects has soared in popularity among Permian Basin oil and natural gas producers in recent years.

But that still falls short of what's needed, said Chris Harich, chief operating officer at XRI.

"We're not recycling enough as an industry as a whole," he told those gathered at the Permian Basin Water in Energy Conference this week.

While companies are recycling 80% of their water into completions operations, he estimated 4 million barrels of fresh water a day are being used in completions operations – in the first two completion stages and in the final five to six to clean the equipment.

"We keep adding water to the bucket, and the bucket is not growing as fast as we're adding water," he said.

XRI was one of four companies discussing pilot projects they have in progress, examining new ways to use that treated, produced water.

XRI

XRI is utilizing its existing MVR Evaporator to test technologies – membranes, evaporators and crystallizers – as it takes a look at the lifecycle costs of produced water, from production to the cost of treatment and injection.

Harich said the pilot unit has confirmed XRI's understanding of the electricity needs and how to make the unit energy-efficient.

Bechtel, Five Point Energy and Deep Blue

Bechtel has been testing its proprietary Low Energy Ejector Desalination System (LEEDS) in conjunction with Deep Blue Holdings, a portfolio company of Five Point Energy, at a saltwater disposal well near Midland.

The pilot was designed to prove out the economics, said Scott Mitchell, Deep Blue CEO.

"What we're looking for, what we wanted, was a consistent number we could stand by. (So that) after the pilot we can say 'This is what the number is, this is the number we stand by and it will be the number long-term."

Jeff Braune, LEEDS product manager with Bechtel, and Mitchell said the pilot, which has consistently treated 400 barrels per day and meeting all performance specifications, will operate for the next six months. Customers for the technology will be solicited beginning in the second quarter and full-scale

construction of the system will begin in the third quarter, entering full-scale operation in the third quarter of 2026.

The two companies envision a treatment hub with facilities for distilled water, clean brine, concentrated brine, injection well, evaporation pit, chemical storage and loading, pre-treatment, traditional treatment and six desalination trains.

Aris Water Solutions

Aris has partnered with Chevron, ConocoPhillips and ExxonMobil to engineer, design, develop, test and field demonstrate an integrated high salinity produced water system at a site near the Texas-New Mexico border, according to Whitney Dobson, vice president, beneficial reuse at Aris.

Lisa Henthorne, chief scientist, said the project evaluated three technologies utilizing membrane and thermal distillation treatment options.

Texas Produced Water Resources

TPWR has had a pilot program studying the impact of produced water on native vegetation and soils from three counties, including Loving, Midland and Reeves counties, in a greenhouse setting. Adrienne Lopez, research and development manager with the company, said the work has been very successful and the company is now planning to a field-scale program along the Pecos River. Planting will be done in April with cultivation April through October.

The company has also applied for land use pilot application permits on two 2,000-square-foot plots in the Midland Basin where TPWR will seed, irrigate and harvest alfalfa. An application has also been submitted to the Texas Commission on Environmental Quality for a permit to discharge treated desalinated water into the upper region of the Pecos River, discharging up to 20,000 barrels per day in mid-2025, increasing to 100,000 barrels per day in later years. The water would contain 5,000 parts per million of total dissolved solids, “which fish like,” she said.