

Fracking Regulations: Is Federal Hydraulic Fracturing Regulation Around the Corner?

David Spence, Associate Professor, Department of Business, Government & Society and Co-Director, EMIC

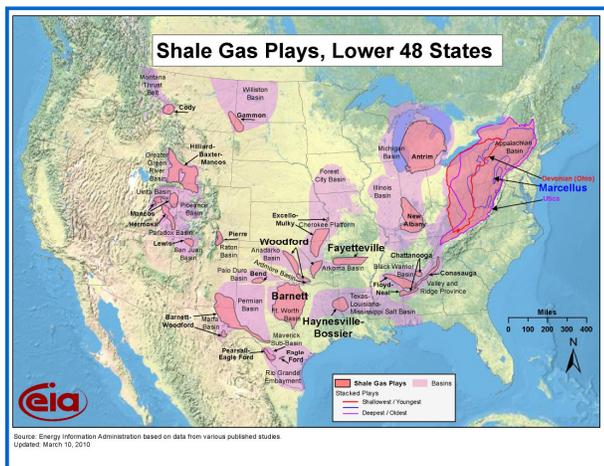


Professor Spence's research and teaching focuses on business-government relations and regulations, particularly energy and environmental regulation. He received his Ph.D. in political science from Duke University, and his J.D. from the University of North Carolina.

Natural gas burns more cleanly than either coal or oil, is available domestically, and is seen by many as a “bridge fuel” between our traditional dependence on coal and oil and a cleaner energy future. So it’s no surprise that one of the biggest energy stories of the past 15 years has been the new accessibility of vast quantities of natural gas trapped in shale formations across the United States (and elsewhere).

While we have long known that shale gas was there, recent technological advances have made shale gas more convenient and price competitive with conventional gas and other fuels. As conventional sources of natural gas have become less plentiful and productive, shale gas has stepped into the breach, offering the prospect of increased supply and price stability.

Oil and gas companies have been producing gas in the Barnett shale formation, found in North Texas, and the Haynesville Shale, immediately north of the Gulf Coast, for years. Oil and gas companies found a regulatory and political environment in those states that was familiar with the oil and gas industry and relatively accepting of development. More recently, oil and gas companies have turned their attention to other shale gas formations, including the enormous Marcellus shale, which underlies the vast areas of Appalachia and the northeast. Estimates of the amount of natural gas in the Marcellus shale are in the hundreds of trillions of cubic feet, enough to satisfy a very large share of American gas demand for years.



Click on image to enlarge map.

In order to get at shale gas, oil and gas companies use a process called “hydraulic fracturing,” or “fracking” for short. Fracking is not a new process; it has been used to produce oil and methane gas from coal beds for decades. Its widespread use is relatively new to shale gas production, however. Fracking involves drilling a wellbore down into the shale formation, casing the well, and injecting fluids at high pressure into the bore. The fracking fluids contain small quantities of toxic chemicals, and the mixture is chemically designed to fracture and prop open the shale, freeing the gas trapped in the shale, so that it can be produced by the well.

After fracturing, some of the fluids flow back up through the wellbore (so-called “flowback water”); flowback water typically contains some of the original fracking fluid constituents, as well as other chemicals and materials found underground. While fracking has been used without much controversy to produce gas from the Barnett shale, the prospect of increasing shale gas production in other parts of the country has proved more contentious. In Colorado and in the Marcellus shale, some residents have opposed fracking in their communities, citing fears of drinking water well contamination, depletion of groundwater tables, spills of chemicals used in fracking fluids, disposal of fracking wastes, and other kinds of environmental harm.



Photo by Mike Greenlar, published in the Syracuse, NY Post Standard, January 19, 2010.

Fears arise from reports of contamination of groundwater associated with fracking to produce coal bed methane gas. However, coal bed methane is frequently produced at or close to depths associated with groundwater tables, while shale gas fracking occurs at depths hundreds or thousands of feet below ground water tables. Nevertheless, fracking does involve drilling wells down through groundwater aquifers, and the transport, storage, injection into the ground, and disposal of fluids containing toxic constituents. In the wake of BP’s Deepwater Horizon disaster, we know that any human activity of this kind is not risk-free.

Regulatory Exemptions for Fracking

Some of the fears about fracking are fed by the relatively light handed regulatory regime applied to shale gas fracking in the United States. Under federal law, fracking enjoys several important regulatory exemptions that are not applicable to most other heavy industries. The first is the exemption of fracking wastes from the definition of hazardous wastes under the [Resource Conservation and Recovery Act \(“RCRA”\)](#). It is expensive to comply with RCRA, in part because the statute requires those treating, storing or disposing of toxic wastes — or wastes containing specifically listed toxic constituents — to meet strict, detailed technical and financial requirements, including the requirement that hazardous

wastes be disposed of only at specially permitted hazardous waste disposal facilities.

While fracking fluid mixtures typically contain only trace elements of toxic constituents, some of those constituents are listed as hazardous wastes under RCRA. Under normal circumstances, that fact alone would subject the mixture to RCRA regulation. However, Congress chose to exempt oil and gas wastes from the regulation as hazardous wastes under the statute.

The Clean Water Act fills part of that gap by regulating the disposal of waterborne fracking wastes into lakes, streams or sewage treatment facilities; and the Hazardous Materials Transportation Act regulates the transport to and from the well site of any hazardous chemicals that will be added to fracking fluids. However, neither federal statute regulates the disposal of fracking wastes on land, or their injection into the ground: those methods of disposing of flowback water or other fracking wastes are subject only to state regulation.

Second, fracking wastes are also exempt from another fairly strict body of regulations: namely, the so-called “underground injection well” requirements of the [Safe Drinking Water Act](#). The Act is designed to protect drinking water aquifers from contamination associated with the injection of liquid wastes into underground wells, and establishes a variety of technical, reporting, and other requirements designed to prevent such contamination. Certainly, fracking wells fall within the Safe Drinking Water Act’s definition of an “underground injection well.” However, the Act includes a specific exemption for hydraulic fracturing activities, one granted by Congress as part of the 2005 Energy Policy Act. As a result, the protection of drinking water aquifers from contamination resulting from the fracking process also falls to the states.

Third, fracking (and most upstream energy production activities) are also exempt from some information disclosure requirements contained in the federal [Emergency Planning and Community Right to Know Act](#). The Act includes a requirement that firms submit annual reports detailing their use of toxic chemicals to the EPA. This so-called “Toxic Chemical Release Form” applies to most heavy industries, which fall within Standard Industrial Classification Codes 20-39—including petroleum refining. If covered by this provision, fracking companies would be required to reveal to the EPA the particular toxic constituents that go into fracking fluids, and their amounts; moreover, they would be required to account for those toxic constituents throughout the fracking process, from purchase to disposal.

Thus, when it comes to fracking, much of the regulatory heavy lifting is left to the states. According to a [recent survey of state fracking regulation](#) by University of Tulsa law professor Hannah Wiseman, states take a wide variety of approaches to the regulation of fracking activities. Some give the state environmental regulatory agency independent regulatory authority over fracking; others tend to regulate exclusively through the state oil and gas commission’s well permitting process.

Fracking operations involve the storage of enormous quantities (sometimes millions of gallons) of fluids, and every shale gas state imposes some limitations on the methods of storing and disposing of chemicals and liquid wastes created by gas production from wells. All states require flowback water, for example, to be contained at the well site. However, some states impose strict technical standards on the storage of high-volume fluids on site; others have only minimal standards. Some, like New York, require fluids to be removed from these containment units frequently; others do not. New York and Pennsylvania require flowback water to be disposed of in specially approved facilities; West Virginia, by contrast, allows land application of flowback water. High profile spills of fracking fluids in [Colorado](#) and [Pennsylvania](#) highlight the importance of these storage and disposal standards.

Information Disclosure and the FRAC Act

Oil and gas companies have resisted disclosure of the exact composition of fracking fluids on the grounds that these mixtures are trade secrets. Creating a fracking fluid mixture that produces the desired results—that is, one that maximizes the ability of the well to produce gas for a sustained period—is an extremely complicated task. The right mixture is both a valuable commodity to the owner, and the product of considerable intellectual effort and resources so it is natural for companies to try to protect that information. On the other hand, state regulation has shed some light on the composition of fracking fluids.

In the summer of 2010, the Pennsylvania Department of Environmental Protection released a [list of chemicals found in fracking fluids](#). That list apparently did not match an earlier list released by the New York State Department of Environmental Conservation, though there was some overlap. Neither list revealed the composition of specific fracking fluids used at specific sites; rather, the lists described constituents found in fracking fluids generally. Inconsistency between the lists, in addition to findings that both lists contained some toxic and dangerous chemicals, has fed public fears about the risks of hydraulic fracturing.

To try and alleviate these concerns, companion bills ([S.1215](#) and [H.R.2766](#)) proposing additional regulation of fracking were introduced in the U.S. Senate and House of Representatives in 2009. Together they constitute the “Fracturing Responsibility and Awareness of Chemicals Act,” also known as the “FRAC Act.” The Act would repeal the exemption of the fracking process from regulation under the Safe Drinking Water Act, and would require disclosure to the state and to the public of “the chemical constituents (but not the proprietary chemical formulas) used in the fracturing process.” While the FRAC Act and bills were reported to committee and their respective houses of Congress, neither bill was ever brought to a vote on the floor.

Meanwhile, the EPA is working on a congressionally recommended [study of hydraulic fracturing](#) which is due to be completed by 2012. The failure of the FRAC Act to generate significant political support may be due in part to the existence of the ongoing EPA study, which offers undecided members of Congress a reason to “wait and see” before acting, and offers opponents of regulation political cover. Presumably, the FRAC Act bills will be reintroduced in the next Congress, during which the EPA’s report on fracking will be presented. As long as state regulation remains uneven, and fracking operations continue to enjoy important exemptions from federal regulation, pressure to regulate will remain.

The portions of the FRAC Act that would lift the exemption from SDWA regulation seem to be motivated by fairly remote risks. Given the depth at which hydraulic fracturing process takes place, and its great distance from drinking water aquifers, it appears that the fracturing process itself poses little risk to drinking water sources, though the wells used to inject fracking fluids into the ground pass through drinking water aquifers. Naturally, if those wells are not properly designed, constructed and sealed, they can leak into adjacent aquifers, which is why all states have technical standards that apply to well construction. Industry representatives contend that there have been no drinking water contamination episodes associated with *shale* gas fracking (as opposed to fracking in connection with other kinds of oil and gas operations), despite the use of the technique more than a million times in connection with shale gas production. Nevertheless, drinking water contamination episodes associated with fracturing to produce coal bed methane have stoked fears that “fracking can contaminate drinking water.”

The information disclosure portions of the FRAC Act have a stronger political basis, and opposition to the disclosure of fracking fluid constituents seems more difficult to justify strategically. Federal law does require companies to keep information (material safety data sheets, or MSDSs) about toxic constituents at fracking sites, so that workers and the public can find out which chemicals are present at the worksite, and how to respond in the event of an accident. Industry contends that this is sufficient, as

the MSDSs provide all the information people need to know about the risks associated with toxic constituents in their pure form, further arguing that when those toxins are diluted in fracking fluid mixtures, risks become minute.

However, even if that argument is technically correct, it ignores important political realities. State and local governments control access to shale gas, and some of those communities do not trust oil and gas companies, particularly after BP's Deepwater Horizon accident. Providing information about individual fracking fluid constituents at the well site (via material safety data sheets) is not quite the same thing as providing information to the public about the hazards associated with the actual fracking fluid *mixtures*. Since fracking fluids contain only trace amounts of toxic constituents, disclosure of the composition of fracking fluids ought to illustrate the mixture's nontoxic nature, thereby reassuring the public and mitigating the some of the community opposition to fracking. Furthermore, opponents of fracking argue that the only reason there has been no confirmed case of drinking water contamination from fracking is such cases are impossible to confirm in the absence of information about fracking fluid mixtures. That argument is likely to resonate with lawmakers and regulators in some parts of the Marcellus shale region.

An Unsteady Future for Federal Fracking Regulation

It is always difficult to predict legislative action. However, there does appear to be some slow-building momentum favoring disclosure of more information about fracking fluid mixtures, for all the strategic reasons I suggest above. That disclosure may be voluntary, or it may be compelled by state regulators. Several gas producers—Chesapeake Energy, Range Resources and ExxonMobil among them—have [issued public statements favoring more information disclosure](#) than is currently required by federal law. These statements highlight a bit of a schism between gas producers and the energy services companies with whom they contract to produce fracking fluids. It is often the contractors who determine the exact composition of fracking fluids, so the mix is their intellectual property, something they naturally wish to protect. Their clients, the gas producers, seek access to shale gas, and recognize that disclosing such information may become a precondition to access to shale gas resources and some parts of the country.

This is not to say that gas producers support passage of the FRAC Act, however. Indeed, the immediate prospects for passage of the FRAC Act seemed dim, barring some sort of major high profile accident involving fracking. The 111th Congress has been paralyzed by partisan rancor, and seems unable to produce a majority in favor of most energy legislation. The November 2010 elections will change the composition of the 112th Congress, probably in ways that further reduce the probability of passing any major federal energy bills.

Instead, it seems likely that the regulation of fracking will continue to be left to the states. In places where states and local communities tend to trust the oil and gas industry, that trust will be reflected in the way governments regulate the fracking process. In the Marcellus shale, we may see companies voluntarily disclosing more information about fracking fluids as a concession to political realities. We may also see state governments imposing additional regulation requiring more disclosure of information about fracking fluids.