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The Oil and Gas Evolution: Learning from the Hydraulic Fracturing Experiences in North Dakota and West Virginia

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THE OIL AND GAS EVOLUTION: LEARNING FROM THE HYDRAULIC FRACTURING EXPERIENCES IN NORTH DAKOTA AND WEST VIRGINIA

By Joshua P. Fershee¹

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I. INTRODUCTION

Hydraulic fracturing, the method used to recover most new oil and gas in the United States,² marks the next evolution in fossil fuel extraction. The world has moved from what is deemed (relatively) easy oil and gas extraction to more complex, more expensive means of extraction. What was traditionally known as tight oil and tight gas is now flowing freely in many parts of the United States thanks to new technologies and higher prices. The technologies for extracting oil and gas are similar, but despite many similarities, the respective commodities have some significant differences that warrant consideration.

This extraction method has created significant excitement coupled with equally high levels of concern. The economic benefits of hydraulic fracturing are well recognized, but the environmental risks remain

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2. Mary Tieman & Adam Vann, *Hydraulic Fracturing and Safe Drinking Water Act Issues*, CONG. RESEARCH SERV., 1, 2 (Apr. 15, 2011), <http://www.arcticgas.gov/sites/default/files/documents/hydraulic-fracturing-and-safe-drinking-water-act-issues.pdf> (stating that “more than ninety percent of new natural gas wells in the United States rely on hydraulic fracturing,” according to the Independent Petroleum Association of America).

a point of contention.³ Risks related to possible groundwater contamination, earthquakes, and other potential harms have raised serious questions about the hydraulic fracturing process, as well as regulatory oversight of the oil and gas industry.⁴

Two of the country's major shale plays are the Bakken Shale, which is located primarily in North Dakota and Montana, and the Marcellus Shale, which is largely in West Virginia and Pennsylvania. While similar, these formations also have some key differences. The main similarity between the Bakken and Marcellus is that advanced hydraulic fracturing techniques have made the minerals found in both formations accessible and cost effective under current market conditions.⁵ The main difference is the commodity that comes from each of the respective formations. The Bakken Shale formation is an "oil play," but the Marcellus Shale, on the other hand, is a "natural gas play."⁶

This Article will thus consider major differences and similarities in United States oil and gas extraction via hydraulic fracturing through a comparison of the experiences in North Dakota and West Virginia. Although there are other parts of the country experiencing growth in oil and gas extraction, Pennsylvania and Texas are two good examples, North Dakota and West Virginia are particularly apt for comparison. Both states have relatively small populations, meaning that the impact of large-scale energy extraction in each state is likely to have a large impact on the state, economically, environmentally, and socially.

There are three main areas worth considering in this comparison. In Part II, this Article will discuss the impact of the oil industry in North Dakota and the gas industry in West Virginia. Part II will also consider some of the financial, environmental, and social impacts of the hydraulic fracturing boom. Part III will then consider the legislative and regulatory landscape of both states and how each state's approach to enforcement and planning can and is likely to impact development in the state. Finally, this Article concludes that the North Dakota and West Virginia experiences can and should inform state and federal policy with regard to hydraulic fracturing and energy policy generally and provides some suggestions about how best to maximize the value of the lessons already learned.

3. *Natural Gas Extraction - Hydraulic Fracturing*, ENVTL. PROT. AGENCY, <http://www.epa.gov/hydraulicfracture/> (last updated Aug. 1, 2012) (stating that "concerns associated with overall natural gas and shale gas extraction, including hydraulic fracturing, are already well known").

4. *See id.*

5. *See* Tieman & Vann, *supra* note 2, at 1; *Hydraulic Fracturing of Oil & Gas Wells Drilled in Shale*, GEOLOGY.COM, <http://geology.com/articles/hydraulic-fracturing/> (last visited Aug. 25, 2012).

6. *See* U.S. ENERGY INFO. ADMIN., REVIEW OF EMERGING RESOURCES: U.S. SHALE GAS AND SHALE OIL PLAYS 4 (2011), available at <ftp://ftp.eia.doe.gov/natgas/usshaleplays.pdf>.

II. ALL ABOUT THE ECONOMY: FINANCIAL, ENVIRONMENTAL, AND SOCIAL IMPACTS

North Dakota and West Virginia are both states in which the energy industry has had a significant economic impact. Over the years, both states have followed boom-and-bust economic cycles related to the energy industry, and in the recent years, both states have fared better than much of the country because of their oil and gas reserves. In some ways, the two states seemed to be running on parallel tracks, but there are some key differences, as well.

A. *An Oil Play: The North Dakota Impact*

North Dakota passed California in oil production early in December 2011, making the state the third-largest United States oil producer.⁷ Then, in March 2012, North Dakota passed Alaska to become the second largest oil producing state, behind Texas.⁸ The heavy oil extraction has allowed North Dakota to maintain a budget surplus of more than \$1 billion, and the surplus is expected to continue into the foreseeable future.⁹

According to a North Dakota State University (“NDSU”) study on the economic impact of the petroleum industry in North Dakota, the industry-wide, oil-and-gas impact for 2009 was approximately \$12.6 billion.¹⁰ This includes estimated direct impacts of \$4.9 billion and \$7.7 billion in estimated indirect impacts.¹¹

Employment figures are similarly impressive for such a low population state. In the 2010 United States Census, North Dakota had a population of 672,591 people.¹² The NDSU study estimated that the petroleum industry directly accounted for 18,328 full-time jobs, which provided \$4.9 billion in economy-wide personal income, retail sales of \$3.3 billion statewide, and \$822 million in state and local tax revenues.¹³ The study also estimated secondary employment of 46,800

7. Selam Gebrekidan, *Shale Boom Turns North Dakota into No. 3 Oil Producer*, REUTERS (Mar. 8, 2012, 2:11 PM), <http://www.reuters.com/article/2012/03/08/us-oil-output-bakken-idUSBRE82714V20120308>.

8. Stephen J. Lee, *N.D Becomes No. 2 Oil Producing State, Trailing Only Texas*, BAKKEN TODAY, May 16, 2012, http://www.bakkentoday.com/event/article/id/33956/publisher_ID/82/.

9. See Dennis Cauchon, *North Dakota Economy Booms, Population Soars*, USA TODAY, Mar. 16, 2011, http://www.usatoday.com/news/nation/census/2011-03-16-north-dakota-census_N.htm.

10. DEAN A. BANGSUND & F. LARRY LEISTRITZ, DEP'T OF AGRIBUSINESS & APPLIED ECON., PETROLEUM INDUSTRY'S ECONOMIC CONTRIBUTION TO NORTH DAKOTA IN 2009, at vi (2010), available at ageconsearch.umn.edu/bitstream/99252/2/AAE676.pdf.

11. *Id.*

12. See *State & County Quickfacts: North Dakota*, U.S. CENSUS BUREAU, <http://quickfacts.census.gov/qfd/states/38000.html> (last modified Aug. 16, 2012).

13. BANGSUND & LEISTRITZ, *supra* note 10, at vi.

people in “full-time equivalent jobs.”¹⁴ This means that nearly 10% of the state’s total population worked directly or indirectly in petroleum-related jobs.¹⁵ This number climbs to 12.4% if one only considers the population over the age of eighteen.¹⁶

The rapidly increasing rate of activity has been, and remains, remarkable. Between 2005 and 2009, expenditures for exploration activities, such as mineral leasing and drilling wells, increased by 482% as controlled for inflation.¹⁷ Overall economic activity over the same time period increased 117%, and the overall gross business volume almost tripled, increasing from \$4.2 billion to \$12.6 billion in those four years.¹⁸

This activity does not come without social costs. The schools in western North Dakota are working to keep pace with the rapid population increase,¹⁹ and the region is faced with wide-spread housing shortages and skyrocketing inflation.²⁰ The heavy truck traffic related to the oil boom has taken a great toll on the roads and will require hundreds of millions of dollars for repair and expansion.²¹ The increased traffic has also led to numerous accidents and deaths, to the point that some believe traffic is “[t]he most dangerous aspect of working in the North Dakota oil patch.”²² The traffic issues and other public safety concerns have swamped courts and police departments²³ and changed a once quiet part of the state into a series of boomtowns.²⁴

14. *Id.*

15. See U.S. CENSUS BUREAU, *supra* note 12 (determining that in 2010, North Dakota had 672,591 people, 22.3% of whom were under the age of eighteen).

16. *Id.*

17. BANGSUND & LEISTRITZ, *supra* note 10, at vi.

18. *Id.*

19. Lauren Donovan, *Oil Patch’s Fringe Towns See Jump in School Enrollments*, BISMARCK TRIB., May 13, 2012, http://bismarcktribune.com/news/state-and-regional/oil-patch-s-fringe-towns-see-jump-in-school-enrollments/article_276c7db2-9d75-11e1-9651-0019bb2963f4.html#ixzz1ux5XPzI.

20. *Oil Boom Is Not Benefiting All*, BISMARCK TRIB., Aug. 22, 2011, http://bismarcktribune.com/news/state-and-regional/oil-boom-is-not-benefiting-all/article_da42cb00-cc7c-11e0-b341-001cc4c03286.html (“The biggest challenge is housing: the lack of it and the cost . . .”).

21. Jenny Michel, *More than \$700 Million in Road Construction Planned for North Dakota*, BISMARCK TRIB., May 2, 2012, http://bismarcktribune.com/bakken/more-than-million-in-road-construction-planned-for-north-dakota/article_f1367d0e-9498-11e1-8a5c-001a4bcf887a.html.

22. Jacob Brooks, *Will Governor’s Bypass Solutions Solve North Dakota’s Traffic Problems? Some Truckers Say Proposed Bypass Is Too Far Out*, WILLISTON HERALD, Apr. 16, 2012, http://www.willistonherald.com/news/will-governor-s-bypass-solutions-solve-north-dakota-s-traffic/article_c7c91c50-87ec-11e1-9ee6-001a4bcf887a.html.

23. See Ashley Martin, *Caseloads Up in Southwest District Court*, DICKINSON PRESS, May 13, 2012, available at http://www.thedickinsonpress.com/event/article/id/57986/publisher_ID/6/.

24. John McChesney, *Oil Boom Puts Strain On North Dakota Towns*, NPR.ORG (Dec. 2, 2011), <http://www.npr.org/2011/12/02/142695152/oil-boom-puts-strain-on-north-dakota-towns>; see also James MacPherson, *Oil Boom Resurrects North Dakota*

Finally, the increased oil-related activity has led to numerous environmental problems and concerns. The low price of natural gas and lack of infrastructure to handle natural gas (which is extracted along with oil) have led companies to flare (i.e., burn) the gas rather than use it for a useful purpose.²⁵ With low natural gas prices and the lack of existing pipelines to move the gas, it is simply cheaper to burn off the associated natural gas that accompanies the oil being extracted.²⁶ Although flaring gas is environmentally preferable to simply venting the gas,²⁷ the process still raises significant air quality concerns that have prompted the Environmental Protection Agency (“EPA”) to put new air quality standards in place for fractured wells.²⁸

Additionally, some research indicates that hydraulic fracturing may pose risks to safe water supplies and that the process could cause earthquakes.²⁹ There is also research that suggests that hydraulic fracturing that is done correctly poses little risk to drinking water supplies and that other similar risks can be minimized, mitigated, or both.³⁰ There are clearly some environmental risks involved, as there are in every mineral extraction. The key issues that need to be addressed next are the degree of risk, the efforts being taken to avoid the possible negative impacts raised by such risk, and the best method of enforcement or oversight to ensure risks are minimized as much as possible.

B. *A Gas Play: The West Virginia Impact*

In contrast to North Dakota, West Virginia’s shale play provides primarily natural gas, not oil. The Marcellus Shale has massive gas reserves, and the ability to access those reserves via hydraulic fractur-

Ghost Town, TIMESUNION.COM (May 13, 2012, 2:59 AM), <http://www.timesunion.com/news/article/Oil-boom-resurrects-North-Dakota-ghost-town-3547601.php> (“The all-but-forgotten former farming village has been reborn as a hub of oil activity. And it may not be the last abandoned settlement to be resurrected from the dust.”).

25. Clifford Krauss, *In North Dakota, Flames of Wasted Natural Gas Light the Prairie*, N.Y. TIMES, Sept. 27, 2011, at A1, available at http://www.nytimes.com/2011/09/27/business/energy-environment/in-north-dakota-wasted-natural-gas-flickers-against-the-sky.html?_r=1&pagewanted=all (“With oil prices high amid strong global demand and leases as short as five years for land in the Bakken, drillers have found it more profitable to just grab the oil and burn the gas.”).

26. *Id.*

27. *Id.*

28. Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 76 Fed. Reg. 66,886, 66,887–889 (proposed Oct. 28, 2011) (to be codified at 40 C.F.R. pt. 63), available at <http://www.gpo.gov/fdsys/pkg/FR-2011-10-28/pdf/2011-27961.pdf>.

29. Henry Fountain, *Add Quakes to Rumbles Over Gas Rush*, N.Y. TIMES, Dec. 13, 2011, at D1, available at <http://www.nytimes.com/2011/12/13/science/some-blame-hydraulic-fracturing-for-earthquake-epidemic.html?pagewanted=all>.

30. See Mike Soraghan, *Baffled About Fracking? You’re Not Alone*, N.Y. TIMES, May 13, 2011, <http://www.nytimes.com/gwire/2011/05/13/13greenwire-baffled-about-fracking-youre-not-alone-44383.html?pagewanted=all>.

ing has, according to a 2009 study conducted by West Virginia University (“WVU”) researchers, provided a boost to the state’s economy and created thousands of job opportunities.³¹

The WVU study concluded that the oil and gas industry led to more than \$4.5 billion in direct impact and directly employed 9,869 people, leading to more than \$551.9 million in wages.³² That activity, in turn, generated \$12 billion in business volume impact and created roughly 24,400 jobs.³³ Those jobs led to \$1.1 billion in employee compensation.³⁴ The Marcellus Shale alone was determined to account for 7,600 jobs in 2009 and had a business volume impact of \$2.35 billion.³⁵ The state has benefitted from the oil and natural gas industry, too, receiving direct payments of \$65.9 million in severance taxes in 2009, with an additional \$44.5 million in other state taxes generated by the industry’s economic activity.

As one might expect, not all of the impacts of hydraulic fracturing in West Virginia have been positive. The process has led to environmental concerns in West Virginia, as it has everywhere else it is occurring. For example, a recent study conducted by researchers at the United States Forest Service determined that more research is needed to determine how to safely dispose of hydraulic fracturing wastewater, which often contains chemicals that could pose an environmental risk.³⁶

The study found that more than half of the trees in a section of the Fernow Experimental Forest (part of the Monongahela National Forest)³⁷ were dead two years after the wastewater was legally disposed of in the forest.³⁸ Approximately 303,000 liters of wastewater were applied over two days to less than half an acre of forest “to minimize the area of forest potentially affected by the fluid application.”³⁹ The study noted that a high concentration of the fluid in such a small area likely contributed to that damage and that using more land would likely have led to less environmental damage.⁴⁰

31. AMY HIGGINBOTHAM ET AL., *THE ECONOMIC IMPACT OF THE NATURAL GAS INDUSTRY AND THE MARCELLUS SHALE DEVELOPMENT IN WEST VIRGINIA IN 2009*, at 1 (2010), available at <http://www.be.wvu.edu/bber/pdfs/BBER-2010-22.pdf>.

32. *Id.* at 1, 10.

33. *Id.* at 1.

34. *Id.* at 10.

35. *Id.* at 1.

36. See Mary Beth Adams, *Land Application of Hydrofracturing Fluids Damages a Deciduous Forest Stand in West Virginia*, 40 J. ENVTL. QUALITY 1340, 1340 (2011), available at http://www.nrs.fs.fed.us/pubs/jrnl/2011/nrs_2011_adams_001.pdf.

37. Mireya Navarro, *Fracking Water Killed Trees, Study Finds*, N.Y. TIMES, July 12, 2011, <http://green.blogs.nytimes.com/2011/07/12/fracking-water-killed-trees-study-finds/>.

38. Adams, *supra* note 36, at 1341 (“By summer 2010, 2 yr after fluid application, 56% of the trees within the fluid application area were dead.”).

39. *Id.* at 1340, 1343.

40. *Id.* at 1343 (“In retrospect, minimizing the area of application resulted in a larger dose (loading).”).

Still, the researchers explained, “the application met the terms of the permit issued by the West Virginia Division of Environmental Protection, Office of Oil and Gas, which is a concentration-based standard.”⁴¹ Thus, “a dose-based standard might be considered as a means to provide more protection to vegetation and . . . research to develop such a standard is a high priority.”⁴²

West Virginia has had reason to be concerned about potential harms to drinking water from hydraulic fracturing since at least 1987.⁴³ At that time, the EPA issued a report related to the drinking water on James Parson’s property in Jackson County, West Virginia, finding that “fracture fluid, along with natural gas was present . . . , rendering it unusable.”⁴⁴ The case appears to have been one in which the responsible parties were unaware of the aquifer; still, the case shows that even if such damage should be avoidable, damage can occur if proper steps are not taken in the drilling process.⁴⁵

Similar to western North Dakota, the gas boom in West Virginia has created traffic problems in affected areas.⁴⁶ Traffic jams have become a regular occurrence as trucks move drilling equipment to new sites.⁴⁷ In addition to traffic concerns, there are worries that the benefit of the gas boom will not benefit the state.⁴⁸ The Affiliated Construction Trades Foundation, a group affiliated with 20,000 West Virginia-based union construction workers, has complained that the gas companies are hiring out-of-state contractors.⁴⁹

This concern has been raised around the state. As one commentator stated, “most of the wealth generated by gas won’t go to West Virginians. As with coal, almost all of West Virginia’s gas will be ex-

41. *Id.*

42. *Id.*

43. See Ian Urbina, *A Tainted Water Well, and Concern There May Be More*, N.Y. TIMES, Aug. 4, 2011, at A13, available at http://www.nytimes.com/2011/08/04/us/04nat-gas.html?_r=1&pagewanted=all.

44. *Id.*; OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, U.S. ENVTL. PROT. AGENCY, REPORT TO CONGRESS: MANAGEMENT OF WASTES FROM THE EXPLORATION, DEVELOPMENT, AND PRODUCTION OF CRUDE OIL, NATURAL GAS AND GEOTHERMAL ENERGY (1987), available at <http://nepis.epa.gov/Exec/ZyNET.exe/9100W11P.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1986+Thru+1990&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C86thru90%5CTxt%5C00000025%5C9100W11P.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p%7Cf&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>.

45. See Urbina, *supra* note 43, at A13.

46. George Hohmann, *Marcellus Shale Gas Boom Mirrors Gold Rush*, CHARLESTON DAILY MAIL, Nov. 25, 2011, <http://www.dailymail.com/Business/201111240048>.

47. *Id.*

48. *Id.*

49. *Id.*

tracted by out-of-state companies that will repatriate the profits elsewhere.”⁵⁰ In addition, there are concerns that the tax revenues generated by the gas industry activity will be offset by the increased infrastructure needs of those doing the drilling.⁵¹

Despite the challenges, West Virginia may be better prepared than other states in the gas boom because of the state’s history as an energy state. All of the long-time oil states, like Texas, Oklahoma, Alaska, and North Dakota, have significant taxes on their energy resources.⁵² According to one report, however, “[a]mong the new boom states, only West Virginia has a substantial tax—an old natural resources levy, a little above 5%, that applies to oil, gas and coal.”⁵³ New York and Pennsylvania, in contrast, have no severance tax, and Ohio has a very modest tax designed only to cover regulatory costs.⁵⁴

III. NORTH DAKOTA AND WEST VIRGINIA EMBRACE STATE-BASED REGULATION

Hydraulic fracturing process is still a relatively new technology, at least at the scale in which it is happening today. Some have deemed this new and expansive use of hydraulic fracturing an energy “revolution.”⁵⁵ Whether this industry “game changer” is more of an evolution than a revolution really depends on the perspective.

There is no doubt that hydraulic fracturing has helped trigger a resurgence of United States oil and gas production not seen for years. However, the oil and gas boom of today is not unlike some of the oil and gas booms of the past. Although the processes used to extract oil and gas have changed, the business models and the commodities being sold have not. In this sense, at least, the resurgence of United States oil and gas is more evolutionary than revolutionary.

In other ways, this new age of oil and gas is revolutionary. The newly (economically) accessible oil in North Dakota may create some market stability prior oil booms did not have. Similarly, the massive natural gas reserves available in West Virginia (and other places around the country) have extended the expected availability of natural gas by decades, creating potential longer-term stability for natural gas markets.

50. Sean O’Leary, *Will Our Natural Gas Boom Help Us?*, THE JOURNAL (Martinsburg, W. Va.), Dec. 24, 2011, <http://www.journal-news.net/page/content.detail/id/572643/Will-our-natural-gas-boom-help-us-.html?nav=5002>.

51. *Id.*

52. Dennis Cauchon, *Some States Unprepared for Shale Energy Boom*, USA TODAY, Feb. 23, 2012, <http://www.usatoday.com/money/industries/energy/story/2012-02-06/shale-boom/53226286/1>.

53. *Id.*

54. *Id.*

55. See Hannah Wiseman, *Trade Secrets, Disclosure, and Dissent in a Fracturing Energy Revolution*, 111 COLUM. L. REV. SIDEBAR 1, 3 (2011).

Whether hydraulic fracturing is viewed as evolutionary or revolutionary seems to be driving much of the debate about proper regulation of the industry. Industry has largely advocated that the process is old and established and is thus an evolution of long-standing processes. This camp seeks to keep regulatory models for hydraulic fracturing within the traditional oil and gas framework, which is primarily at the state level.

In contrast, many environmental groups and some regulators have argued that the process is revolutionary and requires a fundamental change in the regulatory process. These groups tend to advocate for federally mandated rules and disclosures or, absent that, a more fundamental (and different) set of state regulations for hydraulic fracturing.

Traditionally, oil and gas regulation was handled at the state level, and today, most regulation related to hydraulic fracturing remains at the state level. This state legislation varies widely. From a regulatory perspective, legislators and executives from both North Dakota and West Virginia seem to view hydraulic fracturing from primarily an evolutionary perspective, aggressively advocating state oversight.

Some states, like New York, plainly view hydraulic fracturing as revolutionary. The New York governor's office placed a moratorium on all hydraulic fracturing, opting for additional time to study the potential implications before the state developed regulations.⁵⁶ Similarly, Vermont's legislature is considering legislation that would ban the practice for three years (as the House of Representatives proposed)⁵⁷ or longer.⁵⁸ North Dakota, on the other hand, took another tack.

The North Dakota Legislature made clear that it viewed hydraulic fracturing as positive for the state when it passed House Bill No. 1216, which provides as follows:

Hydraulic fracturing - Designated as acceptable recovery process. Notwithstanding any other provision of law, the legislative assembly designates hydraulic fracturing, a mechanical method of increasing the permeability of rock to increase the amount of oil and gas produced from the rock, an acceptable recovery process in this state.⁵⁹

56. See N.Y., N.Y. Exec. Order No. 41 (Dec. 13, 2010), available at <http://www.governor.ny.gov/archive/paterson/executiveorders/EO41.html> (issued by Governor David Paterson); N.Y., N.Y. Exec. Order No. 2. (Jan. 1, 2011), available at <http://www.governor.ny.gov/executiveorder/2> (order continued by Governor Andrew Cuomo).

57. H.B. 464, 2011 Legis. Sess. (Vt. 2012), available at <http://www.leg.state.vt.us/docs/2012/bills/House/H-464.pdf>.

58. See Aaron K. Block, *Vermont House Approves Three-Year Ban on Hydraulic Fracturing*, ALSTON & BIRD'S PROD. LIAB. TRENDS & DEVS. BLOG (Feb. 3, 2012), <http://www.alston.com/productsliabilityblog/blog.aspx> (stating that Vermont's state senate will consider whether to pass the house bill as drafted or enact a permanent ban on hydraulic fracturing).

59. N.D. CENT. CODE § 38-08-25 (2012).

In addition, in November 2011 during a special session, the North Dakota legislature set aside \$1 million to fund expenses to fight possible EPA efforts to regulate hydraulic fracturing.⁶⁰ At the legislative level, at least, there is very little dissent on this issue.⁶¹

North Dakota has not completely ignored the possible need for new regulations because of the dramatic increase in hydraulic fracturing in the state.⁶² In January 2012, the North Dakota Industrial Commission⁶³ sought to improve transparency for the drilling process and improve environmental protections.⁶⁴ The new regulations have a particular focus on reducing the use of open wastewater pits,⁶⁵ requiring chemical disclosures,⁶⁶ and increasing well bonds.⁶⁷ These regulations are an improvement to the prior regulations, but are relatively modest steps forward.

Similarly, West Virginia's governor requested that the state's Department of Environmental Protection ("DEP") use its ability to issue emergency rules⁶⁸ "to promulgate additional regulations to ensure the responsible development of the Marcellus Shale in West Virginia."⁶⁹ The West Virginia DEP filed the emergency rule on August 22, 2011, and it provided a number of new requirements related specifically to "horizontal well development in the state."⁷⁰

Under the rule, operators must estimate the amount of water they will use in drilling and fracturing their wells and disclose those esti-

60. S.B. 2371, 62d Legis. Assemb., Spec. Sess. § 28 (N.D. 2011), available at <http://www.legis.nd.gov/assembly/62-2011/special-session/documents/11-0826-05000.pdf>.

61. Dale Wetzel, *ND Senator Rips \$1M for EPA 'Fracking' Lawsuit*, BLOOMBERG BUSINESSWEEK (Nov. 17, 2011, 10:20 AM), <http://www.businessweek.com/ap/financialnews/D9R2IC800.htm> (stating there was one vote against House Bill No. 1216 and only eight legislators who opposed a resolution seeking to limit the EPA's power to regulate hydraulic fracturing).

62. Press Release, Indus. Comm'n of N.D., Industrial Commission OKs Rule Changes Governing Oil Industry (Jan. 23, 2012), available at <http://www.nd.gov/ndic/ic-press/dmr-oilrules.pdf>.

63. The Industrial Commission of North Dakota consists of the state's Governor, the Attorney General, and the Agriculture Commissioner. See N.D. INDUS. COMM'N, <http://www.nd.gov/ndic/> (last visited Aug. 25, 2012).

64. See Press Release, Indus. Comm'n of N.D., *supra* note 62.

65. N.D. ADMIN. CODE 43-02-03-19.5 (2012). This provision allows the commission to grant an exception to allow wastewater pits for certain wells that are drilled more than 5,000 feet deep, "provided the proposed well or wells utilized a low sodium content water-based mud system, and the reserve pit can be constructed, used. [sic] and reclaimed in a manner that will prevent pollution of the land surface and freshwaters." *Id.*

66. N.D. ADMIN. CODE 43-02-03-27.1 (2012).

67. N.D. ADMIN. CODE 43-02-03-15 (2012).

68. W. VA. CODE § 29A-3-15 (2012).

69. W. Va. Exec. Order No. 4-11 (July 12, 2011), available at <http://www.governor.gov/Documents/20110713150559476.pdf>.

70. Press Release, W. Va. Dep't of Envtl. Prot., DEP Files Emergency Rule for Horizontal Drilling (Aug. 22, 2011), available at <http://www.dep.wv.gov/news/Pages/DEPfilesemergencyruleforhorizontaldrilling.aspx>.

mates to the West Virginia DEP.⁷¹ Operators must submit water management plans for any wells expected to use more than 210,000 gallons of water in any one-month period.⁷² Among several provisions designed to protect water supplies, the operator must state the type and location of their water source, the expected amount of water to be withdrawn, and when they plan to do so.⁷³

The rule also (1) creates disclosure requirements related to the fracturing fluid additives, (2) requires tracking of the amounts and disposal of flowback water, and (3) mandates (for areas larger than three acres) erosion and sediment control plans and proper disposal of drill cuttings and drill mud.⁷⁴ The rule further provides for public notice of at least thirty days before issuance of a drill permit for the first well on a well pad within a municipality's boundary.⁷⁵ This final provision originally required notice of "drilling inside municipal limits or within a mile of those boundaries"; however, at the last minute, the one-mile provision was dropped, and another change was made reducing oversight, leading to some claims that industry groups had influenced the changes.⁷⁶

Nonetheless, several important regulations were passed as part of the emergency measure. Perhaps the most important of these regulations provides that "[a]ll casing installed in the well must be new, with a pressure rating that exceeds the anticipated maximum pressure to which the casing will be exposed and meet the appropriate American Petroleum Institute (API) standards."⁷⁷ As API explains,

Maintaining well integrity is a key design principle and design feature of all oil and gas production wells. Maintaining well integrity is essential for the two following reasons.

- 1) To isolate the internal conduit of the well from the surface and subsurface environment. This is critical in protecting the environment, including the groundwater, and in enabling well drilling and production.
- 2) To isolate and contain the well's produced fluid to a production conduit within the well.⁷⁸

Adopting the API best practices as part of the emergency rule is a strong first step to help avoid well casing disasters, ideally with the

71. W. VA. CODE R. § 35-8-3.3 (2011), available at <http://www.dep.wv.gov/news/Documents/35-8%20%20Horizontal%20Well%20Rule.pdf>.

72. *Id.*

73. *Id.* § 35-8-3.3a.

74. *Id.* § 35-8-4.

75. *Id.* § 35-8-5.

76. Ken Ward, Jr., *Tomblin Weakened Executive Order on Marcellus Drilling*, THE CHARLESTON GAZETTE, July 27, 2011, <http://wvgazette.com/News/201107271366>.

77. § 35-8-4.4.a.

78. AM. PETROL. INST., HYDRAULIC FRACTURING OPERATIONS—WELL CONSTRUCTION AND INTEGRITY GUIDELINES 1, pt. 1 (1st ed. 2009), available at <http://www.shalegas.energy.gov/resources/HF1.pdf>.

goal of making such disasters “never events” in hydraulic fracturing.⁷⁹ Adoption of the API standards also helps put industry at the forefront of the safety movement in an area where industry technical expertise is critical to understanding, and thus mitigating (and hopefully avoiding), risks related to these highly specialized processes.⁸⁰

IV. CONCLUSION: AVOIDING A REVOLUTION DURING THE EVOLUTION OF HYDRAULIC FRACTURING

Hydraulic fracturing has already contributed tremendously to the United States’ economy, and North Dakota and West Virginia have benefitted greatly. Despite the massive exploration and production projects underway, the industry surrounding hydraulic fracturing is very much developing. And the debates about the risks, rewards, and proper regulation of the process are only beginning.

One of the key battlegrounds in the area is whether the EPA will take a role in regulating hydraulic fracturing. Environmental groups and some academics have advocated for a strong EPA role in hydraulic fracturing. Others, including many from the industry and state government officials, have called for the EPA to stay out of the regulatory structure.

Government officials in both North Dakota and West Virginia have been vocal about their opposition to EPA regulation in the energy industry. As noted earlier, the North Dakota legislature strongly supported a \$1 million fund to fight potential EPA efforts to regulate hydraulic fracturing.⁸¹

West Virginia’s governor has been similarly outspoken in opposition of EPA regulation. In his inaugural address, Governor Earl Ray Tomblin took aim at the EPA’s role in regulating the coal industry: “I will fight for our state’s coal industry, the backbone of our economy. We will continue to take on the federal government and oppose efforts by the EPA and others to stop production of the most efficient fuel our country knows.”⁸²

79. See Joshua P. Fershee, *North Dakota Expertise: A Chance to Lead in Economically and Environmentally Sustainable Hydraulic Fracturing*, 87 N.D. L. REV. (forthcoming 2012) (stating that industry best practices could help avoid events like the casing failure that led the BP’s disaster at its Deepwater Horizon well in the Gulf of Mexico).

80. *Id.* (noting that North Dakota’s “oil companies . . . are on the cutting edge of knowledge and best practices in the process”); *cf.* AM. PETROL. INST., *supra* note 78, at 3, pt. 3.2 (“All well designs and well plans include contingency planning. Although seldom needed, these contingency plans are in place to mitigate and eliminate the risk of failure due to unplanned events, and most importantly, to ensure the protection of people and the environment.”).

81. S.B. 2371, 62d Legis. Assemb., Spec. Sess. § 28 (N.D. 2011), available at <http://www.legis.nd.gov/assembly/62-2011/special-session/documents/11-0826-05000.pdf>.

82. Earl Ray Tomblin, Governor of W. Va., Inaugural Address (Nov. 13, 2011), available at <http://www.wv.gov/news/Pages/nauguralAddressofGovernorTomblin.aspx>.

Although both North Dakota and West Virginia have traditionally been opposed to EPA involvement in energy regulation, there is an opportunity for both states to take a leadership role in proper energy regulation, if they can work with the EPA (and the EPA is willing to do so) to develop baseline standards for hydraulic fracturing. As states active in the early part of the hydraulic fracturing explosion, regulators and industry operators in North Dakota and West Virginia have information and expertise that should be put to use in other areas undertaking hydraulic fracturing.

The EPA would be well served to pursue options to require West Virginia's model of requiring compliance with the API's best practices for hydraulic fracturing. Although the EPA is considering other, and possibly more stringent, requirements, the industry's own best practices should be an absolute minimum for any well drilled in the United States. This makes sense for all involved.

A massive hydraulic fracturing accident could cause broad-reaching harm to the environment, landowners, drinking water, industry employees, and consumers. As witnessed when BP's Deepwater Horizon oil platform suffered a blowout in the Gulf of Mexico, everyone can suffer when an industry actor errs.⁸³ In that circumstance, one industry leader stated, "[i]t certainly appears that not all the standards that we would recommend or that we would employ were in place."⁸⁴ Nonetheless, all of the companies in the industry were negatively impacted by the moratorium placed on offshore drilling following the disaster.⁸⁵

Although companies need latitude to determine their own course on many business decisions, API and industry leaders seem to agree that there are some parts of the drilling process that must be followed. Industry leaders, trade associations, environmental leaders, engineers, scientists, and state and federal regulators should be working together to ensure that there are baseline standards in place to create a list of, and then avoid, "never events" for oil and gas drilling.

All involved need to avoid allowing the enemy of their version of "the perfect" to be the enemy of the overall good.⁸⁶ Instead, we need to learn from the BP disaster and we need to learn from the exper-

83. See John M. Broder, *Oil Executives Break Ranks in Testimony*, N.Y. TIMES, June 16, 2010, at A20, available at <http://www.nytimes.com/2010/06/16/business/16oil.html> ("[T]he leaders of Exxon Mobil, Chevron, Shell and ConocoPhillips insisted at a Congressional hearing that they would not have made the mistakes that led to the well explosion and the deaths of 11 rig workers on April 20.").

84. *Id.* (quoting John S. Watson, chairman of Chevron).

85. *See id.*

86. Cf. Cliff L. Rothenstein et al., *Battles Over the Federal Policies Regulating Hydraulic Fracturing*, K&L GATES (Oct. 17, 2011), <http://www.klgates.com/battles-over-the-federal-policies-regulating-hydraulic-fracturing-10-17-2011/> ("Pennsylvania's Marcellus Shale region has become ground zero in this debate for industry and environmentalists alike.").

iences of those drilling, regulating, and studying hydraulic fracturing. As Laurence J. Peter, once said, “[t]here’s only one thing more painful than learning from experience, and that is not learning from experience.”⁸⁷ Looking to the experiences of those in North Dakota and West Virginia—economically, environmentally, and socially—would be a good place to start learning.

87. LAURENCE J. PETER, *PETER’S QUOTATIONS: IDEAS FOR OUR TIME* 185 (1977).