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North Dakota Expertise: A Chance to Lead in Economically and Environmentally Sustainable Hydraulic Fracturing

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NORTH DAKOTA EXPERTISE: A CHANCE TO LEAD IN ECONOMICALLY AND ENVIRONMENTALLY SUSTAINABLE HYDRAULIC FRACTURING

JOSHUA P. FERSHEE*

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Advances in hydraulic fracturing technology and relatively high energy prices have led to an energy industry resurgence in the United States.¹

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1. See David LaGessee, *Shale Oil Boom Takes Hold on the Plains*, Nat’l Geographic, Sept. 28, 2011, <http://news.nationalgeographic.com/news/energy/2011/09/110928-shale-oil-boom-colorado-great-plains/>.

North Dakota has been at the forefront of this energy boom, where shale oil in the Bakken formation has triggered remarkable growth and economic opportunity.² Shale gas in the Marcellus Shale and other parts of the country have further buoyed investment and activity in the energy sector.³

Hydraulic fracturing is the method used to recover most of the oil and gas in this recent U.S. energy boom,⁴ and the method has created significant excitement and concern. The economic benefits of hydraulic fracturing are already clear, but the environmental risks are still under assessment.⁵ Fears of groundwater contamination, earthquakes, and other potential harms have raised serious questions about the processes and oversight in the oil and gas industry.⁶

North Dakota is uniquely, and largely favorably, situated to benefit from hydraulic fracturing, and has already reaped many such benefits. During the recent economic crisis, North Dakota's housing market has been stable, unemployment has been remarkably low, and the state has maintained a strong and increasing budget surplus at a time when many states were operating under budget deficits.⁷ But these benefits have not come without costs.

These costs are wide ranging and should not, and cannot, be ignored. The potential collateral damage from hydraulic fracturing is particularly prevalent with regard to social and environmental harms.⁸ This is not to say that fracturing should be stopped or even that the process and those undertaking it are somehow evil. For the most part, neither is true. Instead, the point is hydraulic fracturing brings with it many benefits, but there are, as always, costs, too.

2. *Id.* ("Last year, U.S. oil production reached its highest level since 2004, about 5.5 million barrels per day, with North Dakota the state posting the largest increase in oil output.")

3. See Lynn Kerr McKay, *Science and the Reasonable Development of Marcellus Shale Natural Gas Resources in Pennsylvania and New York*, 32 ENERGY. L.J., 125, 126 (2011) ("Investment in the development of natural gas resources in the Marcellus Shale formation continues to bring lower energy costs and new jobs to local economies." (footnote omitted)).

4. Mary Tieman & Adam Vann, *Hydraulic Fracturing and Safe Drinking Water Act Issues*, Congressional Research Service, at 2, April 15, 2011, <http://www.arcticgas.gov/sites/default/files/documents/hydraulic-fracturing-and-safe-drinking-water-act-issues.pdf> ("According to the Independent Petroleum Association of America (IPAA), more than 90% of new natural gas wells in the United States rely on hydraulic fracturing, and together they have accounted for the production of more than 600 trillion cubic feet of gas.")

5. Env'tl. Prot. Agency, *Hydraulic Fracturing*, <http://www.epa.gov/hydraulicfracture/> ("Although the [EPA's] national study should enhance our scientific knowledge, some concerns associated with overall natural gas and shale gas extraction, including hydraulic fracturing, are already well known.") (last visited Mar. 28, 2012).

6. See *id.*

7. Monica Davey, *A Placid North Dakota Asks, Recession? What Recession?*, N.Y. TIMES, at A1, Dec. 5, 2008.

8. See Env'tl. Prot. Agency, *supra* note 5.

Rather than hiding from the costs and potential costs, the oil and gas industry, as well as North Dakota regulators and legislators, should be looking for ways to minimize risk, mitigate harms, and maximize benefits in pursuit of long-term growth and prosperity. This means addressing – proactively, and not reactively – the social and environmental risks (and costs) of hydraulic fracturing to ensure the related economic benefits endure.

This Article seeks to put the current North Dakota oil boom in context and help provide a path for developing legislative and regulatory policies that prolong and reinforce sustainable and beneficial development. Part I of the Article discusses the current state of the North Dakota oil industry. This Part argues the current oil economy is different from prior oil booms in the state, and further explains how the North Dakota experience is different from the current state of shale gas plays in the United States, which are also using hydraulic fracturing. Part II then discusses the major social and environmental concerns related to North Dakota’s oil industry resurgence. Finally, Part III concludes with suggestions about how North Dakota might address some of the social and environmental concerns facing the state, with the goal of supporting and sustaining long-term growth and development, while minimizing concomitant harms.

I. THIS NORTH DAKOTA OIL BOOM IS DIFFERENT

A. HISTORY NEED NOT REPEAT ITSELF

The major shale plays in the country, the Bakken Shale and Marcellus Shale, have many similarities, but one fundamental difference. The key similarity is both shale formations are active and vibrant because of recent advances in hydraulic fracturing techniques that make minerals found in the formations cost-effectively accessible.⁹ The main difference is what is coming out of the respective formations. The Bakken Shale formation is viewed as a “shale oil play,” and the Marcellus Shale, on the other hand, is a “shale (natural) gas play.”¹⁰

There is little question North Dakota oil is a big deal. North Dakota passed California in oil production in early 2012, making the state the

9. See Tieman & Vann, *supra* note 4, at 1; Geology.com, Hydraulic Fracturing of Oil & Gas Wells Drilled in Shale, <http://geology.com/articles/hydraulic-fracturing/>.

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

nation's third largest oil producer.¹¹ North Dakota then passed Alaska to take over the second spot, behind Texas.¹² The State maintains a budget surplus of \$1 billion because of this activity and such a surplus is expected for the foreseeable future.¹³

Unlike the Marcellus and other shale gas plays, price does not seem to be a concern for North Dakota oil. This is because oil prices have stabilized, or are at least expected to stay high, due to a number of factors in a way not yet seen in the natural gas sector.¹⁴ Massive price fluctuations in the oil industry were what led to prior bust cycles in U.S. oil,¹⁵ but it is unlikely oil prices will again drop to a level that will make oil extraction in North Dakota not economic.¹⁶

Oil executives are among those who think the game has changed for North Dakota oil. The Wall Street Journal recently published a Weekend Interview with Harold Hamm, who is the founder and CEO of Continental Resources.¹⁷ Mr. Hamm is a leader in the U.S. oil resurgence, and his views appropriately carry a lot of weight in the oil and gas arena.¹⁸ One reason for the rejuvenated U.S. oil industry is the recent erosion of OPEC's market power. In his interview with the Wall Street Journal, Mr. Hamm explained:

For nearly 50 years in this country nobody looked for oil here and drilling was in steady decline. Every time the domestic industry picked itself up, the Saudis would open the taps and drown us with cheap oil. . . . They had unlimited production capacity, and company after company would go bust.¹⁹

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

12. Stephen J. Lee, *Step Aside, Alaska*, GRAND FORKS HERALD (ND), at A1, May, 15, 2012.

13. See Dennis Cauchon, *North Dakota Economy Booms, Population Soars*, USA Today, Mar. 17, 2011, http://www.usatoday.com/news/nation/census/2011-03-16-north-dakota-census_N.htm.

14. See Bill Straub, *No Easy Answer, or Blame, for Rising Gas Prices*, EVANSVILLE COURIER & PRESS, http://www.courierpress.com/news/2012/mar/18/no-headline---ev_gasprices/ ("A significant production increase by one country, like the U.S., could be offset by a reduction by another nation so that the price remains the same. Some oil producers want to stabilize prices around \$100 per barrel.").

15. *Lure of Oil Fields Too Much to Resist*, GRAND FORKS HERALD (ND), Aug. 7, 2001, at 5, 2001 WLNR 2285262.

16. See Straub, *supra* note 14.

17. Stephen Moore, *How North Dakota Became Saudi Arabia*, WALL ST. J., Oct. 1, 2011, <http://online.wsj.com/article/SB10001424052970204226204576602524023932438.html>.

18. *Id.*

19. *Id.*

OPEC simply cannot influence the oil market in the same way as it once could,²⁰ because the market demand for oil has increased so dramatically around the world, particularly in India and Asia.²¹ In today's market, increased production leads to modestly lower prices, as emerging markets take all the oil the suppliers are willing sell. Mr. Hamm noted U.S. oil companies can now "go out and explore for oil and drill without fear of price collapse."²² OPEC's peak strength in recent years was in the 1990s, when two-thirds of U.S. oil was imported.²³ That number is now below 50%, with about 40% of the imports coming from North America (Mexico and Canada).²⁴

It would be improperly simplistic to think OPEC is no longer a factor. Most certainly, OPEC's ability to impact price in the ways it did in the 1970s, 1980s, and 1990s, has been diminished.²⁵ Still, OPEC is a power player in the world oil market, and the massive oil revenues U.S. oil companies are collecting are still coming into OPEC producers, as well.

Oil independence, as Mr. Hamm thinks is possible in North America, has its appeal, but it is not all it might seem. The primary reason the United States might be able to achieve independence from unfriendly foreign-sourced oil is because oil prices are so high.²⁶ Is the U.S. economy really better off being energy independent with oil at \$90 per barrel, or would the U.S. economy be better served with foreign oil at \$25 per barrel? If the answer is the United States is better off at \$90 per barrel, the country should have taxed foreign oil at a high enough rate to ensure domestic production.

In the past twenty years, most of the U.S. oil industry could not compete with other world producers when oil was \$25 or \$30 per barrel, and when the price dipped that low, U.S. oil slowed to a relative trickle.²⁷ But the market has changed and prices below \$30 per barrel are all but inconceivable today. Mr. Hamm is right that the U.S. oil industry, and North Dakota producers more specifically, need not worry about the boom-

20. *Id.* ("Today OPEC's market share is falling and no longer dictates the world price.")

21. Wayne Ma, Dow Jones Newswires, *Asia To Dominate World Oil Demand Growth In 2012* -IEA, WALL ST. J., Mar. 14, 2012, <http://online.wsj.com/article/BT-CO-20120314-703220.html>.

22. Moore, *supra* note 17.

23. *Id.*

24. *Id.*

25. *See id.*

26. *See* Straub, *supra* note 14.

27. *See Lure of Oil Fields Too Much to Resist*, *supra* note 15 ("Between 1997 and 2000, annual production slid from 35.8 million barrels to 31 million barrels, when North Dakota sweet crude dropped below \$7 per barrel.").

and-bust cycle of years past because the price is almost certainly not going back to \$25 per barrel.²⁸

In light of this, there are still concerns North Dakota's oil industry is poised to "bust" again. North Dakota legislators and city officials have appropriately taken a cautious approach to major infrastructure investments for jobs and people that may only be temporary. However, leaders should also note the market dynamics explained above make the current industry resurgence different, and less vulnerable, than similar booms in years past. The current level of activity is not likely to be sustained for fifteen or twenty years, but the activity is not likely to cease abruptly as it once did, either.²⁹

Still, some influential leaders have cautioned a bust like that of the 1980s could happen again. Former North Dakota governor Ed Schafer spent 2011 advocating for a reduction in oil taxes to ensure drilling continued,³⁰ and even Mr. Hamm has argued that taxes are likely to stop drilling in the state.³¹ Both men are correct that taxes at a high enough rate will stop drilling and impede the viability of the oil market, but the key here is the taxes must make it uneconomic (i.e., not profitable) to continue drilling. That is not a serious risk in North Dakota right now.

Mr. Hamm has stated that because of President Jimmy Carter's windfall profits tax, America's active oil rig count went from 4500 to less than 55 in a matter of months.³² This is true, and the policy was probably not a good idea in that market. But that was in part because of OPEC's market power. The U.S. oil industry was operating in the zone where the profit margin was such that the tax rate could impact drilling.

Here is where things are different today, again, at least as long as tax rates stay near current levels. Most North Dakota oil drilling is profitable with oil at about \$50 per barrel.³³ Thus, even at \$85 per barrel, there is a lot of room to increase taxes without having an impact on the drilling. That is,

28. See Moore, *supra* note 17.

29. See Straub, *supra* note 14.

30. Fix the Tax, <http://fixthetax.com/> ("Former North Dakota Governor and U.S. Agriculture Secretary Ed Schafer has launched a grassroots group dedicated to fighting for North Dakota's long-term economic prosperity so future generations have good jobs and a solid financial future."). A few months later, Gov. Shafer joined the Board of Directors of Continental Resources, Inc. *Former N.D. Gov. Ed Schafer Joins Oil Company Board*, BISMARCK TRIB., Nov. 7, 2011, http://bismarcktribune.com/news/state-and-regional/former-nd-gov-ed-schafer-joins-oil-company-board/article_40a86a24-0992-11e1-b5de-001cc4c03286.html#ixzz1qRzJUxjFY.

31. See Moore, *supra* note 17.

32. *Id.*

33. Inst. For Energy Res., Fracking Will Enable North Dakota to Overtake California as a Major Oil Producer Oil, Oct. 19, 2011, <http://www.instituteforenergyresearch.org/2011/10/19/11042/>.

a \$5 per barrel tax that reduces an oil company's take away from \$85 to \$80 per barrel should not impact the company's decision to keep drilling. Such a tax will just make them mad. (To be clear, this is not advocacy for such a tax; that is a discussion for another day. This is simply to illustrate a point.)

Perhaps there would be more drilling if we added more incentives to oil exploration, but it is more likely that we would be rewarding people for doing what they were going to do anyway. This is particularly true in North Dakota, where infrastructure and labor constraints are the primary limiting factors to current drilling expansion, not a lack of incentives.

B. BEWARE COMPARISONS: HYDRAULIC FRACTURING FOR OIL AND FOR GAS CAN DIFFER

Using hydraulic fracturing to extract oil and gas are very similar processes, just like traditional methods for drilling for oil and gas.³⁴ The regions are different, and some of the inputs to the process are different, but by and large, the oil or gas drilling, both remain very similar undertakings. Oil and gas leases have historically been one and the same, with rights to drill for one, granting rights to drill for the other.³⁵ Hydraulic fracturing has not changed that.

The primary difference between shale oil and shale gas is the market the extracted resource will enter. Oil is a highly fungible product with a comparatively stable and obvious market.³⁶ Natural gas, in contrast, has long been subject to massive price fluctuations.³⁷ Over the past forty years, natural gas prices have dropped to levels where price and supplies, along with the cleaner burning attributes of natural gas as a fuel source, have seemed to indicate massive fuel switching was both prudent and wise.³⁸ And time and time again, this has proven problematic.³⁹

34. See Mike Soraghan, *Baffled About Fracking? You're Not Alone*, GreenWire, 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>.

35. Cf. Ian Urbina & Jo Craven McGinty, *Learning Too Late of the Perils in Gas Well Leases*, N.Y. TIMES, Dec. 2, 2011, at A1 ("Americans have signed millions of leases allowing companies to drill for oil and natural gas on their land in recent years.").

36. Cf. Straub, *supra* note 14.

37. See ENERGY INFORMATION ADMIN., OFFICE OF OIL AND GAS, AN ANALYSIS OF PRICE VOLATILITY IN NATURAL GAS MARKETS, 1 (Aug. 2007) available at <ftp://ftp.eia.doe.gov/features/ngprivolatility.pdf> ("The subject of price volatility in natural gas markets has received increased attention in recent years as the market experienced expanding dips and swells in prices while overall prices shifted to a higher level . . .").

38. See Kevin Begos, *Electric Plants Turn to Natural Gas as Fuel*, USA TODAY, Jan. 17, 2012, http://www.usatoday.com/USCP/PNI/NEWS/2012-01-17-BCUSGas-DrillingElectricity1st-LdWritethru_ST_U.htm.

39. See *id.*

Price fluctuation in natural gas is proving unpredictable again. While the shale oil boom continues to be a profitable enterprise, there are indications companies heavily invested in the current shale gas boom will struggle.⁴⁰ Falling prices of natural gas have led some companies to slow their exploration and extraction, with some reports indicating companies are even walking away from gas leases that are not likely to be profitable.⁴¹ Certainly, oil exploration remains a risky business too, and some leases have similarly not been honored. However, it appears market economics have made gas leases more vulnerable than oil leases to such cancellations, and it may be that problems for companies in the natural gas market are facilitating such decisions in the oil sector.⁴²

As such, companies, regulators, and communities need to be keenly aware of the similarities and differences between shale oil and shale gas plays. From an environmental perspective, there may be significant value that can be shared from region to region, but the geologic variances should not be ignored. And, from a community perspective, differences in population and the market for the resources can have a significant impact on decisions as well.

II. SOCIAL AND ENVIRONMENTAL ISSUES: REACTING WITHOUT OVERREACTING

A. SOCIAL OPPORTUNITIES AND CONCERNS

Hydraulic fracturing, along with high energy prices, has created tremendous numbers of job opportunities in North Dakota.⁴³ The state's unemployment rate is 3.5% and the western part of state has unemployment rates even lower at 1.9%.⁴⁴ Truck drivers are making as much as \$80,000

40. See Brittany Stepniak, *Bakken Oil Gains From Natural Gas Strains*, WEALTHWIRE, Mar. 19, 2012, <http://www.wealthwire.com/news/energy/2871> ("Major companies like Chesapeake and Encana are halting previously planned procedures for new wells and shutting down some existing natural-gas wells as well. Instead, they are sending employees to drill and frack for oil.").

41. See Joshua Schneyer & Brian Grow, *Special Report: Energy Giant Hid Behind Shells in "Land Grab,"* Dec. 28, 2011, <http://www.reuters.com/article/2011/12/28/us-energy-giant-id-USTRE7BR0G420111228>.

42. Cf. Lauren Donovan, *Chesapeake Energy Pulling Back, Won't Honor Lease Agreements*, BISMARCK TRIB., Feb. 7, 2012, http://bismarcktribune.com/news/state-and-regional/chesapeake-energy-pulling-back-won-t-honor-lease-agreements/article_89324038-5214-11e1-ba31-0019bb2963f4.html#ixzz1qXSCFNzG ("State Mineral Resources Director Lynn Helms said . . . lease problems 'would not be atypical for Chesapeake' which has had similar problems in other states where it does business.").

43. N.D. Dep't of Mineral Resources, *Activity Update - ND Public Employees Association - Grand Forks*, at 74-75, Oct. 6, 2011, <https://www.dmr.nd.gov/oilgas/presentations/ActivityUpdateNDPEAGrandForks2011-10-06.pdf>.

44. Blake Ellis, *Land a Job in a North Dakota Boomtown*, CNNMONEY, Oct. 30, 2011, http://money.cnn.com/2011/10/28/pf/America_boomtown_jobs/index.htm.

per year, while the fast-food restaurant Taco John's has advertised positions earning \$15 per hour.⁴⁵ Beyond that, there are even reports of exotic dancers leaving Las Vegas to dance in Williston, North Dakota, with claims that some exotic dancers had earned as much as \$3000 per night.⁴⁶

The North Dakota Department of Mineral Resources (DMR) anticipates 170-225 new rigs, which is expected to add 20,000 jobs in drilling.⁴⁷ Further the DMR anticipates 28,000 new wells and 28,000 long-term jobs over the next fifteen to twenty-five years.⁴⁸ These new jobs are already leading to significant increases in income rates.⁴⁹ McKenzie County, for example, has moved into the top five counties in average annual wages, with the average worker earning \$51,493 in 2010.⁵⁰

These increased wages have been a huge benefit to those receiving them, and the increased tax revenues benefit the state. Still, all the new jobs in the region do not necessarily mean poverty is being alleviated in the region. McKenzie County, while ranking in the top five in income among North Dakota counties, still has a poverty rate of 12.8%, which exceeds the state average of 11.7%.⁵¹ To be clear, this is not saying the oil boom has caused poverty; what it does demonstrate is the boom has not eradicated, or even significantly reduced, poverty in the region.

Part of the problem with the massive increase in jobs and wealth in western North Dakota is the impact on the local infrastructure. Nowhere is this clearer than in the housing sector. The cities have grown so large, so fast, there are people earning six-figure salaries who are still unable to find a place to live. A common option: camping in the Wal-Mart parking lot.⁵²

Increased housing demand creates tremendous opportunities for landlords and other landowners, but it creates hardship for many of those not working in the oil industry trying to remain in the region. This is especially true for those on fixed incomes living in rental properties, where monthly housing rents, in some cases, have increased from \$200-300 per month to \$2500.⁵³

45. Blake Ellis, *Double Your Salary in the Middle of Nowhere, North Dakota*, CNNMONEY, Oct. 20, 2011, http://money.cnn.com/2011/09/28/pf/north_dakota_jobs/index.htm.

46. See Ellis, *supra* note 44.

47. N.D. Dep't of Mineral Resources, *supra* note 43, at 75.

48. *Id.*

49. *Oil Boom Not Benefitting All*, BISMARCK TRIB., Aug. 22, 2011, http://bismarcktribune.com/news/state-and-regional/oil-boom-is-not-benefitting-all/article_da42cb00-cc7c-11e0-b341-001cc4c03286.html.

50. *Id.*

51. See Blake Ellis, *Six-figure Salaries, but Homeless*, CNNMONEY, Oct. 26, 2011, http://money.cnn.com/2011/10/21/pf/america_boomtown_housing/index.htm.

52. See *Oil Boom Not Benefitting All*, *supra* note 49.

53. *Id.*

Traffic has become another major concern in western North Dakota. The roads are now filled with trucks related to the oil industry, and the area's infrastructure simply was not built for the number and size of trucks running seemingly nonstop.⁵⁴ In addition to wear and tear and traffic jams, the numbers of accidents and traffic deaths have also increased dramatically.⁵⁵

The influx of people has put a significant strain on law enforcement, as well.⁵⁶ Reports from the Williston Police Department indicate the number of traffic accidents the department investigated (974) is up 30% over last year and traffic misdemeanors also increased 30% between 2009 and 2010.⁵⁷ Additional social concerns abound, including increased levels of drug use, domestic violence, and prostitution.⁵⁸ Schools built to handle 2000 children are serving nearly 4000.⁵⁹ These concerns are hard to track, at least initially, but hard to ignore as well. Such difficulties have been seen in prior energy booms, and are almost certain to be repeated in other regions.

Community responses to social concerns are to be expected. After the initial excitement about the economic benefits of the increased energy activity, communities often respond with attempts to slow or cease additional increases. These efforts often result in zoning changes to resist additional construction, such as recent efforts to prevent additional "man camps" (temporary housing for oil patch workers) in Williston.⁶⁰

Efforts to slow or quell further development have understandable appeal to communities already overwhelmed by the influx of people and activity in their regions.⁶¹ However, many of these efforts maintain and can even exacerbate existing problems by ensuring that infrastructure needed to support the current level of activity is not built. Ideally, communities and businesses would work with one another to balance development with the

54. See Harold Monteau, *North Dakota Oil Boom Bringing Jobs, Wealth—and a Looming Humanitarian Crisis*, INDIAN COUNTRY MEDIA NETWORK, Mar. 15, 2012, <http://indiancountrytodaymedianetwork.com/2012/03/15/north-dakota-oil-boom-bringing-jobs-wealth%E2%80%94and-a-looming-humanitarian-crisis-103023>.

55. *Id.*

56. See Blake Ellis, *Locals to Big Oil: We Want Our Town Back!*, CNNMONEY, Oct. 24, 2011, http://money.cnn.com/2011/10/24/pf/America_boomtown_locals/index.htm.

57. See Monteau, *supra* note 54.

58. *Id.*

59. *Id.*

60. Nick Smith, *County: No New Man Camps*, WILLISTON HERALD, Sept. 13, 2011, http://www.willistonherald.com/news/county-no-new-man-camps/article_d23fc65c-d9ee-5602-82c5-19fa5c1354bf.html.

61. *See id.*

needs of the community. Unfortunately, each of these constituencies tends to operate in silos, not recognizing the potential value of collaboration.

Finally, any energy boom brings along concerns about fraud and coercion. The mineral leasing process often involves experienced business people on one side and inexperienced farmers and other landowners on the other.⁶² This raises the risk that energy speculators and others will take advantage of some portion of the state's population.

In 2009, North Dakota saw a small land-leasing boom as people sought to acquire leases to place possible wind farms across the state.⁶³ The practices used in that process led the North Dakota Legislature to pass laws to govern the wind leasing process.⁶⁴ Although it is not clear how much impact the law itself has had on the process, it certainly reflects a high level of concern and an attempt to address those concerns.

There is no such law for mineral leases in the state, perhaps because of the long history of oil leasing in North Dakota. Nonetheless, the concerns about possible fraud or overreaching on the part of lessees remain. Recent reports indicate that at least one company has decided not to honor some of its leases and is delinquent in making bonus payments on others.⁶⁵ The Department of Mineral Resources has indicated it is monitoring the situation, and if nothing else, this is a distraction the already overwhelmed department could do without.⁶⁶

B. BALANCING ENVIRONMENTAL RISK AND ECONOMIC OPPORTUNITIES

Safety and environmental concerns are paramount among the concerns surrounding hydraulic fracturing.⁶⁷ From safe drinking water to surface damage to animal protection, the hydraulic fracturing industry has faced questions and criticisms on all fronts.⁶⁸ From the hydraulic fracturing opponents' perspective, hydraulic fracturing poses "a threat at every level."⁶⁹ From the industry perspective, hydraulic fracturing is an old

62. See Schneyer & Grow, *supra* note 41.

63. See Colleen J. Rice, *North Dakota Century Code Section 17-04-06: The First Step Toward a Level Playing Field for Wind Projects and Rural Landowners*, 85 N.D. L. REV. 723, 723-24 (2009).

64. See N.D. CENT. CODE § 17-04-06 (2009).

65. Donovan, *supra* note 42.

66. *Id.*

67. See Env'tl. Prot. Agency, *supra* note 5.

68. See Soraghan, *supra* note 34.

69. Stop Fracking and Save Our Water Supply!, <http://nofracking.com>.

technology that represents little more than business as usual.⁷⁰ As is usually the case, the answer is somewhere in between.

There is research to suggest hydraulic fracturing poses risks to safe water supplies and can cause earthquakes.⁷¹ There is also research indicating that, where properly executed, hydraulic fracturing can be accomplished with minimal risk to drinking water supplies and other risks can be minimized and mitigated, if not completely eliminated.⁷² The answer, again, is probably somewhere in between.

Naturally, it seems, the policy discussions, and state reactions, do not reflect any sense of compromise or balance. In New York, for example, the governor's office put forth a moratorium on all hydraulic fracturing pending further study to inform the development of regulations.⁷³ In Vermont, the House of Representatives passed a bill banning the practice for three years,⁷⁴ and the bill is under consideration by the state's senate, which will consider whether to pass the bill as drafted or enact a permanent ban.⁷⁵ In North Dakota and Texas, the response has been to send a clear message to the Environmental Protection Agency (EPA) and others: "Leave our fracking alone."

The North Dakota Legislature passed House Bill No. 1216, which provided:

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.⁷⁶

70. See Tom Zeller, Jr., *E.P.A. Considers Risks of Gas Extraction*, N.Y. TIMES, July 24, 2010, at B1.

71. Henry Fountain, *Add Quakes to Rumbles Over Gas Rush*, N.Y. TIMES, Dec. 13, 2011, at D1.

72. See Soraghan, *supra* note 34.

73. See N.Y. Exec. Order No. 41 (Dec. 13, 2010), available at <http://www.governor.ny.gov/archive/paterson/executiveorders/EO41.html> (stating that no hydraulic fracturing permits can be issued prior to the completion of a study of environmental effects to determine "the regulatory conditions that are necessary to include in oil and gas well permits to protect public health and the environment."). Order No. 41 was issued by Governor David Paterson and was continued by Governor Andrew Cuomo. See N.Y. Exec. Order No. 2 (Jan. 1, 2011), available at <http://www.governor.ny.gov/executiveorder/2>.

74. VERMONT HOUSE BILL No. 464 (passed House Feb. 1, 2012), available at <http://www.leg.state.vt.us/docs/2012/bills/House/H-464.pdf>.

75. See Aaron K. Block, *Vermont House Approves Three-Year Ban on Hydraulic Fracturing*, Feb. 3, 2012, <http://www.alston.com/productsliabilityblog/blog.aspx?entry=4510>.

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

Making the state's position even more clear, in a special session in November 2011, the North Dakota legislature set aside \$1 million "for the purpose of defraying expenses associated with possible litigation and other administrative proceedings involving the United States environmental protection agency's effort to regulate hydraulic fracturing."⁷⁷ At the legislative level, at least, there is very little dissent on this issue.⁷⁸

Similarly, the Railroad Commission of Texas, the state agency with oversight for hydraulic fracturing, recently sent a strongly worded letter to the EPA, which was summarized as follows: "Don't touch our fracking."⁷⁹ The Railroad Commission explains:

We continue to conduct extensive oversight and monitoring of all drilling practices in our state. If we find clear scientific evidence of safety or environmental issues, we will modify our regulatory programs to ensure any new issues are addressed.⁸⁰

In short, the state feels like they have the issue under control and would like to be left alone.

North Dakota has taken a similar position with regard to the EPA. State officials are not arguing that oversight is not necessary, but that such oversight should be the state's responsibility. Still, with the current level of activity, state oversight can be exceedingly difficult. As Lynn Helms, Director, North Dakota Department of Mineral Resources (DMR) explained, "[i]t's a fire drill every day."⁸¹ The DMR's staffing plan was designed to handle 100 rigs and about 5,000 wells.⁸² However, as of February 2011, 169 rigs were running and more than 5,300 wells were

77. N.D. 62nd Cong. Special Session, Senate Bill 2371 § 28, *available at* <http://www.legis.nd.gov/assembly/62-2011/special-session/session-laws/documents/BANKS.pdf#pagemode=bookmarks&CHAPTER579>.

78. Dale Wetzel, *ND Senator Rips \$1M for EPA 'Fracking' Lawsuit*, Bloomberg Businessweek, Nov. 17, 2011, <http://www.businessweek.com/ap/financialnews/D9R2IC800.htm> (stating that Sen. Tim Mathern was the lone vote against House Bill No. 1216 and one of only eight North Dakota legislators who opposed a resolution asking Congress to limit EPA's power to regulate hydraulic fracturing).

79. Terrance Henry, *Another Round in Texas vs. the EPA: 'Don't Touch Our Fracking'*, STATEIMPACT, Feb. 8, 2012, <http://stateimpact.npr.org/texas/2012/02/08/another-round-in-texas-vs-the-epa-dont-touch-our-fracking/>.

80. Letter from Railroad Comm'n of Texas to Administrator Lisa Jackson, Env'tl. Prot. Agency, Feb. 7, 2012, *available at* http://www.rrc.state.tx.us/forms/letters/Jackson_EPA_020712.pdf.

81. *North Dakota Oil Boom Outpaces Oversight; Many Sites Go Unmonitored*, BISMARCK TRIB., Feb. 16, 2011, http://bismarcktribune.com/news/state-and-regional/article_d6bb6986-3a11-11e0-8853-001cc4c03286.html#ixzz1qWGN0tus.

82. *Id.*

pumping oil, with an additional 2,000 new wells expected by the end of 2011.⁸³

The debate about new or additional regulation, then, is not the biggest near-term concern regarding hydraulic fracturing. The bigger concern, for both North Dakota and the rest of the country, is adequately enforcing and monitoring the law and regulations already on the books. The DMR monitored a record 1,213 new wells last year and visited each site at least six times during the three-week construction phase.⁸⁴ This is a wise allocation of resources given that a major risk of environmental harm from hydraulic fracturing is related to the well-construction phase.⁸⁵ “The inspectors are focused on ensuring, among other things, that the steel pipe driven into the ground and cemented into place is done correctly to prevent groundwater contamination.”⁸⁶ The focus on this phase of activity means other risky portions of the process are not as well monitored, if at all. As an example, DMR records indicate “nearly 900 disposal wells that hold saltwater, a byproduct of oil production, and about 5,200 sites that hold other oil waste, are being monitored only twice annually at best.”⁸⁷

Disposal wells should be visited at least six to twelve times a year, meaning sites may go six months or more without a visit, instead of the every one or two months DMR believes is proper.⁸⁸ Thus, regulations in place that might help minimize, if not eliminate, environmental harm may not live up to their potential because the DMR does not have the resources to conduct the currently expected level of oversight. This raises the risk that a breach at the waste sites could go unnoticed for months, increasing dramatically the risk and scope of potential harm. That is, the risk of environmental harm is increasing along with the level of economic harm related to that environmental harm.

III. CONCLUSION

The energy industry — including traditional energy resources like oil, gas, and coal — is vital to U.S. economic interests and North Dakota state-level interests. State and federal policies should support the current growing and evolving oil and gas industry, but they should do so by addressing and balancing potential social and environmental harms.

83. *Id.*

84. *See id.*

85. *See id.*

86. *Id.*

87. *Id.*

88. *See id.*

Although the social implications of the current energy boom are significant, they are also reflective of the evolving employment dynamic that happens as part of our cyclical economy. This is not to say that nothing can be done or that such problems should be counted as part of the cost of doing business. However, solutions to many of the social concerns are necessarily local in nature because the solutions involve balancing local needs with one another. Curbing expansion and slowing growth necessarily means jobs are not created. This may be the correct choice, but it certainly has a legitimate and competing social concern. Ultimately, a plan to invest in much-needed infrastructure to support both the industry and the quality of life of those living in the region would be the ideal solution, but it is one that must be reached locally.

On the environmental side, this is less true. Certainly overregulation or misguided regulation could harm the industry and those working in the industry.⁸⁹ However, the interest in avoiding an environmental disaster is, or at least should be, universal. How to most efficiently and effectively do so is necessarily subject to debate, but the goal should not be. Regulators, industry, and communities should be in a better position to find at least some baseline truths that increase safety and predictability for all involved.

One of the paramount concerns for both the oil and gas industry, as well as regulators and communities, should be that a company gets careless with their drilling methods or waste management processes, and that the carelessness leads to a major environmental disaster. The harm to the environment itself would be a concern, of course, but as noted above, this harm is one that should be universally recognized.

Another major harm to the industry, and the economy, of such a disaster is often missed. The economic key to this oil and gas boom is to keep it going — and the biggest threats to North Dakota's oil industry are no longer OPEC, taxes, or the electric car. Instead, it is an environmental disaster that leads to a large-scale shutdown of drilling activities. That would be the ultimate lose-lose situation; one that would resonate well beyond the state's borders. The industry-wide impacts of a major disaster are one of the clear lessons from BP's Deepwater Horizon disaster in the Gulf of Mexico.

Additional steps to help prevent environmental harm should thus be viewed as more than environmental protection. They should also be seen as

89. Cf. David Henderson, *The Role of Business in the World of Today*, J. CORP. CITIZENSHIP, 30, 32 (Spring 2005) (stating that corporate social responsibility measures seeking to pursue "environmental and social progress [by] making norms and standards more stringent and more uniform . . . may simply pave the way for various forms of over-regulation, from which the costs to people in general are greater than the benefits").

economic protection. Fortunately, because of the state's prior experiences and the expertise within the state, North Dakota is in a position to take some steps to help avoid such a major environmental and economic disaster.

There are three key steps the state should take in the near term to help reduce risk and preserve the economic vitality of the state's oil industry. First, the state needs to commit knowledge and resources to ensure continued oversight of well drilling and expand proper oversight of oil patch waste. Second, the state should consider regulations to help reduce harm to birds and other animals in the region to protect wildlife, which could help reduce the likelihood of federal regulation that is ill suited to the region. Third, the oil industry and DMR, should work together to create a baseline set of best practices for everyone using hydraulic fracturing in North Dakota.

A. MAXIMIZING AND BUILDING UPON STATE EXPERTISE

As discussed above, North Dakota regulators have not been able to maintain their regular oversight of saltwater disposal wells because of higher priority obligations to other parts of the hydraulic fracturing process.⁹⁰ There are also growing concerns about radiation in waste from hydraulic fracturing.⁹¹ Adding additional regulators would certainly help with the monitoring process, but even with funding for additional positions, it takes time to find, hire, and train new people.⁹² In addition, there is no guarantee the current or newly hired regulators will stay in their positions, if other opportunities arise. Thus, while adding and maintaining a regulatory staff is one part of the equation, additional assistance would be wise.

One option would be to capitalize on existing expertise at the John D. Odegard School of Aerospace Sciences at the University of North Dakota (UND). The school houses the Center for Unmanned Aircraft Systems Research, Education and Training.⁹³ As a leader in unmanned aircraft systems (UAS), the Center seeks to "provide a conduit between private industry and UAS researchers, promoting commercialization of new UAS-related products and services while bringing new UAS-related business

90. See *supra* Part II.B.

91. See Dustin Ingram, *Multiple Samples Fail Radiation Test at Landfill*, WILLISTON HERALD, Jan. 18, 2012, http://www.willistonherald.com/news/multiple-samples-fail-radiation-test-at-landfill/article_58426dcc-41f7-11e1-aba7-001871e3ce6c.html.

92. *New Oil Inspectors to Step Up ND Oversight*, BISMARCK TRIB., May 19, 2011, http://bismarcktribune.com/news/article_7ae659c8-8227-11e0-9418-001cc4c03286.html#ixzz1qME7TewI.

93. John D. Odegard School of Aerospace Sciences - Center for Unmanned Aircraft Systems, <http://www.uasresearch.com/home.aspx>.

ventures to North Dakota.”⁹⁴ This creates a tremendous potential economic and environmental opportunity for UND and the UAS program.

Two of the Center’s key goals are to “[p]romote commercialization of new UAS-related products and services” and “[p]romote private sector job growth within Grand Forks and throughout the state of North Dakota.”⁹⁵ The two goals could be well served by developing a method to use UAS technology to monitor the oil patch and other sites for environmental risks. In addition, such environmental sites could also be targets for eco-terrorism, and UAS technologies could help protect against such threats, too.

The Center is already seeking “defense and civil applications of UAS,”⁹⁶ and monitoring and protecting the oil patch is one option that would involve both such applications. In addition, if the UAS monitoring system were effective, it could have potential all across the country and perhaps around the world. Certainly other areas of the country, such as the Marcellus Shale and Eagle Ford Shale, will be facing similar environmental concerns with hydraulic fracturing waste fluids. If UAS expertise can be developed for monitoring waste sites for breaches, radiation, and other risks, the monitoring could all be handled from North Dakota. And, by housing the program at UND, it would be possible to protect the environment while training the next generation of UAS personnel for both civil (including environmental) and defense purposes.

In addition to developing a program and ensuring funding for such a program, there are also regulatory hurdles to overcome to make UAS surveillance of the oil patch a reality. The current U.S. aviation regulatory structure fails to recognize UAS as unique and distinct from the traditional aviation.⁹⁷ This regulatory failure means many of the current regulations and policies “are inadequate to address the often unique issues UAS present.”⁹⁸ As such, UAS operations in U.S. airspace can only be accomplished under a Certificate of Authorization (COA), which functionally operates as a waiver of Federal Aviation Regulations⁹⁹ where the UAS can be operated at what is deemed an “acceptable level of safety.”¹⁰⁰ Hopefully, with the relatively low population in western North

94. *Id.*

95. *Id.*

96. Red River Valley Research Corridor, Unmanned Aircraft Systems Action Summit, <http://www.theresearchcorridor.com/uassummit2012>.

97. Joe Vacek, *Civilizing the Aeronautical Wild West: Regulating Unmanned Aircraft*, AIR & SPACE LAWYER, at 1, 1, Vol. 23, No. 3, 2011.

98. *Id.* at 1, 19.

99. 14 CFR §§ 1-1310 (2012).

100. See Vacek, *supra* note 97, at 19-20.

Dakota and the potential environmental benefits, the FAA would grant permission to the airspace for UAS monitoring.

As a state, North Dakota has expertise and experience in oil and gas extraction, and is similarly situated with regard to UAS. By capitalizing on these two key growth areas, and using them to help one another, the state is poised to maximize the potential of both areas, while improving environmental protection and the nation's defenses. Such opportunities tend to be rare and should not be missed.

B. NORTH DAKOTA PROTECTING NORTH DAKOTA'S ENVIRONMENT

In January of 2012, the United States District Court for the District of North Dakota dismissed charges filed against three oil and gas companies operating in North Dakota.¹⁰¹ The U.S government charged the companies with violating the Migratory Bird Treaty Act because birds covered by the Act were found dead near the companies' respective reserve pits.¹⁰² A reserve pit is, under North Dakota law, "an excavated area used to contain drill cuttings accumulated during oil and gas drilling operations and mud-laden oil and gas drilling fluids used to confine oil, gas, or water to its native strata during the drilling of an oil and gas well."¹⁰³

The federal government determined the birds died because of exposure to the contents of the reserve pits and sought the charges.¹⁰⁴

The opinion states:

This Court expressly finds that the use of reserve pits in commercial oil development in legal, commercially-useful [sic] activity that stands outside the reach of the federal Migratory Bird Treaty Act. Like timber harvesting, oil development and production activities are not the sort of physical conduct engaged in by hunters and poachers, and such activities do not fall under the prohibitions of the Migratory Bird Treaty Act.¹⁰⁵

Judge Hovland further noted, "[i]f there is a desire on the part of Congress to criminalize commercial activity that incidentally injures migratory birds protected under the Migratory Bird Treaty Act, it may certainly do so—but the criminal laws should be clear and certain."¹⁰⁶ This invitation to action (if not imminently likely) is one that could be accepted

101. *United States v. Brigham Oil & Gas, L.P.*, No. 4:11-po-005, 2012 WL 120055, at *1 (D.N.D. Jan. 17, 2012).

102. *Id.*

103. N.D. CENT. CODE § 38-08-02 (2012).

104. *Brigham Oil*, 2012 WL 120055, at *2.

105. *Id.* at *9.

106. *Id.* at *10.

by Congress, under the Migratory Bird Treaty Act or another statute, to help show that Congress “cares about the environment.”

Rather than leaving such decisions to Congress, North Dakota would be well served to draft its own legislation, specific to oil and gas extraction, to help protect birds and other wildlife in the state. North Dakota has long been known for its hunting and fishing,¹⁰⁷ and it is consistent with this history, and economically and environmentally prudent past, to protect the state’s wildlife. If done correctly, this would help demonstrate a continuing commitment to balancing economic and environmental sustainability in the oil fields, while providing clear guidance to companies doing business in the state, with as few burdens as reasonably feasible.

C. BEST PRACTICES AND NEVER EVENTS FOR HYDRAULIC FRACTURING

Finally, the Department of Mineral Resources should work with industry to determine a baseline of best practices in hydraulic fracturing. North Dakota recently became the second largest oil producing state in the country, and it is almost exclusively because of hydraulic fracturing.¹⁰⁸ As such, oil companies in the State are on the cutting edge of knowledge and best practices in the process.

At a minimum, there should be a list of what the medical industry terms “Never Events”: things that should never occur.¹⁰⁹ In medicine, this includes particularly egregious errors such as surgery on the wrong site (e.g., the wrong leg) or on the wrong patient.¹¹⁰ Beyond this, though, the industry’s list of best practices must be enforced to reduce the likelihood of a disaster.¹¹¹

In the wake of the BP oil disaster in the Gulf of Mexico, several companies noted the Deepwater Horizon was done in a way that was improper and not how they drilled and operated their oil platforms.¹¹² A list

107. See, e.g., Nat’l Park Serv., Theodore Roosevelt: Elkhorn Ranch, <http://www.nps.gov/thro/historyculture/elkhorn-ranch.htm> (“Theodore Roosevelt came to the North Dakota Badlands in September 1883 to hunt buffalo.”).

108. Lee, *supra* note, 12.

109. Barry R. Furrow, *The Patient Injury Epidemic: Medical Malpractice as a Curative Tool*, 4 DREXEL L. REV. 41, 52 (2011).

110. *Id.* (“[S]ome harms are easier to define; so-called “never events”—wrong limb surgeries, kidnapped patients, etc.—are dramatic screw-ups that we all recognize as disasters.”).

111. See AM. PETROL. INST., HYDRAULIC FRACTURING OPERATIONS—WELL CONSTRUCTION AND INTEGRITY GUIDELINES, API GUIDANCE DOCUMENT HF1, at 1, pt. 1 (1st ed., Oct. 2009), available at <http://www.shalegas.energy.gov/resources/HF1.pdf> (stating that “[m]aintaining well integrity is essential”).

112. See John M. Broder, *Oil Executives Break Ranks in Testimony*, N.Y. TIMES, June 15, 2010 (“The chairmen of four of the world’s largest oil companies broke their nearly two-month

of industry-driven best practices, such as the American Petroleum Institute's Well Construction and Integrity Guidelines,¹¹³ will not (without an enforcement mechanism) ensure a particular company follows all the rules. Still, such guidelines make clear when a company has deviated from the norm. There may be times when a company can and, perhaps should, choose a different option than current industry best practices, but having such a list in place can add another reason for a company to consider when, why, and how it chooses to take a potentially more risky course. Thus, if a company has a new way to proceed, it can, but the company should have at least considered whether "new" is also "better" and at least as safe as the prior practice.

As such, North Dakota should consider requiring compliance with API's best practices, with the option of seeking a variance where a company has a better method.¹¹⁴ By taking the lead in this way, North Dakota and the companies doing business in the state would have an early and important seat at the table for any national discussions about industry practices and possible regulations, too. In fact, North Dakota's way could become the nation's way, thus facilitating a better balance of economic and environmental sustainability in hydraulic fracturing.

D. MOVING FORWARD

Over the past three years, North Dakota has emerged as the nation's, and one of the world's, hottest energy economies. North Dakota has managed, though not without some difficulties, to sustain growth and development in the face of numerous challenges. The key next steps are to ensure that North Dakota can continue on this path successfully.

To do so, North Dakota must recognize the risks inherent in hydraulic fracturing (and any type of energy extraction), and take steps to mitigate those risks. By maximizing North Dakota's expertise in hydraulic fracturing and unmanned aerial systems, the state is poised to be a technological leader in the industry. By taking the lead to protect birds and other wildlife, North Dakota can continue its rich tradition of being a hunter's and a birder's paradise. The opportunity is there for North Dakota to continue its rise toward the top in oil production. Ensuring the state can

silence on the major spill in the Gulf of Mexico on Tuesday and publicly blamed BP for mishandling the well that caused the disaster.”).

113. AM. PETROL. INST., *supra* note 111.

114. West Virginia has mandated compliance with API's rules, but it is not clear that the state will allow for a variance from those guidelines. See W. VA. CODE R. § 35-8-4.4.a (2011), available at <http://www.dep.wv.gov/news/Documents/35-8%20%20Horizontal%20Well%20Rule.pdf>.

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stay there will require continued and committed efforts to balance economic and environmental sustainability. And these are efforts that would likely be well rewarded.