

Water Recycling Minimal but Growing on Texas Oilfields

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[Enlarge](#) photo by: Jerod Foster
Jonathan Jones, Field Supervisor for Water Rescue Services, holding partially cleaned fracking waste water.

MIDLAND — Standing on a sprawling ranch where drilling rigs, cranes and bobbing stripper wells form a makeshift skyline, Jimmy Davis is not thinking solely about sucking up oil. It is not the only precious liquid that is pumped from under the land that he manages.

“We’re trying to preserve what we have for future generations,” Davis, the operations manager for Fasken Oil and Ranch, said about collecting clean water. Though required in abundance for oil and gas production, it is increasingly hard to find in drought-scorched Texas, where water use by drillers has come under increasing scrutiny.

With that in mind, after lacing water with sand and chemicals to use during the process of hydraulic fracturing, or fracking, Fasken pipes more than 330,000 gallons of the resulting wastewater each day through an on-site recycling system. Negatively charged waste in the water reacts with positively charged ions in the metal pipes, so the undesirable materials settle out and leave clean water that can be used for another hydraulic fracture.

Fasken now recycles close to half of the water it uses for fracking, Davis said. But the process is still experimental. Recycling is a money-loser for the company for now, adding about \$70,000 to the cost of handling the 1.9 million gallons of water needed for each hydraulic fracture.

As the drought continues to take its toll on resources, more companies are considering the long-term benefits of water recycling, and state officials are trying to make that transition easier. Despite that momentum, recycling is far from a mainstream practice among oil and gas drillers because of the associated costs and the prevalence of disposal wells.

For Fasken, Davis said, recycling is simply more expensive than using freshwater.

This is partly because Fasken can get fresh groundwater at virtually no cost under the 165,000 acres of ranch that the company owns, and an underground piping system takes it straight to the mineral well.

Most other operators pay relatively low prices for freshwater. Some estimates put its cost at just more than one cent per gallon, though Davis said he had heard figures as much as four times that amount.

What is more, Texas is home to about 7,500 active disposal wells, making it relatively easy and cheap for drillers to dispatch their waste. That is a stark contrast with Pennsylvania, home to the Marcellus Shale, where geography is unsuited for disposal wells. Energy companies there must either recycle the water or truck it to neighboring Ohio.

So it may not be surprising that recycling has not reached scale in Texas. Permit applications for oilfield water recycling jumped to 13 from just one or two per year (regulators had so few they did not initially count them separately from other recycling projects) from 2011 to 2012, according to the Texas Railroad Commission, which regulates oil and gas activities. So far this year it has received nine.

No state agency tracks how much water is being recycled. The Dow Chemical Company recently said it had processed more than 245,000 barrels of water in South Texas' Eagle Ford Shale, perhaps the state's hottest new shale play. That amount would cover about five hydraulic fracturing operations if the drilling were done vertically; in the Eagle Ford, horizontal drilling is taking off, which requires as much as three times the water per frack.

There are probably more water recyclers than reflected in the permit numbers, however. The Railroad Commission recently exempted "mobile" recyclers, which can recycle water on or near a fracking site to avoid trucking the water long distances, from applying for permits. Water Rescue Services, which operates on Fasken's property, is one such recycler, but such units are not always easy to set up.

"If you're going across a bunch of different landowners, it is harder," said Wes Williams, president of Water Rescue Services. Because Fasken owns a large swath of land, it does not have to seek a neighbor's permission to truck water back and forth or install pipelines. In the Eagle Ford Shale, drillers tend to try their luck on small parcels of land in different areas. Water recycling is impractical because it means trucking water long distances between sites.

Many South Texas farmers and ranchers say their water wells have gone dry. Drillers and their regulators counter that drought and population explosion are at least as much to blame for a water shortage, saying that the oil and gas industry's water consumption accounts for just 1 percent of statewide use. (In the Eagle Ford, however, drillers may account for as much as 20 percent of water use in some counties.)

Industry advocates say that as drillers settle into the Eagle Ford, water recycling will increase.

"Right now, everything is going in our favor," said Brent Halldorson, chief operating officer of Fountain Quail Water Management, a recycler who has worked in North Texas' Barnett Shale for about a decade. Halldorson said Devon Energy, one of his company's clients, has reduced long water hauls — and their cost — by placing recycling equipment in the middle of its operations.

Policymakers are also helping to kick-start the practice. The Railroad Commission's exemption of mobile recyclers is one example, and state lawmakers last year clarified that drillers would not be liable for mishaps involving wastewater that they have already handed off to third-party operators. Industry observers say the drought's grip on Texas has prompted a shift in energy companies' attitudes.

"People are starting to look at produced water as an asset rather than a liability," Halldorson said.

Still, while water recyclers' presence on oilfields is growing, it started not long ago at zero. And despite his optimism, even Halldorson admitted that today's average drilling company probably spends on recycling just over 1 percent of its budget for total water use and disposal.

Recycling cuts down significantly on disposal and trucking costs, though it does not eliminate them. Davis, of Fasken Oil and Ranch, said that after each recycling operation, three to five trucks must carry and dispose of solid waste that is removed from the wastewater, such as boron, sulfates or even radioactive metals. A significant amount of water — about 500,000 gallons — is also needed to drill the initial mineral well, and recycling that "would take a lot of equipment and a lot of money," he said.

The next driver for water recycling could reach beyond the oil and gas business. If recyclers could clean the water enough so it can be used for other purposes, the value could be enormous, said Amy Hardberger, an assistant professor of law at St. Mary's University.

"We haven't seen a market for it yet," Hardberger said. "But I think it's coming."