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A Fracking Good Solution to the Hydraulic Fracturing Regulation Conundrum

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A FRACKING GOOD SOLUTION TO THE HYDRAULIC FRACTURING REGULATION CONUNDRUM

I. INTRODUCTION

Imagine two different states—State A and State B. Both states have vast natural gas reserves, primarily located in economically depressed, rural parts of the states. Property values are low, farmers are having problems paying their bills, and unemployment is rampant. Most of the water in these areas of the states comes from wells.

To obtain this gas, the states may implement a controversial procedure called hydraulic fracturing or “fracking.” One political party supports using the procedure to acquire the gas, which in turn will increase property values, allow farmers to purchase much needed farm equipment, and decrease unemployment. The other party opposes the procedure because it may contaminate drinking water. There is no consensus that there will be long-term economic benefits, but there is a consensus that the benefits will be great if there are any. Similarly, there is no scientific consensus that the procedure will contaminate drinking water. However, there is a consensus that if the water is contaminated there will be serious human and environmental health issues.

After learning about the environmental effects of the procedure, State A passed a law that banned the procedure; however, approximately two years after banning the procedure, State A’s economy worsened. Property values continue to plummet, the unemployment rate continues to climb, and farms are foreclosing because they are no longer profitable. The state is now in the midst of a budget crisis because their expenses continued to rise as the unemployment rate rose and the tax base decreased. There have been protests, and government officials fear these protests may turn violent if the economy continues to struggle. However, the area’s well water is not contaminated, so the locals have clean drinking water.

Unlike State A, State B passed a law that allows the procedure after testing its use in very limited areas and finding no adverse environmental effects. After about two years, State B’s economy is booming. Drilling companies immediately brought jobs and leased the landowners’ rights to the natural gas found underneath their property. The state not only closed its budget deficit but was also allowed to increase its budget for the next year. However, the chemicals used in the process contaminated the well water. The locals can now no longer use their wells because this water could kill them. Doctors are concerned

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about the locals' health because many were exposed to the contaminated water before the state confirmed the contamination.

Which state made the right choice? Was it State A, which continued in its economic collapse but has clean drinking water? Was it State B, which has a booming economy and a budget surplus but has a health crisis and contaminated water wells? The answer is that neither state made the right choice. State A took too extreme of a position in favor of environmental protection and failed to consider the expected economic benefits. On the other hand, State B focused on the expected economic benefits without paying enough attention to the potential environmental risks and effectively allowed companies to avoid compliance.¹

State A and State B should have better balanced the competing interests of economic benefits and environmental concerns to arrive at a solution that would provide the benefits of fracking, while better minimizing the potential risks.² Due to the insufficiencies of current state fracking regulations, this Note proposes a federal statute that would better balance these competing interests because states have been unable to pass the proper legislation on their own.³

First, Part II of this Note explains the history of fracking; how fracking works; the environmental and economic effects of fracking; and how the federal and state governments have approached fracking regulations.⁴ Second, Part III analyzes the state laws and a previously proposed federal regulation and evaluates whether these legislative efforts adequately balance the economic and environmental interests.⁵ Finally, Part IV proposes a federal fracking statute that better protects

¹ This scenario is fictional and not directed towards any particular state. However, parts of this story were borrowed from the experiences of various states.

² See *infra* Part II.B (describing the environmental concerns of fracking); *infra* Part II.C (describing the economic concerns of fracking); see also *infra* Part III.B (analyzing current state fracking laws by showing the current state of the law and what may happen in the future as a result of the failure to properly balance competing interests).

³ See *infra* Part IV (proposing a model fracking statute that allows the federal government to regulate fracking). Currently, Illinois has the strictest fracking regulations in the country. Don Babwin, *Illinois Gas Drilling Rules: Governor Pat Quinn Signs New Fracking Regulations into Law*, HUFFINGTON POST (June 17, 2013, 6:19 PM), http://www.huffingtonpost.com/2013/06/17/illinois-gas-drilling-rules-fracking_n_3455668.html?view=print. However, Illinois's regulations still leave some issues unresolved, such as landowner challenges to trade secret exemptions, emergency disclosure of trade secret information to those injured by the chemicals, and the recurring problems faced by varying state fracking regulations. See *infra* Part III (analyzing these remaining problems and other problems with state regulations).

⁴ See *infra* Part II (explaining the basics of fracking, its environmental and economic effects, and the different approaches to regulating the procedure).

⁵ See *infra* Part III (analyzing the fracking laws to determine if they adequately address the interests involved).

the environment, while still preserving the states', landowners', and gas companies' economic interests.⁶

II. BACKGROUND

Support and opposition to fracking are politically polarized with a solid majority of Democrats opposing and Republicans supporting it.⁷ First, this section describes the history of fracking.⁸ Second, it explains the chief environmental concerns and the possible environmental benefits associated with fracking.⁹ Third, it explains the economic effects of fracking.¹⁰ Finally, it explains regulatory approaches to fracking that the federal and state governments tried in the past and are currently using.¹¹

A. *History of Fracking and What Exactly Is Modern "Fracking"?*

Fracking developed in the United States in the late nineteenth century as a way to stimulate shallow rock formations to make natural gas extraction possible.¹² In 1947, Stanolind Oil and Gas Corporation ("Stanolind") began using the modern fracturing methodology.¹³ In 1949, Stanolind licensed the fracturing technique to the Halliburton Oil Well Cementing Company ("Halliburton"), the first company to commercialize the process.¹⁴ Use of the process declined and reached a

⁶ See *infra* Part IV (proposing that the federal government pass a modified version of an un-enacted proposed fracking statute).

⁷ See Joe Mahoney, *Fracking Opinions Split on Party Lines*, DAILY STAR (July 28, 2012), <http://thedailystar.com/localnews/x1495163828/Fracking-opinions-split-on-party-lines> (reporting a Quinnipiac University poll, which found that 66% of Republicans support fracking, 68% of Democrats oppose fracking, and 55% of those unaffiliated with a party believe fracking will harm the environment).

⁸ See *infra* Part II.A (explaining the history of fracking).

⁹ See *infra* Part II.B (outlining the environmental concerns and benefits of fracking).

¹⁰ See *infra* Part II.C (describing the economic effects of fracking).

¹¹ See *infra* Part II.D (discussing the history of fracking regulation and how regulations have evolved).

¹² Carl T. Montgomery & Michael B. Smith, *Hydraulic Fracturing: History of an Enduring Technology*, J. PETROLEUM TECH., Dec. 2010, at 26, 27. Nitroglycerin was the early chemical used in fracturing and was often used dangerously and illegally to stimulate the wells. *Id.*; see Herschel McDivitt, *Hydraulic Fracturing 101: What It Is; Why It Is Used; Why All the Fuss? Is It Used in Indiana?*, IN.gov (2013), http://www.in.gov/dnr/dnroil/files/og-Hydraulic_Fracturing_Data_for_Oil_and_Gas_Wells.pdf (providing a brief history of the fracturing of oil and gas wells).

¹³ Montgomery & Smith, *supra* note 12, at 27.

¹⁴ Mark McPherson, *Texas: The Barnett, Haynesville and Eagle Ford Shales*, ALI-ABA TOPICAL COURSES 31, 35 (Dec. 13, 2011), http://files.ali-cle.org/thumbs/datastorage/skoobesruoc/pdf/TSTX04_chapter_03_thumb.pdf. Halliburton's first commercialized use was in Oklahoma and then in Texas in 1949. *Id.*

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twenty-year low in 1994, but its popularity increased dramatically in the twenty-first century after gas prices increased and new drilling processes developed.¹⁵ The two principal concerns of fracking are how fracking works and what additives are injected into the ground.¹⁶

Modern fracking is a method of rock fracturing, which hits rocks with a mixture of “frac fluid” consisting of water, sand, low-gravity oils, and chemical additives at high pressures.¹⁷ Drillers inject proppants—usually consisting of small granules of sand—along with the frac fluid.¹⁸ The frac fluid breaks open the rock, and the proppants keep the rock open.¹⁹

Although the exact type and amount of chemicals added to the frac fluid vary, a typical blend will use concentrations of between three and twelve chemicals.²⁰ Between 25% and 75% of the injected frac fluid is

¹⁵ Robin Beckwith, *Hydraulic Fracturing: The Fuss, the Facts, the Future*, J. PETROLEUM TECH., Dec. 2010, at 34, 35. Horizontal drilling was the major new technique that was developed around this time. *Id.* The Naval Facilities Engineering Service Center in California developed the new technique between 1985 and 1993. B. Cable, *Horizontal Drilling System (HDS) Field Test Report – FY91*, DEF. TECHNICAL INFO. CENTER (Oct. 1993), <http://www.dtic.mil/dtic/tr/fulltext/u2/a274219.pdf>. Despite the widespread use of fracking, the majority of Americans have either never heard of fracking or are not familiar with fracking. See Andrew C. Revkin, *Americans Polarized on Climate, Tuned Out on ‘Fracking,’* N.Y. TIMES (June 19, 2012), <http://dotearth.blogs.nytimes.com/2012/06/19/americans-polarized-on-climate-tuned-out-on-fracking/> (reporting that 28% of Americans are not familiar with fracking, whereas 35% of Americans have never heard of the term fracking).

¹⁶ See generally Terry W. Roberson, *Environmental Concerns of Hydraulically Fracturing a Natural Gas Well*, 32 UTAH ENVTL. L. REV. 67 (2012) (explaining that the chief concerns of fracking are environmental in nature and that the enacted laws deal mostly with regulating chemical use and required disclosure).

¹⁷ Jessica Rivero Gilbert, *Assessing the Risks and Benefits of Hydraulic Fracturing*, 18 MO. ENVTL. L. & POL’Y REV. 169, 175 (2011). Often, the low-gravity oil used is diesel fuel. *Id.*

¹⁸ *Id.*

¹⁹ ENVTL. PROT. AGENCY, EPA 816-R-04-003, EVALUATION OF IMPACTS TO UNDERGROUND SOURCES OF DRINKING WATER BY HYDRAULIC FRACTURING OF COALBED METHANE RESERVOIRS (2004), available at http://www.epa.gov/ogwdw/uic/pdfs/cbmstudy_attach_uic_ch04_hyd_frac_fluids.pdf; John D. Furlow & John R. Hays, Jr., *Disclosure with Protection of Trade Secrets Comes to the Hydraulic Fracturing Revolution*, 7 TEX. J. OIL, GAS & ENERGY L. 289, 303 (2011–2012); see 2 PH. A. CHARLEZ, ROCK MECHANICS: PETROLEUM APPLICATIONS, ch. 6–7 (1997) (describing in technical detail the fracking process and alternative uses for fracking besides extracting gas and oil). The chemical additives, making up about 0.05%–1% of the entire composition of the frac fluid are one of the most controversial aspects of fracking. Furlow & Hays, *supra* at 303–04. Also highly controversial is the force at which the frac fluids are jettisoned into the rock, which can induce earthquakes in some circumstances. *Id.* at 307 & n.108.

²⁰ U.S. DEP’T OF ENERGY, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER 61 (2009), available at http://www.netl.doe.gov/technologies/oil-gas/publications/epreports/shale_gas_primer_2009.pdf. The chemical additives serve multiple purposes, “including reducing friction (as the fluid is injected), biocide (to prevent bacterial growth),

later removed, but the remaining fluid usually remains in the ground.²¹ This remaining fluid has generated the fear that fracking threatens human and environmental health.²²

B. Environmental and Human Health Effects of Fracking

Fracking has several environmental and health effects that have caused concern, but it also has some environmentally beneficial effects.²³ First, like other unconventional drilling techniques, fracking is a source of concern for environmentalists.²⁴ The four major environmental

scale inhibition (to prevent mineral precipitation), corrosion inhibition, clay stabilization (to prevent swelling of expandable clay minerals), gelling agent (to support proppants), surfactant (to promote fracturing), and cleaners.” CHARLES G. GROAT & THOMAS W. GRIMSHAW, THE ENERGY INST. UNIV. OF TEX. AT AUSTIN, FACT-BASED REGULATION FOR ENVIRONMENTAL PROTECTION IN SHALE GAS DEVELOPMENTS 16 (2012), available at http://heartland.org/sites/default/files/texas_fracking_study_feb_2012.pdf. Although the exact number of chemical additives used is unknown, the actual number is estimated to be “as high as 2,500 service company products containing 750 chemical compounds.” *Id.* Although most of these chemicals increase the wells’ production, some (e.g. the biocides and corrosion inhibitors) are included to preserve the wells’ safety and integrity. Furlow & Hays, *supra* note 19, at 303–04.

²¹ OFFICE OF RESEARCH & DEV., ENVTL. PROT. AGENCY, EPA/600/R-11/122, PLAN TO STUDY THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING ON DRINKING WATER RESOURCES 23 (2011), available at http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/hf_study_plan_110211_final_508.pdf.

²² See generally Justin Doom, *Fracking Linked to ‘Small’ Earthquakes, Scientist Says*, BUS. WK. (Aug. 6, 2012), <http://www.businessweek.com/news/2012-08-06/fracking-linked-to-small-earthquakes-scientist-says> (finding a link between fracking and the rise in number of small earthquakes); Mark Drajem, *Pennsylvania Fracking Can Put Water at Risk, Duke Study Finds*, BLOOMBERG (July 9, 2012, 11:00 PM), <http://www.bloomberg.com/news/2012-07-09/pennsylvania-fracking-can-put-water-sources-at-risk-study-finds.html> (reporting that some environmental studies have found a link between fracking sites and partially contaminated water wells); Jim Efstathiou Jr., *Gas Fracking Poses Serious Environmental Risks, Panel Finds*, BLOOMBERG (Aug. 11, 2011, 10:23 AM), <http://www.bloomberg.com/news/2011-08-11/gas-fracking-poses-serious-environmental-risks-u-s-panel-finds.html> (reporting that the Secretary of Energy Advisory Board has some concerns about the environmental risks associated with fracking).

²³ See A.W., *Some Fracking Good News*, ECONOMIST (May 25, 2012, 3:28 PM), <http://www.economist.com/blogs/schumpeter/2012/05/americas-falling-carbon-dioxide-emissions> (explaining the correlation between the increase in fracking and the decrease in carbon dioxide emissions discovered in the United States and also expressing the environmentalists’ concerns with the fracking procedure); *Fracking Great: The Promised Gas Revolution Can Do the Environment More Good than Harm*, ECONOMIST (June 2, 2012), <http://www.economist.com/node/21556249> (countering public outcry against fracking by explaining that its use can have some environmental benefits).

²⁴ See Steven Cohen, *Effective Regulation and Sustainable Economic Growth*, HUFFINGTON POST (Aug. 20, 2012, 8:45 AM), http://www.huffingtonpost.com/steven-cohen/effective-regulation-and_b_1810282.html (using hydraulic fracturing as an example of an area of law that needs effective regulation). Other sources of government regulation also raise serious concerns. See Travis D. Van Ort, Note, *Hydraulic Fracturing Additives: A Solution to the*

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concerns associated with fracking are: potential water contamination, earthquakes, air pollution, and lack of renewable energy development.²⁵

Tension Between Trade Secret Protection and Demands for Public Disclosure, 4 KY. J. EQUINE, AGRIC., & NAT. RES. L. 439, 441–42 (2011–2012) (explaining some specific instances that have caused concern regarding fracking); Jennifer Dlouhy, *Regulators Tweak Final Offshore Well Rules*, HOUS. CHRON. (Aug. 15, 2012, 10:00 PM), <http://www.chron.com/business/article/Regulators-tweak-final-offshore-well-rules-3791307.php> (reporting that the federal government took two years after the 2010 B.P. oil spill to change the process by which it will respond to future off-shore oil spills); Andrew Higgins, *Japan's Slow Tsunami Response Stirs Anger*, WASH. POST (Mar. 16, 2011), http://www.washingtonpost.com/business/economy/nikkei-recovers-57percent-us-stock-futures-fluctuate-over-nuclear-crisis/2011/03/16/ABQd0sg_story.html (explaining the problems caused by Japan's slow response to the tsunami in spring of 2011); Stephen Power & Tennille Tracy, *Spill Panel Finds U.S. Was Slow to React*, WALL ST. J. (Oct. 6, 2010), <http://online.wsj.com/article/SB10001424052748703735804575536042567062622.html> (explaining that government emergency responders were slow to clean up recent environmental disasters); see also Donald F. Kettl & Jonathan Walters, *The Katrina Breakdown: Coordination and Communication Problems Between Levels of Government Must Be Addressed Before the Next Disaster Strikes*, GOVERNING (Dec. 2005), <http://www.governing.com/topics/economic-dev/The-Katrina-Breakdown.html#> (arguing for improvement in inter-government coordination so past problems will not reoccur in the future).

²⁵ See LISA SUMI, OUR DRINKING WATER AT RISK: WHAT EPA AND THE OIL AND GAS INDUSTRY DON'T WANT US TO KNOW ABOUT HYDRAULIC FRACTURING 47 (2005), <http://www.earthworksaction.org/files/publications/DrinkingWaterAtRisk.pdf> (contending that regulators have not effectively followed up on citizen complaints concerning water contamination); Maciej Onoszko, *Polish Fracking Well Probe Shows No Harm to Environment*, REUTERS (Mar. 2, 2012, 6:59 AM), <http://www.reuters.com/article/2012/03/02/us-poland-shale-idUSTRE8210KX20120302> (identifying the pollution of groundwater and creation of earthquakes as concerns, but reporting that a Polish well has not harmed the environment); *infra* note 31 and accompanying text (expressing concern over earthquakes possibly linked to fracking); *infra* notes 32–34 and accompanying text (discussing potential atmospheric pollution concerns associated with the fracking process); see also Phillip Duncan, *Little Rock Law Firm Investigating Arkansas Fracking (Hydraulic Fracturing) Water Contamination and Damage Claims*, PRWEB (July 8, 2012), <http://www.prweb.com/releases/2012/7/prweb9676218.htm> (discussing Arkansas water contamination issues and recognizing that some local attorneys are looking into possible legal claims for residents); Jim Efstathiou Jr., *Fracking-Linked Earthquakes Spurring State Regulations*, BLOOMBERG (Apr. 20, 2012, 10:19 AM), <http://www.bloomberg.com/news/2012-04-20/fracking-linked-earthquakes-spurring-state-regulations.html> (noting that fracking may be linked to earthquakes, which has caused states to reassess their regulations); Deborah Solomon & Russell Gold, *EPA Ties Fracking, Pollution*, WALL ST. J. (Dec. 9, 2011), <http://online.wsj.com/article/SB10001424052970203501304577086472373346232.html> (reporting an EPA study that linked fracking to water pollution in Wyoming). But see Daniel Gilbert & Russell Gold, *EPA Backpedals on Fracking Contamination*, WALL ST. J. (Apr. 1, 2012), <http://online.wsj.com/article/SB10001424052702303404704577313741463447670.html> (calling into question the EPA's original claims of contaminated water in three states after it dropped the suits against the drilling companies). There are already other spills such as in West Virginia where the West Virginia Department of Environmental Protection "said that 95,000 gallons of drill water mixed with fresh water poured out of an open valve . . . into a tributary of Big Wheeling Creek." Denise Yost, *Will West Virginia Fracking Spill Impact Ohio River?*, NBC4I (Feb. 26, 2013, 4:04 PM), <http://www.nbc4i.com/>

Some residents that live near fracking sites, such as the residents of Dimock, Pennsylvania, complained about a decrease in the quality of the water.²⁶ In 2009, the Pennsylvania Department of Environmental Protection (“PDEP”)—because of many complaints about water quality—had Cabot Oil and Gas Corporation (“Cabot”) stop its operations in Dimock, which led to the discovery that faulty Cabot wells leaked methane into local water supplies.²⁷ After a multi-million dollar settlement, Cabot denied that the contaminants posed a threat to human health.²⁸

story/21389011/will-w-va-fracking-spill-impact-ohio-river. The concern is that the Big Wheeling Creek joins into the Ohio River, which provides drinking water for millions. *Id.*

²⁶ See Michael Rubinkam, *Residents of Pa. Drilling Town Near Settlement*, YAHOO! FINANCE (Aug. 15, 2012, 9:09 PM), <http://finance.yahoo.com/news/residents-pa-drilling-town-near-201305431.html> (reporting that the residents in Dimock, Pennsylvania sued and reached a settlement agreement with Cabot Oil & Gas Corporation, the company that allegedly contaminated the residents well water). Cabot has not claimed responsibility for the high levels of methane found in the drinking water, and in the past year, regulators have determined that the water is now “safe to drink.” *Id.* However, many residents who get their water from wells dispute whether the water is actually safe to drink today and refuse to use the well water. *Id.*; see Laura Legere, *DEP Lets Cabot Resume Dimock Fracking*, TIMES-TRIB. (Aug. 22, 2012), <http://thetimes-tribune.com/news/dep-lets-cabot-resume-dimock-fracking-1.1361871> (describing a Dimock resident’s choice to continue the lawsuit because the methane levels in his water were unchanged by Cabot’s correction efforts).

²⁷ Legere, *supra* note 26. According to Scott Perry, Pennsylvania Department of Environmental Protection’s deputy secretary for oil and gas management, Cabot has since fixed many of the faulty wells. *Id.* Tests on the wells showed that “any gas between the cemented strings of steel casing [wa]s . . . below pressure limits set by state regulations and [wa]s not escaping from the wellbore.” *Id.* Some states add an additional requirement—such as Illinois—to place the onus on fracking companies to prove that any contamination of water sources near the drilling site was not caused by fracking. 225 ILL. COMP. STAT. ANN. 732/1-85 (West, WestlawNext through P.A. 98-121 of the 2013 Reg. Sess.). In Illinois there is a presumption that any person conducting or who has conducted fracking operations is liable for polluting a water supply if:

- (1) the water source is within 1,500 feet of the well site; (2) water quality data showed no pollution or diminution prior to the start of high volume horizontal hydraulic fracturing operations; and (3) the pollution or diminution occurred during high volume horizontal hydraulic fracturing operations or no more than 30 months after the completion of the high volume horizontal hydraulic fracturing operations.

Id.

²⁸ See Mary Esch, *U.S. Insurer Won’t Cover Gas Drill Fracking Exposure*, U.S. NEWS (July 12, 2012), http://www.usnews.com/news/business/articles/2012/07/12/us-insurer-wont-cover-gas-drill-fracking-exposure?s_cid=related-links:TOP (explaining that Cabot settled for \$4.1 million in 2010 and stating that a Cabot spokesperson contends the contaminants in the water did not pose a threat to residents’ health or the environment). Nationwide Mutual Insurance Company also announced that it would not cover damage related to the hydraulic fracturing drilling process because it believed the risks involved with fracking “are too great to ignore.” *Id.*

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In addition to methane leaks, environmentalists claim that frac fluid left in the ground can seep into water supplies.²⁹ Many of the chemicals in the frac fluids can have harmful effects on human health, such as severe burns, organ failure, cancer, and even death.³⁰ Environmentalists also speculate that a combination of this left-behind water and the high-pressure rock fracturing causes earthquakes, and researchers from the

²⁹ *Drilling Boom in Marcellus Shale Poses Health Risks to Northeastern Pennsylvanians, Says Gas Drilling Injury Lawyer Joseph Price*, PRWEB (Sept. 28, 2012), <http://www.prweb.com/releases/2012/9/prweb9958419.htm>. There are also concerns that the natural gas drilling industry may be paying off researchers, but as of now, this claim has yet to be substantiated. Tim McDonnell, *Natural Gas Fracking Industry May Be Paying Off Scientists*, WIRED (July 30, 2012, 6:00 AM), <http://www.wired.com/wiredscience/2012/07/gas-fracking-science-conflict/>.

³⁰ Lena Groeger, *What the Frack Is in That Water?*, PROPUBLICA (Mar. 7, 2012, 10:38 AM), <http://www.propublica.org/special/what-the-frack-is-in-that-water>; see STAFF OF H. COMM. ON ENERGY & COMMERCE, 112TH CONG., CHEMICALS USED IN HYDRAULIC FRACTURING 6–11 (Comm. Print 2011), available at <http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic-Fracturing-Chemicals-2011-4-18.pdf> (outlining chemicals that are commonly used in hydraulic fracturing); Jo Ciavaglia, *Is Fracking Law a Gag or Guarantee?*, PHILLY BURBS (Apr. 2, 2012, 5:55 AM), http://www.phillyburbs.com/news/local/courier_times_news/is-fracking-law-a-gag-or-guarantee/article_b82033e2-29da-5310-acee-83bce89eab6c.html (explaining that in a study conducted concerning human and animal health, six states revealed that reproductive issues were most prevalent). For example, the following chemicals, listed together with their harmful effects, are commonly found in frac fluid: crystalline silica “[d]ust is harmful if inhaled repeatedly over a long period of time and can lead to silicosis or cancer;” methanol “[v]apors can cause eye irritation, headache and fatigue, . . . in high enough doses can be fatal[,] [and] [s]wallowing may cause eye damage or death;” isopropanol “[v]apors can cause irritation of the eyes and the upper respiratory tract[,] [and] [i]ngestion causes drunkenness and vomiting;” hydrotreated light distillate “[i]n acute cases can cause skin and eye irritation, headache and dizziness[,] [but] [l]ong-term exposure can damage liver, kidneys or blood;” 2-butoxyethanol “[v]apors irritate the eyes and nose[,] [and] [i]ngestion or skin contact can cause headache, nausea, vomiting and dizziness;” ethylene glycol “[i]ngestion causes stupor or coma and can lead to fatal kidney injury;” diesel “[c]ontact with skin may cause redness, itching, burning, severe skin damage and cancer;” sodium hydroxide “[d]ust may cause damage to lungs[,] [and] [e]xposure to solid or liquid forms can severely burn the eyes, skin and mucous membranes, or lead to death;” naphthalene “[i]nhalation can cause respiratory tract irritation, nausea, vomiting, abdominal pain, fever or death.” Groeger, *supra*; see Dominique Mosbergen, *Hormone-Disrupting Chemicals Found at Fracking Sites Linked to Cancer, Infertility: Study*, HUFFINGTON POST (Dec. 20, 2013, 3:40 PM), http://www.huffingtonpost.com/2013/12/20/fracking-chemicals-cancer-study_n_4468243.html?ncid=edlinkusaolp00000003 (reporting a study in a health magazine, which claims water samples taken near fracking sites contained chemicals linked to a slew of health problems). However, new processes are being developed to remove the chemicals and other contaminants from the water after it is used for fracking. See Erica Gies, *Race Is On to Clean Up Hydraulic Fracturing*, N.Y. TIMES (Dec. 4, 2012), http://www.nytimes.com/2012/12/05/business/energy-environment/race-is-on-to-clean-up-hydraulic-fracturing.html?_r=0 (reporting that new startup companies can use a process of advanced oxidation to clean the water used in fracking).

U.S. Geological Survey reported increases in the number of earthquakes that occurred in the central United States as fracking increased.³¹

Also, the amount of methane released is a concern.³² Although “methane does not remain in the atmosphere as long as carbon dioxide,” it still poses a threat.³³ In a molecule-to-molecule comparison, methane is twenty times more potent than carbon dioxide as a greenhouse gas.³⁴

³¹ See Mark Drajem, *Fracking Tied to Unusual Rise in Earthquakes in U.S.*, BLOOMBERG (Apr. 12, 2012, 2:32 PM), <http://www.bloomberg.com/news/2012-04-12/earthquake-outbreak-in-central-u-s-tied-to-drilling-wastewater.html> (reporting that geologists found an increase in the number of earthquakes and attribute the increase to fracking). The area of the survey ran from Ohio to as far west as Colorado and as far south as Oklahoma. *Id.* Researchers from the U.S. Geological Survey said that “for the three decades until 2000, seismic events in the nation’s midsection averaged 21 a year” but more than doubled to 50 in 2009, quadrupled to 87 in 2010, and had a more than six-times increase to 134 in 2011. *Id.* The researchers say they “are committed to monitoring the issue and working with authorities where there are concerns, but . . . noted that currently there is no scientific data associating hydraulic fracturing with earthquakes that would cause damage.” *Id.* It is also unclear which fracking sites will and will not have earthquakes. *Id.* In the Barnett Shale of Texas, fifty-nine “small-magnitude” earthquakes of a 2.5 magnitude or under occurred during a two-year period, but these earthquakes’ magnitudes registered below the level reported by the National Earthquake Information Center. *Doom, supra* note 22. Typically, the U.S. Geological Survey only collects data from seismic events of at least a 3.0 magnitude. *Id.* Regardless, many studies have provided support that fracking triggers manmade earthquakes. *Id.*; see *Fracking Causes Earthquakes, Studies Confirm*, CANADIAN PRESS (Apr. 17, 2012, 10:53 AM), <http://www.cbc.ca/news/technology/story/2012/04/17/environment-fracking-earthquake-studies.html> (reporting that two separate studies found links between fracking and a rise in earthquakes in certain areas); Kim Palmer, *Ohio Agency Says Fracking-Related Activity Caused Earthquakes*, REUTERS (Mar. 9, 2012, 6:31 PM), <http://www.reuters.com/article/2012/03/09/us-energy-fracking-ohio-idUSBRE8281DX20120309> (reporting that the Ohio Department of Natural Resources found fracking caused recent earthquakes).

³² Mark Fischetti, *Fracking Would Emit Large Quantities of Greenhouse Gases*, SCI. AM. (Jan. 20, 2012), <http://www.scientificamerican.com/article.cfm?id=fracking-would-emit-methane>; see Tara Dadrill, *Study Reveals Fracking Releases Have More Methane than Previously Estimated*, YAHOO! NEWS (Feb. 22, 2012), <http://news.yahoo.com/study-reveals-fracking-releases-more-methane-previously-estimated-213900637.html> (reporting that a “[National Oceanic and Atmospheric Administration] study found gas fields in Colorado are leaking methane at a rate of about 4 percent instead of the estimated 1.6 percent”).

³³ Dadrill, *supra* note 32. Methane lasts in the atmosphere for about 9 to 15 years, while carbon dioxide remains in the atmosphere for anywhere between 50 and 200 years. *Overview of Greenhouse Gases: Carbon Dioxide Emissions*, ENVTL. PROT. AGENCY, <http://www.epa.gov/climatechange/ghgemissions/gases/co2.html> (last updated June 14, 2012); *Overview of Greenhouse Gases: Methane Emissions*, ENVTL. PROT. AGENCY, <http://www.epa.gov/methane/> (last updated Apr. 1, 2011).

³⁴ *Overview of Greenhouse Gases: Methane Emissions, supra* note 33. In fact, some scientists blame the increase of greenhouse gases, primarily methane and carbon dioxide, for the heat wave during the summer of 2012. See Dauna Coulter, *The Summer of 2012 – Too Hot to Handle?*, NAT’L AERONAUTICS & SPACE ADMIN. (Aug. 3, 2012), http://science.nasa.gov/science-news/science-at-nasa/2012/03aug_summer2012/ (discussing causes of the 2012 heat waves and mentioning that the increase in atmospheric carbon dioxide could be part

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However, there are environmental benefits to using this gas as a replacement for coal and oil.³⁵

Although most environmental attention given to fracking is negative, some experts believe that these risks are often exaggerated and fracking brings environmental benefits.³⁶ In the northeast, the Marcellus Shale rock formation contains a mile of “impermeable” stone between the shale and drinking sources, which causes some to believe that fracking is actually safer than traditional methods of drilling.³⁷ Further,

of the problem). Also, the increase in availability of natural gas as a result of fracking could reduce energy companies’ investments in even greener technology such as wind and solar power, as they focus more on natural gas. Murrey Jacobson, *Energy Boom in West Creating Jobs and Growth, but Changing Way of Life*, PBS NEWSHOUR (Aug. 7, 2012, 3:50 PM), <http://www.pbs.org/newshour/rundown/2012/08/energy-boom-in-west-creating-jobs-and-growth-but-changing-way-of-life.html>. While fracking in the United States has reduced many companies’ desires to find alternative energies, investors anticipate that the limited fracking taking place in Europe will force European companies to invest in more alternative energy sources. Barbara Lewis & Henning Gloystein, *Shale Gas Failure Offers Rescue for EU Green Energy Drive*, REUTERS (Aug. 23, 2012, 4:48 AM), <http://www.reuters.com/article/2012/08/23/us-eu-shale-gas-renewables-new-version-idUSBRE87M08E20120823>. However, some view the abundance of natural gas as a temporary bridge for American energy independence until renewable energy becomes economically viable. See Rachel Ehrenberg, *The Facts Behind the Frack*, SCIENCE NEWS (Aug. 24, 2012, 10:37 AM), http://www.sciencenews.org/view/feature/id/343202/title/The_Facts_Behind_the_Frack (providing a brief explanation of the general concerns and benefits of fracking).

³⁵ Kevin Begos, *AP Impact: CO2 Emissions in U.S. Drop to 20-Year Low*, ASSOCIATED PRESS (Aug. 16, 2012, 10:39 PM), <http://bigstory.ap.org/article/ap-impact-co2-emissions-us-drop-20-year-low>.

³⁶ Richard Black, *‘Fracking’ Safe with Strong Regulation, Report Says*, BBC NEWS (June 28, 2012, 7:05 PM), <http://www.bbc.co.uk/news/science-environment-18611647>; Jon Entine, *Fracking Safety Improves Dramatically, Says Independent Study*, FORBES (May 15, 2012, 5:35 PM), <http://www.forbes.com/sites/jonentine/2012/05/15/fracking-safety-improves-dramatically-says-independent-study/>. While no one argues that the fracking process by itself helps the environment, some experts argue that natural gas is better for the environment when compared to other fossil fuels; thus, fracking provides environmental benefits. See generally Brad Plumer, *Can Natural Gas Help Tackle Global Warming? A Primer*, WASH. POST (Aug. 20, 2012, 11:43 AM), <http://www.washingtonpost.com/blogs/ezra-klein/wp/2012/08/20/can-natural-gas-really-help-tackle-global-warming-heres-everything-you-need-to-know/> (debating the claims of those who say that fracking harms the environment by explaining the good that natural gas can do to reduce the harms associated with the theory of global warming). However, along with the environmental benefits of using natural gas come new detriments, such as an increase in methane. See *supra* note 32 and accompanying text (discussing the increase of methane as one of the numerous environmental concerns associated with fracking).

³⁷ Kevin D. Williamson, *Facing Frack Hysteria*, N.Y. POST (Feb. 8, 2012, 5:00 AM), http://www.nypost.com/p/news/opinion/opedcolumnists/facing_frack_hysteria_PWwCCKjR1BxHCVNDT7ARO. Mr. Williamson believes that these formations are safer to drill using fracking because they are insulated from drinking sources more thoroughly than other areas that have shallower wells. *Id.* However, few actually believe that fracking in the shale is safer than drilling elsewhere, and drilling in general poses safety risks

the burning of natural gas is not as bad for the environment as burning oil and coal.³⁸ Burning natural gas causes more short-term warming, but the shorter life of methane (9–15 years) over carbon dioxide (50–200 years) in the atmosphere makes natural gas a cleaner alternative in the long-term.³⁹ Even those opposed to fracking recognize the environmental benefits of cleaner burning natural gas.⁴⁰ There are also strong correlations between decreases in carbon dioxide in the atmosphere and increases in fracking, which coincided with the general replacement of coal with natural gas.⁴¹

regardless of whether fracking is used. See Thomas Swartz, *Hydraulic Fracturing: Risks and Risk Management*, 26 NAT. RESOURCES & ENV'T 30, 30–32 (2011), available at http://usa.marsh.com/Portals/9/Documents/NRE_fall11_swartz.pdf (providing an explanation of safety risks and how they can be better managed by drilling companies); 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, 127–42 (2009) (discussing environmental concerns of fracking); see also Ian Urbina, *Regulation Lax as Gas Wells' Tainted Water Hits Rivers*, N.Y. TIMES (Feb. 26, 2011), <http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=all> (blaming lack of industry regulation on environmental problems associated with fracking).

³⁸ *Natural Gas: Cleaner, Not Cooler*, ECONOMIST (Aug. 6, 2011), <http://www.economist.com/node/21525418>.

³⁹ *Overview of Greenhouse Gases: Carbon Dioxide Emissions*, *supra* note 33; *Overview of Greenhouse Gases: Methane Emissions*, *supra* note 33; see Kevin Begos, *Experts: Some Fracking Critics Use Bad Science*, BUS. WK. (July 22, 2012), <http://www.businessweek.com/ap/2012-07-22/experts-some-fracking-critics-use-bad-science> (stating that natural gas is better for the environment and the hysteria surrounding fracking has caused some to ignore this fact).

⁴⁰ See Abraham Lustgarten, *Natural Gas Not As 'Clean' As Previously Thought, New Research Suggests*, HUFFINGTON POST (Jan. 25, 2011, 7:25 PM), http://www.huffingtonpost.com/2011/01/25/natural-gas-clean_n_813750.html (arguing that the actual environmental benefits of burning natural gas instead of burning coal or oil are much lower than some might think but recognizing that natural gas still offers a significant environmental advantage).

⁴¹ See *U.S. Emissions Drop as World's Biggest Polluter Chooses Gas over Coal*, TIMES LIVE (Aug. 18, 2012), <http://www.timeslive.co.za/scitech/2012/08/18/us-emissions-drop-as-world-s-biggest-polluter-chooses-gas-over-coal> (noting that there is a relationship between the increased use of natural gas from fracking and the decrease in emissions, but there are other factors at play, including the warmer winter that allowed for a decrease in heater usage). In the first quarter of 2012, American carbon emissions dropped almost 8% from the 2011 levels, which is the lowest level since 1992. *Id.* The quarter also saw the lowest level in carbon emissions generated by coal since 1983, and coal—the dirtiest major source of energy—accounted for 43% of American power generation, down from when it was 51% in 2005. *Id.* The decrease in coal usage and the related drop in CO₂ emissions is said to result from the soaring supply and decreasing price of natural gas. *Id.*

C. *Economic Impacts of Fracking*

Not only is fracking explained through environmental terms but also through economics.⁴² In its most basic form, fracking's effect on local economies impact the following: property values, public works projects, taxes, and jobs.⁴³ Property owners that allow companies to drill generally receive both a per-acre rental fee and royalty fee.⁴⁴ In many of the rural areas where fracking occurs, property values improved drastically once drilling began.⁴⁵

⁴² See Ed Dolan, *Fracking and the Environment: An Economic Perspective*, ECONOMONITOR (May 4, 2012), <http://www.economonitor.com/dolanecon/2012/05/04/fracking-and-the-environment-an-economic-perspective/> (looking at the fracking issue from the perspective of an economist and arguing that economics can be used to reduce the environmental risks).

⁴³ See Roben Farzad, *The Land that Fracking Forgot*, BUS. WK. (June 7, 2012), <http://www.businessweek.com/articles/2012-06-07/the-land-that-fracking-forgot> (illustrating the effect of fracking on property values and public works improvement projects); Mitchell Schnurman, *Barnett Shale Still Thrives Despite Downturn*, STAR-TELEGRAM (Mar. 3, 2012), <http://www.star-telegram.com/2012/03/03/3780252/barnett-shale-still-thrives-despite.html> (noting the increase in jobs within the natural resources industry). Fracking also helps increase the communities' standard of living, as the income boost provides the funds to purchase new items such as tractors. Farzad, *supra*. There are other local economic impacts, such as increase in restaurant and hotel usage by visiting prospectors and regulatory authorities, but these have very minimal impacts on the local economies compared to the change in job growth and property values that fracking brings. See *id.* (emphasizing the impacts of the fracking ban on property values, as opposed to other economic effects); see also Inae Oh, *New York Fracking Protest Urges Cuomo to Ban Controversial Drilling*, HUFFINGTON POST (Aug. 22, 2012, 5:08 PM), http://www.huffingtonpost.com/2012/08/22/new-york-fracking-protest-cuomo-photos_n_1822575.html (reporting that many New Yorkers in the southern part of the state, where fracking is banned, cannot afford the taxes on their farms and want the money generated by fracking to purchase new equipment). In Illinois, lawmakers expect fracking to create more than 70,000 jobs in economically depressed southern Illinois. Brian Brueggemann, *Illinois Fracking Bill Passes House, Sponsor Says Bill Could Create 70,000 Jobs*, HUFFINGTON POST (May 31, 2013, 10:28 AM), http://www.huffingtonpost.com/2013/05/31/illinois-fracking-bill-house-vote_n_3364312.html?utm_hp_ref=chicago. But see Claudia Cowan, *California Dems Push Anti-Fracking Bills, Aim to Curb Potential Oil Bonanza*, FOX NEWS (May 29, 2013), <http://www.foxnews.com/politics/2013/05/29/california-dems-push-anti-fracking-bills/> (reporting that some California lawmakers would rather ban fracking in the state's Monterey Shale formation rather than reap the expected influx of money into the state).

⁴⁴ See Elisabeth N. Radow, *Homeowners and Gas Drilling Leases: Boon or Bust?*, N.Y. ST. B. ASS'N J., Nov./Dec. 2011, at 10, 16 (noting that the rental fee is paid regardless of whether any gas is produced and the royalty fee is contingent on the amount of gas the well produces).

⁴⁵ Farzad, *supra* note 43. Mr. Farzad chronicles Wayne County, Pennsylvania (an area along the Delaware River that has a current moratorium on fracking) before drilling, during drilling, and after the drilling was paused. *Id.* In Wayne County, before drilling, property "sold for \$2,000 to \$3,000 an acre in 2004" and sold for "as much as \$10,000 an acre by 2009." *Id.* Some property owners anticipated several thousand dollars in royalties

Fracking also provides a needed cash influx to local governments.⁴⁶ Some states and communities that allow drilling can provide new or enhanced services to residents through shale gas taxes.⁴⁷ Further, natural gas obtained from fracking has helped states to eliminate their budget deficits.⁴⁸

Additionally, fracking leads to job growth.⁴⁹ Fracking sparked job growth in mostly rural communities that fell on hard times.⁵⁰ The

each day for a long time; however, when the Delaware River Basin Commission (an interstate regulatory body that oversees the Delaware River) paused drilling, royalties ceased and the leases stopped. *Id.*

⁴⁶ See *New York Fracking Opponents Put Pressure on Governor Cuomo*, HUFFINGTON POST (Aug. 2, 2012, 9:23 AM), http://www.huffingtonpost.com/2012/08/01/new-york-fracking-opponents_n_1730217.html (noting that fracking can help reduce local taxes, which are noted as being “high” in New York).

⁴⁷ See Farzad, *supra* note 43 (noting that drilling companies were going to put in new roads, and fire hydrants and contribute to other public works projects before they were kept from drilling); see also Schnurman, *supra* note 43 (identifying that shale gas revenues, although lower than originally predicted, will be used for the Dallas/Fort Worth Airport, the Tarrant Regional Water District in Texas, and other Fort Worth and northern Texas governmental bodies).

⁴⁸ See Tom Shepstone, *Marcellus Drilling Benefits Whole State*, PENNLIVE (Aug. 3, 2012, 12:45 AM), http://www.pennlive.com/editorials/index.ssf/2012/08/marcellus_drilling_benefits_wh.html (indicating that shale gas provided Pennsylvania with more than \$1.1 billion in tax revenues from 2006 to 2012, a time of recession and budget deficits for the state). However, some claim that politicians’ projections remain overly optimistic concerning how much natural gas taxes will actually generate for their state or community. See Julie Carr Smyth, *John Kasich Claim About Oil and Gas Recovery Ruled Wrong by Experts*, HUFFINGTON POST (Aug. 2, 2012, 4:43 PM), http://www.huffingtonpost.com/2012/08/02/john-kasich-shale_n_1734388.html (arguing that “Ohio Gov[ernor] Kasich’s claim that a single energy company could recover \$1 trillion worth of oil and gas from the state’s shale is an exorbitant overestimate”).

⁴⁹ See Michael McNutt, *Oklahoma Begins New Fiscal Year with Increase in Tax Revenues*, OKLAHOMAN (Aug. 15, 2012), <http://newsok.com/oklahoma-begins-new-fiscal-year-with-increase-in-tax-revenues/article/3700931/?page=1> (showing the strong correlation between job growth and increases in state tax revenues and Oklahoma’s rapidly increasing natural gas production from fracking).

⁵⁰ See PA. DEP’T OF LABOR & INDUSTRY, MARCELLUS SHALE FAST FACTS 6 (Jan. 10, 2012), available at <http://www.marcellus.psu.edu/resources/PDFs/Jan12FastFacts.pdf> (reporting that Pennsylvania added just over 13,000 “core” jobs related to fossil fuel extraction from the Marcellus Shale between 2008 and 2011); see also *Weighing Benefits and Pitfalls of Increased Oil and Gas Production in the U.S.*, PBS NEWSHOUR (Aug. 10, 2012), http://www.pbs.org/newshour/bb/science/july-dec12/energy_08-10.html (predicting that fracking “will support 1.5 million jobs in the U.S. by 2015”). For example, rural Johnson and Pope counties in southern Illinois have unemployment rates of 15% and 20%, respectively. *Southern Illinois Braces for Oil Rush as ‘Fracking’ Regulations Considered by Lawmakers*, FOX NEWS (May 6, 2013), <http://www.foxnews.com/politics/2013/05/06/southern-illinois-braces-for-oil-rush-as-fracking-regulations-considered-by/>. It is the desperate economic realities that caused Illinois’s fracking regulations to pass the Democrat-controlled state Senate and state House of Representatives by overwhelming majorities of 52–3 and 108–9, respectively. See Brueggemann, *supra* note 43 (touting the expected economic benefits of

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average salaries paid by the companies for some of these jobs remain high.⁵¹ In fact, fracking has brought so many jobs to sparsely populated areas that some employers have difficulty filling all available positions.⁵² However, the states that allow fracking and the communities where the drilling takes place are not the only economies affected by fracking.⁵³

The economic benefits of fracking transcend local communities and state borders.⁵⁴ The shale gas boom in states with vast resources has helped economies outside their borders.⁵⁵ Ancillary industries connected to the drilling process—such as sand (to make proppants) and railroad transport (to move the sand out of state)—are focused in states

allowing fracking in the state); Kerry Lester, *Ill. Passes Nation's Toughest Fracking Regulations*, KATU (June 1, 2013, 6:59 PM), <http://www.katu.com/politics/ill-passes-nations-toughest-fracking-regulations-209815741.html> (highlighting the economic concerns that caused the bipartisan bill to pass by such an overwhelming majority in both branches).

⁵¹ See Lt. Governor Cawley Says Marcellus Shale Creating Jobs in Blair County, PR NEWSWIRE (July 26, 2012), <http://www.prnewswire.com/news-releases/lt-governor-cawley-says-marcellus-shale-creating-jobs-in-blair-county-163889376.html> (noting that approximately 29,000 people are employed in the drilling industry in Pennsylvania with average annual earnings of about \$81,000); Schnurman, *supra* note 43 (reporting that Tarrant County's oil and gas workers were paid an average weekly salary of \$2790).

⁵² See Sean Murphy, *Oil, Gas Boom Brings Scarcity of Workers in Small Towns*, BULLETIN (Aug. 14, 2012, 5:00 AM), <http://www.bendbulletin.com/article/20120814/NEWS0107/208140315/> (stating that in one community, fracking jobs pay about double what the local prison pays its guards, so the prison is having staffing issues). However, some believe that fracking does not really boost employment and instead takes jobs from other energy industries. See Moran Zhang, *U.S. Shale Gas Boom Won't Boost GDP, Job Gains*, INT'L BUS. TIMES (July 26, 2012, 9:10 AM), <http://www.ibtimes.com/articles/367125/20120726/shale-gas-boom-fracking-gdp-unemployment.htm> (noting that HSBC economist Kevin Logan believes the job growth proclamations associated with natural gas drilling are exaggerated and will just replace fleeting jobs from other sectors of the energy market, such as dwindling coal mining); see also Tom Bawden, *Fracking Floors Energy Giants*, INDEP. (Aug. 19, 2012), <http://www.independent.co.uk/news/business/analysis-and-features/fracking-floors-energy-giants-8059727.html> (reporting that larger energy companies are hurt by the increased fracking because the large amount of natural gas on the market is causing prices for alternative sources of energy to plummet); Sonja Elmquist, *Wilbur Ross Says U.S. Coal Is Facing Years of Headwinds*, BLOOMBERG (July 16, 2012, 3:28 PM), <http://www.bloomberg.com/news/2012-07-16/wilbur-ross-says-u-s-coal-is-facing-years-of-headwinds.html> (noting that the coal industry will likely have problems for several years because of the increase in natural gas production).

⁵³ See James Phillipps, *How Fracking Is Providing the U.S. with a Stimulus Boost*, CITYWIRE MONEY (Aug. 23, 2012, 12:55), <http://citywire.co.uk/money/how-fracking-is-providing-the-us-with-a-stimulus-boost/a613390> (explaining how fracking in one state can benefit the national economy because of the need for materials, inputs, and other equipment that is produced in states where fracking is not performed).

⁵⁴ See Michael R. Bloomberg & George P. Mitchell, *Fracking Is Too Important to Foul Up*, WASH. POST (Aug. 23, 2012), http://www.washingtonpost.com/opinions/fracking-is-too-important-to-foul-up/2012/08/23/d320e6ee-ea0e-11e1-a80b-9f898562d010_story.html (arguing that there are many economic benefits derived from fracking).

⁵⁵ Phillipps, *supra* note 53.

with little or no gas.⁵⁶ However, there are also national economic concerns over the amount of fracking.⁵⁷ Both the economic and

⁵⁶ See *How Railroad Companies Could Benefit from Shale Gas Boom*, TREFIS (Aug. 9, 2012), <http://www.trefis.com/stock/nsc/articles/137803/how-railroad-companies-could-benefit-from-shale-gas-boom/2012-08-09> (noting that the troubled railroad industry is benefitting from the use of fracking); see also Phillipps, *supra* note 53 (explaining that Midwestern states—such as Minnesota and Wisconsin—have sand that is ideal for fracking, and the need to transport the sand out of state has revitalized the stagnant railroad industry in those states and elsewhere). Since the fuel and supplies used to get the fuel both come from the United States, fracking helps to wean the United States off foreign energy dependence. Angel González, *Expanded Oil Drilling Helps U.S. Wean Itself from Mideast*, WALL ST. J. (June 27, 2012), <http://online.wsj.com/article/SB10001424052702304441404577480952719124264.html>. The shale gas revolution has experts predicting North America as the “new Middle East.” Tim Mullaney, *U.S. Energy Independence Is No Longer Just a Pipe Dream*, USA TODAY (May 15, 2012), <http://www.usatoday.com/money/industries/energy/story/2012-05-15/1A-COV-ENERGY-INDEPENDENCE/54977254/1>. Experts predict that the United States will get 94% of its energy from domestic sources, up from the current 77%. *Id.* Energy companies have now tried the fracking technology to obtain oil along with natural gas in states such as Alaska and Pennsylvania. *Id.* America’s natural gas recovered through fracking is helping the idea of U.S. energy independence become a reality for electricity, but current vehicles do not run on natural gas and the technology is not as developed for recovering oil. *Id.* Currently, Canadian companies are uncovering vast quantities of oil and gas that can be exported easily to the United States. González, *supra*. In the past, it was not economically feasible to recover this petroleum because much of this petroleum lies in places like sands. *Id.* However, recent price increases makes recovering it very profitable, and there is much available to export to the United States. *Id.* However, North Dakota has similar oil sands to Canada, and because of this, the experts predict that the United States’ “oil production is on track to surpass Saudi Arabia’s by 2020.” Asjlyln Loder, *Fracking Pushes U.S. Oil Production to Highest in 20 Years*, BLOOMBERG (Jan. 9, 2013, 2:33 PM), <http://www.bloomberg.com/news/2013-01-09/fracking-pushes-u-s-oil-production-to-highest-in-20-years-2-.html>; see Mark Curriden, *Texas Tea Time*, A.B.A. J., Feb. 2013, at 47, 48 (reporting predictions that the United States will become a net exporter of oil by the year 2030). Also, some experts believe that the increase in natural gas available on the market could encourage some manufacturing companies to return to the United States. See Jeannie Kever, *Shale Gas Could Boost Other Industries*, COLUMBUS DISPATCH (Oct. 11, 2012, 5:59 AM), <http://www.dispatch.com/content/stories/business/2012/10/11/shale-gas-could-boost-other-industries.html> (“The shale-gas boom could cut costs significantly for the chemical industry and ultimately benefit the apparel, electronics, machinery and other industries.”).

⁵⁷ See Roben Farzad, *High Oil Prices Cut the Cost of Natural Gas*, BUS. WK. (Apr. 19, 2012), <http://www.businessweek.com/articles/2012-04-19/high-oil-prices-cut-the-cost-of-natural-gas> (stating that some drilling companies’ lines of credit are being lowered because the value of their proven reserves is down with the market price of natural gas); Clifford Krauss, *Economy’s Mixed Blessing: Commodity Prices Fall*, N.Y. TIMES (June 13, 2012), http://www.nytimes.com/2012/06/14/business/economy/weak-economys-mixed-blessing-falling-commodity-prices.html?pagewanted=all&_r=0 (reporting that the price for natural gas is about 50% less in 2012 than it was in 2011); *Natural Gas Prices Fall to 10-Year Low*, CBS NEWS (Apr. 11, 2012, 2:34 PM), http://www.cbsnews.com/8301-505123_162-57412539/natural-gas-prices-fall-to-10-year-low/ (noting that the excess supply of natural gas is driving prices down); *Oil Service Firms Brace for Drilling Slowdown*, BUS. WK. (June 18, 2012), <http://www.businessweek.com/ap/2012-06-18/oil-service-firms-brace-for-drilling->

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environmental effects of fracking combine to influence fracking regulations.⁵⁸

D. Approaches to Fracking Regulation

Currently, states regulate fracking because fracking is exempt from the federal Safe Drinking Water Act (“SDWA”).⁵⁹ Government officials likely tried to balance the important—and often competing—economic and environmental interests when they drafted fracking regulations.⁶⁰

slowdown (reporting industry analysts’ concerns about the natural gas supply growth). However, these concerns are countered by arguing that the excess natural gas should be exported to Europe and Asia where demand is high and supply is low. Sean Dixon, *Liquefied Natural Gas Exports and Export Facilities: A Statutory Framework*, A.B.A. TRENDS, July/Aug. 2012; Mark Scott, *The Big New Push to Export America’s Gas Bounty*, N.Y. TIMES (Oct. 23, 2012), <http://www.nytimes.com/2012/10/24/business/energy-environment/excelerate-energy-aims-to-be-a-leader-in-natural-gas.html>; see Michael A. Levi, *The Case for Natural Gas Exports*, N.Y. TIMES (Aug. 15, 2012), <http://www.nytimes.com/2012/08/16/opinion/the-case-for-natural-gas-exports.html> (arguing that having more natural gas and allowing it to be exported would reduce the influence that countries such as Russia and Iran wield on parts of the world). See generally Henry Chu, *Poland Dreams of Energy Independence – Through Fracking*, L.A. TIMES (July 15, 2012), <http://www.latimes.com/news/nationworld/world/la-fg-poland-fracking-20120715,0,6703189.story> (showing why Poland wants energy independence and what it is doing to accomplish this). Poland has enough natural gas to be energy independent for fifty years, which is an ever increasing need as Russia keeps flexing its muscles on the former U.S.S.R. *Id.* U.S. and Polish exports could reduce Russia’s influence on the region. *Id.* However, an alternative to exporting is producing vehicles that use natural gas or converting old vehicles to run on natural gas instead of gasoline. See Andrew Maykuth, *\$1M in Shale Money Coming to Phila. Region*, PHILLY.COM (May 18, 2013), http://articles.philly.com/2013-05-18/business/39338553_1_cng-vehicles-natural-gas-vehicles-grants (reporting that a suburban school district near Philadelphia, Pennsylvania would receive a subsidy to upgrade its current fleet of school buses and trucks to run on natural gas).

⁵⁸ See generally Steve Kastenbaum, *Fracking in New York: Risk vs. Reward*, CNN (May 2, 2012, 2:39 PM), <http://www.cnn.com/2012/03/09/us/new-york-fracking/index.html> (explaining that New York’s state government is weighing the economic benefits of fracking against the environmental concerns of fracking).

⁵⁹ 42 U.S.C. § 300h(d)(1) (2006). “The term ‘underground injection’ . . . excludes[:] (i) the underground injection of natural gas for purposes of storage; and (ii) 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.” *Id.*

⁶⁰ See Douglas L. Keene & Rita R. Handrich, *Hydrofracking & The Environment: Juror Attitudes, Beliefs, and Priorities*, JURY EXPERT, Sept./Oct. 2012, at 1, 2, available at http://www.thejuryexpert.com/wp-content/uploads/JuryExpert_1209_Hydrofracking.pdf (stating that the two competing interests for hydraulic fracturing involve economic and environmental issues); see also Dennis Jacobo, *Americans Still Prioritize Economic Growth Over Environment*, GALLUP ECON. (Mar. 29, 2012), <http://www.gallup.com/poll/153515/Americans-Prioritize-Economic-Growth-Environment.aspx> (finding that 49% of Americans favor economic growth over environmental protection and 41% favor environmental protection, which is a much smaller spread than polls from previous years).

First, Part II.D.1 discusses the evolution of federal fracking regulation.⁶¹ Second, Part II.D.2 explains the fracking bans that some states have enacted.⁶² Finally, Part II.D.3 explains the various state fracking chemical disclosure requirements.⁶³

1. From *LEAF* to the “Halliburton Exemption”

Natural gas drilling, like other drilling, has been subject to regulation for a while.⁶⁴ In 1974, Congress passed the SDWA to protect American drinking water from potential contaminants.⁶⁵ To accomplish this, the Environmental Protection Agency (“EPA”) established the Underground Injection Control (“UIC”) program, which prohibits endangering underground drinking water sources through “underground injection.”⁶⁶ Decades later, the EPA took the position that the SDWA did not apply to fracking because it interpreted the UIC to only apply to operations where the “principal function” was the injection of the fluids.⁶⁷ However, in 1997, the Eleventh Circuit in *Legal Environmental Assistance Foundation Inc. v. EPA* (“*LEAF*”) overruled this interpretation of the UIC and mandated the EPA to regulate fracking under the SDWA.⁶⁸

⁶¹ See *infra* Part II.D.1 (explaining this change in federal fracking regulation over the last forty years).

⁶² See *infra* Part II.D.2 (describing the individual state and multi-state regulatory agency bans on fracking).

⁶³ See *infra* Part II.D.3 (reviewing the laws and regulations that the states that allow fracking passed).

⁶⁴ Natural Gas Act, 15 U.S.C. § 717 (2006); *The History of Regulation*, NATURALGAS.ORG, <http://www.naturalgas.org/regulation/history.asp> (last visited Aug. 23, 2013); see *Fed. Power Comm’n v. Natural Gas Pipeline Co. of Am.*, 315 U.S. 575, 582–83 (1942) (upholding the constitutionality of the Natural Gas Act of 1938 for drilling companies that send natural gas across state lines).

⁶⁵ Safe Drinking Water Act of 1974, 42 U.S.C. § 300f (2006).

⁶⁶ See 40 C.F.R. § 144.3 (2012) (defining “well injection” as “the subsurface emplacement of fluids through a well”).

⁶⁷ *Legal Env’tl. Assistance Found., Inc. v. E.P.A.*, 118 F.3d 1467, 1471 (11th Cir. 1997). “EPA decided that methane gas production wells which are also used for hydraulic fracturing are not required to be regulated under the UIC programs because the principal function of these wells is not the underground emplacement of fluids; their principal function is methane gas production.” *Id.* This case involved an environmentalist group, the Legal Environmental Assistance Foundation (“LEAF”), filing a complaint to the EPA about contaminated drinking water near a methane coal bed in Alabama. *Id.* The EPA refused to regulate the Alabama mine, because it did not believe it was legally required under the UIC to regulate wells with a principle function of methane gas production, like those used in fracking. *Id.*

⁶⁸ See *id.* at 1478 (saying the EPA “must bow to the specific directives of Congress” and remanding the case to the EPA for reconsideration of whether Alabama’s UIC program should be withdrawn because Alabama failed to regulate fracking). Later, LEAF

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After the court's decision in *LEAF*, Congress acted to give the states regulatory power.⁶⁹ In 2005, with foreign dependence on oil increasing and the price of energy soaring, the idea of exempting fracking from the SDWA gained traction in the Capitol.⁷⁰ President Bush signed the Energy Policy Act of 2005 (colloquially referred to as the "Halliburton Exemption"), which explicitly exempts fracking—except for the injection of diesel—from federal regulation.⁷¹ Since then, members of Congress

challenged the EPA's determination that Alabama was in compliance with the SDWA. *Legal Envtl. Assistance Found., Inc. v. E.P.A.*, 276 F.3d 1253, 1254–55 (11th Cir. 2001). The court agreed with the EPA that Alabama's program "represents an effective program . . . to prevent underground injection which endangers drinking water sources." *Id.* at 1264–65 (citing 42 U.S.C. § 300(h)–4(a)). Federal courts also published other decisions that told the EPA that it had the job of ensuring that fracking did not contaminate drinking water. *See Natural Res. Def. Council, Inc. v. E.P.A.*, 907 F.2d 1146, 1149, 1165–66 (D.C. Cir. 1990) (holding that EPA rules regarding underground injection were valid except insofar as the EPA ignored its duty to regulate the disposal of hazardous waste in salt domes).

⁶⁹ *See* MARY TIEMANN & ADAM VANN, CONG. RESEARCH SERV., R41760, HYDRAULIC FRACTURING AND SAFE DRINKING WATER ACT REGULATORY ISSUES 20 (2013), available at <http://www.fas.org/sgp/crs/misc/R41760.pdf> (explaining that *LEAF* caused Congress to amend the SDWA).

⁷⁰ *See* Stephanie I. Cohen, *House Begins Debate on Energy Bill: President Calls on Congress to Pass Bill by August*, MARKETWATCH (Apr. 20, 2005, 2:21 PM), <http://www.marketwatch.com/story/house-begins-debate-on-energy-bill?siteid=mktw> (discussing reasons why House members considered a new energy bill).

⁷¹ Energy Policy Act of 2005, Pub. L. No. 109-58, § 322, 119 Stat. 594, 694 (2005). The exception reads:

Paragraph (1) of section 1421(d) of the Safe Drinking Water Act (42 U.S.C. 300h(d)) is amended to read as follows:

. . . The term 'underground injection'

. . . .

“(B) excludes—

“(i) the underground injection of natural gas for purposes of storage; and

“(ii) 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.”

Id. Although this exemption was included in the bill, at the time it was passed the more popular provisions of the bill dealt with the tax credits given to consumers who purchased more energy-efficient vehicles and make energy-conservation improvements to their homes. *Bush Signs Massive Energy Reform Bill*, FOX NEWS (Aug. 9, 2005), <http://www.foxnews.com/story/0,2933,165030,00.html>. However, the EPA recently began pushing to limit the exemption's authority given to the states. *See* Mark Drajem & Katarzyna Klimasinska, *EPA Shrinking 'Halliburton Loophole' Threatens Obama Gas Pledge*, BLOOMBERG (Jan. 31, 2012, 11:01 PM), <http://www.bloomberg.com/news/2012-02-01/epa-shrinking-halliburton-loophole-threatens-obama-gas-pledge.html> (discussing how the EPA wants to put tighter restrictions on how drilling companies can use diesel fuel); David Allen Hines, *The "Halliburton Loophole": Exemption of Hydraulic Fracturing Fluids from Regulation Under the Federal Safe Drinking Water Act*, INST. FOR ENERGY & ENVTL. RESEARCH FOR NORTHEASTERN PA. (Mar. 8, 2012), <http://energy.wilkes.edu/PDFFiles/Laws%20>

have introduced bills to repeal this exemption, but this proposed legislation has not gained much support.⁷² Fracking regulation is now exclusively controlled by each state.⁷³

and%20Regulations/Halliburton%20Loophole%20Essay%20Final.pdf (explaining the “Halliburton Loophole,” which prevents the EPA from regulating the underground injection of chemicals in fracking). This was called the “Halliburton Exemption” or “Halliburton Loophole” by critics of the bill because Vice President Richard Cheney led Halliburton Corporation (the largest supplier of fracking services) before running for Vice President. *Id.* Vice President Cheney also led a Special Energy Policy Task Force, and it is widely believed that the exemptions in the act were included based on Vice President Cheney’s recommendations in 2001. *Id.*

⁷² See S. 1135: FRAC Act, GOVTRACK, <http://www.govtrack.us/congress/bills/113/s1135> (last visited Aug. 23, 2013) (noting that the bill is unlikely to pass); see also Fracturing Responsibility and Awareness of Chemicals Act, S. 587, 112th Cong. (2011) (providing the language to a proposed federal regulation). The 2011 Fracturing Responsibility and Awareness of Chemicals Act (“FRAC Act”) was reintroduced on June 11, 2013, but it is also unlikely to pass. S. 1135: FRAC Act, *supra*. The FRAC Act would repeal the “Halliburton Exemption” and require:

- (1) state underground injection programs to direct a person conducting hydraulic fracturing operations to disclose to the state (or the Administrator if the Administrator has primary enforcement responsibility in such state) the chemicals intended for use in underground injections before the commencement of such operations and the chemicals actually used after the end of such operations; and
- (2) a state or the Administrator to make such disclosure available to the public.

S. 587: FRAC Act, GOVTRACK, <http://www.govtrack.us/congress/bills/112/s587> (last visited Aug. 8, 2012); see also Fracturing Responsibility and Awareness of Chemicals Act, H.R. 1084, 112th Cong. (2011) (including similar provisions as the one introduced by the Senate). President Obama pushed for additional regulations at the federal level, including the Bureau of Land Management proposal of a chemical disclosure rule for fracking on federal land, but nothing was passed. Oil and Gas; Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands, 77 Fed. Reg. 27691 (proposed May 11, 2012); see President Barack Obama, The 2012 State of the Union: An American Built to Last (Jan. 24, 2012), available at <http://www.whitehouse.gov/state-of-the-union-2012> (identifying that as President, he will not walk away from clean energy alternatives). See generally Miguel Llanos, *U.S. Wants ‘Fracking on Federal Lands to Disclose Chemicals*, NBC NEWS (May 4, 2012, 11:48 AM), http://usnews.nbcnews.com/_news/2012/05/04/11538271-us-wants-fracking-on-federal-lands-to-disclose-chemicals?lite; Ayesha Rascoe, *U.S. Proposes New Rules for Fracking on Federal Lands*, REUTERS (May 4, 2012, 5:35 PM), <http://www.reuters.com/article/2012/05/04/us-usa-fracking-regulations-idUSTRE84315N20120504>. Others in the President’s administration, such as Secretary of the Interior Ken Salazar, have criticized the states’ approach to fracking regulations. Balazs Koranyi, *U.S. Needs Federal Fracking Rules: Salazar*, REUTERS (June 25, 2012, 6:36 PM), <http://www.reuters.com/article/2012/06/25/us-energy-salazar-idUSBRE85O19Q20120625>. Secretary Salazar believes that there should be more federal control over the fracking process. *Id.*

⁷³ Rebecca Jo Reser & David T. Ritter, *State and Federal Legislation and Regulation of Hydraulic Fracturing*, ADVOC., Winter 2011, at 31, 32. The EPA announced, on November 23, 2011, that it would regulate chemical disclosure under the Toxic Substances Control Act, 15 U.S.C. § 2607. Letter from Stephen A. Owens, Assistant Adm’r, U.S. Evtl. Prot. Agency, to Deborah Goldberg, Earthjustice (Nov. 23, 2011), available at <http://www.epa>.

2. States That Do Not Allow Fracking

Some states do not allow fracking, such as Vermont, which is the first and only state to statutorily ban fracking.⁷⁴ North Carolina has a

gov/oppt/chemtest/pubs/EPA-Letter-to-Earthjustice-on-TSCA-Petition.pdf. However, it is unclear what these regulations would look like, and the EPA has not acted upon this letter to environmentalists. See Furlow & Hays, *supra* note 19, at 345 (voicing concerns about whether Stephen Owen's claims in his letter will become reality).

⁷⁴ VT. STAT. ANN. tit. 29, § 571 (West, WestlawNext through laws of the adjourned sess. of the 2011-2012 Vt. Gen. Assemb.); *Vermont Becomes First State to Ban Fracking*, FOX NEWS (May 17, 2012), <http://www.foxnews.com/politics/2012/05/17/vermont-becomes-first-state-to-ban-fracking/>; *Vermont Fracking Ban: Green Mountain State Is First in U.S. to Restrict Gas Drilling Technique*, HUFFINGTON POST (May 18, 2012, 11:27 AM), http://www.huffingtonpost.com/2012/05/17/vermont-fracking-ban-first_n_1522098.html. However, Vermont does not have any known natural gas, so this law is more of a statement and will not have any practical effect on the industry. *Vermont Fracking Ban: Green Mountain State Is First in U.S. to Restrict Gas Drilling Technique, supra*. However, some cities, such as Buffalo, New York and Pittsburgh, Pennsylvania, have banned fracking in a similarly symbolic manner. Scott Detrow, *Is Pittsburgh's Fracking Ban Hurting Business?*, STATEIMPACT (May 25, 2012, 11:05 AM), <http://stateimpact.npr.org/pennsylvania/2012/05/25/is-pittsburghs-drilling-ban-hurting-business/>; Daniel Trotta & Edith Honan, *Buffalo, N.Y. Bans Hydraulic Fracturing*, REUTERS (Feb. 8, 2011, 6:12 PM), <http://www.reuters.com/article/2011/02/08/us-energy-natgas-usa-buffalo-idUSN0810753020110208>. However, some states, such as Ohio and Pennsylvania, passed laws that municipalities fear took away the municipal control over fracking safety. See Pamela Engel, *Activists Push Local Control of 'Fracking'*, COLUMBUS DISPATCH (Sept. 8, 2012, 4:57 AM), <http://www.dispatch.com/content/stories/local/2012/09/08/activists-push-local-control-of-fracking.html> (reporting an activist group's push to prevent Ohio from regulating fracking within the state); see also *Robinson Twp. v. Pennsylvania*, 52 A.3d 463, 484 (Pa. Commw. Ct. 2012) (declaring the part of Pennsylvania's fracking law that takes control away from municipalities unconstitutional), *aff'd and rev'd in part*, *Robinson Twp., Washington Cnty. v. Pennsylvania*, 2013 WL 6687290 (Pa. 2013).

In this case, by requiring municipalities to violate their comprehensive plans for growth and development, 58 Pa. C.S § 3304 violates substantive due process because it does not protect the interests of neighboring property owners from harm, alters the character of neighborhoods and makes irrational classifications—irrational because it requires municipalities to allow all zones, drilling operations and impoundments, gas compressor stations, storage and use of explosives in all zoning districts, and applies industrial criteria to restrictions on height of structures, screening and fencing, lighting and noise.

Id. at 484 (footnote omitted). However, the dissent said:

Section 3304 of Act 13 is a valid exercise of the police power. The law promotes the health, safety, and welfare of all Pennsylvanians by establishing zoning guidance to local municipalities that ensures the uniform and optimal development of oil and gas resources in this Commonwealth. Its provisions strike a balance both by providing for the harvesting of those natural resources, wherever they are found, and by restricting oil and gas operations based on (a) type, (b) location, and (c) noise level.

current ban on drilling procedures that “unreasonably vary from the vertical.”⁷⁵ This was amended to possibly allow fracking to begin as early as 2014, but this still amounts to, at a minimum, a temporary ban on fracking until 2014.⁷⁶

Similarly, the New Jersey legislature attempted to ban fracking; however, New Jersey Governor Chris Christie vetoed a bill that would have done so.⁷⁷ Governor Christie did however approve a temporary ban on fracking, but this ban expired in January of 2013.⁷⁸ Similarly,

Id. at 497 (Brobson, J., dissenting). Like Vermont, a few foreign nations, such as France and Bulgaria, completely ban fracking. Katarzyna Klimasinska, *European Fracking Bans Open Market for U.S. Gas Exports*, BLOOMBERG (May 23, 2012, 10:39 AM), <http://www.bloomberg.com/news/2012-05-23/european-fracking-bans-open-market-for-u-s-gas-exports-1-.html>. *But see* Chu, *supra* note 57 (discussing Poland’s embrace of fracking as a way to lessen Russia’s control over the region).

⁷⁵ N.C. GEN. STAT. ANN. § 113-393(d) (West, WestlawNext through S.L. 2013-128, 130-144 of the 2013 Reg. Sess.). *See generally* Robert Bradley Jr., *A North Carolina Politician Commits a Happy Fracking Blunder*, FORBES (July 18, 2012, 2:57 PM), <http://www.forbes.com/sites/robertbradley/2012/07/18/a-north-carolina-politician-commits-a-happy-fracking-blunder/> (explaining the benefits for North Carolina and how the law was eventually passed).

⁷⁶ 2012 N.C. Sess. Laws 143. After the bill passed both houses of the state legislature, Governor Beverly Perdue vetoed the bill because she believed it “d[id] not do enough to ensure that adequate protections for [the] drinking water, landowners, county and municipal governments, and the health and safety of [North Carolina] families w[ould] be in place before fracking beg[an].” Jake Seaton, *NC Lawmakers Override Perdue’s Veto of Fracking Bill*, NBC-17 (July 2, 2012, 12:38 PM), <http://www.wncn.com/story/20947952/nc-lawmakers-override-perdues-veto-of-fracking-bill>. However, both the House and Senate mustered the required three-fifths majority to override her veto. *Id.*

⁷⁷ Letter from Chris Christie, Governor of N.J., to the N.J. General Assembly (Sept. 24, 2012), available at http://www.state.nj.us/governor/news/news/552012/pdf/20120921a_A-575AV.pdf; *see* Terrence Dopp, *N.J. Fracking Opponents Take Second Shot at Ban Christie Vetoed*, BLOOMBERG (Feb. 6, 2012, 1:08 PM), <http://www.bloomberg.com/news/2012-02-06/new-jersey-fracking-opponents-take-second-shot-at-ban-after-christie-veto.html> (explaining that the New Jersey legislature would have a second chance at prohibiting fracking following Governor Christie’s veto on a prior ban).

⁷⁸ 2011 N.J. Laws 194; *New Jersey Fracking Ban: Gov. Chris Christie’s 1-Year Recommendation Accepted by Lawmakers*, HUFFINGTON POST (Jan. 10, 2012, 10:56 AM), http://www.huffingtonpost.com/2012/01/10/new-jersey-fracking-ban-chris-christie_n_1197075.html; James Osborne, *N.J. Fracking Moratorium Expires*, PHILLY.COM (Jan. 19, 2013), http://articles.philly.com/2013-01-19/news/36417781_1_cheaper-gas-gas-prices-moratorium. This really does not mean very much because, similar to Vermont, there is very little natural gas in New Jersey. ANGA *Statement on New Jersey Legislature Vote to Ban Hydraulic Fracturing*, PR NEWSWIRE (June 30, 2011), <http://www.prnewswire.com/news-releases/anga-statement-on-new-jersey-legislature-vote-to-ban-hydraulic-fracturing-124812839.html>. However, local governments in the state can ban the procedure; for instance, Middlesex County, New Jersey banned fracking. Bob Makin, *Middlesex First County in State to Ban Fracking*, MYCENTRALJERSEY.COM (Dec. 21, 2013), <http://www.mycentraljersey.com/article/20131220/NJNEWS/312200043/>. Additionally, most of the shale in New Jersey is in the Delaware River Watershed, which is governed by the federal and inter-state regulatory agency, the Delaware River Basin Commission (“DRBC”). Delaware River

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New York currently has a moratorium on shale gas extraction.⁷⁹ Yet, unlike New Jersey and Vermont, New York has vast natural gas resources.⁸⁰ Also, the Delaware River Basin Commission currently prohibits fracking along the Delaware River, where there are large reserves of natural gas; this restriction prohibits drilling in parts of Delaware, New Jersey, New York, and Pennsylvania regardless of these individual states' laws.⁸¹

Basin Compact, Pub. L. No. 87-328, 75 Stat. 688 (1961). Both houses of the legislature re-introduced bills to ban fracking, which are still going through committees and hearings. Assemb. 567, 215th Leg., Reg. Sess. (N.J. 2012); S. 246 215th Leg., Reg. Sess. (N.J. 2012).

⁷⁹ See *New York To Allow Fracking; State To Provide Guidelines After Labor Day*, HUFFINGTON POST (Aug. 20, 2012, 12:50 PM), http://www.huffingtonpost.com/2012/08/20/new-york-allow-fracking-state-guidelines-labor-day_n_1810158.html (reporting that New York's ban on fracking, enacted in 2008, may be lifted soon); see also Anna Driver, *New Jersey Issues One-Year Moratorium on Fracking*, REUTERS (Aug. 25, 2011, 3:51 PM), <http://www.reuters.com/article/2011/08/25/us-shale-newjersey-idUSTRE77O6VN20110825> (reporting on New Jersey's temporary moratorium on fracking). The DRBC derives its power to control the Delaware River Watershed from the Delaware River Basin Compact. Delaware River Basin Compact, Pub. L. No. 87-328, 75 Stat. 688 (1961); *Natural Gas Drilling Index Page*, DEL. RIVER BASIN COMMISSION, <http://www.nj.gov/drbc/programs/natural/> (last visited Aug. 23, 2013). The DRBC has five voting members: one member from each of the four states—the governors of Pennsylvania, New Jersey, New York, and Delaware—and one representative of the federal agencies, appointed by the President of the United States. §§ 2.1–2.2, 5.1(d), 75 Stat. 688, 691, 714.

⁸⁰ *The Future – New York's Remaining Natural Gas and Oil Resource Potential*, N.Y. DEPARTMENT OF ENVTL. CONSERVATION, http://www.dec.ny.gov/docs/materials_minerals_pdf/nyserda4.pdf (last visited Aug. 13, 2013). Like New York, the United Kingdom has large quantities of natural gas and is also under a temporary ban on fracking. See Duncan Geere, *Britain Relaxes Fracking Ban*, WIRED (Apr. 17, 2012), <http://www.wired.co.uk/news/archive/2012-04/17/britain-fracking> (discussing that the British government is considering to lift the temporary ban); see also Black, *supra* note 36 (identifying that tighter regulations would be needed if the government chooses to move forward with shale gas extraction); Nick Collins, *Fracking Should Go Ahead in Britain, Report Says*, TELEGRAPH (June 29, 2012, 7:30 AM), <http://www.telegraph.co.uk/science/science-news/9362608/Fracking-should-go-ahead-in-Britain-report-says.html> (recognizing that a government report in Britain revealed that the risks associated with fracking are minimal).

⁸¹ See Jon Hurdle, *Fracking Critics Urge Officials to Block Delaware Basin Gas Development*, WDDE (Nov. 14, 2011), <http://www.wdde.org/19762-gas-fracking-critics-Delaware> (explaining why a fracking ban remains and why this matters). This mostly affects the gas-rich regions in northeastern Pennsylvania and southeastern New York. See *Natural Gas Drilling Index Page*, *supra* note 79 (discussing the Delaware River Basin in these parts). Many believe that the Republican Governors from Pennsylvania and New Jersey supported lifting the ban, while the Democratic Governors of New York and Delaware favored the continuation of the moratorium; however, the Army Corps of Engineers' position remains unknown. Hurdle, *supra*. Ultimately, the official vote never occurred and remains postponed indefinitely. *Key Delaware River Gas Drilling Vote Postponed*, WALL ST. J. (Nov. 18, 2011, 5:41 PM), <http://online.wsj.com/article/APa11d7405f6524fcaba568158a09764df.html>.

3. States that Allow Fracking but Have Rules “Requiring” Chemical Disclosure

Currently, sixteen states have laws that require the disclosure of at least some information about the chemicals in frac fluid.⁸² These rules vary according to the degree of specificity in what companies must disclose along with the trade secret exemptions.⁸³ Colorado requires the most detailed disclosure of information by requiring companies to identify each ingredient intentionally added to frac fluid by its Chemical Abstracts Services (“CAS”) number, disclose the maximum concentration of each ingredient in the fluid, identify its trade name, and provide a description of its intended use or function.⁸⁴ West Virginia requires the least amount of information, only requiring that the company disclose a list of the additives used before and after the drilling process and not requiring disclosure of the additive volumes.⁸⁵ Other states fall in between the two extremes, such as Louisiana, which only requires companies to disclose the CAS numbers and maximum concentrations for ingredients deemed hazardous under the Occupational Safety and Health Administration (“OSHA”).⁸⁶ Yet others,

⁸² See 225 ILL. COMP. STAT. ANN. 732/1-77 (West, WestlawNext through P.A. 98-121 of the 2013 Reg. Sess.) (requiring chemical disclosure for fracking operations starting June 17, 2013); BRANDON J. MURRILL & ADAM VANN, CONG. RESEARCH SERV., R42461, HYDRAULIC FRACTURING: CHEMICAL DISCLOSURE REQUIREMENTS 4 (2012), available at <http://www.fas.org/sgp/crs/misc/R42461.pdf> (summarizing the various state chemical disclosure regulations); see also Zachary Lees, Note, *Anticipated Harm, Precautionary Regulation and Hydraulic Fracturing*, 13 VT. J. ENVTL. L. 575, 583, 592, 604 (2012) (explaining that chemical disclosure laws are one of the precautionary types of hydraulic fracturing regulatory schemes). Chemical disclosure is a precautionary regulation, which is one of two legal responses described by Zachary Lees, to an uncertain probability of harm posed by fracking (i.e. precautionary approach or anticipatory nuisance). *Id.* at 583–604.

⁸³ See BRANDON J. MURRILL & ADAM VANN, CONG. RESEARCH SERV., R42461, HYDRAULIC FRACTURING: CHEMICAL DISCLOSURE REQUIREMENTS 4 (2012), available at <http://www.fas.org/sgp/crs/misc/R42461.pdf> (summarizing the various state chemical disclosure regulations).

⁸⁴ COLO. CODE REGS. §§ 404-1:205Ab(2)A(ix)–(xii) (2013)). However, Colorado does not require parties to link the ingredients to the additive that they compose. See *id.* §§ 404-1:205Ab(2)A) (demonstrating the omission of such a disclosure requirement).

⁸⁵ W. VA. CODE ANN. § 22-6A-7(e)(5) (West, WestlawNext through 2012 First Extraordinary Sess.). This is not the only type of weak disclosure, as other types of information generally provide low levels of disclosure such as additive type, trade name, additive vendor, or volume of additive. BRANDON J. MURRILL & ADAM VANN, CONG. RESEARCH SERV., R42461, HYDRAULIC FRACTURING: CHEMICAL DISCLOSURE REQUIREMENTS 6 n.38 (2012), available at <http://www.fas.org/sgp/crs/misc/R42461.pdf>.

⁸⁶ LA. ADMIN. CODE tit. 43, § 118(d)(C)(1)(d)–(e) (West, WestlawNext through rules published in the Louisiana Register dated June 20, 2013). Companies must disclose “ingredients contained in the hydraulic fracturing fluid that are subject to the requirements of 29 CFR [§] 1910.1200(g)(2).” *Id.* § 118C1d.

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such as Michigan and New Mexico, require submitting Material Safety Data Sheets (“MSDS”) for chemical ingredients in the frac fluid.⁸⁷ The most detailed information disclosed on the MSDS is the name of hazardous chemicals.⁸⁸

Others, such as Ohio, require the trade name, total amount used, and the supplier of all products, fluids, or substances “intentionally added to facilitate the drilling of any portion of the well.”⁸⁹ Oklahoma, on the other hand, mandates disclosure of the total volume and type of base fluid, CAS numbers, and maximum concentrations of ingredients intentionally added.⁹⁰ Texas requires companies to disclose the CAS numbers, maximum concentrations of hazardous ingredients in the frac fluid, and the CAS numbers for non-hazardous chemicals intentionally added to the frac fluid, while other states only seek disclosure of items listed on the FracFocus.org form.⁹¹ Before drilling takes place, Illinois mandates disclosure of the base fluid used, all additives used, and the

⁸⁷ 29 C.F.R. § 1910.1200(g)(2) (2012); N.M. CODE R. § 19.15.16.19(B) (LexisNexis, Lexis Advance through New Mexico Register, Vol. XXIV, No. 22 dated November 27, 2013); MICH. DEP’T OF ENVTL. QUALITY, SUPERVISOR OF WELLS INSTRUCTION 1-2011: HIGH VOLUME HYDRAULIC FRACTURING WELL COMPLETIONS 3 (2011), available at http://www.michigan.gov/documents/deq/SI_1-2011_353936_7.pdf.

⁸⁸ See 29 C.F.R. § 1910.1200(g) (requiring the preparer of the Material Safety Data Sheet (“MSDS”) to identify hazardous chemicals under OSHA’s Hazard Communication requirements). MSDSs only provide information on chemicals considered to be “hazardous” under OSHA’s Hazard Communication requirements. *Id.* § 1910.1200(a)(1). However, OSHA recently altered the Hazard Communication requirements to require more detailed information be disclosed on safety data sheets beginning June 1, 2015. *Id.* § 1910.1200(j)(2).

⁸⁹ OHIO REV. CODE ANN. § 1509.10(A)(9)(a) (West, WestlawNext through files 24, 26-38 of the 130th Gen. Assemb.).

⁹⁰ OKLA. ADMIN. CODE § 165:10-3-10(b)(1)(H) (West, WestlawNext through rules published in Vol. 30, No. 21 of the Okla. Reg.).

⁹¹ 16 TEX. ADMIN. CODE § 3.29(c) (West, WestlawNext through Aug. 31, 2013) (stating that what is hazardous is defined by OSHA’s Hazard Communications requirements of 29 C.F.R. § 1910.1200); see N.D. ADMIN. CODE 43-02-03-27.1(1)(g) (West, WestlawNext through Supplement 347 (Jan. 2013)) (requiring the drilling companies post all required information that is made available to the public on the FracFocus website); 58 PA. CONS. STAT. ANN. § 3222.1(b)(2) (West, WestlawNext through end of 2012 Reg. Sess.) (requiring that “the operator of the well . . . complete the chemical disclosure registry form and post the form”). The FracFocus Chemical Disclosure Registry requests the following information: the trade name, supplier, and purpose; the ingredients; the CAS number; and the maximum concentrations in the frac fluid. *Find a Well*, FRACFOCUS CHEMICAL DISCLOSURE REGISTRY, <http://www.fracfocusdata.org/DisclosureSearch/StandardSearch.aspx> (last visited Jan. 10, 2014); see Benjamin Haas et al., *Fracking Hazards Obscured in Failure to Disclose Wells*, BLOOMBERG (Aug. 14, 2012, 5:26 PM), <http://www.bloomberg.com/news/2012-08-14/fracking-hazards-obscured-in-failure-to-disclose-wells.html> (explaining the problems associated with posting information on FracFocus.org).

names and CAS numbers of all chemicals used.⁹² However, some states vary on the level of disclosure required based upon when the information is submitted.⁹³

However, companies can avoid disclosure altogether if the chemical mixture is a trade secret, if the vendor does not disclose the chemicals, or if the chemicals are not intentionally added to the frac fluid.⁹⁴ The Supreme Court held that trade secrets are property under the Constitution, and a “taking” of this property requires just compensation.⁹⁵ However, if a company knows the conditions of

⁹² 225 ILL. COMP. STAT. ANN. 732/1-77(c)(2) (West, WestlawNext through P.A. 98-121 of the 2013 Reg. Sess.)

⁹³ See 178.00.1-B-19 ARK. CODE R. § (k)(7)-(8), (l)(3)-(4) (LexisNexis, Lexis Advance through Nov. 6, 2013) (stating the requirements before fracking include: a list of additives, names, and CAS numbers of ingredients used in the fracking fluid, whereas the requirements after fracking encompass: types and volumes of fluid and proppant used; name and type of additives; names and CAS numbers of ingredients added to the frac fluid; and actual additive concentrations in the fluid); IDAHO ADMIN. CODE r. 20.07.02.056.01.05 (West, WestlawNext through Feb. 6, 2013) (noting that before fracking a person must disclose: chemical additives, proppants, and concentrations or rates proposed to be mixed and injected, including type, name, and CAS number of additives and “[t]he formulary disclosure of the chemical compounds used in the well,” while the requirements after fracking include: well stimulation service contractor’s job log, continuous record of the annulus pressure, and post-treatment fluid analysis); MONT. ADMIN. R. 36.22.608(3), 36.22.1015 (West, WestlawNext through Issue 18 of the 2012 Mont. Admin. Reg.) (requiring before fracking the following: “an estimated total volume of treatment to be used; . . . trade name or generic name of the principal components or chemicals; . . . [and] the estimated amount or volume of the principal components, . . . [and] inert substances,” whereas the requirements after fracking include: types of additives used and their concentrations in the fluid; types of treatment pumped and their maximum pressure; and names and CAS numbers of the chemicals); WYO. CODE R. Ch. 3 § 45(d), (h) (LexisNexis, Lexis Advance through Dec. 2, 2012) (stating that before fracking an owner or operator must disclose: “the chemical additives, compounds and concentrations or rates proposed to be mixed and injected” and identifying that the requirements after fracking include: the total volume of pumped fluid and the “actual chemical additive name, type, concentration or rate, and amounts”).

⁹⁴ See, e.g., COLO. CODE REGS. § 404-1:205A(c)(1)-(2) (2013) (stating that the components of frac fluid not intentionally added or disclosed by the vendor do not have to be disclosed); Sarah K. Adair et al., *Considering Shale Gas Extraction in North Carolina: Lessons from Other States*, 22 DUKE ENVTL. L. & POL’Y F. 257, 269-71 (2012) (looking at other states’ successes and failures to see which provisions should be considered by North Carolina).

⁹⁵ *Ruckelshaus v. Monsanto Co.*, 467 U.S. 985, 1020 (1984); see *Penn Cent. Transp. Co. v. N.Y.C.*, 438 U.S. 104, 124 (1978) (noting the factors to consider in determining whether a regulation constitutes a taking). The factors to consider are the following: the character of the governmental action, its economic impact, and its interference with reasonable investment-backed expectations. *Id.* at 124. “A ‘taking’ may more readily be found when the interference with property can be characterized as a physical invasion by government, than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good.” *Id.* (citation omitted); see U.S. CONST. amend. V (“[N]or shall private property be taken for public use, without just

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submission and the conditions are “rationally related to a legitimate Government interest,” a voluntary disclosure in exchange for the “economic advantages of a registration” prevents it from being considered a taking.⁹⁶ If the legislative interest is public health, the regulation must promote public health.⁹⁷ The government conditions attached to relinquishing property must have a reasonable relationship to the benefit.⁹⁸ Companies contend the protections are necessary to remain competitive in the industry.⁹⁹

These fracking law exemptions vary.¹⁰⁰ Some states used the Uniform Trade Secrets Act’s (“UTSA”) and *Restatement (First) of Torts’*

compensation”). See generally Holli Brown, *The Attack on Frack: New York's Moratorium on Hydraulic Fracturing and Where It Stands in the Threat of Takings*, 41 ENVTL. L. REP. 11146 (2011) (explaining the arguments on both sides of the debate and concluding that the regulations do not seem like takings that require compensation).

⁹⁶ See *Monsanto*, 467 U.S. at 1007 (holding that safety data sheets voluntarily given to the EPA in exchange for registration is not a taking that requires just compensation); see also *Andrus v. Allard*, 444 U.S. 51, 67–68 (1979) (quoting *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 422 (1922) (Brandeis, J., dissenting)) (stating that “the advantage of living and doing business in a civilized community” may require the relinquishment of some Constitutional rights). *Monsanto* involved the EPA’s requirement that companies disclose certain information that would eventually be available to the public in exchange for a permit to produce the pesticides. *Monsanto*, 467 U.S. at 990. The court weighed the interests using the *Penn Central* factors and determined that the interest in public safety and the history of pesticide production regulations outweighed the company’s interests. *Id.* at 1005–08. The Court held in *Andrus* that the prohibition of commercial transactions in preexisting avian artifacts under the Eagle Protection Act and the Migratory Bird Treaty Act does not violate the Fifth Amendment Takings Clause. *Andrus*, 444 U.S. at 65–68. The Court held in *Pa. Coal Co. v. Mahon* that whether a regulatory act constitutes a taking requiring compensation depends upon the extent of the resulting decrease in the value of the property. 260 U.S. 393, 416 (1922). Justice Brandeis, in his dissenting opinion, argued that the diminution-of-value test presented by the majority is flawed because value is inherently relative and cannot be determined by a court of law. *Id.* at 419 (Brandeis, J., dissenting).

⁹⁷ See *Philip Morris, Inc. v. Reilly*, 312 F.3d 24, 44 (1st Cir. 2002) (saying that while the state claimed to enact the regulation to promote public health, this court was unconvinced that the regulation was tailored to such interest). *Reilly* involved a requirement that tobacco companies disclose certain information about their products in order to sell in Massachusetts. *Id.* at 50. The court found this to be an unconstitutional condition because the publishing of the information to the public was not necessary to further the state’s interests. *Id.* at 45.

⁹⁸ E.g., *Dolan v. City of Tigard*, 512 U.S. 374, 395 (1994); *Nollan v. Cal. Coastal Comm’n*, 483 U.S. 825, 841 (1987).

⁹⁹ See Steve Hargreaves, *Obama Administration Tightens Fracking Rules*, CNN MONEY (May 4, 2012, 12:25 PM), http://money.cnn.com/2012/05/04/news/economy/fracking_rules/index.htm (reporting companies’ concerns that “disclosure [of chemical information] would harm their competitive advantage”).

¹⁰⁰ Compare W. VA. CODE ANN. § 22-6A-7 (West, WestlawNext through laws of the 2013 First Extraordinary Sess.) (remaining silent about trade secret protections), with 16 TEX. ADMIN. CODE § 3.29(a)(26) (West, WestlawNext through Jan. 31, 2013) (setting out, specifically, the state’s trade secrets exemptions).

definitions of trade secrets.¹⁰¹ Arkansas provides a procedure whereby the company can request trade secret protection by submitting the chemical family of the additive to the state, and the state will keep the identity of the chemical family confidential if the additive in question would require disclosure of a trade secret under federal law.¹⁰² Colorado allows companies to designate and withhold information as a trade secret, but the company must disclose the chemical family (or similar descriptor) to the state.¹⁰³ Some states provide protections to the extent of their open records laws.¹⁰⁴ Louisiana specifically allows the chemical

¹⁰¹ See UNIF. TRADE SECRETS ACT § 1(4) (1985) (defining the term “[t]rade secret”). A trade secret is:

information, including a formula, pattern, compilation, program, device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

Id.; see also 16 TEX. ADMIN. CODE § 3.29(a)(26) (defining “trade secret” “in accordance with the definition . . . [used] in the Restatement of Torts, Comment B to Section 757 (1939)”); RESTATEMENT (FIRST) OF TORTS § 757 cmt. b (1939) (defining a trade secret, which is the definition that Texas adopted for its fracking law).

¹⁰² 178.00.1-B-19 ARK. CODE R. § (1)(3)(C) (LexisNexis, Lexis Advance through Nov. 6, 2013); see 42 U.S.C. § 11042(b) (2006) (stating the trade secret factors). The following are the factors to consider when defining an additive as a trade secret:

(1) Such person has not disclosed the information to any other person, other than a member of a local emergency planning committee, an officer or employee of the United States or a State or local government, an employee of such person, or a person who is bound by a confidentiality agreement, and such person has taken reasonable measures to protect the confidentiality of such information and intends to continue to take such measures[;] (2) [t]he information is not required to be disclosed, or otherwise made available, to the public under any other Federal or State law[;] (3) [d]isclosure of the information is likely to cause substantial harm to the competitive position of such person[;] (4) [t]he chemical identity is not readily discoverable through reverse engineering.

Id.

¹⁰³ See COLO. CODE REGS. § 404-1:205(d) (2013).

¹⁰⁴ See IDAHO CODE ANN. § 9-340D(1) (West, WestlawNext through end of 2012 2d Reg. Sess. of the 61st Leg.) (protecting information if it provides “independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use; and . . . [i]s the subject of efforts that are reasonable under the circumstances to maintain its secrecy”); IDAHO ADMIN CODE r. 20.07.02.006 (West, WestlawNext through Feb. 6, 2013) (requiring the submitted information be kept confidential to the extent of the state’s open records law); see also TEX. GOV’T CODE ANN. §§ 552.001-.353 (outlining Texas’s Open Records Law); WYO. STAT. ANN. § 16-4-203(d)(v) (West, WestlawNext through 2012 Budget Sess.) (providing that “[t]rade secrets, privileged information and confidential

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identities and CAS numbers to be withheld if the companies identify them as trade secrets or if they fall under OSHA's trade secret protections for employers; however, companies must still disclose the chemical family.¹⁰⁵ Montana allows companies to withhold identifying chemicals if these chemicals qualify as trade secrets but requires companies to identify the trade secret chemical "by trade name, inventory name, chemical family name, or other unique name and the quantity . . . used."¹⁰⁶ Illinois is the least protective of trade secrets, requiring drilling companies to supply the Illinois Department of Natural Resources with both redacted and un-redacted copies of the lists of chemicals used, while other states have very broad trade secret exemptions.¹⁰⁷ In a different vein, Ohio and Texas provide methods for

commercial, financial, geological or geophysical data furnished by or obtained from any person" are protected from public disclosure); 16 TEX. ADMIN. CODE § 3.29(c)(1)(B) (providing protection pursuant to Texas's Open Records Law); WYO. CODE R. Ch. 3 § 45(f) (LexisNexis, Lexis Advance through Dec. 2, 2012) (stating that the permit application must include information "justifying and documenting the nature and extent of the proprietary information, [and] confidentiality protection shall be provided consistent with . . . the Wyoming Public Records Act").

¹⁰⁵ LA. ADMIN. CODE tit. 43, § 118(C)(2)(a) (West, WestlawNext through rules published in the La. Reg. dated Nov. 20, 2012); see 29 C.F.R. § 1910.1200(i) (2013) (setting out OSHA's trade secret protections for employers).

¹⁰⁶ MONT. ADMIN. R. 36.22.1016(1) (West, WestlawNext through Issue 12 of the 2013 Mont. Admin. Reg.).

¹⁰⁷ 225 ILL. COMP. STAT. ANN. 732/1-77(f) (West, WestlawNext through P.A. 98-121 of the 2013 Reg. Sess.); see N.M. CODE R. § 19.15.16.19(B) (LexisNexis, Lexis Advance through New Mexico Register, Vol. XXIV, No. 22 dated November 27, 2013) (exempting "the reporting or disclosure of proprietary, trade secret or confidential business information"); N.D. ADMIN. CODE 43-02-03-27.1(1)(g) (West, WestlawNext through Supplement 347 (Jan. 2013)) (giving as much protection as FracFocus.org allows); OKLA. ADMIN. CODE § 165:10-3-10(b)(4) (West, WestlawNext through rules published in Vol. 30, No. 9 of the Okla. Reg.) (allowing companies to withhold chemical information "in good faith" if it is a trade secret under the Uniform Trade Secrets Act ("UTSA") but retaining the right to require a written explanation of why this information is a trade secret); *Website Terms and Conditions of Use, FRACFOCUS CHEMICAL DISCLOSURE REGISTRY*, <http://fracfocus.org/terms-of-use> (last visited Aug. 23, 2013) (recognizing the "restrictions placed on the disclosure of the makeup of these products by suppliers to protect trade secrets if these products have been and will be handled consistent with 29 C.F.R. § 1910.1200(i) and Appendix D, and have been denoted as proprietary, trade secret or confidential business information on the product's MSDS"). See generally OKLA. STAT. tit. 78, §§ 85-94 (West, WestlawNext through Chapter 370 of the Second Reg. Sess. Of 53rd Leg.) (codifying the UTSA definition of trade secrets as Oklahoma's law); UNIF. TRADE SECRETS ACT § 1(4) (1985) (defining the term "trade secret"). Fracking critics still claim that states with even stricter requirements, such as Texas, allow companies to retain too many of the chemicals as trade secrets. See Ben Elgin et al., *Fracking Secrets by Thousands Keep U.S. Clueless on Wells*, BLOOMBERG (Nov. 30, 2012, 11:01 PM), <http://www.bloomberg.com/news/2012-11-30/frack-secrets-by-thousands-keep-u-s-clueless-on-wells.html> (reporting industry critics' fears that the Texas law requiring disclosure is meaningless because of the amount of chemical information that companies can avoid disclosing by claiming the ingredients as a trade secret).

certain specified interested parties to challenge a companies' claim that their formulas are trade secrets.¹⁰⁸

However, some states remove the trade secret exemption in emergencies where state or federal law would require disclosure to a health professional, doctor, or nurse.¹⁰⁹ Other states remove the trade secret exemption only in an emergency situation.¹¹⁰ Even in the direst scenario, medical workers given the information must sign a confidentiality agreement agreeing not to disclose the information to the

¹⁰⁸ See OHIO REV. CODE ANN. § 1509.10(I)(2) (West, WestlawNext through files 47 of the 130th Gen. Assemb.) (allowing “[a] property owner, an adjacent property owner, or any person or agency of this state having an interest that is or may be adversely affected” to challenge the trade secret designation in the Franklin County Court of Common Pleas); 16 TEX. ADMIN. CODE § 3.29(f)(1) (West, WestlawNext through Aug. 31, 2013) (allowing “[a] landowner on whose property the relevant wellhead is located; . . . the landowner who owns real property adjacent to property [containing] . . . the relevant wellhead; or . . . a department or agency of th[e] state with jurisdiction over a matter to which the claimed trade secret information is relevant” to file a challenge with the Railroad Commission of Texas, which will forward the request to the state attorney general if filed within the requisite twenty-four-month period). However, the Texas attorney general must petition a court to grant injunctive relief. See, e.g., 10 TEX. BUS. & COM. CODE § 301.102(a) (West, WestlawNext through the end of the 2011 Reg. Sess. and 1st called sess. of the 83rd leg.) (requiring the attorney general’s office to petition a district court for a restraining order in other areas of the law, which shows the attorney general lacks this power). Additionally, Ohio only allows the challenge in the central Franklin County, even though significant drilling takes place in the southeastern region of the state. *But cf.* MATTHEW MCFEELEY, NATURAL RES. DEF. COUNCIL, STATE HYDRAULIC FRACTURING DISCLOSURE RULES AND ENFORCEMENT: A COMPARISON 13 (2013), available at <http://www.nrdc.org/energy/files/Fracking-Disclosure-IB.pdf> (explaining and criticizing the Texas trade secret challenge procedure). See generally *Fracking Comes to SE Ohio*, MARIETTA TIMES (June 4, 2011), <http://www.mariettatimes.com/page/content.detail/id/536486/Fracking-c>. Although not about chemical disclosure, any adversely affected persons—including environmental groups—in Illinois may sue (1) fracking companies for violations of the Act, and (2) the Illinois Department of Natural Resources for failure to perform its duties in the county where the fracking took place. 225 ILL. COMP. STAT. ANN. 732/1-101(a), 732/1-102(a), (b) (West, WestlawNext through P.A. 98-604 of the 2013 Reg. Sess.).

¹⁰⁹ See 178.00.1-B-19 ARK. CODE R. § (k)(9) (LexisNexis, Lexis Advance through Nov. 6, 2013); IDAHO ADMIN. CODE r. 20.07.02.200.01 (West, WestlawNext through Feb. 6, 2013); LA. ADMIN. CODE tit. 43, pt. XIX, § 118(C)(3) (West, WestlawNext through rules published in the La. Reg. dated Nov. 20, 2012).

¹¹⁰ 225 ILL. COMP. STAT. ANN. 732/1-77(m); OHIO REV. CODE ANN. § 1509.10(H)(1); 58 PA. CONS. STAT. ANN. § 3222.1(b)(11) (West, WestlawNext through end of 2012 Reg. Sess.); COLO. CODE RECS. § 404-1:205(d) (2013); MONT. ADMIN. R. 36.22.1016(4) (West, WestlawNext through Issue 18 of the 2012 Mont. Admin. Register); 16 TEX. ADMIN. CODE § 3.29(c)(4); see *id.* § 3.29(a)(14) (defining a “[h]ealth professional or emergency responder” as “[a] physician, physician’s assistant, industrial hygienist, toxicologist, epidemiologist, nurse, nurse practitioner, or emergency responder who needs information in order to provide medical or other health services to a person exposed to a chemical ingredient”).

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public, including the patients treated.¹¹¹ In addition to trade secret exemptions, three states exempt companies from disclosing chemicals that: (1) are not disclosed to it by the manufacturer, vendor, or service provider; (2) were not intentionally added to the frac fluid; or (3) occur incidentally (or in unintentionally present trace amounts), which may be the result of chemical reaction or may be naturally present in materials added to the frac fluid.¹¹² There are several issues raised by these statutes and regulations such as whether some states should continue their bans of fracking, whether fracking should be regulated at the state and federal level, and whether there should even be trade secret exemptions in fracking chemical disclosure laws.¹¹³ Part III of this Note addresses each of these issues.¹¹⁴

III. ANALYSIS

The current fracking regulation scheme raises several issues. First, Part III.A analyzes the pertinent federal court decisions on trade secret disclosure as a compensable taking by comparing these decisions to

¹¹¹ See *AP Enterprise: Docs Say Drilling Law Hurts Health*, FOX NEWS (Apr. 11, 2012), <http://www.foxnews.com/us/2012/04/11/ap-enterprise-docs-say-drilling-law-hurts-health/#ixzz25dPWzPrJ> (reporting doctors' concerns over the confidentiality agreements); Ciavaglia, *supra* note 30 (explaining how Pennsylvania's fracking law could be essentially a "gag order" on doctors' ability to inform patients of what chemicals the patients were exposed to); Alicia Gallegos, *Doctors Fight "Gag Orders" over Fracking Chemicals*, AM. MED. NEWS (Aug. 27, 2012), <http://www.ama-assn.org/amednews/2012/08/27/gvl10827.htm> (outlining some major concerns for doctors in signing the confidentiality agreements); *Medical Muzzling: Fracking-Related Gag Order on Doctors Must Be Changed*, PENNLIVE (Aug. 19, 2012, 9:24 AM), http://www.pennlive.com/editorials/index.ssf/2012/08/medical_muzzling_fracking-rela.html (noting doctor's concerns with Pennsylvania's fracking law); Susan Phillips, *Pennsylvania Doctors Worry Over Fracking 'Gag Rule'*, NAT'L PUB. RADIO (May 17, 2012, 5:30 PM), <http://www.npr.org/2012/05/17/152268501/pennsylvania-doctors-worry-over-fracking-gag-rule> (stating that doctors are worried about the restriction on speaking about the chemicals with their patients). *But see* Scott Detrow, *Fracking Disclosure: Colorado's Compromise Is Pennsylvania's Controversy*, STATEIMPACT (June 7, 2012, 9:30 AM), <http://stateimpact.npr.org/pennsylvania/2012/06/07/fracking-disclosure-colorados-compromise-is-pennsylvanias-controversy/> (reporting that the Texas Medical Association approves Texas's fracking chemical disclosure law, including the doctor confidentiality agreement). See generally Katie Huffling, *The Hidden Health Risks of Fracking*, BALT. SUN (July 19, 2012), http://articles.baltimoresun.com/2012-07-19/news/bs-ed-fracking-nurses-20120719_1_public-health-health-care-natural-gas (explaining medical workers' concerns with chemical trade secret protection).

¹¹² 58 PA. CONS. STAT. ANN. § 3222.1(c); COLO. CODE REGS. § 404-1:205A(c); 16 TEX. ADMIN. CODE § 3.29(d).

¹¹³ See *infra* Part III (analyzing all of these issues).

¹¹⁴ See *infra* Part III (identifying the problems posed by the current fracking regulation schemes).

fracking issues.¹¹⁵ Second, Part III.B analyzes the risks posed by the weak chemical disclosure laws.¹¹⁶ Third, Part III.C analyzes the problems that varying chemical disclosure laws have created for drilling companies.¹¹⁷ Finally, Part III.D compares the proposed federal fracking regulation with state fracking regulations.¹¹⁸

A. *Trade Secret Protections Are Not Needed to Avoid a Compensable Taking*

While the current legislation fails to address the problems associated with fracking, there are concerns that the Fifth Amendment “Takings Clause” severely limits what states can do to protect their citizens.¹¹⁹ The majority of states that have chemical disclosure requirements in their fracking laws likely included the trade secret exceptions to avoid the mandatory disclosure being deemed a “taking” of “property” that would require just compensation.¹²⁰ Because a government taking requires payment under the Fifth Amendment, states wanted to avoid paying money to companies that protest the disclosure as a taking of the companies’ property.¹²¹ However, case law concerning trade secrets and the Takings Clause prevents states from having to pay companies that disclose this information to the state and possibly even the public.¹²²

In *Ruckelshaus v. Monsanto Company*, the safety data sheet disclosure—required in exchange for pesticide product registration—is similar to chemical disclosure in exchange for a fracking drilling

¹¹⁵ See *infra* Part III.A (comparing the most relevant federal court decisions to the takings issues raised by government disclosure of trade secrets).

¹¹⁶ See *infra* Part III.B (evaluating the environmental risks caused by weak chemical disclosure laws).

¹¹⁷ See *infra* Part III.C (reviewing the effects of varying state chemical disclosure laws on drilling companies).

¹¹⁸ See *infra* Part III.D (comparing the proposed federal legislation with the current state regulations).

¹¹⁹ See BRANDON J. MURRILL & ADAM VANN, CONG. RESEARCH SERV., R42461, HYDRAULIC FRACTURING: CHEMICAL DISCLOSURE REQUIREMENTS 8 (2012), available at <http://www.fas.org/sgp/crs/misc/R42461.pdf> (stating that the implication of the Takings Clause is the likely reason why state regulations include trade secret protections).

¹²⁰ See *id.* at 8 nn.50–51 (summarizing some of the case law on this topic).

¹²¹ See *id.* at 8 & nn.50–51 (arguing that the *Monsanto* and *Reilly* cases were the likely reason why states include trade secret exemptions to their chemical disclosure laws). There is also a debate as to whether states that have bans on fracking should have to compensate the landowners under the Takings Clause. See Brown, *supra* note 95, at 11156 (arguing that states should not have to pay landowners and drillers under current Takings Clause jurisprudence because the moratoriums enacted only amount to a temporary regulatory taking).

¹²² See *infra* notes 124–35 (analyzing *Monsanto* and *Reilly* with fracking chemical disclosure laws).

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permit.¹²³ The environmental and economic issues in *Monsanto*, relating to pesticide use, are analogous to the health and safety issues associated with the chemical formulas that are injected underground during fracking.¹²⁴ Thus, the key factor in *Monsanto*—the regulation’s interference with the company’s reasonable investment-backed expectations—is also the key factor in the analysis of fracking chemical disclosure statutes.¹²⁵

Just as the pesticide industry has historically been concerned with safety and extensive government regulation, so too has the drilling industry.¹²⁶ It is reasonable to require companies that pose a threat to the health and safety of citizens to give up their interests in some property in order to receive a valuable government benefit.¹²⁷ Pesticide companies had to register to enter the pesticide industry in the United States, and similarly drilling companies must register, which makes a permit a valuable government benefit.¹²⁸

¹²³ Compare *Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 991–92 (1984) (describing uses of the safety data sheets), with N.M. CODE R. § 19.15.16.19(B) (LexisNexis, Lexis Advance through New Mexico Register, Vol. XXIV, No. 22 dated November 27, 2013) (requiring drilling companies to disclose the information contained in the MSDS described in 29 C.F.R. § 1910.1200).

¹²⁴ See *Monsanto*, 467 U.S. at 990 (stating that there are benefits of pesticide use, such as improvements in agricultural productivity, but pesticide use “has also led to increased risk of harm to humans and the environment”); *supra* Part II.B (discussing the environmental risks of fracking); see also *supra* Part II.C (explaining the economic benefits of fracking).

¹²⁵ See *Monsanto*, 467 U.S. at 1005 (“It is to the last of these three factors[,] [the regulation’s interference with reasonable investment-backed expectation,] that we now direct our attention, for we find that the force of this factor is so overwhelming, at least with respect to certain of the data submitted by Monsanto to EPA, that it disposes of the taking question regarding those data.”); see also *Penn Cent. Transp. Co. v. N.Y.C.*, 438 U.S. 104, 124 (1978) (restating the three factors that subsequent court decisions used).

¹²⁶ Compare *Monsanto*, 467 U.S. at 1008–09 (noting the historical regulation of pesticide production), with *The History of Regulation*, *supra* note 64 (chronicling the history of natural gas drilling regulations). See generally *Natural Gas Act*, 15 U.S.C. § 717 (2006) (indicating the first federal regulation of natural gas drilling was passed in 1938); *Fed. Power Comm’n v. Natural Gas Pipeline Co. of Am.*, 315 U.S. 575, 582–83 (1942) (upholding the constitutionality of the *Natural Gas Act of 1938*).

¹²⁷ *Andrus v. Allard*, 444 U.S. 51, 67 (1979) (quoting *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 422 (1922) (Brandeis, J., dissenting)).

¹²⁸ See OKLA. ADMIN. CODE § 165:10-3-1(a) (West, WestlawNext through rules published in Vol. 30, No. 11 of the Okla. Reg.) (requiring drillers to obtain a permit and threatening fines against operators who drill, deepen, or reenter a well without a valid permit from the state); 16 TEX. ADMIN. CODE § 3.5(a) (West, WestlawNext through Feb. 28, 2013) (requiring a permit in order to “drill, deepen, plug back, or reenter any oil well, gas well, or geothermal resource well”); WYO. CODE R. Ch. 3 § 45(a) (LexisNexis, Lexis Advance through Dec. 2, 2012) (requiring an approved drill permit application before “the initiation of any well stimulation activity”).

However, fracking chemical disclosure is different than the challenged disclosure of tobacco products. In *Philip Morris, Inc. v. Reilly*, the court was not convinced that disclosing the chemical ingredients of cigarettes to the public would actually promote public health; however, this is not the case with fracking chemical disclosures.¹²⁹ Another difference between fracking chemical disclosure and tobacco disclosure is that the chemicals being injected into the ground are more likely to affect those who did not consent to the fracking, compared to those who choose not to smoke and have a greater opportunity to avoid the effects of tobacco.¹³⁰ This difference is important because those who choose not to be affected by fracking may still feel the effects if a neighboring landowner chooses to sell his or her drilling rights to a company that makes a mistake.¹³¹

Monsanto and *Reilly* are also unrelated in that the perceived government benefit in the tobacco disclosure law was the ability to sell tobacco products in the state; while the government benefit in *Monsanto* was registration, which allowed the company to produce pesticides.¹³² This difference is important when compared to fracking because the chemical disclosures are not important for the sale of the natural gas derived from fracking, but instead are part of a complex regulatory

¹²⁹ Compare *Philip Morris, Inc. v. Reilly*, 312 F.3d 24, 44 (1st Cir. 2002) (saying that the court was not convinced that the disclosure law actually promoted public health because Massachusetts only had to show that disclosure “could” further the public health, which the court felt was too low a standard), with *Robinson Twp. v. Pennsylvania*, 52 A.3d 463, 497 (Pa. Commw. Ct. 2012) (Brobson, J., dissenting) (stating that the Pennsylvania fracking law “promotes the health, safety, and welfare of all Pennsylvanians by establishing zoning guidance to local municipalities that ensures the uniform and optimal development of oil and gas resources”).

¹³⁰ See OHIO REV. CODE ANN. § 1509.10(I)(2) (West, WestlawNext through files 47 of the 130th Gen. Assemb.) (specifically stating that adjacent landowners may be affected and people other than the landowner may have an interest adversely affected by the landowner’s decision to allow the injection of chemicals). However, the harm from second-hand smoke to those who choose not to smoke but are forced to be in a place allowing smoking makes these regulations similar as well.

¹³¹ See *id.* (implying that an adjacent landowner may suffer harm by his neighbor’s fracking operations because the law allows the adjacent landowner to challenge the drilling companies’ trade secret exemptions for chemicals used); 16 TEX. ADMIN. CODE § 3.29(f)(1) (West, WestlawNext through Aug. 31, 2013) (implying a risk of harm by allowing adjacent landowners to challenge the trade secret designations by a company drilling on a neighbor’s land).

¹³² Compare *Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 997-98 (1984) (noting that in order to receive a license to produce, the company was required to submit information to register the pesticides), with *Reilly*, 312 F.3d at 47 (“The right offered here is the right to sell tobacco products in Massachusetts.”).

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scheme that requires registration before production, like in *Monsanto*.¹³³ These differences and similarities allow legislators to enact fracking regulations that fail to protect a company's trade secrets and instead mandate the company disclose confidential information without the receipt of just compensation. However, the companies' economic interest in keeping this information from competitors should concern regulators.¹³⁴ Nonetheless, the states still provide trade secret protection to drilling companies often at the expense of environmental and human health.¹³⁵

B. *Problems with Current State Fracking Regulations*

One major problem with current fracking regulations is that some states only allow the required disclosures to be made on certain websites.¹³⁶ This means that the information posted can only be as good as the website to which it is posted, and there are concerns about the accuracy of what information is available on the FracFocus website.¹³⁷ However, states can cure the problem of mandating disclosure on a specific private website by creating their own disclosure websites.¹³⁸

There are various other problems with the current state regulations, and Part III.B will further address these concerns. Related to what is disclosed on websites is what companies are allowed to withhold from

¹³³ See *Reilly*, 312 F.3d at 47 ("Allowing a manufacturer to simply sell its legal product is more similar to building on one's land than to the complex regulatory scheme in *Monsanto*").

¹³⁴ See *infra* Part III.C (expressing drilling companies' concerns about chemical formula disclosure).

¹³⁵ See *infra* Part III.B (analyzing the problems with currently enacted and proposed fracking regulations).

¹³⁶ See 58 PA. CONS. STAT. ANN. § 3222.1(b)(2) (West, WestlawNext through end of the 2012 Reg. Sess.) ("[T]he operator of the well shall complete the chemical disclosure registry form and post the form . . ."); N.D. ADMIN. CODE 43-02-03-27.1(1)(g) (West, WestlawNext through Supplement 347 (Jan. 2013)) ("Within sixty days after the hydraulic fracture stimulation is performed, the owner, operator, or service company shall post on the fracfocus chemical disclosure registry all elements made viewable by the fracfocus website.").

¹³⁷ See Haas et al., *supra* note 91 (noting that most of the postings on FracFocus are voluntary and the companies are not required to post anything to the site in most states).

¹³⁸ See 225 ILL. COMP. STAT. ANN. 732/1-110(b) (West, WestlawNext through P.A. 98-108 of the 2013 Reg. Sess. (excluding P.A. 98-104)) (mandating that the state create a user-searchable online database for the public that must include the following for each well it permits: "the identity of its operators, its waste disposal, its chemical disclosure information, and any complaints or violations under this Act"); 58 PA. CONS. STAT. ANN. § 3222.1(b)(6) (requiring the state to set up a public disclosure website, where the companies must post their information, and the website must allow users to search by "geographic area, chemical ingredient, [CAS] number, time period, and operator").

disclosure as trade secrets.¹³⁹ Part III.B.1 examines the effects of keeping trade secret exemptions in state laws.¹⁴⁰ Second, Part III.B.2 evaluates the problems solved by medical emergency exceptions to trade secret exemptions and the problems that still exist.¹⁴¹ Finally, Part III.B.3 analyzes the statutorily authorized trade secret challenges allowed by some states.¹⁴²

1. Trade Secret Exemptions

In addition to first-rate chemical disclosure methods, chemical disclosure laws can be very beneficial in the case of a well leak or other disaster that results from drilling.¹⁴³ However, the state chemical disclosure laws are too weak if there is an environmental disaster caused by fracking because several states protect company-designated trade secrets.¹⁴⁴ In West Virginia and Michigan, where the states do not even require disclosure of enough information to consider them trade secrets, there is simply not enough information provided to the government to monitor the situations adequately.¹⁴⁵ Also, New Mexico's fracking law, which essentially requires the same chemical information as Michigan's fracking rule, goes one step further and specifically allows companies to avoid disclosing any information designated as a trade secret.¹⁴⁶ If an

¹³⁹ See Haas et al., *supra* note 91 (explaining the problems associated with posting information on FracFocus.org); see also 225 ILL. COMP. STAT. 732/1-110(a) (exempting trade secrets from being disclosed on the public website).

¹⁴⁰ See *infra* Part III.B.1 (evaluating the effects of exempting trade secrets from fracking chemical disclosure laws).

¹⁴¹ See *infra* Part III.B.2 (examining the benefits and problems with medical emergency exceptions to trade secret exemptions).

¹⁴² See *infra* Part III.B.3 (considering the statutorily authorized trade secret challenges allowed by some state fracking laws).

¹⁴³ See Lees, *supra* note 82, at 604–05 (explaining that chemical disclosure laws are one of the precautionary types of hydraulic fracturing regulatory schemes). However, as new processes are developed that can better clean the water after it is used for fracking, the need for disclosure may be reduced. See Gies, *supra* note 30 (discussing these new processes and the current problem with poor post-operations water purification).

¹⁴⁴ See Elgin et al., *supra* note 107 (criticizing the disclosure laws that both provide companies an exemption from disclosure while also attempting to increase the amount of information disclosed); Huffling, *supra* note 111 (explaining medical workers' concerns with current chemical disclosure laws and providing recommendations for improvement).

¹⁴⁵ See W. VA. CODE ANN. § 22-6A-7 (West, WestlawNext through end of the 2012 1st Extraordinary Sess.) (failing to include a trade secret exemption or chemical volume disclosure requirement); MICH. DEP'T OF ENVTL. QUALITY, *supra* note 87 (focusing on the MSDS and water use disclosure).

¹⁴⁶ Compare N.M. CODE R. § 19.15.16.19(B) (LexisNexis, Lexis Advance through New Mexico Register, Vol. XXIV, No. 22 dated November 27, 2013) (stating that the law “does not require the reporting of information beyond the [MSDS]” or the “disclosure of proprietary, trade secret or confidential business information”), with MICH. DEP'T OF ENVTL.

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environmental disaster caused by fracking occurred in these states, the emergency responders would have no quick recourse for obtaining information relating to what chemicals actually caused the problems. In recent environmental disasters, corporations and the government took too long to respond and clean up leaks; although, the parties responsible for resolving the leaks knew what chemicals were leaking.¹⁴⁷ Trade secrets are also not defined for the purposes of these laws, which could cause even more confusion and delay in response.¹⁴⁸

Additionally, the state laws present problems with how much information may be withheld as a trade secret.¹⁴⁹ Some of these trade secret exemptions do not adequately protect the health interests of those in the communities near the drilling.¹⁵⁰ They also have poor effects on the environmental health in the local communities and far outside the communities, if there is a chemical leak.¹⁵¹ Oklahoma's law is ripe for abuses because it allows drillers to withhold trade secrets "in good faith."¹⁵² While the state may require companies to submit written documentation in support of withholding the chemical information that the company claims as a trade secret, there is no telling how long it will take for the state to actually obtain access to such information.¹⁵³ It could

QUALITY, *supra* note 87 (requiring fracking well operators to disclose all MSDSs but not specifically mentioning trade secrets).

¹⁴⁷ See Higgins, *supra* note 24 (explaining how the Japanese government's slow reaction to its 2011 tsunami caused nuclear material to be released from a power plant); Power & Tracy, *supra* note 24 (outlining how B.P. and the regulatory agencies were slow to react to the 2010 oil spill in the Gulf of Mexico).

¹⁴⁸ See N.M. CODE R. § 19.15.16.19 (lacking a definition for "proprietary, trade secret or confidential business information"); Dlouhy, *supra* note 24 (explaining how confusion over the meaning of a word in the law caused delay and created new risks).

¹⁴⁹ See BRANDON J. MURRILL & ADAM VANN, CONG. RESEARCH SERV., R42461, HYDRAULIC FRACTURING: CHEMICAL DISCLOSURE REQUIREMENTS 8 (2012), available at <http://www.fas.org/sgp/crs/misc/R42461.pdf> (explaining the basics of the state trade secret protections).

¹⁵⁰ See *infra* Part III.B.2 (explaining problems with state emergency requirements for removal of disclosure).

¹⁵¹ See *supra* Part II.B (describing the effects of fracking on the environment such as: earthquakes, methane release, and water contamination that can spread).

¹⁵² See OKLA. ADMIN. CODE § 165:10-3-10(b)(4) (West, WestlawNext through rules published in Vol. 30, No. 21 of the Okla. Reg.) (allowing operators to withhold self-designated trade secrets in good faith).

¹⁵³ See *id.* (noting that the state may require written support and explanations for withholding information as trade secrets, but there is no affirmative duty on the state regulators to actually do so). However, Illinois is the only state that requires drillers to submit both redacted and un-redacted copies of the list of chemicals used. 225 ILL. COMP. STAT. ANN. 732/1-77(f) (West, WestlawNext through P.A. 98-121 of the 2013 Reg. Sess.). The redacted copy is what is used when posting information to the public website, while the un-redacted copy stays with the Department of Natural Resources in case there is an

take weeks or months to resolve, and if there is also a natural disaster, the process could take even longer.¹⁵⁴ As a result, some states have enacted emergency exceptions to the trade secret exemptions in an attempt to alleviate some of these concerns.¹⁵⁵

2. Emergency Exceptions to Trade Secret Exemptions

Laws that allow states to disclose information (designated as a trade secret) to certain medical personnel and emergency responders, in case there is an emergency situation, can help those fixing potential leaks. However, the confidentiality agreement that these medical and emergency workers must sign to gain access to the chemical information remains a major issue.¹⁵⁶ While resolving some issues, these provisions create new problems.¹⁵⁷

For example, if there were a fracking well leak, the chemicals and methane would leak quickly into local well water and possibly travel elsewhere by streams, rivers, and lakes.¹⁵⁸ Combine the problems associated with the slow response to stop and clean-up the accidents with a slow response to give up the information and the damage will likely be exponential.¹⁵⁹ However, this is not the only problem with the trade secret exemption if there is an emergency.¹⁶⁰

Because there are many different kinds of chemicals being released into the ground and their effects vary, the confidentiality agreement requirements prevent doctors from helping patients in the best way

emergency. *See id.* (stating that both redacted and un-redacted copies are required and the redacted copies will be available to the public).

¹⁵⁴ *See Higgins, supra* note 24 (reporting the anger over Japanese leadership's failure to fix the problem quicker); *see also Kettl & Walters, supra* note 24 (arguing for improved communication and coordination between levels of government for an improved response to possible future man-made disasters).

¹⁵⁵ *See supra* notes 109-11 and accompanying text (explaining these medical emergency exceptions to the trade secret exemptions and which states have enacted them).

¹⁵⁶ *See generally Ciavaglia, supra* note 30 (explaining issues associated with the doctor confidentiality agreement).

¹⁵⁷ *See id.* (pointing out that this law may prevent the treating physicians from discussing certain topics with their patients).

¹⁵⁸ *See Cohen, supra* note 24 (discussing the problems posed by a lack of government regulations following disasters like the B.P. oil spill in 2010 and the Fukushima nuclear power accident after the Japanese tsunami in 2011); *see also Yost, supra* note 25 (explaining how a waste water spill in West Virginia could have contaminated the Ohio River, which is the drinking water source for millions).

¹⁵⁹ Cohen, *supra* note 24.

¹⁶⁰ *See AP Enterprise: Docs Say Drilling Law Hurts Health, supra* note 111 (discussing how doctors are concerned about the confidentiality agreements in the medical emergency exemptions).

possible.¹⁶¹ This severely hampers the patient's healing process because a doctor who obtains the trade secret chemical information would be forbidden from telling patients what chemicals they were exposed to.¹⁶² Because the laws allow companies to require doctors to sign confidentiality agreements, the laws would also restrict doctors from telling other doctors, which presumably includes specialists or primary care physicians who will treat the patient for the same problems later.¹⁶³ This confidentiality agreement would also hurt doctor research by preventing doctors from discussing with other doctors ways to help patients who were exposed to similar chemicals.¹⁶⁴ Where the incident occurred closer to the border, confidentiality agreements could also potentially keep the information from doctors in other states, because only states that have these laws require the disclosure of such information.¹⁶⁵ To enable more public disclosure, some states authorize certain parties to challenge trade secret designations.¹⁶⁶

3. Statutorily Authorized Challenges to Companies' Trade Secret Designations

This additional way to obtain the trade secret information, by challenging the designation of trade secrets, solves a few problems but still creates additional issues.¹⁶⁷ Because all trade secret disputes in Ohio are only allowed to be filed in one county—most of the state's drilling takes place outside the very populated Franklin County—those most

¹⁶¹ See Phillips, *supra* note 111 (explaining doctors' concerns over the confidentiality agreements); see also *supra* note 30 (discussing the various chemicals injected into the ground during fracking and the potential health hazards associated with the injection of such chemicals).

¹⁶² See Phillips, *supra* note 111 (describing that doctors likely cannot even share the trade-secret chemicals with the patients they are treating).

¹⁶³ See *id.* (stating that it is not clear whether the doctor who signs the confidentiality agreement can tell other doctors, who later treat this same patient, about what the patient was exposed to).

¹⁶⁴ See *AP Enterprise: Docs Say Drilling Law Hurts Health*, *supra* note 111 (noting that the law does not explicitly say who the doctors will be prohibited from discussing the information with). *But see* Detrow, *supra* note 111 (noting that the Texas Medical Association approved Texas's fracking chemical disclosure law, including the doctor confidentiality agreement).

¹⁶⁵ See 58 PA. CONS. STAT. ANN. § 3222.1(b)(11) (West, WestlawNext through end of the 2012 Reg. Sess.) (requiring disclosure to medical personnel, but presumably this would only apply to medical personnel in Pennsylvania); see also Gallegos, *supra* note 111 (noting doctors' concerns about ambiguities in state laws).

¹⁶⁶ See *supra* note 108 (explaining which parties are authorized to challenge trade secret designation and the processes for doing so).

¹⁶⁷ See McFEELEY, *supra* note 108, at 13 (explaining and criticizing the Texas and Ohio trade secret challenge procedures).

likely to challenge the designations are disadvantaged.¹⁶⁸ Ohio's law provides little redress for those of modest means in the southeast corner of the state near the West Virginia border, where a good amount of the drilling takes place.¹⁶⁹ Once the challenge is filed, there is no telling how long the court will take to make a decision, and if the claim is fruitless, this would be costly and cause needless operation stoppage for the drillers.¹⁷⁰

Although similar to Ohio's provision, Texas's law is slightly different because it leaves the decision with the Texas Attorney General.¹⁷¹ The law also does not require a challenge in one region of the state, which removes issues associated with traveling or hiring an attorney.¹⁷² However, this still does not solve the problem of efficiency because the Attorney General could take even longer than a court to solve the problem, and the Attorney General needs court permission to issue injunctions.¹⁷³ This law requires submission to the Railroad Commission, and the commission then must forward the request to the Attorney General, whose decision is subject to appeal.¹⁷⁴ This is essentially a three-step process that eliminates any speed benefit associated with avoiding the court at the outset.

Ohio's and Texas' challenge provisions create additional issues and still do not solve the two major problems with the state laws: a process for the public to challenge confidentiality claims and doctors' abilities to

¹⁶⁸ See OHIO REV. CODE ANN. § 1509.10(I)(2) (West, WestlawNext through files 47 of the 130th Gen. Assemb.) (stating that challenges can only be made in the Franklin County Court of Common Pleas).

¹⁶⁹ See *id.* ("A property owner . . . may commence a civil action in the court of common pleas of Franklin county . . . challenging the owner's or person's claim to entitlement to trade secret protection . . ."); *Fracking Comes to SE Ohio*, *supra* note 108 (noting the influx of drilling to southeastern Ohio and the problems peculiar to this region's geology).

¹⁷⁰ See *Oil Service Firms Brace for Drilling Slowdown*, *supra* note 57 (implying that companies are losing money from idle wells).

¹⁷¹ See 16 TEX. ADMIN. CODE § 3.29(f)(2), (5) (West, WestlawNext through Aug. 31, 2013) (allowing the person requesting the removal of the trade secret designation to challenge the company's exemption in writing to the director of the Oil and Gas Division of the Railroad Commission of Texas, who is to submit the request to the Texas attorney general's office).

¹⁷² See 16 TEX. ADMIN. CODE § 3.29(f).

¹⁷³ See, e.g., TEX. BUS. & COM. CODE § 301.102 (West, WestlawNext through the end of the 2011 Reg. Sess. and first called sess. of the 82nd leg.) (stating that the attorney general must petition a court for injunctive relief).

¹⁷⁴ See 16 TEX. ADMIN. CODE § 3.29(f)(5), (9) (recognizing that the attorney general's decision may be appealed to a district court of Travis County within ten business days). Although the appeal must be heard in Travis County, this is still not as burdensome as requiring the initial hearing to take place in a specific county, as is the case in Ohio. Compare OHIO REV. CODE ANN. § 1509.10(I)(2) (requiring the initial hearing take place in Franklin County), with 16 TEX. ADMIN. CODE § 3.29(f)(9) (mandating an appeal proceed in Travic County).

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treat patients.¹⁷⁵ This is not to say that fracking is too dangerous to be used because not all wells will cause environmental problems.¹⁷⁶ However, accidents could happen, and the state fracking laws still leave major problems unaddressed.¹⁷⁷ The varying state fracking chemical disclosure laws also cause problems for drilling companies.¹⁷⁸

C. *Problems with Having Varying State Chemical Disclosure Laws for Drilling Companies*

The varying state chemical disclosure laws force a drilling company that operates in multiple states to deal with very different regulations in each state.¹⁷⁹ Currently, companies that drill in multiple states have to deal with each state's regulatory agency and ensure that their disclosure statements comply with each state's disclosure regulations.¹⁸⁰ For many of these companies, this imposes additional administrative burdens.¹⁸¹ Because of the competing economic and environmental interests, states must alter legislation in the future to keep up with the new

¹⁷⁵ See MCFEELEY, *supra* note 108, at 14 (concluding that these problems are still unaddressed by many of the state chemical disclosure laws).

¹⁷⁶ See Entine, *supra* note 36 (reporting an independent study that says fracking should present no major environmental issues in New York if the state allows drilling); Kastenbaum, *supra* note 58 (weighing the benefits and risks of fracking and concluding that New York must decide how much risk is acceptable to obtain the economic rewards of fracking). In fact, some of the wells that were accused of leaking into local drinking supplies were later vindicated by government agencies as not actually contaminating the water. Gilbert & Gold, *supra* note 25.

¹⁷⁷ See MCFEELEY, *supra* note 108, at 14 (concluding that there are problems still unaddressed and proposing elements that should be in every fracking disclosure law).

¹⁷⁸ Van Ort, *supra* note 24, at 452-53.

¹⁷⁹ See *supra* Part II.D.3 (discussing the varying state laws and showing how different each and every state fracking chemical disclosure law is from the others). A related problem is the risk that municipalities within each state will pass their own fracking ordinances, which could cause an even greater problem for businesses than the states' varying laws. See *supra* note 74 (discussing how some cities passed local fracking laws and describing the Pennsylvania Commonwealth Court's ruling in *Robinson* that held that the Pennsylvania state government cannot take this authority entirely away from the local governments).

¹⁸⁰ See 42 U.S.C. § 300h(d)(1) (2006) (taking away from the EPA federal control over fracking, which leaves the control in the states that are free to enact fifty different regulations if they so choose).

¹⁸¹ See Van Ort, *supra* note 24, at 452 (describing problems that varying state regulations impose on drilling companies). There are also concerns that the varying degrees of chemical disclosure could cause one state to destroy the economic value of trade secrets for companies that drill in that state. *Id.* While this is a correct assertion, a proper analysis of federal case law shows that fracking chemical disclosure laws that mandate disclosure in exchange for a drilling permit are not a taking that requires compensation. See *supra* Part III.A (explaining how fracking chemical disclosure laws would not be a taking requiring just compensation).

environmental reports that are released, new economic benefits that are discovered (or needed because of a recession), and public opinion polls.¹⁸²

Because fracking is a highly controversial issue, with detractors and supporters across the country essentially split along strict party lines, the fracking operations in each state rest on the whims of each state's election results.¹⁸³ This creates further uncertainty for businesses in terms of what they must disclose.¹⁸⁴ These problems with state regulations can only be solved through adequate and uniform federal regulation of fracking chemical disclosure.¹⁸⁵

D. Comparison of the Proposed Federal Regulations and the Enacted State Regulations

The proposed federal regulations are substantially similar to some state regulations.¹⁸⁶ The Fracturing Responsibility and Awareness of Chemicals Act ("FRAC Act") provides similar medical emergency disclosure requirements, and this perpetuates the same problems that exist at the state level.¹⁸⁷ However, this problem is greater in the federal proposal than in the state laws because the companies are not required to disclose the information directly to the medical personnel before an emergency, while the states that have a medical emergency exception

¹⁸² See generally Kastenbaum, *supra* note 58 (reporting that New York legislators are weighing the economic benefits and environmental concerns of fracking to possibly alter their current ban on fracking); *supra* Part II.B (discussing the environmental effects of fracking); *supra* Part II.C (discussing the economic benefits of fracking).

¹⁸³ See Mahoney, *supra* note 7 (reporting a Quinnipiac University poll, which found that 66% of Republicans support fracking, 63% of Democrats fear fracking will harm the environment, and 55% of those unaffiliated with a party believe fracking damages the environment).

¹⁸⁴ See Van Ort, *supra* note 24, at 453 (voicing concern that frequent changes in state laws will force energy drilling companies to repeatedly learn new state laws and regulations on what they must disclose).

¹⁸⁵ See *infra* Part IV (proposing a federal statute to regulate fracking).

¹⁸⁶ Compare Fracturing Responsibility and Awareness of Chemicals Act, S. 587, 112th Cong. (2011) (requiring "identification of the chemical constituents of mixtures, [CAS] numbers for each chemical and constituent, material safety data sheets when available, and the anticipated volume of each chemical to be used," while still protecting trade secrets and including medical emergency exemptions like many states), with 58 PA. CONS. STAT. ANN. § 3222.1 (West, WestlawNext through end of 2012 Reg. Sess.) (requiring the disclosure of similar information while also protecting trade secret and including a medical emergency exception to trade secret protection).

¹⁸⁷ See S. 587 (requiring in a medical emergency that a company disclose to state or medical personnel all chemical information, regardless of its designation as a trade secret); see also *supra* Part III.B.3 (analyzing state laws on the disclosure of information designated as trade secrets to medical personnel in emergency situations).

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require direct disclosure before an accident occurs.¹⁸⁸ Also, the Bureau of Land Management's proposed disclosure rule for fracking on federal land does not even contain the medical personnel exception.¹⁸⁹ Another problem is that the FRAC Act, like most state statutes that require public disclosure, would not create a government-operated website for the companies to post the information.¹⁹⁰

However, the FRAC Act does provide some additional benefits that the state laws lack. It requires the disclosed information be posted on an "appropriate" website, while most states either require the information be posted on FracFocus.org or do not have any public disclosure requirement.¹⁹¹ It also requires "immediate" disclosure during an emergency when the request for protected information is received, which is an important part of the emergency clean-up process that is not addressed in some of the state laws.¹⁹² The FRAC Act, while keeping

¹⁸⁸ Compare S. 587 ("[T]he applicable person using hydraulic fracturing shall, upon request, immediately disclose to the State . . . or the treating physician or nurse the proprietary chemical formula . . ." (emphasis added)), with 58 PA. CONS. STAT. ANN. § 3222.1(b)(11) (West, WestlawNext through end of the 2012 Reg. Sess.) ("[T]he vendor, service provider or operator shall immediately disclose the information to the health professional . . ."), and COLO. CODE REGS. § 404-1:205(e) (2013) ("The vendor or service provider shall also provide the chemical constituents of a Trade Secret Chemical Product to any health professional who requests such information in writing . . ."), and MONT. ADMIN. R. 36.22.1016(4) (West, WestlawNext through Issue 18 of the 2012 Mont. Admin. Reg.) ("[T]he owner, operator, or service contractor shall immediately disclose the chemical constituents of a product to that health professional . . .").

¹⁸⁹ See Oil and Gas; Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands, 77 Fed. Reg. 27691, 27700 (proposed May 11, 2012) (protecting trade secrets, but remaining silent about whether information could be disclosed to medical personnel in the event of an emergency).

¹⁹⁰ See S. 587 (requiring only that the information be posted "on an appropriate Internet website" without actually creating its own website or requiring the states to do the same).

¹⁹¹ Compare S. 587 (allowing the public disclosure through any "appropriate" website), with N.D. ADMIN. CODE 43-02-03-27.1(1)(g) (West, WestlawNext through Supplement 347 (Jan. 2013)) (allowing only the posting of information to FracFocus.org to satisfy the law). But see 58 PA. CONS. STAT. § 3222.1(b)(6) (requiring that the department create a state website to better disseminate the information to the public).

¹⁹² Compare S. 587 ("[T]he applicable person . . . shall, upon request, immediately disclose." (emphasis added)), and COLO. CODE REGS. § 404-1:205(e) ("[T]he vendor or service provider shall immediately disclose the chemical constituents of a Trade Secret Chemical Product to that health professional upon a verbal acknowledgement by the health professional that such information shall not be used for purposes other than the health needs asserted . . ." (emphasis added)), with OHIO REV. CODE ANN. § 1509.10(H)(2) (West, WestlawNext through files 24, 26-38 of the 130th Gen. Assemb.) (requiring that the information be disclosed to treating medical personnel but remaining silent about the speed to which this information must be disclosed), and MONT. ADMIN. R. 36.22.1016(3) (West, WestlawNext through Issue 18 of the 2012 Mont. Admin. Reg.) (requiring the trade secret information be disclosed to medical personnel during an emergency but not requiring the information be disclosed immediately).

standards across the country for disclosure requirements mostly uniform, still provides an opportunity for disclosures to be made to the state, which could keep the information closer to those in need during a potential emergency.¹⁹³ Because of these benefits, the FRAC Act should not be ignored. However, while this proposal would solve the uniformity issue, the FRAC Act shares too many problems with the various state regulations to be an effective solution. Part IV of this Note proposes how Congress could improve the SDWA to better balance the competing economic and environmental interests.¹⁹⁴

IV. CONTRIBUTION

Although there are potential dangers to allowing hydraulic fracturing, this process should not be categorically banned at the federal level, and a federal statute is needed to ensure that the economic benefits and environmental risks are properly balanced.¹⁹⁵ While there is no constitutional takings problem with requiring companies to disclose information that is proprietary, there are economic reasons for companies to keep some information secret.¹⁹⁶ There should be federal control over fracking, and Congress should pass a federal fracking chemical disclosure statute that requires more disclosure than required in the previously proposed FRAC Act.¹⁹⁷

A. *Proposed Statute*

Specifically, section 1421(d) of the Safe Drinking Water Act (42 U.S.C. § 300h(d)) should be amended by striking paragraph (1) and inserting the following:¹⁹⁸

¹⁹³ See S. 587 (“A person conducting hydraulic fracturing operations shall disclose to the State . . .”).

¹⁹⁴ See *infra* Part IV (proposing that Congress pass an improved version of the FRAC Act that would better balance the human and environmental health risks with the economic benefits of fracking).

¹⁹⁵ See *supra* Part II.B (explaining the environmental risks of fracking); Part II.C (highlighting the economic benefits of fracking); Part III.B (analyzing environmental issues posed by some of these laws, as well as the implications for drilling companies if a state adopts a law that requires too much disclosure of chemical information). Although the Illinois legislation is the best statute among the state legislation passed, there are still too many weaknesses in the Illinois statute.

¹⁹⁶ See *supra* Part III.A (analyzing the case law that shows there should not be a takings problem if states require chemical disclosure in exchange for a drilling permit).

¹⁹⁷ See *supra* Part III.D (explaining the similarities and differences between the FRAC Act and state legislation, which also points out some of the problems with both the FRAC Act and the several state regulations).

¹⁹⁸ This part of the suggested statute is based on the FRAC Act. S. 587.

(d) "Underground injection" defined

For purposes of this part –

(1) IN GENERAL – The term "underground injection" means the subsurface emplacement of fluids by well injection;

(2) INCLUSION – The term "underground injection" includes the underground injection of fluids or propping agents pursuant to hydraulic fracturing operations relating to oil or gas production activities;

(3) EXCLUSION – The term "underground injection" does not include the underground injection of natural gas for the purpose of storage.¹⁹⁹

Additionally, section 1421(b) of the Safe Drinking Water Act (42 U.S.C. § 300h(b)) should be amended as follows: In paragraph (1)(C), by inserting before the semicolon the following:

including a requirement that any person using hydraulic fracturing disclose to the State (or to the Administrator, in any case in which the Administrator has primary enforcement responsibility in a State) the chemical constituents used in the fracturing process.

Additionally, section 1421(b) should be amended by adding at the end the following:

(4) DISCLOSURES OF CHEMICAL CONSTITUENTS –

(A) IN GENERAL – All operators shall obtain a drilling permit by the state and shall disclose to the State (or to the Administrator, in any case in which the Administrator has primary enforcement responsibility in a State), in exchange for a drilling permit, by not later than such deadlines as shall be established by the State (or the Administrator) –

(i) Before the commencement of any hydraulic fracturing operations at any lease area or a portion of a lease area, a list of chemicals intended for use in any underground injection during the operations (including identification of the chemical constituents of mixtures, Chemical Abstracts Service numbers for each chemical and constituent, material safety data sheets when available, and the anticipated volume of

¹⁹⁹ This part is quoted from the proposed FRAC Act. S. 587.

each chemical to be used), the vendor (if information about the additive was not disclosed to the operator by the vendor), and the purpose of each additive product used; and

(ii) After the completion of hydraulic fracturing operations described in subparagraph (4)(A)(i) above, the list of chemicals used in each underground injection during the operations (including identification of the chemical constituents of mixtures, Chemical Abstracts Service numbers for each chemical and constituent, material safety data sheets when available, and the anticipated volume of each chemical to be used), the vendor (if information about the additive was not disclosed to the operator by the vendor), and the purpose of each additive product used.²⁰⁰

(B) PUBLIC AVAILABILITY – The agency will create, within 180 days of the enactment of this statute, a federally-operated website that allows the public to search by state using the following categories: geographic area within each state, chemical ingredient, Chemical Abstracts Service number, time period, and operator.²⁰¹

(C) PRIVATE DISCLOSURE WEBSITES – Nothing in this Act eliminates the ability of companies to voluntarily disclose information to private websites and the ability of states to require this same information also be posted on private websites.

(D) TRADE SECRETS –

(i) Definition – “Trade secret” means information that: (1) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by the public or any other persons who can obtain

²⁰⁰ This requires additional disclosures after the operations in case the pre-drilling submitted information changed during the process. This is based on a combination of state rules, except the information required in this statute requires the same type of information as required before drilling. *But see supra* note 93 (describing the various laws that require varying details of information depending on whether the information is being submitted before or after the drilling).

²⁰¹ *See* 225 ILL. COMP. STAT. ANN. 732/1-110 (West, WestlawNext through P.A. 98-108 of the 2013 Reg. Sess. (excluding P.A. 98-104)) (mandating that the state create its own searchable public disclosure website); 58 PA. CONS. STAT. ANN. § 3222.1(b)(6) (West, WestlawNext through end of 2012 Reg. Sess.) (requiring the state to create its own searchable public chemical disclosure website). The agency is the EPA, which will be the main regulator of fracking.

*commercial or economic value from its disclosure or use; and (2) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy;*²⁰²

(ii) Operators may designate certain information as “trade secrets,” and this designation is subject to approval by the State (or the Administrator). The operator bears the burden of proving the information meets the definition of a trade secret as defined in this Act. No office (state or federal, including all employees) may disclose the designated “trade secret” information except in the specified situations below. If a trade secret designation is awarded, the operator must provide the State (or the Administrator) with redacted copies and un-redacted copies of the list of chemicals and the redacted copy will be used when posting information to the public.²⁰³

(iii) States may not provide additional trade secret protections to operators or require disclosure of more detailed information than required by this Act;

(E) IMMEDIATE DISCLOSURE IN CASE OF EMERGENCY –

(i) Subject to subparagraph (4)(F)(ii) below, the regulations promulgated pursuant to subsection (a) shall require that, in any case in which the State (or the Administrator, as applicable) or an appropriate treating physician or nurse determines that a medical emergency exists and the proprietary chemical formula or specific chemical identity of a trade-secret chemical used in hydraulic fracturing is necessary for emergency or first-aid treatment, the applicable person using hydraulic fracturing shall immediately disclose to the federal, state, or local emergency responders, the treating physician or nurse, the proprietary chemical formula or specific chemical identity of a trade-secret chemical, regardless of the existence of –

- (a) A written statement of need; or
- (b) A confidentiality agreement;

²⁰² See *supra* note 101 (quoting the UTSA definition of a “trade secret”).

²⁰³ See 225 ILL. COMP. STAT. ANN. 732/1-77(f) (West, WestlawNext through P.A. 98-121 of the 2013 Reg. Sess.) (providing a similar scheme with redacted and unredacted copies).

(ii) Any operator that makes a disclosure required under subparagraph (4)(E)(i) above may require (1) the execution of a written statement of need; and (2) a confidentiality agreement as soon as practicable after the determination by the State (or the Administrator) or the treating physician or nurse. A patient's treating physician may challenge this confidentiality agreement requirement in a district court (individual states may authorize the state courts to handle these challenges in addition to the federal courts) if the treating physician reasonably believes, using his medical judgment, that the patient's recovery is dependent on a subsequent treating physician, the patient, or another essential party receiving such information. If such equitable relief is granted, the receiver would be required to sign a confidentiality agreement;

(iii) Nothing in this Act will keep a treating physician, located in a state outside where the hydraulic fracturing that caused the health problems took place, from receiving the same information as in-state physicians. All restrictions, requirements, and grants in paragraph (4)(E)(ii) above will be applied to the out-of-state treating physician and patient.

(F) TRADE SECRET CHALLENGES – The following parties may submit requests to the challenger's local district court (individual states may authorize the state courts to handle these challenges in addition to the federal courts) challenging a claim of entitlement to trade secret protection for any chemical ingredients and/or Chemical Abstracts Service numbers used in the hydraulic fracturing treatment(s) of a well:

(i) The landowner on whose property the relevant wellhead is located;

(ii) The landowner who owns real property adjacent to property described in subparagraph (4)(F)(i) above;

(iii) A department or agency of the federal government with jurisdiction over a matter to which the claimed trade secret information is relevant; and

(iv) A department or agency of the state with jurisdiction over a matter to which the claimed trade secret information is relevant.

Once an interested party has evidence sufficient to support a finding that the hydraulic fracturing

*operations are unsafe because the chemical composition is unknown, the operators have the burden of proving beyond a preponderance of the evidence that the information they seek to withhold from the public is proprietary. Then, the court must balance the interests of the operators in keeping their information private with the interested party's interest in human and environmental health.*²⁰⁴

(G) OTHER RELIEF—Any person having an interest that is or may be adversely affected may commence a civil action against the Department on his or her own behalf to compel compliance with this Act where there is an alleged failure of the Department to perform any act or duty under this Act that is not discretionary with the Department. This action may be commenced in the district court that has jurisdiction over the area where the drilling took place.²⁰⁵

(H) STATE BANS—Nothing in this Act shall be construed or used to prevent individual states from placing bans or temporary moratoriums on the use of hydraulic fracturing within their borders.²⁰⁶

B. Commentary

The language contained in this proposed statute ensures that drilling companies will be allowed to drill, while better managing environmental concerns. This model statute provides extra protection to drilling companies by creating a uniform disclosure policy and prohibiting states from adopting stronger disclosure laws that could strip the company of the benefits associated with its research and development of proprietary chemical blends. However, the proposed statute also provides more protection to locals by ensuring greater protection from pollution. Adopting the specific language concerning the creation of a state-operated website will also allow for better oversight, which is a problem if information is only available on private websites.²⁰⁷ Further,

²⁰⁴ This is based on a combination of the similar clauses found in the Texas and Ohio statutes. See *supra* note 108 (explaining Texas's and Ohio's trade secret challenge clauses).

²⁰⁵ 225 ILL. COMP. STAT. ANN. 732/1-102(b).

²⁰⁶ The federal government should not mandate that every state allow the operation because there actually can be economic benefits if some states allow the procedure, while others ban it. See *supra* note 57 (explaining the economic benefits for drilling companies if some states ban the process).

²⁰⁷ See *supra* Part III.B (analyzing the problems of only having a single, private public disclosure website).

specifically ensuring that private companies remain allowed to post the information, along with the states, will add a second layer of protection to information accuracy because the public will have two sources of information in case one is slower or inaccurate. This would also give the public a choice in the event they find one website easier to use compared to the other.

Some state statutes are too favorable to the drilling companies; however, the proposed statute reduces drilling companies' ability to avoid chemical disclosure by claiming whatever they want as a trade secret.²⁰⁸ First, the proposed statute requires a company to disclose all information—regardless of its designation as a trade secret—to the state at the outset. In disclosing the information, the companies are allowed to designate some of the information as a trade secret, which would prevent disclosure of the information to the public. Drilling companies should not be required to disclose all information because some of it is legitimately proprietary information that the companies invested a large amount of money in developing. However, this statute is less industry-friendly compared to all current legislation—except Illinois—because the state will still be allowed to have access to the information.

This proposed statute adopts two state protections, but it makes important adjustments to these state provisions. First, there is still a medical emergency exception to the trade secret exemption, but unlike some states, it requires immediate disclosure. It also addresses doctors' concerns about treating their patients to the best of the doctors' abilities by allowing the doctors to disclose the obtained information to their patients if the doctors determine it would improve their ability to treat their patients.²⁰⁹ However, the drilling companies can still require anyone who receives this information to sign a confidentiality agreement so that the information is only used when necessary to improve patient care.

Second, this proposed statute allows interested parties to challenge the trade secret designations but places the burden of proof on the companies. This will better balance human and environmental health concerns by allowing the disclosure of proprietary secrets if the interests in favor of disclosure outweigh the companies' interests in keeping the information private. This provision also allows for a challenge in any federal district court or any state court, as permitted under state law. Although this is not a perfect solution, it allows challengers greater

²⁰⁸ See *supra* Part III.B.1 (demonstrating the problems with the trade secret protections in the state disclosure statutes).

²⁰⁹ See *supra* Part III.B.2 (addressing doctors' concerns about their ability to effectively treat patients if they cannot disclose this information to their patients).

access to courts to challenge the designations and eliminates the extra step required by some states before a court issues an injunction against the drilling.²¹⁰

Finally, any federal statute needs to allow states to ban hydraulic fracturing. Although it may not be the best economic choice, in the end it is a decision best left to the state legislatures. Currently, this is not a problem anyway because most states that have natural gas allow fracking, and the other states will likely also permit fracking after observing the economic benefits enjoyed by other states.²¹¹

V. CONCLUSION

The different state laws vary widely on what must be disclosed, where the information must be disclosed, when the information must be disclosed, and how often trade secret protections should be given to companies.²¹² Seemingly, the states with these laws have some sort of protection for trade secrets because no state wants to pay the companies if a Fifth Amendment taking is found. However, the cases that relate to similar disclosure requirements show that this would not be necessary.²¹³ Because the potential danger posed by chemicals would severely hurt human health if it leaked into local drinking water, there should be stronger regulation that lowers the risk of harm associated with a possible leak. There is also a need for uniform disclosure laws to help drilling companies. This is best accomplished by a federal regulation that better balances the human and environmental health risks with the economic benefits resulting from fracking.

Returning to the story of State A and State B, imagine that Congress passed the amendment proposed in Part IV of this Note.²¹⁴ State A (the state that banned fracking) would be more inclined to allow fracking in the state because the regulations in place would ease some of its

²¹⁰ See *supra* Part III.B.3 (evaluating the problems with Ohio only allowing challenges in one county throughout the entire state and Texas only allowing challenges to the state attorney general, which adds another step to stopping the companies because the attorney general needs a court to issue an injunction).

²¹¹ See *supra* note 50 and accompanying text (explaining that the economic benefits of fracking caused Illinois to pass its own regulations allowing the procedure).

²¹² See *supra* Part II.D.3 (discussing the various provisions of the different state chemical disclosure laws).

²¹³ See *supra* Part III.A (analyzing the case law on trade secret disclosures and concluding that when the information is given in exchange for a valuable government benefit, such as a permit, the information can be disclosed without paying just compensation so long as the industry has a history of regulation and the disclosure is required for safety).

²¹⁴ See *supra* Part IV (proposing a suggested federal fracking chemical disclosure statute that Congress should pass).

environmental concerns so that the state can enjoy the economic benefits that accompany fracking. Similarly, the environmental problems in State B (the state that allowed fracking) would likely be non-existent because the law would require the state and federal governments to collect enough information to adequately fix any potential environmental disasters before they reached the level described in Part I of this Note.²¹⁵ The proposed statute in this Note fixes the major problems with the current state regulations and paves the way for a balanced approach to the fracking regulation problem that is uniform among the states.

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²¹⁵ See *supra* Part I (discussing a fictional scenario in which State B had a range of human and environmental health issues because it was ill-equipped to handle a potential environmental problem posed by fracking).

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