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Hydraulic Fracturing: An Overview of the Legal Issues

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I. Hydraulic fracturing is a “well stimulation” technique that facilitates the production of oil or gas from low-permeability rock formations. The process, which was commercially developed in the late 1940s, uses a mixture of water and additives at high pressure to create artificial fractures in target formations, thereby creating pathways for oil or gas to flow to the well. For decades after hydraulic fracturing was commercially developed, it drew little public attention. But in recent years, as the process has been used in the development of shale plays, the process has received extensive attention and has become controversial. Many members of the public have expressed concerns that hydraulic fracturing might adversely affect underground sources of drinking water or harm the environment in other ways. This article discusses several legal issues raised by those concerns.

I. Background

1. Hydraulic Fracturing

When oil or gas is found underground, it is not located in open caverns. Rather, it is found in the pore spaces of subterranean rock formations. If a well is drilled into such a formation, the oil or gas travels to the wellbore by flowing through the underground rock formation. The oil or gas is able to flow through the rock by passing from one pore space to the next


through interconnections between the pores.\textsuperscript{3} If the interconnections between pores are too narrow or too few in number, the rock will have low permeability. That is, fluid will not flow easily through the rock.\textsuperscript{4}

Low permeability formations sometimes are called “tight,”\textsuperscript{5} and generally it will not be economical to produce oil or gas from such formations using conventional methods.\textsuperscript{6} But if a well operator can artificially create cracks or fractures in the rock, the oil or gas can flow through those fractures, and will not be limited to flowing through interconnections between pores.\textsuperscript{7} The purpose of fracturing is to create such cracks or fractures.

Well operators first began fracturing wells in the 1860s in Pennsylvania, by lowering nitroglycerin torpedoes into wells and detonating them.\textsuperscript{8} This process, called “explosive fracturing,”\textsuperscript{9} often would significantly increase a well’s rate of production.\textsuperscript{10} A safer and superior fracturing process — hydraulic fracturing — was

\begin{itemize}
\item \textsuperscript{3} See Raymond, supra note 2, at 39. In some formations, natural fractures in the rock provide an additional pathway for the flow of oil or gas. See Norman J. Hyne, Nontechnical Guide to Petroleum Geology, Exploration, Drilling and Production 60 (Pennwell Corporation 2nd ed. 2001) (hereinafter, “Hyne”)
\item \textsuperscript{5} See Manual of Oil and Gas Terms at 998.
\item \textsuperscript{7} See id. at 327, 329.
\item \textsuperscript{8} Hyne, supra note 3, at 422-3; see also Roberts v. Dickey, 20 F. Case. 880, 883-84 (W.D. Pa. 1871) (discussing patent granted in 1866 for invention relating to explosive fracturing).
\item \textsuperscript{9} See Hyne at 478.
\item \textsuperscript{10} See id. at 422-3.
\end{itemize}
commercially developed in the late 1940s and, by some estimates, has been used in over a million wells since then.\textsuperscript{11}

In hydraulic fracturing,\textsuperscript{12} a fluid is pumped into the well at a sufficiently high pressure that the target rock formation fractures.\textsuperscript{13} The fractures would tend to close upon withdrawal of the fracturing fluid. To prevent that, small particles called “proppants” are added to the fracturing fluid, which carries the proppants into the fractures. When the water is withdrawn, the proppants stay behind, propping open the fractures.\textsuperscript{14} Sand is the most common proppant, but sometimes resin-coated sand or small, specially-manufactured ceramic particles or sintered bauxite particles are used.\textsuperscript{15}

Typically, about 98 to 99.5\% of a fracturing fluid consists of water and proppants, while the remainder consists of a number of chemical additives that are mixed with the water to facilitate the fracturing process.\textsuperscript{16} These additives include: (1) biocides to prevent microbial growth; (2) corrosion inhibitors to protect the well’s piping; (3) viscosifiers to increase the viscosity of water, so that it is better able to carry proppants into the fractures; and (4) friction reducers to reduce the pressure drop caused by friction between the flowing fluid and the well’s pipe walls.\textsuperscript{17} Many of the


\textsuperscript{12} The process sometimes is called “fracing,” particularly in industry literature, and is pronounced so that it rhymes with the word “tracking.” In popular culture, the term typically is spelled “fracking.” Sometimes, the process is called “hydrofracturing” or “hydrofracking.” \textit{See} Kurth, \textit{supra} note 11, at 278-279; Manual of Oil and Gas Terms at 377, 450.

\textsuperscript{13} \textit{See} Shale Gas Primer at 82 (defining “hydraulic fracturing”); \textit{see also} Manual of Oil and Gas Terms at 450.

\textsuperscript{14} \textit{See} Hyne, \textit{supra} note 3, at 424.


\textsuperscript{16} \textit{See} Shale Gas Primer at 61, 62.

\textsuperscript{17} \textit{See id.} at 61-4.
additives are harmless substances, though some are hazardous at sufficient concentrations.\textsuperscript{18}

After the fracturing process is complete, the operator of the well allows the natural pressure of the formation that is being fractured to push the fracturing water back up the wellbore to the surface, where this “flowback” water is recovered. An initial recovery rate of 30 to 70 percent is typical, during the flowback process, which may last for 3 to 10 days, after which the well is put into production.\textsuperscript{19} Some additional fracturing water is recovered, along with oil or gas, during production.\textsuperscript{20} Generally, well operators have disposed of flowback water by underground injection or sending it to treatment plants, but operators are increasingly developing the ability to use some of the flowback water in subsequent fracturing operations. The reason operators sometimes are unable to use all of the flowback water in subsequent frac jobs is that the chemistry of the flowback water is altered by salts and other substances that dissolve into the water from the formation being fractured.

Hydraulic fracturing has been used for several decades in “tight” gas formations, as well as in coal seams that are being fractured to facilitate the production of coalbed methane.\textsuperscript{21} In the last several years, hydraulic fracturing has been used in conjunction with horizontal drilling to produce oil or gas from shale formations that have extremely low permeability.\textsuperscript{22}

2. \textit{Horizontal Drilling}

In conventional vertical drilling, the drilling proceeds more or less vertically downward. Years ago, operators developed the ability to engage in “directional drilling,” in which drilling proceeds diagonally, rather than straight downward. A benefit of

\textsuperscript{18} See id. at 62.

\textsuperscript{19} See id at 66.

\textsuperscript{20} See id.


\textsuperscript{22} Quest, supra note 6, at 329.
diagonal drilling is that it allows operators to drill to a particular target, even if it would be impossible or undesirable to locate the drilling rig directly above the target. For example, the bottom hole target might be located below a residential neighborhood where no one wants to locate a drilling rig. Also, it is more expensive to drill in water than on land. If the bottom hole target is directly beneath a location a short distance offshore, it might be most economical to locate the well on land, but near the shore, using directional drilling to reach the target.23

Years ago, operators also developed the ability to conduct horizontal drilling. In horizontal drilling, the drilling initially proceeds vertically downward, but as the drilling approaches the target formation, the drill bit gradually is turned, so that by the time the drilling reaches the target formation, the drilling is proceeding in a horizontal direction. The drilling then might proceed in a horizontal direction for as much as a mile. This allows a long stretch of well pipe to be placed in the target formation, which might be a horizontal rock layer or “horizon” that is only a few hundred feet from top to bottom (or maybe much shorter than that), but which may stretch for many miles in each horizontal direction.24 Having a long stretch of pipe in the target formation can be an advantage because oil or gas enters the well through perforations in the portion of the pipe that is in the target formation (rather than just at an opening at the very end or bottom of the pipe).25 Thus, a longer length of wellbore in the target formation means that a greater length of pipe can be perforated to allow the inflow of oil or gas.

23 See Hyne, supra note 3, at 289-290.


25 See Hyne, supra note 3, at xl.
II. Legal Issues Raised By Hydraulic Fracturing

Hydraulic fracturing raises numerous regulatory issues, as well as litigation issues.

a. Regulatory Issues

Although the most-commonly expressed concern about hydraulic fracturing is that it might somehow cause contamination of groundwater, people have expressed other expressed additional concerns, which have prompted responses by regulators. Below, this article discusses regulatory issues relating to: (a) water supplies and the quantity of water used in the process; (b) hydraulic fracturing itself; (c) disclosure and identification of the chemicals used as fracturing fluid additives; (d) disposal of flowback water; and (e) air emissions during the flowback portion of the hydraulic fracturing process.

a. Water supply issues

Some people have expressed concern about the quantity of water used in hydraulic fracturing. The amount of water used to fracture a well depends upon the length of the zone to be fractured. In the Haynesville Shale, a gas play located in northwest Louisiana and Northeast Texas, operators typically will fracture along a horizontal lateral that is a few thousand feet long. In doing so, they generally use about three to four million gallons of water. This amount is similar to the amount used in fracturing horizontal wells in other shale plays. Such a quantity of water is not large compared to the amount of water used in agriculture and some

26 Shale Gas Primer, supra note 4, at 64.
27 This amount of water often is said to be similar to the amount of water used in some areas to irrigate about ten acres of corn. See FREQUENTLY ASKED QUESTIONS ABOUT HYDRAULIC FRACTURING, http://cogcc.state.co.us/Announcements/Hot_Topics/Hydraulic_Fracturing/Frequent_Questions_about_Hydraulic%20Frac.pdf (an information sheet available from the Colorado Oil and Gas Commission, which states that 5 million gallons of water is the amount of water used to irrigate about 7.5 acres of corn in a growing season; HYDRAULIC FRACTURING OF NATURAL GAS WELLS IN MICHIGAN, http://www.michigan.gov/documents/deq/Hydrofrac-2010-08-13_331787_7.pdf (describing 5 million gallons of water as the amount of water used to irrigate 8 to 10 acres of corn).
industrial processes, but such usage can be an issue if an area is already short on water or if a large number of wells are being fractured.

When companies began fracturing wells in the Haynesville in 2008, they usually used groundwater from the Carrizo-Wilcox aquifer, the same aquifer that many landowners in the area use to supply their domestic water needs. The Louisiana Office of Conservation (“Conservation”) began receiving complaints from landowners that their private water wells were “going dry.”\footnote{Remarks of Commissioner Jim Welsh at EPA Workshop on 3/29/2011, available at http://dnr.louisiana.gov/assets/docs/conservation/documents/EPAWors.pdf.} Under traditional rules regarding use of groundwater, if the companies performing the fracturing owned a water well, or had permission to use someone’s well, they would be entitled to pump as much water as they wished, even if their usage disadvantaged others by causing the aquifer’s level to drop.\footnote{Adams v. Grigsby, 152 So. 2d 619, 622 (La. App. 2nd Cir.), \textit{writ denied}, 153 So. 2d 880 (La. 1963); La. R.S. 31:4, 31:14.} That rule was modified slightly by legislation enacted in 2003 that gives Conservation limited authority to restrict usage.\footnote{La. R.S. 38:3097.1 \textit{et seq}.}

On October 16, 2008, Commissioner of Conservation Jim Welsh issued a memorandum “encourag[ing]” oil and gas operators to use water from surface sources (such as streams and ponds) for their fracturing “where practical and feasible.”\footnote{GROUND WATER USE ADVISORY: COMMISSIONER OF CONSERVATION RECOMMENDS WISE WATER USE PLANNING IN THE HAYNESVILLE SHALE, http://dnr.louisiana.gov/index.cfm?nd=newsroom&tmp=detail&aid=509.} Further, if that was not feasible, Welsh “recommended” that they use water from the Red River Alluvial aquifer, which has water that is less suitable for domestic use than the water in the Carrizo-Wilcox aquifer. Most operators complied with Welsh’s request that they switch to using surface water. Statistics show that, from October 2009 through January 2011, surface water supplied 80% of the water used for fracturing wells in the Haynesville.\footnote{SUSTAINING LOUISIANA’S FRESHWATER AQUIFERS, available at http://dnr.louisiana.gov/index.cfm?nd=newsroom&tmp=detail&aid=509.} The operators’ voluntary response avoided the need for regulation.
But the switch to surface water raised another issue. Louisiana Civil Code article 450 provides that the water in running streams and navigable water bodies belongs to the State. And Article VII, Section 14(a) of the Louisiana Constitution prohibits the donation of State property. If the State allows companies to use surface waters without charge, is that a prohibited donation? The Louisiana Attorney General issued an opinion suggesting that it is.\(^3\) The legislature responded by enacting legislation that authorizes the Department of Natural Resources (“DNR”) to enter cooperative endeavor agreements that allow companies to use surface water.\(^4\) The agreements must be in writing, and companies must pay “fair market value” for the water.

The legislation does not require companies to enter cooperative endeavor agreements, and some companies have declined to do so. But other companies have entered such agreement with DNR, paying “fair market value” for the water pursuant to the legislatively-authorized process, thereby obtaining protection against any claim that they have improperly utilized state-owned water.

The use of water in hydraulic fracturing has become an issue in other states as well. Texas is experiencing a severe drought, and some people have expressed concern about whether Texas has sufficient supplies of water to satisfy both traditional users of water and the operators who are hydraulically fracturing wells in the various shale plays found in Texas, such as the Haynesville, Barnett, and Eagle Ford. One of the Texas Railroad Commissioners\(^5\) appointed an Eagle Ford Task Force to investigate various issues arising from the development of the Eagle Ford Shale. The Task Force, which includes representatives of various stakeholders, recently concluded that the Carrizo-Wilcox aquifer is sufficient to supply both traditional users of

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\(^4\) La. Acts 2010, No. 955

\(^5\) In Texas, the oil and gas industry is regulated by the Railroad Commission.
water and operators who are performing hydraulic fracturing in the Eagle Ford.\textsuperscript{36}

In 2011, Michigan enacted new rules to regulate large volume hydraulic fracturing, which the rules define as any frac job using more than 100,000 gallons of water. Hydraulic fracturing has been used for decades in Michigan for natural gas wells drilled to the shallow Antrim Shale. Those wells are relatively shallow, vertical wells, and operators in that area perform small frac jobs that utilize only modest amounts of water, about 50,000 gallons per Antrim well.\textsuperscript{37} Michigan’s new rules do not attempt to address small frac jobs of the type used in the Antrim Shale. Regulators adopted the rules to address the possibility that operators will begin using large volume frac jobs for development of the deeper Utica Shale. A concern about water usage is part of what motivated regulators to adopt the new rules.\textsuperscript{38}

\textit{i. Regulation of Hydraulic Fracturing Under the Safe Drinking Water Act}

The most-frequently expressed concern about hydraulic fracturing is that the process might somehow cause contamination of groundwater. The federal Safe Drinking Water Act regulates underground injections in an attempt to protect underground sources of drinking water, but for the most part, the Act does not apply to hydraulic fracturing. Further, even to the extent that the Act does apply, regulators traditionally have not applied their regulatory authority to the process, though that appears likely to change. The current status of SDWA regulation, and how the current status has been reached, is summarized below.


\textsuperscript{38} See id.
1. The Safe Drinking Water Act is enacted

Congress enacted the Safe Drinking Water Act (“SDWA”) in 1974. Part C of the SDWA addresses the protection of underground sources of drinking water.\(^{39}\) It requires the EPA to develop minimum standards for regulatory programs that will prevent underground injections that endanger drinking water.\(^{40}\) If the EPA determines that a particular State has developed a program for underground injection control (“UIC”) that meets the EPA’s minimum regulatory standard, that State may assume primary responsibility for regulating underground injections.\(^{41}\) Otherwise, the EPA itself must develop and administer a UIC program for the State.\(^{42}\) Part C provides that one of the minimum standards for UIC programs is that they must prohibit all underground injections that are not authorized by permit or by rule.\(^{43}\) Part C generally defines “underground injection” as being “the subsurface emplacement of fluids by well injection,” though the definition also includes certain exceptions to this general definition, as will be discussed in more detail below.\(^{44}\)

For years, few, if any, UIC programs regulated hydraulic fracturing or required a person to obtain a SDWA permit prior to fracturing. Both industry and the regulatory community apparently believed that fracturing did not constitute an underground injection for purposes of the SDWA. This belief likely was influenced by the facts that: the purpose of hydraulic fracturing is not disposal; the fracturing process lasts for a relatively short time, after which a well may produce oil or gas for years; much, though not all, of the fracturing fluid is recovered from the well; and some of the SDWA’s language, as well as some of its legislative history,

\(^{39}\) See 42 U.S.C. § 300h-h(8).
\(^{40}\) Id. at § 300h(a)-(b).
\(^{41}\) Id. at § 300h-1(b)(3).
\(^{42}\) Id. at § 300h-1(c).
\(^{43}\) Id. at § 300h(b)(1)(a).
\(^{44}\) Id. at § 300h(d)(1).
suggest that the SDWA was, for the most part, not intended to regulate drilling for oil or gas.\textsuperscript{45}

2. The \textit{LEAF} Litigation

Although hydraulic fracturing did not attract much public attention until recently, it has been used for decades in producing oil or gas from low-permeability formations. For example, hydraulic fracturing has been used to facilitate the production of natural gas from coal seams for many years, including coal seams located in Alabama. In 1994, the Legal Environmental Assistance Foundation (“\textit{LEAF}”) petitioned the EPA to withdraw its prior approval of Alabama’s underground injection control program.\textsuperscript{46} LEAF asserted that Alabama’s UIC program was deficient because it did not regulate hydraulic fracturing. The EPA denied LEAF’s petition, concluding that Alabama’s UIC program satisfied the minimum standards required by the EPA’s regulations.\textsuperscript{47} The EPA reasoned that its regulatory definition of “underground injection” only encompassed wells whose “principal function” is the underground injection of fluids, and that the principal function wells for coalbed methane production is the production of natural gas, not the injection of fluids.

After LEAF’s petition was denied, the organization filed suit, challenging the denial.\textsuperscript{48} LEAF contended that the EPA’s interpretation of its regulations would make the regulations inconsistent with the SDWA. The EPA disagreed, arguing that the statutory definition of “underground injection” found in the SDWA was ambiguous, that Congress had only intended the SDWA to apply to wells whose principal function is to receive underground injections, and that the EPA’s regulations were based on a permissible interpretation of the SDWA.\textsuperscript{49}

\textsuperscript{45} Some of these factors are discussed in Legal Envtl. Assistance Found., Inc. v. Envtl. Prot. Agency, 118 F.3d 1467 (11th Cir. 1997).

\textsuperscript{46} See id. at 1471.

\textsuperscript{47} See id.

\textsuperscript{48} See id. at 1472.

\textsuperscript{49} See id. at 1473-4.
The Eleventh Circuit rejected the EPA’s argument, noting that Part C requires States to “prohibit . . . any underground injection” that is not authorized by permit or rule. Thus, the SDWA requires regulation of all wells used for “underground injection,” notwithstanding that the wells might have an additional purpose — even a primary purpose — other than underground injection.

Therefore, if hydraulic fracturing otherwise fit within the statutory definition of “underground injection,” it had to be regulated. The court had little trouble concluding that hydraulic fracturing fit within that definition — ”the subsurface emplacement of fluids by well injection.” In briefing, the EPA noted, but did not expressly adopt, an argument previously asserted by the Alabama Department of Environmental Management. The Alabama DEM had argued that fracturing does not involve the underground “emplacement” of fluids because “emplacement” implies that a fluid is permanently placed in a location, but a substantial portion of fracturing water is recovered from the well after fracturing is complete. The Eleventh Circuit rejected that argument too, noting that a portion of fracturing fluid is not recovered. The court reasoned that the unrecovered fluid is “emplaced.” Further, stated the court, the EPA’s regulations treat certain other activities as an underground injection, even though those activities involve a temporary emplacement of fluids underground.

The Court then turned to the EPA’s argument that the SDWA’s legislative history demonstrated that the Congress did not intend for it to apply to “drilling techniques.” The court rejected that argument also, concluding that hydraulic fracturing is not a drilling technique, but instead is a post-drilling technique. The court also noted that the EPA’s legislative history argument was based primarily on a “brief exchange” during floor debate.

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50 See id. at 1474 (quoting 42 U.S.C. § 300h(b)(1)).
51 See id. at 1475.
52 See id. at 1474 n.10.
53 See id. at 1475.
54 See id. at 1475-6.
55 See id. at 1476-7.
Further, because the SDWA’s language was clear, there was no reason to resort to legislative history to interpret the statute.\textsuperscript{56}

Subsequent to this litigation, Alabama enacted rules to regulate hydraulic fracturing. LEAF challenged those rules too.\textsuperscript{57} The second round of litigation involved much narrower issues, with the parties fighting over such questions as whether wells in which fracturing is used had to be included in one of five existing regulatory categories for underground injection wells, or whether a new classification was proper. In the second round of litigation, LEAF prevailed on certain issues, and the EPA prevailed on others.

3. EPA’s 2004 Report

Following the \textit{LEAF} decision, the EPA decided to study the potential for the hydraulic fracturing of coalbed methane wells to result in the contamination of underground sources of drinking water (“USDWs”).\textsuperscript{58} The EPA focused on coalbed methane wells in part because those wells tend to be shallower and closer to USDWs than conventional oil and gas wells.\textsuperscript{59} Indeed, many coalbeds that are targeted for coalbed methane production are actually within USDWs or immediately adjacent to USDWs.\textsuperscript{60} Further, the Eleventh Circuit decision in \textit{LEAF} had specifically concerned hydraulic fracturing in connection with coalbed methane production, and the concerns EPA had heard citizens expressing about hydraulic fracturing arose from the use of hydraulic fracturing in coalbed methane (“CBM”) production.\textsuperscript{61}

\textsuperscript{56} See id at 1475.


\textsuperscript{59} See id.

\textsuperscript{60} See id. at ES-10.

\textsuperscript{61} See id.
The EPA designed its study to have “three possible phases.\(^{62}\) The goal of the first phase “was to assess the potential for contamination of USDWs due to the injection of hydraulic fracturing fluids into CBM wells and to determine based on these findings, whether further study is warranted.\(^{63}\) In Phase I, EPA reviewed more than 200 peer-reviewed publications, interviewed approximately 50 persons from industry and state or local regulatory agencies, and communicated with approximately 40 citizens and groups who had expressed concerns that the use of hydraulic fracturing in coal bed methane production had affected their drinking water wells.\(^{64}\)

The EPA produced a preliminary report in August 2002 and a final report in June 2004. The final report noted that there were numerous incidents in which persons believed their drinking water wells had been contaminated by hydraulic fracturing operations, but the EPA “found no confirmed cases that are linked to fracturing fluid injection into CBM wells or subsequent underground movement of fracturing fluids.”\(^{65}\) Further, “[a]lthough thousands of CBM wells are fractured annually, EPA did not find confirmed evidence that drinking wells had been contaminated by hydraulic fracturing fluid injection into CBM wells.”\(^{66}\) The report stated: “Based on the information collected and reviewed, EPA has concluded that the injection of hydraulic fracturing fluids into CBM wells poses little or no threat to USDWs and does not justify additional study at this time.”\(^{67}\) Thus, “continued investigation under a Phase II study is not warranted at this time.”\(^{68}\) The EPA concluded that the removal of a large quantity of the fracturing fluids in the form of flowback is one reason that hydraulic fracturing poses little threat.\(^{69}\) Other factors working to mitigate risks included dilution and dispersion,

\(^{62}\) See id. at ES-8.
\(^{63}\) See id.
\(^{64}\) See id.
\(^{65}\) Id. at ES-16.
\(^{66}\) Id. at ES-1.
\(^{67}\) Id.
\(^{68}\) Id. at ES-16.
\(^{69}\) See id. at ES-17.
adsorption of fracturing fluids onto coal, and potential for bio-degradation of some constituents contained in fracturing fluid.\footnote{See id. at ES-17. Some commentators have criticized the study’s conclusions and argued that the study was too narrow in scope. See, e.g., Hannah Wiseman, Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation, 20 Fordham Envtl. L. Rev. 115 (2009).}

The EPA noted, however, that sometimes diesel fuel was being used as part of the fracturing fluid.\footnote{See 2004 Study, supra note 58, at ES-1.} The EPA stated that this was a matter of concern because diesel contains benzene, toluene, ethyl benzene, and xylenes ("BTEX").\footnote{See id.} These BTEX compounds are considered “potentially hazardous.”\footnote{Id. at ES-16.} Although the EPA determined that hydraulic fracturing generally was not a threat to underground sources of drinking water, the EPA believed that the use of diesel in particular was a source of concern. This concern was influenced by the fact that many of the coalbeds that were being fractured were found within or immediately adjacent to underground sources of drinking water.

The 2004 report stated that the EPA addressed its concern about BTEX by entering a memorandum of agreement with three companies that performed 95 percent of all CBM hydraulic fracturing to cease using diesel in hydraulic fracturing fluid injected into coalbed methane production wells that are located in USDWs.\footnote{See id. at ES-2.}

4. The Memorandum of Agreement

In late 2003, prior to the issuance of the final draft of the 2004 report, the EPA entered a memorandum of agreement with the three companies that performed the vast majority of hydraulic fracturing in coalbeds, BJ Services Company, Halliburton Energy Services, Inc., and Schlumberger Technology Corporation.\footnote{See A Memorandum of Agreement, http://www.epa.gov/safewater/uic/pdfs/moa_uic_hyd-fract.pdf.}
the agreement, which was signed in December 2003, the companies agreed to “eliminate diesel fuel in hydraulic fracturing fluids injected into CBM production wells in USDWs within 30 days of signing this agreement.” \[76\] The companies also agreed to notify the EPA “within 30 days after any decision to re-institute the use of diesel fuel additives in hydraulic fracturing fluids injected into USDWs for CBM production.” \[77\] The agreement provided that any party to it could withdraw from the agreement with 30 days written notice to the other parties. \[78\]

5. Absence of new regulations

Neither the LEAF litigation nor the 2004 study prompted the EPA to modify its UIC regulations or to require states (other than Alabama) to regulate hydraulic fracturing as an underground injection. In late 2004, the EPA’s Acting Assistant Administrator wrote a letter to Senator Jim Jeffords, answering questions that Jeffords had posed to the Agency. In its answers, the EPA explained why it had not enacted new regulations.

Q: Why did EPA choose to use an MOU as opposed to a regulatory approach to achieve the goal of eliminating diesel fuel in hydraulic fracturing?

EPA: While the report’s findings did not point to a significant threat from diesel fuel in hydraulic fracturing fluids, the Agency believed that a precautionary approach was appropriate. EPA chose to work collaboratively with the oil service companies because we thought that such an approach would work quicker and be more effective than other approaches the Agency might employ. \[79\]

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\[76\] Id. at 5.

\[77\] Id.

\[78\] See id.

\[79\] 151 Cong. Rec. S7278 (June 23, 2005).
The EPA’s letter verified that, prior to *LEAF*, the EPA had interpreted the SDWA as not covering hydraulic fracturing, and seemed to imply that the EPA still did not interpret its regulations as covering hydraulic fracturing.

Q: In light of the Court decision and the Agency’s July 2004 response to the Court remand, did the Agency consider establishing national regulations or standards for hydraulic fracturing or minimum requirements for hydraulic fracturing regulations under Class II programs?

EPA: When State UIC programs were approved by the Agency—primarily during the early 1980s—there was no Eleventh Circuit Court decision indicating that hydraulic fracturing was within the definition of “underground injection.” Prior to *LEAF v. EPA*, EPA had never interpreted the SDWA to cover production practices, such as hydraulic fracturing.

In light of the Phase I HF study and our conclusion that hydraulic fracturing did not present a significant public health risk, we see no reason at this time to pursue a national hydraulic fracturing regulation to protect USDWs or the public health. It is also relevant that the three major service companies have entered into an agreement with EPA to voluntarily remove diesel fuel from their fracturing fluids.80

The EPA’s continuing interpretation of its regulations as not covering fracturing seems to be verified by the fact that the

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EPA did not force states, other than Alabama, to regulate fracturing under the UIC programs. Environmental organizations understood that EPA had failed to regulate, as those organizations made clear in their public statements. For example, one environmental group, the Oil and Gas Accountability Project, stated in a letter to Congress:

[T]he EPA and all states except Alabama have refused to regulate the toxics that are used during hydraulic fracturing operations. What this means, in practice, is that it is legal for hydraulic fracturing companies to inject toxic chemicals into or close to drinking water aquifers.

EPA does not currently regulate hydraulic fracturing, a common technique used to stimulate oil and gas production that can potentially compromise groundwater resources and reserves.\(^81\)


In 2005, Congress enacted the Energy Policy Act.\(^82\) The Act amended the SDWA to provide that the definition of “underground injection ... excludes ... the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities.”\(^83\) This legislatively overruled LEAF in part by expressly excluding application of the SDWA in situations in which the fracturing fluid does not contain diesel. The Energy Policy Act does not expressly state that fracturing constitutes an “underground injection” for purposes of the SDWA if the fracturing fluid includes diesel fuel, but many people believe that is implied by the Act’s provision that the SDWA does not apply to fracturing if the fracturing involves fluids “other than diesel fuels.”

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\(^81\) 151 Cong. Rec. S7279 (June 23, 2005).


\(^83\) See 42 U.S.C. § 300h(d)(1).
After the enactment of the Energy Policy Act, the EPA still did not amend its regulations to expressly address hydraulic fracturing that uses diesel.

7. The EPA’s website post and the resulting litigation

At some point in 2010, the EPA posted a page on its website with information regarding hydraulic fracturing. Among other things, the page stated: “Any service company that performs hydraulic fracturing using diesel fuel must receive prior authorization for the UIC program.” 84 Many people in the oil and gas industry were surprised. They had believed that the EPA and States had statutory authority under the SDWA to regulate hydraulic fracturing in which diesel fuel is used, but that neither the EPA nor the States (except for Alabama) had ever drafted regulations to do so.

Two industry groups, the Independent Petroleum Association of America and the U.S. Oil & Gas Association, filed suit,85 challenging the statement on the EPA’s website. The industry groups characterized the EPA’s statement as an attempt to regulate by making a posting on its website, and as an attempt to evade the procedures required by the Administrative Procedures Act, such as the publication of draft rules, followed by a comment period, and, eventually the publication of final regulations. The industry groups cited jurisprudence holding that an agency sometimes must follow APA procedures if the agency plans to implement a significant change in its interpretation of its own regulations.86

The case was set for argument before the D.C. Circuit in late-2011, but the parties asked the court to remove the case from the oral argument calendar, stating that they were close to reaching


a settlement. The details of any proposed settlement have yet been made public.

8. EPA’s Development of Guidance

In 2011, the EPA has begun developing guidance for the permitting of hydraulic fracturing using diesel.87

9. EPA’s Emergency Powers

The Safe Drinking Water Act grants certain emergency powers to the EPA, which the EPA may exercise if state and local officials fail to act.88 In December 2010, the EPA issued an Emergency Administrative Order to Range Resources, concluding that contaminants identified in certain water wells “may present an imminent and substantial endangerment to the health of persons,” and that Range’s oil and gas activities might be to blame. The Order mandated that Range do a number of things. Range agreed to comply with portions of the order, but declined to follow other portions of the order. Range sought a hearing on the matter, and disputed that its activities had caused the alleged contamination. The EPA declined to give Range an administrative hearing and, on January 18, 2011, the federal government filed suit, seeking a permanent injunction to require Range to comply with all aspects of the order, as well as penalties for each day that Range had failed to comply with all aspects of the order.89

On January 20, 2011, Range filed a petition for review of the Emergency Order with the United States Fifth Circuit.90 The district court judge then stayed the action filed by the federal government, pending the Fifth Circuit’s decision. The Fifth

87 A web page with information on the EPA’s ongoing development of guidance is available at http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells_hydrout.cfm#diesel.

88 See 42 U.S.C. § 300i.


Circuit heard oral argument on Range’s petition for review, but no decision has been issued as of early March 2012.

ii. Mandatory disclosure rules

Traditionally, companies that perform hydraulic fracturing have kept the composition of their fracturing fluid confidential in order to shield the identity of any chemicals that constitute trade secrets and to preserve any competitive advantage they obtain through experience regarding what composition of fracturing fluid works best in particular circumstances. But as concern about hydraulic fracturing has grown, several states have enacted requirements that companies disclose the composition of fracturing fluid to regulators on a well-by-well basis. The information is then made available to the public. The mandatory disclosure rules generally provide protections for trade secrets. For example, under some mandatory disclosure systems, companies need not identify specific chemical compounds that constitute trade secrets. Under other mandatory disclosure systems, companies must identify all chemical compounds to regulators, but the compounds that constitute trade secrets are not disclosed to the public, whereas all other compounds are publicly disclosed. The federal government also is taking steps to require disclosures.

1. State regulations

In mid-2010, Wyoming became the first state to enact a requirement that operators disclose the composition used in fracturing fluid on a well-by-well basis. Arkansas enacted a similar requirement later that year. Since then, Louisiana, Montana, Texas, Colorado, and West Virginia have enacted

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92 See id.


94 See Keith B. Hall, Montana Adopts Rule Requiring Disclosure of Composition
mandatory disclosure regulations, as has a Canadian province, British Columbia.98

Effective October 20, 2011, the Louisiana Department of Natural Resources (“DNR”) enacted a new regulation that requires operators to disclose information about the water used in hydraulic fracturing. Specifically, the regulation requires operators to disclose

- the volume of hydraulic fracturing fluid used
- the types of additives used (for example, biocides, corrosion inhibitors, friction reducers, etc.), as well as the volume of each type
- the trade name and supplier of each additive, and
- a list of each chemical compound in the additive that is classified as hazardous by the Occupational


96 See id.


Safety and Health Administration, along with the maximum concentration of the compound.\textsuperscript{99}

If the identity of the chemical compound is a trade secret, the operator is excused from identifying the compound, but is required to identify the chemical family to which the compound belongs.\textsuperscript{100} The Louisiana regulation’s provision that companies only need to disclose compounds classified as hazardous by OSHA is a limitation not found in most mandatory disclosure regimes, which generally require disclosure of all compounds.

Louisiana’s new regulation addresses one of the recommendations made by State Review of Oil and Natural Gas Environmental Regulations, (“\textit{STRONGER}”), a multi-stakeholder organization that issued a report after evaluating Louisiana’s regulation of hydraulic fracturing. In its report,\textsuperscript{101} \textit{STRONGER} gave Louisiana high marks, but recommended that the State implement some changes, including a requirement that operators identify the composition of fracturing fluids. DNR’s Office of Conservation developed the proposed regulation, basing it in part on the mandatory disclosure regulation previously enacted in Arkansas, and a statute enacted in Texas that directed the State’s regulators to draft mandatory disclosure regulations.

Louisiana’s new regulation requires that the mandated disclosure be made either to the Office of Conservation or to FracFocus, a website operated by the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. FracFocus posts information regarding fracturing fluid composition on a well-by-well basis, using information

\textsuperscript{99} La. Admin. Code 43.XIX.118.


\textsuperscript{101} The report is available at http://www.strongerinc.org/documents/Final%20Louisiana%20HF%20Review%203-2011.pdf.
submitted by operators. FracFocus also contains information on fracturing fluids used in wells in several other States.  

2. Federal regulations

In response to a petition filed by Earthjustice and several other organizations, the United States Environmental Protection Agency has stated that it will use the Toxic Substances Control Act ("TSCA") to draft regulations requiring companies to disclose information regarding “chemical substances and mixtures used in hydraulic fracturing.” Although the EPA has not indicated what information will be subject to disclosure, the agency stated that it will attempt to avoid duplication of “the well-by-well disclosure programs already being implemented in several states,” and that it anticipates that its regulations will “focus on providing aggregate pictures of the chemical substances and mixtures used in hydraulic fracturing.”

In a November 23, 2011 letter to Earthjustice, the EPA stated that “the first step” in its development of disclosure regulations will be to “convene a stakeholder process to develop an overall approach that would minimize reporting burdens and costs, take advantage of existing information, and avoid duplication of efforts.” The EPA said that it will facilitate a public comment process.

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102 FracFocus started as a site where operators could voluntarily disclose fracturing fluid information, and the site still is available for such voluntary disclosures. In addition, several States that have adopted mandatory disclosure regulations have directed operators to make their disclosures by posting information on FracFocus.

103 Earthjustice’s website states that the group is a San Francisco based organization that was founded in 1971 as the Sierra Club Legal Defense Fund, but that the group later changed its name to reflect that it is independent of the Sierra Club, and that it provides legal representation to “hundreds” of clients in addition to the Sierra Club.

104 Earthjustice, along with approximately 120 other organizations, submitted the August 4 petition pursuant to 15 U.S.C. § 2620 (section 21 of TSCA), which allows citizens to petition the EPA to draft TSCA regulations.

105 Links to the EPA statement and correspondence are available at Keith B. Hall, EPA to Use Toxic Substances Control Act to Require Disclosures Regarding Hydraulic Fracturing Fluids, Environmental & Energy Law Brief (Nov. 28, 2011), http://www.environmentalandenergylawbrief.com/hydraulic-fracturing/epa-to-use-toxic-substances-control-act-to-require-disclosures-
process by publishing an advance notice of its proposed rulemaking, “identifying key issues for further discussion and analysis.” The EPA did not specify in its letter or its public announcement when it would convene the stakeholder process or publish notice of its proposed rulemaking.

It is unclear exactly what information will need to be disclosed. Earthjustice’s petition asked that chemical manufacturers be required to supply EPA with “various records,” including the chemical and trade names of all substances manufactured for use in hydraulic fracturing, along with other information regarding each substance, including the amount produced; all existing data concerning the effects of exposure on health and the environment; copies of all health and environmental studies “known to” the manufacturers; and information regarding all adverse health or environmental effects that the manufacturers know have been “alleged to have been caused” by the substance.

In addition to the EPA’s announcement that it will use TSCA to require certain disclosures, Secretary of Interior Ken Salazar has announced that the Bureau of Land Management is considering requiring companies to disclose of the composition of fracturing fluid used to fracture wells on federal lands.  

**iii. Disposal of flowback**

Another concern that people have raised about hydraulic fracturing is the disposal of flowback water. In Louisiana and many other States, companies generally use underground injection wells for the disposal of flowback. The disposal of flowback by

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107 Increasingly, companies are making efforts to use flowback in subsequent frac jobs, both to decrease fresh water needs and disposal requirements, but salts and other substances that dissolve into the fracturing water from the formation being fractured alter the water’s chemistry, and make it challenging to re-use the water in subsequent fracturing.
underground injection is regulated by the Safe Drinking Water Act, and such disposal has not generated much controversy.

But in Pennsylvania, where hydraulic fracturing frequently is used in developing the Marcellus Shale, relatively few underground injection disposal wells are available. Operators were sending their flowback to waste water treatment plans, which treat water and then discharge the treated water into natural bodies of water under Clean Water Act guidelines. Many people began expressing concerns that those treatment plants were not designed to remove salts and other substances often found in flowback. The Governor of Pennsylvania asked companies to cease sending flowback to treatment plants, and it seems that companies have complied, using more flowback than before in subsequent frac jobs and sometimes transporting flowback to underground injection wells in other States.

In October 2011, the United States Environmental Protection Agency announced plans to address concerns such as those expressed in Pennsylvania by developing regulations for the disposal of flowback that is sent to publicly owned treatment works (“POTWs). Specifically, the EPA announced plans to require that flowback water be pre-treated before it is sent to POTWs. The EPA noted that POTWs are not always designed to remove substances, such as salts, metals, and naturally-occurring radioactive materials, that are naturally found underground and which can dissolve into fracturing water from the formation being fractured. The EPA also noted that, in theory, the salts found in flowback can interfere with the working of wastewater treatment plants, though this usually does not occur in practice because the operators of treatment plants that accept flowback understand this fact, and they usually combine flowback with larger streams of water from other sources, so that the concentration of salts is diluted to a concentration level that does not interfere with the operation of treatment plants.

108 The 2005 Energy Policy Act does not exempt the disposal of flowback from the SDWA.

109 See Shale Gas Primer, supra note 4, at 69.
The EPA has stated that it expects to gather information and input from stakeholders, draft regulations, and then seek public comments in 2014. The EPA announced its plans in its Final 2010 Effluent Guidelines Program Plan, which was released in 2011.\textsuperscript{110} Section 304 of the Clean Water Act requires EPA to publish such a plan every two years to identify sources that discharge water either directly to surface waters or to wastewater treatment plants, and which EPA has selected for new or additional regulations. The EPA published its preliminary 2010 Plan on December 28, 2009 at 74 Fed. Reg. Notice 68599.

\textit{iv. Air Issues}

Natural gas is the cleanest burning of all fossil fuels. On an energy equivalent basis, the use of natural gas produces only about half the carbon dioxide as coal, as well as fewer particulates and smaller quantities of nitrous oxides and sulfur dioxide.\textsuperscript{111} Thus, to the extent that hydraulic fracturing helps produce natural gas that displaces the use of coal, fracturing can benefit the environment.

But some people have expressed concern that natural gas sometimes is emitted during the flowback portion of hydraulic fracturing. During flowback, a two-phase mix of flowback water and natural gas come to the surface. The water is recovered. As for the natural gas, sometimes it is recovered for sale, sometimes it is sent to a flare (particularly if the well being fractured is not yet connected to a pipeline), and sometimes it is vented to the atmosphere. Venting of natural gas is a concern because the principal component of natural gas is methane,\textsuperscript{112} which acts as a greenhouse gas.\textsuperscript{113} A couple of states, such as Wyoming and

\begin{footnotesize}
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\item \textsuperscript{111} Shale Gas Primer, supra note 4, at 5; see also Lawrence M. Cathles III, \textit{et al.}, \textit{A commentary on “The greenhouse-gas footprint of natural gas in shale formations”} by R.W. Howarth, R. Santoro, and Anthony Ingraffea, Climatic Change, doi 10.1007/s10584-011-0333-0 available at http://www.springerlink.com/content/x001g12z2332462p/fulltext.pdf.
\item \textsuperscript{112} See Hyne, supra note 3, at 10.
\item \textsuperscript{113} See Lawrence M. Cathles III, \textit{et al.}, \textit{A commentary on “The greenhouse-gas
\end{itemize}
\end{footnotesize}
Colorado, have begun to require “reduced emissions completions” or “green completions” in which natural gas is not vented during flowback. Further, the EPA has drafted regulations, which are scheduled to become final in April 2012,\(^\text{114}\) which generally will prohibit venting during flowback, requiring that companies recover the natural gas or send it to a flare.\(^\text{115}\)

**b. Litigation**

By some estimates, more than a million wells have been hydraulically fractured in the last 60 years, and there have been few, if any, documented cases in which hydraulic fracturing has caused contamination of ground water. But there have been numerous anecdotal claims of contamination, and several lawsuits have been filed in which plaintiffs allege that their water has been contaminated by hydraulic fracturing. Such lawsuits have been filed in Pennsylvania,\(^\text{116}\) Texas,\(^\text{117}\) Arkansas,\(^\text{118}\) Colorado,\(^\text{119}\) footprint of natural gas in shale formations” by R.W. Howarth, R. Santoro, and Anthony Ingraffea, Climatic Change, doi 10.1007/s10584-011-0333-0 available at http://www.springerlink.com/content/x001g12t2332462p/fulltext.pdf.

\(^\text{114}\) There are some indications that final adoption of the regulations might be delayed by an Office of Management and Budget review.


\(^\text{118}\) See Berry v. Southwestern Energy Co., No. 1:11-cv-0045 (E.D. Ark.).

\(^\text{119}\) Strudley v. Antero Resources Corp., No. 2011-cv-2218 (Denver Dist. Ct.).
Further, because the use of hydraulic fracturing is widespread, and because hydraulic fracturing has caught the attention of the plaintiffs’ bar, it is likely that many similar actions will be filed in the future.

i. Damages alleged and relief sought

In the hydraulic fracturing litigation filed to date, plaintiffs have alleged several types of harm. Plaintiffs have sought money damages for (1) personal injuries caused by exposure to or the drinking of contaminated water; (2) the costs of periodic medical monitoring to check for latent diseases or other harms potentially caused by such exposure; (3) the replacement of a domestic water supply; (5) remediation or clean-up of the property or an aquifer; (6) loss of property value; and (7) punitive damages. In some of the cases, plaintiffs also have sought injunctions to prohibit future fracturing.

ii. Causes of action asserted

The causes of action most commonly asserted in hydraulic fracturing litigation include claims based on (i) the ultrahazardous or abnormally dangerous activity doctrine; (ii) trespass; (iii) nuisance; (iv) breach of contract; (v) fraud; (vi) private attorney general or citizen suit statutes; and (vii) negligence.

122 There are some lawsuits that occasionally are included on lists of hydraulic fracturing litigation, but which arguably do not belong on such lists. Those cases involve allegations by plaintiffs that oil and gas activity has caused contamination of their water supply, but the plaintiffs do not appear to specifically blame hydraulic fracturing. Indeed, sometimes the plaintiffs even have placed the blame on something other than fracturing, such as a blowout. See, e.g., Baker v. Anschutz Exploration Corp., No. 2011-1168 (N.Y. Sup. Ct.); Beckman v. Exco Operating Co., No. 5:11-cv-00617 (W.D. La.); Andre v. Exco Operating Co., No. 5:11-cv-00610 (W.D. La.).

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1. Ultrahazardous activity

The common law has long recognized a theory of strict liability for defendants who engage in “ultrahazardous” or “abnormally dangerous” activities. The leading case generally is recognized as being the English case *Rylands v. Fletcher*, 3 H.L. 330 (1868). In that case, the defendants were mill owners who constructed a large reservoir in which they stored water on their land. The water broke through material used to plug an abandoned mine shaft and flooded the plaintiff’s coal mine. The lower courts held that the defendants were not negligent and that they could not be liable in the absence of negligence. The House of Lords disagreed with the conclusion that the plaintiff had to prove negligence in order to recover, and held that a defendant can be strictly liable for an abnormal and inappropriate use of his property.

If a particular type of activity is classified as “ultrahazardous” or “abnormally dangerous,” a defendant can be held liable if he engages in that activity and thereby causes harm, even if the defendant was not negligent. Further, the defendant can be liable even if some intervening cause, such as the negligence of a third person or some force of nature, leads to the accident that results in harm.

To determine whether an activity is “abnormally dangerous,” courts look to several factors. Factors that weigh in favor of classifying an activity as abnormally dangerous include the following: (1) the activity involves a high degree of risk; (2) any harm caused by the activity probably will be great harm, rather than minor harm; (3) it is impossible to eliminate risk associated with the activity even by the use of reasonable care; (4) the activity does not involve a matter of common usage; (5) the

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124 See, e.g., Fiorentino, No. 3:09-2284 (M.D. Pa.); Harris, No. 4:10-0708 (N.D. Tex.).

125 See Restatement (Second) Torts § 519.

126 Id.

127 See Restatement (Second) Torts § 523.
activity is inappropriate to the place where it is conducted; and (6) the risk of the activity outweighs value of the activity to the community.\footnote{See Restatement (Second) Torts § 520.} Classic examples of “abnormally dangerous” activity include blasting with explosives and pile driving.

One issue that parties will contest is whether the doctrine applies at all. Louisiana is one of the states where hydraulic fracturing is being actively used. Although Louisiana recognizes the concept of an ultrahazardous activity, 1996 tort reform legislation limited the doctrine to just two types of activities — blasting with explosives and pile driving.\footnote{See Acts 1996, 1st Ex. Sess. No. 1 § 1 (amending Civil Code art. 667).}

Texas is another state where hydraulic fracturing is frequently used. Texas jurisprudence suggests that Texas does not recognize the abnormally dangerous activity doctrine.\footnote{See Turner v. Big Lake Oil, 96 S.W.2d 221 (Tex. 1936).} In Turner, the defendant was storing a large quantity of produced water (salt water that sometimes is produced simultaneously with oil). The water escaped, and flowed onto the plaintiff’s land, killing vegetation and contaminating watering holes used by the plaintiff’s cattle. The plaintiff filed suit, alleging strict liability based on Rylands v. Fletcher. The Texas Supreme Court rejected that claim, stating that the plaintiff would have to establish that the defendant had been negligent because Texas did not recognize the rule of Rylands v. Fletcher. Thus, the abnormally dangerous activity theory of strict liability should be unavailable in hydraulic fracturing litigation if either Louisiana law or Texas law applies.

Further, even in states that recognize the abnormally dangerous activity doctrine, a defendant can argue that hydraulic fracturing is not an abnormally dangerous activity. More than one million wells have been hydraulically fractured, and there are few, if any, documented cases in which hydraulic fracturing has caused contamination of groundwater. In addition, a defendant could present expert testimony that risks can be addressed by use of proper care in the casing and cementing of wells. Further, hydraulic fracturing provides substantial benefits to society. Moreover, a defendant can argue that he was not fracturing in an...
inappropriate place, and that instead he was fracturing right where he should — where geophysical evidence and prior drilling indicate a productive shale formation exists.

All these arguments can be used to assert that the factors examined by courts to determine whether an activity is abnormally dangerous weigh against hydraulic fracturing being deemed abnormally dangerous. Indeed, in a case in Pennsylvania, a court denied the defendants’ Federal Rule of Civil Procedure 12(b)(6) motion to dismiss an ultrahazardous activity claim, but suggested in dicta that it had doubts that plaintiffs’ ultrahazardous activity claim would survive a summary judgment motion later in the case.131

Even if a court deems hydraulic fracturing to be ultrahazardous, there still are defenses that might apply. For example, Restatement (Second) Torts § 523 recognizes that assumption of the risk is a defense. Comment (b) to § 523 provides an example of assumption of the risk. The comment states that, if a possessor of land, knowing the risk of blasting, consents to allow blasting on neighboring property, he cannot recover if he is harmed by the blasting. Most oil and gas companies operate their wells pursuant to mineral leases. If the landowner granted the lease knowing that the lessee might conduct hydraulic fracturing, and the landowner understood that fracturing allegedly has great risk, then assumption of the risk might bar the landowner’s recovery.

Further, authority exists for the proposition that strict liability does not apply if the type of harm asserted by the plaintiff is not the sort of harm that one would expect from the ultrahazardous nature of the defendant’s activity.132 The classic example concerns blasting. Strict liability may apply for damages caused by the explosive force of the blasting or by flying debris that results from the explosion, but strict liability would not apply if the plaintiff is a mink farmer who alleges that the blasting made his adult mink nervous, with the result that they killed their

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132 See Restatement (Second) Torts § 519(2).
Thus, if a plaintiff alleged that some unusual injury was caused by hydraulic fracturing, strict liability might not apply. Contributory negligence also is a recognized defense.\(^{134}\) A circumstance in which this defense might apply is if a person who alleges he incurred physical injuries by drinking contaminated water continued to drink that water after having a reasonable basis to believe it might be contaminated.

2. **Trespass**\(^ {135}\)

A trespass occurs if the defendant makes an unauthorized entry onto the surface of the plaintiff’s property, or causes a thing or a substance to make such an unauthorized entry.\(^ {136}\) Further, it is well-established that a trespass claim can be based on an unauthorized entry into the subsurface of the plaintiff’s property.\(^ {137}\) A defendant generally will be liable for damages that he causes, and some authorities, such as the Restatement of Torts, declare that if a trespass is intentional, a defendant can be liable even if the plaintiff cannot show harm.\(^ {138}\)

Depending upon circumstances, several potential defenses to a subsurface trespass might be available. First, even under the Restatement, if a trespass is not intentional, and the defendant’s activity was not ultrahazardous, the plaintiff must show actual harm in order to recover.\(^ {139}\) It will not be enough for the plaintiff merely to show that a substance has encroached upon his land. And, if the physical intrusion is neither intentional nor the result of


\(^{134}\) See Restatement (Second) Torts § 524.

\(^{135}\) Trespass issues arising from hydraulic operations were discussed by Owen L. Anderson in *Lord Coke, the Restatement, and Modern Subsurface Trespass Law*, a paper presented in 2010 at the 57th Mineral Law Institute.

\(^{136}\) See Gliptis v. Fifteen Oil Co., 16 So. 2d 471 (La. 1944) Restatement (Second) Torts § 158.

\(^{137}\) See Gliptis, 16 So. 2d 471 (La. 1944); Restatement (Second) Torts § 159.

\(^{138}\) See Restatement (Second) Torts § 158.

\(^{139}\) See id. at § 165.
negligence, the plaintiff will not be entitled to recover even if he can show injury.\textsuperscript{140}

Further, when a plaintiff is unable to show harm, other defenses might be available, such as the defendant’s ability to show that he operated in a manner authorized by a government-issued permit. An analogy can be made to cases in which plaintiffs have complained about fluids from underground disposal wells migrating across subterranean property lines. When defendants in such cases were operating injection disposal wells pursuant to valid permits, courts have held that plaintiffs fail to state actionable trespass claims if they allege that fluids have intruded into the subsurface of their property, but they cannot show actual harm.\textsuperscript{141}

If the plaintiff alleges that he was harmed because a subsurface intrusion of fracturing fluid and proppants facilitated drainage of hydrocarbons from his property, but the plaintiff does not allege any other harm, the “rule of capture”\textsuperscript{142} might provide a defense. In \textit{Coastal Oil & Gas v. Garza Energy Trust}, 258 S.W.3d 1 (Tex. 2008), the plaintiffs alleged that the defendant drilled a well on neighboring property, and that the fracturing fluid and proppants (but not the well bore) encroached into the subsurface of their property. The plaintiff asserted that the encroachment constituted a trespass, and that the trespass harmed them by facilitating the drainage of minerals from beneath their land. The Texas Supreme Court held that, because the only harm alleged by the plaintiff was drainage, the rule of capture precluded recovery. Accordingly, the court did not have to decide whether the intrusion of fracturing fluid would have constituted an actionable trespass if there had been some harm other than drainage.

\textsuperscript{140} See \textit{id.} at § 166.

\textsuperscript{141} See, e.g., \textit{Chance v. BP Chems., Inc.}, 77 Ohio St.3d 17 (Ohio 1996); \textit{Boudreaux v. Jefferson Island Storage & Hub}, 255 F.3d 271 (5th Cir. 2001).

\textsuperscript{142} The rule of capture provides that if a landowner drills a well on his property, and the well does not trespass onto his neighbor’s property, then the landowner is entitled to all the oil or gas produced by his well, even if the well drains oil or gas from beneath his neighbor’s property. \textit{See La. Rev. Stat. 31:8}; \textit{Kelly v. Ohio Oil Co.}, 49 N.E. 399 (Ohio 1897); see also Manual of Oil and Gas Terms, \textit{supra} note 4.
In some cases, “unitization” might provide a defense. In Wainoco v. Numuz, 488 So. 2d 955 (La. 1986), the plaintiff’s land had been unitized with the neighbor’s land. A well was drilled from a well pad on the neighboring property, but the drilling deviated from vertical (apparently, unintentionally), and the well bore allegedly intruded into the subsurface of the plaintiff’s land at some deep depth. The plaintiff alleged a trespass, but the Louisiana Supreme Court held that the unitization order modified property rights, with the result being that plaintiff did not have a claim for subsurface trespass.

3. Nuisance

One common law source states: “A private nuisance is a nontrespassory invasion of another’s interest in the private use and enjoyment of land.” The pollution of surface or ground waters can constitute a private nuisance. For a defendant to have liability for a private nuisance, his invasion of the plaintiff’s interest must be either (a) “intentional and unreasonable,” or (b) actionable under rules controlling liability for negligence or abnormally dangerous activity. An invasion of the plaintiff’s interest is considered intentional if the defendant acts for the purpose of causing the invasion of interest, or he knows that his actions are causing the invasion, or he knows that his actions are substantially certain to do so.

Under Louisiana law, the legal authority for nuisance claims rests on the obligations of neighborhood set forth in Civil Code articles 667 thru 669. An owner of immovable property

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143 Unitization is a regulatory action or contractual agreement that modifies the rule of trespass by providing that all landowners holding property within a particular unit area will share in production of any oil or gas produced from within the unit, without regard to where the well is drilled. See, e.g., Hunter Co., Inc. v. McHugh, 11 So. 2d 495 (La. 1943).

144 See Restatement (Second) Torts § 821(D).

145 See id. at § 832.

146 See id. at § 822.

147 See id. at § 821E.

generally may “do with his estate whatever he pleases,” even if doing so will cause “some inconvenience” to his neighbor. In determining whether a person has caused “real damage” to his neighbor, or merely “some inconvenience,” a court examines the reasonableness of a person’s actions in light of the circumstances.

In cases in which a plaintiff alleges contamination, his claim probably is more appropriately based on an alleged trespass by fracturing fluid, rather than nuisance. But if the plaintiff desires to assert a claim that is based on alleged harm or inconvenience caused by noise, vibrations, or other aggravations arising from fracturing operations that are conducted on neighboring property, he may wish to assert a nuisance claim. The success of such a claim will depend on the factfinder’s evaluation of whether the defendant’s conduct was reasonable under the circumstances. A defendant might be well served to argue that he was operating in compliance with a permit issued by regulators, and that such compliance is evidence of its reasonableness. The defendant also can point to the value that hydraulic fracturing provides to the community — jobs, tax revenue, a decreased dependence on foreign sources of energy, and the production of a clean burning fuel. A plaintiff will want to focus on the aggravation and inconvenience he incurred, as well as any permit violations that might have occurred that would have added to the inconvenience.

4. Breach of contract

Some mineral leases contain an express requirement that the lessee “restore” the property after the lease is complete. A plaintiff alleging that his property has been contaminated by hydraulic fracturing may be able to rely on such a clause.

In addition to enforcing such express duties, courts typically impose upon mineral lessees various implied covenants. There are several different implied covenants that

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150 See Rodrigue, 475 So. 2d at 1077.
151 See, e.g., Corbello v. Iowa Production, 850 So. 2d 686, 693-4 (La. 2003).
152 See generally Keith B. Hall, The Continuing Role of Implied Covenants in
are commonly recognized. Most of the commonly-recognized implied covenants relate to development of the property, but some States also recognize an implied covenant of surface restoration.\textsuperscript{153} This covenant requires the leaseholder to take reasonable steps to restore the surface of the land to its pre-drilling condition whenever the lease terminates or the leaseholder ceases operations.\textsuperscript{154} A plaintiff could argue that the implied covenant of surface restoration also requires a leaseholder to remediate \textit{subsurface} contamination. But the implied covenant of surface restoration is not one of the implied covenants that is widely recognized.\textsuperscript{155}

Even if a state does not recognize an implied covenant of surface restoration, a plaintiff still may be able to assert a plausible implied covenant claim. A common characteristic of each of the various implied covenants in every jurisdiction is the standard of conduct imposed — that of a reasonably prudent operator.\textsuperscript{156} This sounds similar to a negligence standard, and possibly could be used to bring a claim against an operator whose alleged failure to prudently operate leads to surface or subsurface contamination. Such a claim likely would strike some oil and gas lawyers as unusual because implied covenants and the reasonably prudent operator standard typically are used as a measure of the \textit{extent} of a leaseholder’s duties to diligently explore and develop, not the degree of \textit{care} with which the leaseholder must perform its duties. For example, in a state that recognizes an implied covenant of “exploration,” the leaseholder would have a duty to conduct the exploration activities that a reasonably prudent operator would


\textsuperscript{154} See id.

\textsuperscript{155} Although the comment to Mineral Code article 122 suggests that an implied covenant of surface restoration likely exists, Louisiana Supreme Court jurisprudence demonstrates that an implied covenant to restore has narrow application, if it applies at all. See, e.g., Terrebonne Parish School Board v. Castex Energy, Inc., 893 So. 2d 789 (La. 2005). Further, though it may not a great stretch to extend such a covenant to the subsurface, it is noteworthy that the doctrine usually is described as an implied covenant of \textit{surface} restoration.

\textsuperscript{156} See Hall, supra note 152, at 331.
conduct, but would not have a duty to take extraordinary steps to explore for oil or gas.\textsuperscript{157}

But, in addition to using a reasonably prudent operator standard as the measuring stick for the extent of the leaseholder’s duties under implied covenants to explore and develop, some states impose an implied covenant of “reasonable care.”\textsuperscript{158} Although this covenant sometimes is viewed merely as a “catch all” covenant for the \textit{extent} of a leaseholder’s duties, courts occasionally have interpreted this covenant as also imposing a duty to use reasonable \textit{care} in operations, in order to avoid an accident.\textsuperscript{159} There are, however, relatively few such cases

If a plaintiff attempts to assert an implied covenant claim based on a leaseholder’s alleged failure to use reasonable care to avoid contamination, the leaseholder can make a strong argument that this is not the purpose of the implied covenant doctrine. The reason that courts impose implied covenants in the context of oil and gas leases more frequently than in the context of other types of contracts is because of a particular characteristic of oil and gas leases. Namely, because of the uncertainties involved in mineral exploration, oil and gas leases generally do not specify in detail the exploration and production activities the leaseholder will conduct.\textsuperscript{160} Thus, some of the most important aspects of a leaseholder’s performance are left to his or her discretion.

Because so much is left to the discretion of the leaseholder, courts impose implied covenants to protect the lessor by requiring the leaseholder to be reasonably diligent in exploration and development.\textsuperscript{161} But implied covenants are not needed to guard


\textsuperscript{158} See Patrick H. Martin and Bruce M. Kramer, 5 \textit{Williams & Meyers Oil and Gas Law}, §§ 861, 861.1 (LexisNexis).

\textsuperscript{159} See id. at § 861; \textit{see, e.g.}, Empire Oil & Refining Co. v. Hoyt, 112 F.2d 356 (6th Cir. 1940).


against negligent conduct because negligence law already does that. Accordingly, if the factual basis of a lessor’s claim is the alleged negligence of the leaseholder, the leaseholder can argue that the plaintiff’s allegations do not support a breach of contract claim that is based on implied covenants.

5. Fraud

Some plaintiffs have asserted fraud claims in hydraulic fracturing litigation, alleging that the defendant made misrepresentations or failed to warn the plaintiff of some danger.

Defendants have several possible defenses to fraud claims. If the plaintiffs’ initial pleading lacks detail, the defendant should seek dismissal of any fraud claim based on a failure to plead fraud with particularity. Further, a plaintiff generally must establish that he was harmed because by acting in reliance on the alleged fraud. If a plaintiff already knew about the alleged dangers of hydraulic fracturing, or would have taken the same actions anyway, then the defendant may be able to defeat the fraud claim by arguing that the plaintiff did not act in reliance on the alleged fraud.

6. Private attorney general claims

Many environmental statutes authorize private citizens to bring actions in certain circumstances against a defendant who allegedly has violated an environmental law. Often, standing will be an issue in such cases. Private attorney general or citizen suit provisions generally do not grant citizens an unqualified standing to sue anytime a person allegedly violates some environmental statutes. Such provisions generally grant standing only in certain circumstances. If a defendant is sued by a plaintiff pursuant to a citizen suit provision, the defendant should examine the language of the citizen suit provision and examine the facts of

the case to determine whether the plaintiff has standing to assert a citizen suit.

7. Negligence

A person can be liable for negligence if he causes harm to another by failing to conform to the standard of conduct expected of a reasonable person.\textsuperscript{164} If legislation or regulations mandate (or prohibit) certain conduct, a court may adopt that requirement as the standard of conduct of a reasonable person for purposes of negligence liability.\textsuperscript{165} If a court does so, violation of the statute or regulation establishes negligence.\textsuperscript{166} In the alternative, a court might stop short of adopting the legislation or regulation as the standard of conduct, but may allow a plaintiff to use the legislation or regulation as evidence of the proper standard of case.\textsuperscript{167}

There are numerous regulations that apply to oil and gas drilling. For example, regulations establish standards for well construction. Regulations also require well operators to take precautions against spills of fluids. Other regulations require operators to obtain a permit before drilling a well, and permits often impose requirements that are specific to the particular well being drilled. If the plaintiff asserts that contamination resulted from a defendant’s actions or inactions that also constitute a violation of regulations, the plaintiff should argue that the breach of regulations demonstrates negligence. On the other hand, if the conduct that allegedly caused the contamination is conduct covered by regulatory standards, and the defendant can establish that he complied with the applicable regulations, he should argue that such compliance establishes an absence of negligence.

\textit{iii. Causation}

A key issue in most hydraulic fracturing litigation will be causation, with the first question being, “Did the defendant’s oil

\textsuperscript{164} See La. Civ. Code art. 2315; Restatement (Second) Torts § 283.

\textsuperscript{165} See Restatement (Second) Torts § 286; cf. Jones v. Lawrence, 940 So. 2d 34, 38-9 (La. App. 2nd Cir. 2006).

\textsuperscript{166} See Restatement (Second) Torts § 288B.

\textsuperscript{167} See id.
and gas operations cause the alleged contamination?‖ In some of the early hydraulic fracturing cases, the plaintiffs allege that their private water wells were contaminated by methane, the principal component of natural gas.\textsuperscript{168} The plaintiffs’ allegations of methane contamination are generally consistent with well-publicized anecdotal complaints about people being able to “light their faucets on fire.”

But in some parts of the country, including areas where significant drilling into the Marcellus Shale has occurred, methane can occur naturally in water wells. One group of researchers reported that, “regardless of gas industry operations,” they found detectable levels of methane in 85 percent of the 60 water wells that they sampled in northeast Pennsylvania and upstate New York.\textsuperscript{169}

Another report stated that methane was found in 77 percent of 171 groundwater wells sampled in West Virginia.\textsuperscript{170} A report discussing water wells in Michigan stated that “[m]ethane can occur naturally in water wells,” and that, “Gas in water-bearing formations is sometimes emitted directly from household faucets.”\textsuperscript{171}

For this reason, it often will be important to determine the source of any methane that allegedly contaminates a water well. Chemists can perform isotopic analysis of the methane as a sort of “chemical fingerprinting” to determine whether the methane was formed by thermogenic processes, which would indicate that the methane was created deep beneath the ground, or whether the methane was created by biogenic action, which would indicate that

\textsuperscript{168} See, e.g., Fiorentino v. Cabot Oil & Gas Corporation, 750 F.Supp.2d 506 (M.D. Pa.).


\textsuperscript{170} See Penn State, Methane Gas and its Removal from Wells in Pennsylvania, at 1 (available at http://pubs.cas.psu.edu/FreePubs/pdfs/XH0010.pdf).

\textsuperscript{171} See, e.g., Donald K. Keech and Michael S. Gaber, Methane in Water Wells, Water Well Journal, 33, 33-34 (1982).
the methane was created in biological processes nearer the surface.  

If the methane found in a water well is biogenic methane, that indicates that the methane probably is not from a gas well, because gas wells generally recover thermogenic methane that is produced deep underground, not biogenic methane that is produced near the surface.  

If the methane found in a water well is thermogenic, that does not necessarily mean, however, that an oil or gas well is the culprit, because various processes can cause thermogenic methane to migrate toward the surface, allowing it to accumulate in shallow formations or in water wells.

In most cases, the plaintiff will have the burden of proving causation, as reflected in such cases as Mitchell Energy Corp. v. Bartlett.  

In Mitchell, the court held that it was not sufficient for the plaintiff’s expert to testify that identical hydrogen sulfide isotopes were found in a contaminated water aquifer and in the defendant’s nearby oil well.  To establish causation, the expert needed to “rule out other causes of the presence of hydrogen sulfide in appellees’ water.”  

In Pennsylvania, however, there exists a rebuttable presumption that an oil or gas “well operator is responsible for the pollution of a water supply that is within 1,000 feet of the oil or gas well, where the pollution occurred within six months after the completion of drilling or alteration of such well.”  

Thus, defendants sometimes will carry the burden of proof as to causation.

iv. Experts

Several types of experts may be needed in hydraulic fracturing litigation.  If plaintiffs allege that their groundwater is contaminated by methane, parties may need environmental chemists who can conduct isotopic analyses of the methane in an

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172 See Osborn, supra note 169, at 8172.
173 See id.
174 958 S.W. 2d 430 (Tex. App. 1997).
175 See id. at 448.
176 See 58 P.S. § 601.208(c).
attempt to determine its source. If plaintiffs allege that their groundwater is contaminated by fracturing fluids, the parties may need chemists to conduct various analyses, and the parties also may need hydrologists to determine whether the fracturing fluids plausibly could have migrated from the defendant’s oil or gas well to the source of the plaintiffs’ groundwater. Further, because a well construction failure often will be a more likely pathway for contamination (as opposed to fractures created during the fracturing process), parties may need a petroleum engineer who can testify regarding well construction.

In addition, specific circumstances may call for a variety of other experts. For example, if the plaintiff alleges personal injuries or seeks medical monitoring, medical experts likely will be needed. If the plaintiff alleges that his property value has decreased, real estate appraisers may be needed. If the plaintiff seeks damages for remediation or clean up of his property, environmental consultants may be needed.

III. Legal Issues Indirectly Related to Hydraulic Fracturing

In addition to legal issues directly raised by hydraulic fracturing, there are several issues that are raised indirectly.

a. Preemption of local laws by state oil and gas statutes

In some states, opponents of hydraulic fracturing have convinced local governments to ban hydraulic fracturing or, in some cases, virtually all oil and gas activity. Local restrictions often will raise dispute regarding whether local laws are preempted by state oil and gas laws, which often are intended to create a set of uniform, statewide rules. For example, Louisiana law requires a person to obtain a permit from Conservation before drilling a well, and provides that Conservation’s grant of a permit constitutes

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177 Preemption issues are discussed by Phillip E. Downer, III and Rebecca D. Barham in Haynesville Shale: Local Regulations and State Preemption, a paper submitted in 2011 for the 58th Mineral Law Institute, and by Bruce M. Kramer in Local Land Use Regulation of Oil and Gas Development: Pumpjacks and Preemption, a paper presented in 2009 at the 56th Mineral Law Institute.
“sufficient” authority to drill.\textsuperscript{178} Revised Statute 30:28(F) further provides that “[n]o other agency or political subdivision of the state shall have the authority, and they are hereby expressly forbidden, to prohibit or in any way interfere with the drilling of a well or test well in search of minerals by the holder of such a permit.” The United States Fifth Circuit held that this statute completely preempted a Shreveport ordinance that attempted to bar drilling within 1000 of a lake that served as a source of drinking water, and to regulate drilling that occurred further away.\textsuperscript{179}

In a different case, however, an agency obtained injunctive relief that placed restrictions on drilling near the expressway crossing Lake Pontchartrain. The Louisiana Fifth Circuit affirmed, concluding that state law would bar any agency other than Conservation from establishing permit requirements, but that state law would not prohibit issuance of an injunction “to protect the public safety and welfare.”\textsuperscript{180}

The issue of preemption has been litigated in other states recently. In 2011, a state court judge in West Virginia has struck down an ordinance enacted by the City of Morgantown to ban hydraulic fracturing within the City and anywhere within one mile of the City.\textsuperscript{181} The case was filed by Northeast Natural Energy, LLC, which previously had received a permit from the West Virginia Department of Environmental Protection to drill and hydraulically fracture a Marcellus Shale well in an area outside the city limits of Morgantown, but within one mile of the City. Northeast had not yet hydraulically fractured the well when the ordinance went into effect. Northeast argued to the court that the City’s ordinance was preempted by state law and therefore was unenforceable.

\textsuperscript{178} La. Rev. Stat. 30:28(F).

\textsuperscript{179} Energy Management Corp. v. Shreveport, 397 F.3d 297 (5th Cir. 2006).

\textsuperscript{180} Greater New Orleans Expressway Comm’n v. Traver Oil, 494 So. 2d 1204 (La. App. 5th Cir. 1986).

The case was assigned to Judge Susan Tucker, who granted summary judgment in favor of Northeast on August 12, 2011. Her opinion discussed the concept of preemption, explaining that when state legislation “fully occupies” a particular subject area, establishing a “comprehensive regulatory scheme,” no local ordinance can contravene that state law. To determine whether state law would preempt local laws regulating hydraulic fracturing, Judge Tucker examined state statutes relating to environmental protection and regulation of the oil and gas industry.

Judge Tucker noted that one West Virginia statute declares that “The state has the primary responsibility for protecting the environment; other government entities, public and private organizations and our citizens have the primary responsibility of supporting the state in its role as protector of the environment.” Another statute declares that the purpose of the West Virginia Department of Environmental Protection (“WVDEP”) is to “consolidate environmental regulatory programs in a single agency, while also providing a comprehensive program for the conservation, protection, exploration, development, enjoyment and use of the natural resources of the state of West Virginia.” State law also requires the Director of the WVDEP to maintain an office of oil and gas under his supervision, with that office being charged with a duty of administering and enforcing the West Virginia Oil and Gas Act. In addition, a state statute indicates that it is within the sole discretion of the WVDEP to perform all duties relating to the exploration, development, production, storage, and recovery of West Virginia’s oil and gas.

Judge Tucker determined that these statutes demonstrate that West Virginia has enacted a comprehensive state regulatory program that will preempt any local ordinance that is inconsistent with state law, rendering such local ordinances invalid. In this case, the local ordinance enacted by Morgantown was inconsistent with state law because the local ordinance would ban certain drilling and hydraulic fracturing altogether, even if the processes are authorized by WVDEP. Therefore, the ordinance was invalid.182

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182 The case is Northeast Natural Energy, LLC v. City of Morgantown, Civil Action No. 11-C-411, Circuit Court of Monангalia County. The City of
In contrast, in February 2012, two separate trial courts in the state of New York ruled that local bans on all oil and gas activity are not preempted. In one case, the court held that the Town of Dryden’s ban on oil and gas activity is not preempted by state law. The case turned on interpretation of Environmental Conservation Law § 23-0303, a section of New York’s state statutes governing oil and gas activity. Section 23-0303 states:

The provisions of this article shall supersede all local laws or ordinances relating to the regulation of the oil, gas and solution mining industries; but shall not supersede local government jurisdiction over local roads or the rights of local governments under the real property tax law.

The dispute arose after the Town of Dryden enacted a zoning ordinance in 2011 that banned all oil and gas activity within the Town’s jurisdiction. Although the ordinance bans all oil and gas activity, the supporters of the ban primarily were motivated by opposition to the possible use of hydraulic fracturing to produce natural gas from the Marcellus Shale, which lies beneath the Town of Dryden.

The ban was challenged in court by Anschutz Exploration, which had invested $5.1 million and acquired mineral leases covering 22,200 acres within the Town’s jurisdiction prior to Morgantown apparently had planned to appeal, but media reports indicate that the City inadvertently missed the 30-day deadline to file a notice of appeal. The 30-day deadline is found in West Virginia Rule of Civil Procedure 73, which was amended in December 2010 to add a subsection (c) that requires a party to file a notice of appeal within 30 days of the judgment being appealed. Previously, parties “perfected” an appeal by taking certain steps within four months of a judgment. One report quoted the City Manager as saying that he thought the City had four months to appeal, and quoted the City’s lead counsel for the litigation as saying, “[W]e overlooked the recent amendment, and I take responsibility for that.” Thus, the judgment is now final.

to the ban’s enactment. Anschutz argued that the ban was preempted by ECL § 23-0303’s provision that New York’s state oil and gas laws “shall supersede all local laws or ordinances relating to the regulation of oil and gas.” Anschutz also noted that a prior case had ruled that ECL § 23-0303 preempted a zoning ordinance enacted by the Town of Kiantone that would have prohibited the drilling of any oil or gas well within that Town unless the company paid a $25 permit fee and posted a $2500 bond. 184

But the judge in Anschutz Exploration Company v. Town of Dryden ruled that Dryden’s total ban was not preempted. Judge Phillip R. Rumsey stated that, by referring to “regulation of oil and gas,” the state statute means regulation of operational details. He analogized ECL § 23-0303 to New York’s Mined Land Reclamation Law, ECL § 23-2703, which New York’s top court has held does not preempt zoning laws. Judge Rumsey relied on the fact that the Reclamation Law statute has language similar to the language in ECL § 23-0303 regarding superseding all local laws. Given that similarity and the fact that the Reclamation Law has been interpreted as not preempting local zoning laws, Judge Rumsey reasoned that ECL § 23-0303 must not preempt local zoning laws.

But the two statutes also have differences that arguably undermine Judge Rusmey’s reasoning that the preemptive effect of the statutes must be the same. For example, the Reclamation Law expressly states that it does not prohibit “local zoning ordinances.” Section 23-0303, the New York oil and gas statute dealing with preemption, contains no such language. The closest thing that the oil and gas statute has to that type of language is a provision stating that the statute does not superease “local government jurisdiction over local roads.” But the Town of Dryden ordinance is an outright ban on oil and gas activity, and is not written as a regulation of roads. Judge Rumsey addressed this fact by suggesting that, although the ban is not expressly written as a regulation of roads, the ban nevertheless is not preempted because oil and gas companies use local roads to transport their equipment and supplies.

A few days later, a New York court upheld a Town of Middlefield zoning ordinance that bans all oil and gas activity, including hydraulic fracturing, throughout the Town’s jurisdiction.185

The Town of Middlefield enacted the ban in June 2011. Although reports at the time indicated that the supporters of the ban were motivated in large part by opposition to hydraulic fracturing, the ordinance prohibits all oil and gas activity, whether or not it involves fracturing. The ban was challenged by Cooperstown Holstein Corporation, which had granted two oil and gas leases a few years before, and which hoped that the leaseholder would drill on the leased land. Cooperstown Holstein argued that the local ban on oil and gas activity was preempted (made unenforceable) by a state oil and gas statute, New York Environmental Conservation Law § 23-0303.

The court that heard the challenge to the Town of Middlefield’s ban agreed that the statute attempts to achieve uniform rules for the oil and gas industry statewide by preempting local laws which “regulate” the oil and gas industry, but the court concluded that a zoning ordinance prohibiting oil and gas activity in certain locations is not what ECL § 23-0303 means by “regulation.” The court stated in its written decision that, after consulting dictionary definitions of “regulation” and the legislative history of New York’s Environmental Conservation Law, the court was convinced that:

[T]he legislature’s intention was to insure state-wide standards to be enacted by the Department of Environmental Conservation as it related to the manner and method to be employed with respect to oil, gas and solution drilling or mining, and to insure proper state-wide oversight of uniformity ... 

Clearly, the state’s interests may be harmonized with the home rule of local municipalities in their determination of where oil, gas and solution drilling or mining may occur. The state maintains control over the ‘how’ of such procedures while the municipalities maintain control over the ‘where’ of such exploration.

b. Local inconvenience issues

Drilling sites can be noisy, dusty, brightly-lit (to allow drilling around the clock), and the focus of increased auto traffic during drilling operations. Further, the hydraulic fracturing of a well can produce these inconveniences to a greater degree than conventional operations. The Office of Conservation has issued Order No. U-HS to regulate dust, noise, vibration, lighting, fencing, general upkeep of drilling sites, and minimum distances between a well and residences\(^\text{186}\) for Haynesville Shale drilling in urban areas.

c. Blowouts, surface spills, and well construction standards

The controversy over hydraulic fracturing has generated closer scrutiny of the oil and gas industry in general, including problems that arise whenever there is a surface spill, blowout, or casing and cementing failure that leads to a release of potentially harmful substances into the environment. Indeed, many critics of hydraulic fracturing, point to almost any problem relating to the oil and gas industry as being a “fracking” problem. This likely will lead to closer scrutiny of industry practices and existing regulations relating to spill prevention and containment, well control, and well construction.

d. Unitization issues

When hydraulic fracturing is used in conjunction with horizontal drilling to produce oil or gas from shale formations, unitization issues can arise. In north Louisiana, many units are 640

acre units, one square mile in size. As operators move toward the use of longer horizontal laterals, particularly as they begin to use laterals a mile or more in length, it becomes impossible to fit the entire lateral within a unit of that size. Thus, if one imagines a lateral that runs north and south, a lateral of the length preferred by the operator may be “too long” north and south.

On the other hand, the area drained by a well in a shale formation likely will not extend far beyond the fracture zone, which might be a shorter distance east-to-west than the width of a unit in which the well is drilled. Thus, the operator may desire to drill multiple wells in the same unit (with laterals running parallel to each other), even though the conventional rule is that a unit should be the maximum size efficiently drained by one well. These facts raise interesting legal issues as operators apply new techniques while working under rules that often were not drafted with the new techniques in mind.

IV. Conclusion

Hydraulic fracturing is a well stimulation technique that facilitates the production of oil and gas from low permeability formations by creating fractures in those formations, thereby establishing pathways for oil or gas to flow to the well. The process, which was developed in the late 1940s, has become controversial in recent years, with critics raising various environmental concerns. Existing or proposed regulations address issues relating to water usage, the use of diesel fuel in hydraulic fracturing, the disclosure of the composition of fracturing fluids, the disposal of flowback, control of air emissions, and local inconvenience issues. The regulatory field is changing rapidly, and is likely to continue changing.

In addition to raising regulatory issues, hydraulic fracturing raises litigation issues. Plaintiffs have brought suit in several states, alleging various injuries and asserting various causes of action. Most of those suits claim that harm has been caused by contamination that allegedly has been caused by hydraulic fracturing.
