

Shale drilling is going greener

Cutting costs and cleaning up the process can go hand in hand

Brett Clanton, Houston Chronicle, 12-18-10

POTH, Texas — The oil and gas industry has proved it can tap massive natural gas deposits found in dense shale rock formations from New York to Texas. Its next big challenge: cleaning up the process.

A recent visit to a shale well site in this tiny ranch town about 50 miles southeast of San Antonio offers a glimpse of how it will happen.

Today, the roughly 5-acre site is crowded with big trailers and trucks. Heavy equipment runs even when idle. Some 50 storage tanks, each with a swimming pool's worth of water, line the perimeter. And workers and delivery trucks shuttle in and out. But in a few years, there is likely to be much less - of everything.

That's because oil and gas companies are coming under increasing pressure from the public and regulators to reduce the environmental impact of hydraulic fracturing - a decades-old practice in which millions of gallons of water, chemicals and sand are injected into a well to crack open rocks and free oil and gas reserves - as it becomes more widespread.

Oil field services providers that offer the service are also rethinking the current model to cut costs. Indeed, their oil company customers are demanding it as natural gas prices remain low and shale formations take center stage in the onshore U.S. oil and gas business.

Halliburton's broad plan

The latest example came last month, when oil field services giant Halliburton announced a sweeping plan to significantly reduce the surface footprint and environmental impact of its hydraulic fracturing operations by 2013.

Halliburton, the market leader in North America, aims to do this by redesigning equipment to be more efficient, automating more functions to reduce personnel and traffic to sites, and reducing the amount of fresh water required in the process.

While the company's motivation may be largely financial, the plan also hints at what could be the oil field of the future.

"We're ready to change the map," Ron Hyden, Halliburton's technology director for production enhancement, said as he stood amid towering rows of equipment at the Poth well site. "We were concerned that a 1980s frac operation would not be sustainable in this century."

Other oil services companies also have taken steps to clean up fracking, from launching technology that recycles wastewater streams to rolling out more robust pumping equipment that lessens the need for so many trucks on-site.

"There's definitely still room for improvement of the overall process," said Gary Flaharty, spokesman for Houston's Baker Hughes, the second-largest hydraulic fracturing service provider.

What distinguishes Halliburton is the comprehensiveness of its effort, said Jeffrey Spittel, an industry analyst who follows the oil field services sector for Madison Williams in Houston.

"This is the most systemic approach I've seen," he said.

Over the next three years, Halliburton aims to cut per-well capital costs of hydraulic fracturing jobs by 20 percent, reduce personnel at each site by 30 percent and slash the time it takes to ready a well for production by 25 percent.

On-site simplification

One part of the strategy involves simplifying well site equipment and logistics. Today, for instance, the company pays third-party trucking companies millions a year to deliver up to 10 million pounds of sand, called proppant, for each fracturing job. It then stores the sand in giant trailerlike containers on-site that use diesel engines, hydraulics and conveyors to route the sand to huge blenders nearby.

Halliburton is redesigning the storage containers to stand upright, atop the blenders, and operate without the complicated controls. Instead, they will have a solar-powered battery powering a system that transmits a signal when supplies are low. That upgrade would eliminate several big diesel engines, cutting emissions and maintenance time, and enable the company to dispatch delivery trucks only when needed.

In addition, the company is building more reliable pumping engines, lessening the need to have as many backup units on site. It's experimenting with automated equipment that can be run from remote operations centers.

And, in answer to concerns about toxic chemicals in fracturing fluids leaching into groundwater supplies, it has developed a formula made up of ingredients sourced from the food industry.

Drinking-water concerns

The U.S. Environmental Protection Agency announced earlier this year that it will be studying the effect of hydraulic fracturing on drinking water and in November subpoenaed Halliburton when it didn't turn over all requested information about its fracturing fluid mixes.

The company has since complied and has launched a website that offers information about some but not all chemicals used in the process. Though it insists fracking is safe, the company said it wants to protect proprietary information.

"There are some chemistries out there that we wish we could just share with the general public 100 percent, as long as our competitors didn't find out about it," said David Adams, vice president of Halliburton's production enhancement product service line. "That's the balance we're trying to manage right now."

Consistency called key

Meanwhile, oil and gas exploration and production in shale formations will only keep growing, as will hydraulic fracturing.

Shale gas, which accounted for only 1 percent of the U.S. natural gas supply in 2000, represents 20 percent today and could grow to 50 percent by 2035, according to a March report by IHS-Cambridge Energy Research Associates.

Up to 80 percent of new wells are expected to require some form of hydraulic fracturing. Those trends have environmental interests closely watching companies that perform the service.

"We absolutely welcome innovations by industry to try to minimize the environmental footprint of what they're doing," said Kate Sindig, a senior attorney with the Natural Resources Defense Council in New York.

"The key, though, is that these can't be things that some companies use sometimes in some places when they feel like it," she said, "which is what is happening now."

The oil and gas industry, it appears, may be coming around to that way of thinking.