

NEW WATERLESS FRACKING METHOD AVOIDS POLLUTION PROBLEMS, BUT DRILLERS SLOW TO EMBRACE IT: Little-noticed drilling technique uses propane gel, not water, to release natural gas. Higher cost, lack of data and industry habit stand in the way.

By Anthony Brino, InsideClimate News, and Brian Nearing, Albany Times-Union, Nov 6, 2011



ALBANY, N.Y.—In the debate over hydraulic fracturing for natural gas, two facts are beyond dispute: Huge amounts of water are used to break up gas-bearing rock deep underground and huge amounts of polluted water are returned to the surface after the process is complete.

Tainted with chemicals, salts and even mild radioactivity, such water, when mishandled, has damaged the environment and threatened drinking water, helping fuel a heated debate in New

York and other states over whether gas drilling is worth its risk to clean drinking water, rivers and streams.

Now, an emerging technology developed in Canada and just making its way to the U.S. does away with the need for water. Instead, it relies on a thick gel made from propane, a widely-available gas used by anyone who has fired up a backyard barbecue grill.

Called liquefied propane gas (LPG) fracturing, or simply "gas fracking," the waterless method was developed by a small energy company, [GasFrac](#), based in Calgary, Alberta.

Still awaiting a patent in the U.S., the technique has been used about 1,000 times since 2008, mainly in gas wells in the Canadian provinces of Alberta, British Columbia and New Brunswick and a smaller handful of test wells in states that include Texas, Pennsylvania, Colorado, Oklahoma and New Mexico, said GasFrac Chief Technology Officer Robert Lestz.

Like water, propane gel is pumped into deep shale formations a mile or more underground, creating immense pressure that cracks rocks to free trapped natural gas bubbles. Like water, the gel also carries small particles of sand or man-made material—known as proppant—that are forced into cracks to hold them open so the gas can flow out.

Unlike water, the gel does a kind of disappearing act underground. It reverts to vapor due to pressure and heat, then returns to the surface—along with the natural gas—for collection, possible reuse and ultimate resale.

And also unlike water, propane does not carry back to the surface drilling chemicals, ancient seabed salts and underground radioactivity.

"We leave the nasties in the ground, where they belong," said Lestz.

David Burnett, a professor of petroleum engineering at Texas A&M University, one of the nation's premier petroleum engineering schools, said fracking with propane makes sense.

"From a reservoir engineering perspective, there is no reason this would not be effective," said Burnett, who runs the [Environmentally Friendly Drilling Systems Program](#), a project of the university and the Houston Advanced Research Center, a not-for-profit academic and business consortium. Supported by some of the nation's largest energy companies, as well as by the New

York State Energy Research and Development Authority, the drilling program seeks new technologies that develop gas and oil in a safe and environmentally friendly manner.

Burnett said using gas instead of water can serve two ends—protecting the environment and reducing costs to the drilling industry of handling and disposing of tainted water.

But he said propane fracturing is "not a game changer," at least not yet.

"This is a very conservative industry," Burnett said. "Engineers want to see what someone else did first, and they want the data." Most companies that have tried the GasFrac technique have not published data publicly, he said, possibly out of fear of tipping off potential competitors to its benefits.

A search of public research reports on file with the [Society of Petroleum Engineers](#) found only two case studies for wells that used propane fracking—one in 2011 and one in 2009. "You are going to need more than one or two wells to prove this to the industry," Burnett said. And because gas fracking is a proprietary method owned by a still small company with limited ability to supply and service many new users, "if more people want to use the technology, the cost will probably go up. So GasFrac is kind of caught in a Catch-22."