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ENERGY

A SPECIAL REPORT

Congress may consider hydraulic fracturing this year

Boom in shale drilling for natural gas brings to the forefront debate over environmental risks.

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The vast expansion in domestic natural gas production and the increase in "proved reserves" for the future are crucial components of any credible climate change proposal because they bridge the gap between the future promise of renewables and the carbon-intensive reality of today's fossil-fuel economy. Most of this expansion is associated with the exploration and production in shale deposits containing huge reserves of natural gas. Hydraulic fracturing, the practice of injecting a high-pressure fluid mix of water, sand and a proprietary chemical mix into formations to release this natural gas, will continue to draw attention in 2010 as legislators grapple with reports that the practice poses risks to the environment.

Historically, the density and depth of the deposits have rendered accessing these resources uneconomic. During the past decade—indeed, primarily the past five years—the natural gas industry's ability to apply horizontal drilling and hydraulic-fracturing techniques to shale formations has led to a significant increase in production from these deposits and, predictably, to a boom in investment in and further exploration of existing and new shale plays peppered throughout the country: the Barnett Shale play in Texas, the Fayetteville Shale play in Arkansas, the Woodford Shale play in Oklahoma and the Haynesville Shale play in Louisiana. The Marcellus Shale play—reaching from the eastern foothills of Tennessee through Kentucky, West Virginia, Ohio, Pennsylvania and New York—is estimated to contain between 168 trillion and 516 trillion cubic feet of natural gas, about 10% of which is thought to be recoverable with today's technology.

The recently announced merger between Exxon Mobil Corp. and XTO Energy Inc. is widely seen as conferring an aura of inevitability regarding the development of the United States' shale gas resources. Natural gas production from shale deposits is expected to increase sharply during the coming years, although the natural gas market experiences heavy price volatility. Gaining access to the gas, however, is only possible through the use of hydraulic fracturing to unlock it, as the gas otherwise would be trapped in the impermeable formations.

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For many years, the U.S. Environmental Protection Agency (EPA) has declined to regulate hydraulic fracturing under the Safe Drinking Water Act's Underground Injection Control (UIC) program, reasoning that it does not fit into any of the injection practices regulated by the program and that states with drilling operations have permitting regulations covering the drilling, casing and cement requirements designed to isolate the wellbore from groundwater.

Although hydraulic fracturing has been used for decades to stimulate oil and gas wells, in recent decades hydraulic fracturing increasingly has been deployed in coalbed methane drilling, an unconventional practice that fractures shallow coal seams to release natural gas. Concern over the safety of this type of drilling, which often is conducted in close vertical proximity to groundwater aquifers, prompted a number of lawsuits regarding EPA's exclusion of the practice under the UIC program. In two related opinions issued in 1997 and 2001, the U.S. Court of Appeals for the 11th Circuit essentially compelled the EPA to consider regulating hydraulic fracturing under the UIC program. See *LEAF v. EPA*, 118

F.3d 1467 (11th Cir. 1997); *LEAF v. EPA*, 276 F.3d 1253 (11th Cir. 2001).

Following these opinions, the EPA began a three-year study of hydraulic fracturing in coalbed methane drilling and in 2004 concluded that the practice posed "little or no threat to [drinking water] and does not justify further study at this time." Following this report, Congress overrode the 11th Circuit decisions and specifically exempted the practice from regulation under the UIC permitting program.

Although EPA career staff remain largely supportive of the 2004 study, some environmental advocates question its conclusions, noting that the same year the study was released an EPA staff employee wrote a letter to the EPA inspector general and members of Congress that accused the EPA of subverting science in the 2004 study to achieve political objectives. The exemption, which was contained in the Energy Policy Act of 2005, is widely derided in environmental advocacy circles as the "Halliburton loophole," and has been a target for environmental advocacy groups and some members of Congress since it was enacted.

This issue would have likely simmered in the background had it not been for the ensuing development boom in shale gas. With shale gas drilling expanding into states that have little experience of gas drilling, such as Arkansas, New Mexico and Pennsylvania; with the potential for shale drilling within the New York City watershed; and with the heavily publicized hydraulic-fracturing provision in the Exxon Mobil/XTO agreement (Exxon Mobil has the right to walk away from the deal if legislative developments make hydraulic fracturing illegal or commercially impracticable), the issue has gained some perceived urgency, particularly because drilling has yet to ramp up in many areas with the greatest potential reserves.

The National Resource Defense Council, Earthworks, the Environmental Working Group and others have collected anecdotes in post-2004 reports on the health and environmental effects of oil and gas production that purport to connect fracking to groundwater contamination and other assorted issues including explosions and vapor intrusion. ProPublica, a public interest Web site, has echoed these reports in a series of influential articles that have sought to tie hydraulic fracturing to groundwater contamination incidents in Colorado, Pennsylvania and Wyoming. Several local agencies and EPA Region 8 have conducted limited investigations of allegations of groundwater contamination with inconclusive results.

The one thing that all of these reports have in common is that they do not conclusively demonstrate that hydraulic fracturing caused the alleged contamination. In a September 2009 report distributed to Congress entitled "Hydraulic Fracturing: Preliminary Analysis of Recently Reported Contamination," a consultant retained by the EPA Office of Ground Water and Drinking Water found that the evidence presented in the available reports asserting a link between hydraulic fracturing and groundwater contamination was "not sufficient to confirm or rule out hydraulic fracturing as the source of impacted or contaminated ground water." Some reports cited by environmental advocacy groups did not identify whether hydraulic fracturing was conducted at the production well allegedly associated with the problems, or featured confounding factors (e.g., accidental spills during operation and transport, improper management of impoundment pits, air emissions, etc.) that make it difficult to link water impacts specifically to hydraulic-fracturing activities.

Of the "more than 1,000 cases of contamination" that ProPublica alleged were documented by various state and local governments—a figure that quickly spread throughout environmental advocacy groups and has been passed along somewhat uncritically—the EPA could identify only 12 that could "have a possible link to hydraulic fracturing," but even for them the EPA could not make a determination. This led several senior EPA officials to acknowledge in testimony to Congress last year that the agency knew of no contamination incidents associated with hydraulic fracturing. Indeed, Energy Secretary Steven Chu recently signaled his belief that fracturing can be performed safely.

THE DEBATE OVER SAFETY

Shale gas drillers, for their part, remain adamant that the environmentalists' allegations are misguided and that geological and hydrologic study of the formation and a correspondingly tailored casing program effectively protect groundwater during the drilling process. In addition, the industry maintains that the relatively greater vertical distance, often thousands of feet, from groundwater and the presence of multiple layers of intervening, impermeable formations render shale gas drilling inherently safer than coalbed methane drilling, which the EPA has already found to pose "little or no" threat to groundwater.

Nonetheless, several members of New York's congressional delegation inserted language in the 2010 appropriations bill for the EPA and the Department of the Interior urging the EPA "to carry out a study on the relationship between hydraulic fracturing and drinking water, using a credible approach that relies on the best available science, as well as independent sources of information." Congress did not provide a line item in the EPA's budget for this study, which is expected to cost millions of dollars. If it can resolve these cost issues, the EPA is likely to begin the study this year, with plans to focus on shale deposits as opposed to coalbed methane.

It remains to be seen how Congress will treat shale gas drilling generally, and hydraulic fracturing specifically, while the EPA study is going on. The Fracturing Responsibility and Awareness of Chemicals Act (the FRAC Act), introduced in June 2009 by Rep. Diana DeGette (D-Colo.) and Rep. Maurice Hinchey (D-N.Y.) in the House of Representatives and Sen. Robert Casey (D-Pa.) and Sen. Charles Schumer (D-N.Y.) in the Senate, received a fresh jolt of publicity in January when the House Energy and Commerce's energy and environment subcommittee convened a hearing on the Exxon Mobil/XTO merger, which, while nominally about the impact of the proposed merger on the natural gas market, quickly focused on hydraulic fracturing.

The FRAC Act does two things. First, it modifies the definition of "underground injection" specifically to include hydraulic fracturing, meaning that the EPA may have no discretion not to regulate the practice. Second, it imposes an affirmative obligation on oil and gas operators to disclose fracking fluid constituents to the applicable regulatory agency, which is then obligated to make that list available to the public. Most gas producers, including Exxon Mobil and XTO, have signaled a willingness to disclose these chemical constituents, provided that the specific proprietary formula could remain confidential.

When introduced during previous sessions, earlier iterations of the FRAC Act generally have stalled in committee. If Congress takes up an energy bill this year, however, some observers expect a concerted attempt to include the FRAC Act or some part of it. One possible course, advocated by many of the representatives at the Exxon Mobil/XTO hearing, may be to defer legislative action on hydraulic fracturing until the EPA reports the results of its new study, and those results identify countervailing evidence of a link between the practice and groundwater contamination. Either way, this policy debate shows no signs of going away in the near future.

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