

From the Dallas Business Journal

<http://www.bizjournals.com/dallas/blog/2013/06/take-a-look-inside-a-frack-water.html>

Jun 7, 2013, 2:40pm CDT Updated: Jun 7, 2013, 10:16pm CDT

A look inside a Wise County frack water recycling center



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I just witnessed a frack water recycling operation first-hand, from a truck dropping off salty, muddy water straight from a drill site to the finished product -- both freshwater and saltwater.

Recycling frack water is critically important because it keeps water out of disposal wells, preserves freshwater for other uses and cuts down on transportation costs. From the Barnett Shale to the Eagle Ford Shale, hydraulic fracturing uses million of gallons of freshwater mixed with chemicals to release gas and oil that's trapped in the shale rock.

A percentage of that water comes back to the surface as a salty, muddy liquid that's not useful for anything. The Texas Railroad Commission estimates that every month, [9.1 billion gallons of waste water are shot into disposal wells](#), which are also blamed for minor earthquakes in Texas and other states.

Roanoke-based Fountain Quail Water Management has spent almost a decade perfecting the process of recycling that water so it can be useful again rather than permanently dumped into a disposal well.

Fountain Quail COO [Brent Halldorson](#) took me and photographer [Jake Dean](#) to a site just outside Bridgeport (northwest of Fort Worth) where the company's recycling operation runs 24 hours a day, seven days a week.

The facility can recycle up to 5,000 barrels of both flowback water and produced water a day, or about 150 gallons a minute.

Oklahoma City-based Devon Energy (NYSE: DVN) has five drilling rigs running within about five miles of the site, so Fountain Quail stays busy taking in water and returning 100 percent of it back to Devon for use on future drilling operations.

The process typically produces 80 percent freshwater and 20 percent saltwater. The freshwater is stored in a pond on-site that both trucks and pipelines can hook up to reuse for drilling.

Devon has even found a use for the saltwater.

"What's really exciting for me here is that last 20 percent of what was left over, right now today most of that is being reused by Devon for drilling and completing wells, they need heavy saltwater for that," Halldorson explained. "Basically, 100 percent of what's being brought to us is getting reused in some way."

So, now the real question: Can you drink the freshwater after they've run it through the recycling process?

He says the water is just as clean as what you'd drink in a bottle, but it's distilled water.

"We don't recommend drinking it," Halldorson said. "Pure distilled water is actually, if you drink it, it's not good for you because it will actually absorb minerals out of your body."

He walked me through the recycling process:

- Trucks drop off water either from a frack job or produced water from an existing well.
- The water is treated with chemicals that make the mud and clay particles bond together, making them easier to filter out. This process is called flocculating, or flocking for short.
- The remaining saltwater is then run through a unit called a Nomad, which boils the water to separate the salt, leaving freshwater.
- Once the freshwater and saltwater are separated, the heated liquids run in pipes next to the incoming water, transferring the heat so the process keeps itself running.
- The saltwater is stored in an on-site tank for use in well completion.
- The freshwater is stored in an on-site pond with a black liner for use in frack jobs.
- Trucks or pipelines transport the water back to drill sites for reuse.
- Fountain Quail has used similar technology in the Eagle Ford Shale and Permian Basin, including a mobile flocking machine.

The process changes depending on the type of water that comes in, Halldorson said. Flowback water from frack jobs has a different composition from produced water that comes up from a well that's already producing.

"That's why we man our sites 24/7," Halldorson said. "You have to be able to adapt as the water changes."

[Paul Maier](#), a site manager for Fountain Quail, said it's a constant "juggling act" to calibrate the system correctly.

All the on-site engines run on natural gas supplied from a nearby compressor station. In some

cases, they hook directly to the wellhead.

The recycling center can be moved in about five days to a new site as Devon moves to new drilling locations.

Fountain Quail has been recycling frack water in the Barnett Shale with Devon for nine years.

Fountain Quail President [Delzon Elenburg](#) still remembers when [George Mitchell](#), who founded The Woodlands-based Mitchell Energy, [figured out the fracking chemical concoction that cracked the shale](#) in the late 1990s. Devon acquired Mitchell Energy in 2002.

"I knew when [George Mitchell](#) got that Barnett Shale going that it was a real thing and it was going to work," Elenburg said. "The thing that it needed more than anything was water to make it happen. That water to make it happen created huge demand on the freshwater side."

He said Fountain Quail spent nine months to a year trying to figure out the best way to recycle the water. The trial and error resulted in a lot of "bloody noses" and "black eyes," but they finally perfected it, Elenburg said.

Earlier this year, the Texas Legislature considered a bill that would make [recycling mandatory and prohibit the use of disposal wells](#). Both bills died in committee.

Nicholas covers the energy and banking beats for the Dallas Business Journal.
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