Getting to the Bottom of Fracking

SOURCE: AP/David Zalubowski

In this April 22, 2008 photo, a natural gas well pad sits in front of the Roan Plateau near the Colorado mountain community of Rifle. Hydraulic fracturing, also called "fracking" or "fracing" is a widely used but somewhat controversial oil and gas drilling technique.

By Sarah Collins, Tom Kenworthy | March 3, 2010

Hydraulic fracturing, also called "fracking" or "fracing," is a widely used but somewhat controversial oil and gas drilling technique that is opening up new energy possibilities in the United States. It's also starting to draw a lot of high-level attention in Washington, and this scrutiny is appropriate and overdue.

Fracking has been used in combination with improved horizontal well-drilling technology to help open vast new natural shale gas reserves from Texas to western New York state that were previously locked in deep underground shale formations. Those discoveries have stirred debate on whether natural gas can serve as a bridge fuel to a lower-carbon future by shifting electricity generation from coal-burning power plants to natural gas plants, which emit half as much carbon pollution and no mercury. These newly available natural gas sources could be global warming game changer if gas production can occur cleanly.

But the widespread use of fracking has also raised concerns about potential contamination of drinking water supplies. The fracking fluid that is pumped into wells at high pressure to fracture rock and release natural gas contains sand and vast amounts of water in addition to chemicals that can be toxic to humans. Preventing underground leaks of fracking fluid requires proper installation of well casings and careful monitoring. Surface water contamination is also a concern because once drilling is completed the used fluids are brought to the surface and often stored in ponds that can leak.

U.S. Environmental Protection Agency Administrator Lisa Jackson said on February 24 that her agency will soon begin a $1.8 million study of hydraulic fracturing, with several million more dollars to come if the EPA's new budget request is approved. "The [timing] of the study will depend on us being able to adjust our operating budget for the current fiscal year…What we've done is to try to fund the whole thing out of our budget this year and next year, but we would hope to start this year," Jackson said.

This follows up on a May 2009 comment by Jackson in which she called allegations of fracking-caused drinking water contamination "startling" and called for Congress to review the process. A consulting firm retained by EPA reviewed 12 contamination cases only to declare that they "may have a possible link to hydraulic fracturing, but to date, EPA has insufficient information on which to make a definitive decision."

The U.S. House Energy and Commerce Committee has also launched an investigation into fracking's environmental and public health effects. Committee Chairman Rep. Henry Waxman (D-CA) and Rep. Ed Markey (D-MA) sent letters to eight companies in the industry on February 18, requesting more information on the natural gas drilling process.

Reps. Waxman and Markey requested documents in six key areas:

- The number and location of wells using hydraulic fracturing in each state in 2008 and 2009
- The total volume of production and chemicals used in the process
- Health and environmental effects of the fluids
- Allegations that the process harms human health or the environment
- The percentage of fluids recovered
- The volume of flowback and produced water

Reps. Waxman and Markey also argued that "information is needed to assess whether the use of the chemicals [in fracking] posed a threat to drinking water supplies" in a memo to the Subcommittee on Energy and Environment that day.

They pointed out in the memo that "EPA has raised particular concerns about diesel fuel, noting that the 'use of diesel fuel in fracturing fluids poses the greatest threat' to underground sources of drinking water." They noted that aside from a 2003 EPA voluntary memorandum of agreement with three top gas and well servicing companies to cease the use of diesel fuel in fracking fluids "there is virtually no federal regulation of hydraulic fracturing."

As the EPA and Congress began a closer look at fracking, Cornell University's College of Agriculture and Life Sciences held a February 22 briefing on the potential environmental and community impacts of natural gas development using hydraulic fracturing and whether state regulation is adequate. Congress exempted fracking from federal protection standards in 2005 under the Safe Drinking Water Act, and they also exempted well site activities from the Clean Water Act's discharge permit requirements.

The exemption leaves states responsible for protecting their residents from groundwater and other sorts of contamination, and state protections vary. Colorado provides reasonable protection, while states that are new to the gas industry have few safeguards. New York has suspended production in the Marcellus Shale until it creates protection rules.

For their part, many in the natural gas production industry believe that leaving it to the states is adequate. “Regulations currently in place adequately and appropriately protect the public and the environment,” argues a briefing paper prepared by the natural gas industry.

But Susan Riha, a Cornell professor who led the university’s inquiry, said that proper disposal and treatment of the water containing fracking fluids after it is withdrawn from completed wells is a major concern. In addition to fracking fluids, the water can contain high levels of salt and naturally occurring radioactive materials.

Reps. Waxman and Markey also mentioned some studies of water contamination linked to fracking in their memo to the subcommittee:

> “In New York, the State Department of Environmental Conservation analyzed wastewater extracted from wells and found levels of radium-226 as high as 267 times the limit safe for discharge into the environment and thousands of times the limit safe for people to drink. Others have raised concerns about water scarcity, since the drilling and hydraulic fracturing of a horizontal shale gas well may require 2 to 4 million gallons of water.”

The Cornell study focuses on the Marcellus Shale, a region stretching from the eastern tip of Tennessee to central New York that contains one of the world’s premier gas deposits—enough to meet 14 years or more of U.S. demand according to experts at Pennsylvania State University. Discoveries in the Marcellus Shale and other shale gas formations led the Potential Gas Committee, a group of industry experts and academics, to up its assessment of proven and potential U.S. natural gas reserves by 35 percent last year.

Cornell began its study because of industry interest in leasing some of the university’s land holdings. Both Cornell and New York have put moratoriums on drilling pending further study. Legislation has been introduced in both the House and Senate that would require drilling companies to disclose the chemicals they use in hydraulic fracturing and to remove the ban on regulation under the Safe Drinking Water Act. Reps. Diana DeGette (D-CO) and Maurice Hinchey (D-NY) are sponsoring the Fracturing Responsibility and Awareness of Chemicals Act, H.R. 2766, while Sens. Robert Casey (D-PA) and Charles Schumer (D-NY) are sponsoring S. 1215, of the same name.

Riha said passage of that legislation would help EPA determine whether fracking is causing contamination of drinking water supplies—assessments that are now difficult because companies don’t disclose what chemicals they are using.

> “I think they should just move ahead [with legislation] to get more information about how many times chemicals show up in drinking water ... because it will help with future studies. If it’s not required [to disclose chemicals used in fracturing fluids], then it will be extremely difficult to study their impact on water supplies.”

Industry opponents argue that fracking has been safely done for decades and say the legislation would impose unnecessary burdens both on the oil and gas sector and EPA. Hydraulic fracturing, says the Industrial Minerals Association-North America, “already has been extensively studied” and “further study is unnecessary and would be a waste of limited agency resources.”

It should be noted, however, that some companies, such as Chesapeake Energy, have been willing to cooperate with environmental concerns and have disclosed fracking fluid ingredients.

Determining the environmental effects of hydraulic fracturing and establishing new safeguards where appropriate is crucial not just for protecting public health and safety, but for the natural gas industry as well. Among the needed steps are:

- A thorough and credible analysis of the impacts that a surge in natural gas production will have on our air, water, and special landscapes
- Expanded industry efforts to reduce methane releases during the production and distribution of natural gas, a significant source of greenhouse gas emissions
- Establishing best practices and encouraging state regulators to enforce them
- Requiring public disclosure of toxic chemicals used in natural gas production

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