

WHAT THE FRACK? HOW WEAK INDUSTRIAL DISCLOSURE RULES PREVENT PUBLIC UNDERSTANDING OF CHEMICAL PRACTICES AND TOXIC POLITICS

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I. INTRODUCTION

Hydraulic fracturing, known colloquially as “fracking,” is a relatively new practice in the energy industry that is expanding rapidly and generating much controversy among citizens and their politicians. As will be discussed herein, fracking makes use of chemically-formulated fluid that is forced down a gas well at great pressure to fracture underground rock formations and release embedded natural gas. Many journalists, environmentalists, and public health advocates are concerned about what may happen if the fracking fluid escapes the well and contaminates nearby drinking water supplies.

Scientists and environmental advocates have argued that they cannot thoroughly investigate complaints of water contamination without knowing the chemical composition of fracking fluid.¹ Therefore, in recent years the federal government and several states have introduced new regulations that mandate the disclosure of the chemicals that are used in fracking fluid. This Article will argue that these regulations are often a useful first step toward achieving public knowledge of this new industry and its possible environmental ramifications. However, this Article will ultimately argue that the information obtained via these regulations is usually a dry collection of trivial details that lack the scientific and social context that is necessary for true understanding.

Many journalists and activists have reported on the environmental effects of fracking, the general political controversy surrounding the practice, and the strengths and weaknesses of fracking fluid disclosure rules in certain jurisdictions. This Article attempts a comprehensive analysis and

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¹ Cora Currier, *ALEC and ExxonMobil Push Loopholes in Fracking Chemical Disclosure Rules*, PROPUBLICA (Apr. 24, 2012), <http://www.propublica.org/article/alec-and-exxonmobil-push-loopholes-in-fracking-chemical-disclosure-rules>.

comparison of all relevant fracking fluid disclosure regulations currently extant in the United States, and considers whether the information gained is truly useful for citizens, journalists, and regulators. Section II offers readers an admittedly simplified primer on the science of fracking practices in the energy industry and the chemicals used. Section III covers federal requirements for the disclosure of fracking fluid chemicals, and Section IV does the same at the state level. Section V offers a discussion of the related matter of gag orders and nondisclosure agreements that have been mandated by some states and fracking companies. The Conclusion of this Article argues that the disclosed fracking fluid information must consist of more than dry lists of chemical substances and must include additional context in order to be truly useful for the citizen at a higher level of comprehension.

II. A SHORT, SIMPLIFIED PRIMER ON THE SCIENCE OF FRACKING

In geology, a *fracture* is any separation in an otherwise solid rock formation. A fracture typically occurs when weight and pressure exceed the compressive strength or tensile strength of the rock or both, causing it to split along its weakest plane.² Fractures in which the now separated bodies of rock begin to move in relation to each other are known as *faults*, whereas the much more common and benign fractures are known as *joints*. Fractures allow for the movement of water, other fluids (such as lava), and gases through underground formations that are otherwise solid rock. Meanwhile, if the rocks are sedimentary in nature, they may contain trace amounts of fluid or gas that have become trapped under pressure. Fracturing allows these additional fluids or gases to escape and flow through the resulting gaps in the rock.³

One valuable substance that is often trapped in underground sedimentary rock formations is natural gas, which typically forms from the decomposition of plants and animals, with the gas becoming trapped in mud that later becomes sedimentary rock due to compression over

² R.G. PARK, FOUNDATIONS OF STRUCTURAL GEOLOGY 23–25 (3d ed. 1997). Compressive strength is the ability of a substance to withstand pressure from above without changing shape or breaking; tensile strength is the ability to withstand twisting or stretching. For natural rock formations, overhead pressure is caused by the sheer weight of water, soil, and other rocks above; twisting or stretching are typically caused by plate tectonics and seismic activity. *See generally* Evert Hoek & Edwin T. Brown, *Empirical Strength Criterion for Rock Masses*, 106 J. GEOTECHNICAL ENGINEERING DIVISION 1013 (1980).

³ R.H. Sibson, J. McM. Moore & A.H. Rankin, *Seismic Pumping—A Hydrothermal Fluid Transport Mechanism*, 131 J. GEOLOGICAL SOC'Y LONDON 653, 656–657 (1975). *See also* F.L. Ladiera & N.J. Price, *Relationship Between Fracture Spacing and Bed Thickness*, 3 J. STRUCTURAL GEOLOGY 179, 180–81 (1981).

thousands or millions of years.⁴ Under natural conditions, it may take millennia for seismic processes to form fractures that allow natural gas to be released from the rock. But, in the 1940s mining engineers developed an artificial fracturing process to reach this valuable fuel resource.⁵ In short, a well shaft is drilled toward an underground rock formation, and fluid is injected into the well at very high pressure to create artificial fractures in the rock below the bottom of the shaft, thus releasing previously trapped natural gas. Since gas is lighter than liquid, the newly-freed gas floats up the same column of fluid that was used to free it, and can thus be captured at the top of the well.⁶ This technique is called hydraulic fracturing, and the colloquialism “fracking” is typically used in public discourse.

Non-hydraulic fracturing, as a technique to open up recalcitrant wells with the use of explosive materials, dates back to the earliest oil wells of the 1860s.⁷ The first attempt at hydraulic fracturing for a natural gas well, using a mixture of gasoline and sand, was in Kansas in 1947; the attempt was unsuccessful due to the behavior of the substance under pressure.⁸ Some further research into new hydraulic fracturing fluids by the companies Stanolind and Halliburton led to the first commercial fracking operations in 1949 in Oklahoma and Texas.⁹

By the 1960s, geologists learned that the sandstone formations underlying much of the “Four Corners” region of the southwestern United States offered large amounts of trapped natural gas, but accessing this gas via traditional mining techniques was too expensive.¹⁰ Massive hydraulic

4 U.S. ENERGY INFO. ADMIN., *Natural Gas Explained*, http://www.eia.gov/energyexplained/index.cfm?page=natural_gas_home (last visited Oct. 29, 2015). B.M. Krooss, R. Littke, B. Muller, J. Frielingsdorf, K. Schwochau & E.F. Idiz, *Generation of Nitrogen and Methane from Sedimentary Organic Matter: Implications on the Dynamics of Natural Gas Accumulations*, 126 CHEMICAL GEOLOGY 291, 298–99 (1995). As its name implies, natural gas is in gaseous form as opposed to liquid fossil fuels like petroleum. Gaseous fossil fuel comes in several different varieties based on its origin and composition, but for simplicity this article uses the generalized term *natural gas* for all varieties.

5 Leonard J. Kalfayan, *Fracture Acidizing: History, Present State, and Future*, SPE INT’L (2007), <https://www.onepetro.org/download/conference-paper/SPE-106371-MS?id=conference-paper%2FSPE-106371-MS> (last visited Oct. 29, 2015).

6 Timothy Krantz, *Fracking Threatens L.A.’s Water Supply*, L.A. DAILY NEWS (Aug. 25, 2014), <http://www.dailynews.com/opinion/20140825/fracking-threatens-las-water-supply-guest-commentary>. This is a highly simplified explanation of the process, though the fundamental mechanics are largely consistent across various techniques and practices. For a full explanation, see U.S. DEP’T OF ENERGY, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER 56–64 (2009), http://energy.gov/sites/prod/files/2013/03/f0/ShaleGasPrimer_Online_4-2009.pdf.

7 *Shooters—A “Fracking” History*, AM. OIL & GAS HIST. SOC’Y, <http://aoghs.org/technology/hydraulic-fracturing/> (last visited Oct. 29, 2015).

8 *See id.*

9 Carl T. Montgomery & Michael B. Smith, *Hydraulic Fracturing: History of an Enduring Technology*, 62 J. PETROLEUM TECH. 26, 26–27 (2010).

10 *See, e.g.*, C.R. Fast, G.B. Holman & R. J. Covlin, *The Application of Massive Hydraulic Fracturing to the Tight Muddy “J” Formation, Wattenberg Field, Colorado*, 29 J. PETROLEUM TECH. 10, 10–11 (1977); Robert Chancellor, *Mesaverde Hydraulic Fracture Stimulation, Northern Piceance Basin – Progress Report*, ROCKY MOUNTAIN ASS’N GEOLOGISTS SYMP. 285, 285–89 (2009).

fracturing (also known as high volume fracking) began at thousands of wells in this region in the early 1970s.¹¹ Similar gas-bearing formations were discovered under western Canada and the North Sea region of Europe in the late 1970s, and advanced fracking practices followed apace.¹² New drilling technologies for the creation of horizontal wells, which branch out underground from an original vertical well shaft, were developed by the early 1990s, greatly increasing the efficiency of fracking operations in certain types of rock formations.¹³

Fracking remained a lucrative but relatively obscure practice until about 2008, when fuel companies targeted the Marcellus Shale formation in the northeastern United States. Named after a scenic outcrop near Marcellus, New York, this immense formation of sedimentary rock stretches for more than 600 miles and underlies almost all of West Virginia, about three-quarters of Pennsylvania, large percentages of New York and Ohio, slivers of other nearby states, and Ontario in Canada.¹⁴ About 390 million years ago, the region was between a newly-risen chain of mountains and a coastline. Rivers flowing down from the mountains deposited muddy sedimentary material in a large basin. Over the succeeding millennia, this material was compressed to form shale, with great amounts of natural gas (a byproduct of the decomposition of the area's plant life) becoming trapped inside rock along the way.¹⁵

Geologists had long known that the Marcellus Shale formation contained natural gas and that some wells were drilled as early as the 1960s. However, there was little commercial interest because the gas was believed to exist only in isolated pockets, and the formation is typically very deep (as far as 10,000 feet) underground and often under other rock

¹¹ R.G. Agarwal, R.D. Carter & C.B. Pollock, *Evaluation and Performance Prediction of Low-Permeability Gas Wells Stimulated by Massive Hydraulic Fracturing*, 31 J. PETROLEUM TECH. 362, 362 (1979). Massive hydraulic fracturing makes use of at least one hundred tons of fluid at each well per fracking operation.

¹² DETLEF MADER, HYDRAULIC PROPPANT FRACTURING AND GRAVEL PACKING 173–74 (1989).

¹³ Kalyani Robbins, *Awakening the Slumbering Giant: How Horizontal Drilling Technology Brought the Endangered Species Act to Bear on Hydraulic Fracturing*, 63 CASE W. L. REV. 1143, 1143–44 (2013). See also Andrea Messer, *Unconventional Natural Gas Reservoir Could Boost U.S. Supply*, PA. ST. U. NEWS (Jan. 17, 2008), <http://news.psu.edu/story/191364/2008/01/17/unconventional-natural-gas-reservoir-could-boost-us-supply>.

¹⁴ Kevin Mayhood, *Low Down, Rich and Stingy: Energy Companies Just Figuring Out How to Coax Natural Gas from Deepest Appalachian Shale Deposits*, COLUMBUS DISPATCH (Mar. 11, 2008), http://www.dispatch.com/content/stories/science/2008/03/11/Sci_shale.ART_ART_03-11-08_B4_A99I7HO.html; David G. Kargbo, Ron G. Wilhelm & David J. Campbell, *Natural Gas Plays in the Marcellus Shale: Challenges and Potential Opportunities*, 44 ENVTL. SCI. & TECH. 5679, 5679 (2010).

¹⁵ S. J. Mazzullo, *Deltaic Depositional Environments in the Hamilton Group*, 43 J. SEDIMENTARY PETROLOGY 1061, 1062–65 (1973).

formations, making it inaccessible via older mining technologies.¹⁶ Reacting to the energy crisis of the late 1970s, the U.S. Department of Energy drilled test wells in Pennsylvania that revealed potential supplies of natural gas in the Marcellus Shale formation that were far larger than previously believed.¹⁷ Due to fluctuations in world natural gas prices and delays in the further development of fracking technologies, large-scale commercial exploitation of the Marcellus Shale formation did not begin until around 2008, but then became a highly profitable craze quite suddenly. As an example, Pennsylvania had just four Marcellus-related commercial gas wells in 2005, but more than 3300 by 2011. The state had issued more than 7400 permits for such wells during the same period.¹⁸ Meanwhile, thanks to further technological advances, fracking is becoming more common across the country and around the world for all types of mining for gaseous resources. By 2012, there were an estimated 82,000 fracking wells across the United States.¹⁹ In mid-2015 the voluntary industry website FracFocus listed nearly 100,000 fracking wells nationwide, with the true number most likely being higher than that.²⁰

Notwithstanding the economic benefits of the fracking craze in the Marcellus Shale region and elsewhere,²¹ this Article focuses on the

¹⁶ See John A. Harper, *The Marcellus Shale—An Old "New" Gas Reservoir in Pennsylvania*, 38 PA. GEOLOGY 2, 9–12 (2008).

¹⁷ *Id.* at 3–4.

¹⁸ COMMONWEALTH OF PA., GOVERNOR'S MARCELLUS SHALE ADVISORY COMMISSION, REPORT 33–34 (July 22, 2011), <http://www.marcellus.psu.edu/resources/PDFs/MSACFinalReport.pdf>. In the intervening period, several hundred new wells were drilled each year in Pennsylvania, topping out at more than 1400 new wells in 2010 before a lull in 2011 caused by a drop in natural gas prices. All figures are per fiscal year.

¹⁹ Elizabeth Ridlington & John Rumpler, *Fracking by the Numbers: Key Impacts of Dirty Drilling at the State and National Level*, ENV'T AM. RES. & POL'Y CTR. at 20 (Oct. 2013), http://www.environmentamerica.org/sites/environment/files/reports/EA_FrackingNumbers_sern.pdf.

This figure only includes new wells that had been drilled specifically for fracking purposes since 2005, and the figure is only an estimate due to difficulty in obtaining equally useful data from all states and even finding a precise definition of "fracking." *Id.* at 29; see also *infra* notes 78–80 and accompanying text.

²⁰ FRACFOCUS CHEMICAL DISCLOSURE REGISTRY, <https://fracfocus.org/>. This service and its likely inaccuracy will be discussed in detail at *infra* notes 123–141 and accompanying text.

²¹ See, e.g., Jim Efstathiou Jr., *Fracking Boom Seen Raising Household Incomes by \$1,200*, BLOOMBERG BUS. (Sept. 3, 2013), <http://www.bloomberg.com/news/articles/2013-09-04/fracking-boom-seen-raising-household-incomes-by-1-200>; *American Industry and Fracking: From Sunset to New Dawn*, THE ECONOMIST (Nov. 16, 2013), <http://www.economist.com/news/business/21589870-capitalists-not-just-greens-are-now-questioning-how-significant-benefits-shale-gas-and>; Kevin A. Hassett & Aparna Mathur, *Benefits of Hydraulic Fracking*, AM. ENTERPRISE INST. (Apr. 4, 2013), <http://www.aei.org/publication/benefits-of-hydraulic-fracking/>.

Many of the financial benefits of fracking are framed in terms of job creation. The financial press has reported that a vague quantity of "thousands" (or occasionally "millions") of jobs have been created thanks to the Marcellus Shale boom. See, e.g., Jim Efstathiou Jr., *Fracking Will Support 1.7 Million Jobs, Study Shows*, BLOOMBERG BUS. (Oct. 23, 2012), <http://www.bloomberg.com/news/articles/2012-10-23/fracking-will-support-1-7-million-jobs-study-shows>; Clare Foran, *How Many Jobs Does Fracking Really Create?*, NAT'L J. (Apr. 14, 2014), <http://www.nationaljournal.com/energy/2014/04/14/how-many-jobs-does-fracking-really-create>.

Pennsylvania and West Virginia have each reported multi-billion dollar increases in economic activity related to Marcellus Shale drilling stemming from new jobs, tax revenues, or the sale/leasing of

controversy surrounding the imagined or real environmental and public health impacts of fracking, as well as the availability of crucial information for citizens and journalists. The most immediate environmental impact of fracking involves the land area that is given up for new drilling sites, often consuming farms or forests, and causing increased traffic on nearby roads. The rapid development of thousands of new wells also creates a pressing need for storage tanks and underground pipelines to deliver the extracted natural gas to ports and refineries, necessitating even more land usage.²² Related problems include noise pollution emanating from drilling sites,²³ and even suspicions of *induced seismicity*, or small earthquakes caused by the unnatural fracturing of underground rock formations.²⁴ However, fracking's effect on nearby water supplies has been the most contentious environmental and public health issue by far, resulting in the questionable disclosure practices that are at the heart of this Article.²⁵

former state lands to drilling companies. See, e.g., Casey Junkins, *Gas Drilling Booms in Valley: Marcellus Shale Dominates Talk in 2010*, THE INTELLIGENCER WHEELING NEWS REG. (Dec. 25, 2010), <http://www.theintelligencer.net/page/content.detail/id/550180/Gas-Drilling-Booms-in-Valley.html?nav=515>; Diana Furchtgott-Roth & Andrew Gray, *The Economic Effects of Hydrofracturing on Local Economies: A Comparison of New York and Pennsylvania*, MANHATTAN INST. FOR POL'Y RES. (May 2013), http://www.manhattan-institute.org/pdf/gpr_1.pdf. It should be noted that these pronouncements are often based on faulty data and repeated from corporate promotional materials. Abraham Lustgarten, *The FRAC Act Under Attack*, SALON (July 14, 2009), http://www.salon.com/2009/07/14/gas_3/.

²² Andrew Blohm, Jeremy Peichel, Caroline Smith & Alexandra Kougentakis, *The Significance of Regulation and Land Use Patterns on Natural Gas Resource Estimates in the Marcellus Shale*, 50 ENERGY POL'Y 358, 360–65 (2012); See Charles Davis, *The Politics of "Fracking": Regulating Natural Gas Drilling Practices in Colorado and Texas*, 29 REV. POL'Y RES. 177, 181 (2012). The Environment America Research & Policy Center has estimated that between 2005 and 2012, 360,000 acres of land were damaged across the United States by the fracking industry, including 130,000 acres in Texas and more than 50,000 acres each in Colorado and North Dakota. Ridlington & Rumpler, *supra* note 19, at 25.

²³ Fracking-related noise pollution, often from motorized pumps that operate twenty-four hours per day, plus the initial drilling of well shafts, is a particular source of controversy in England. Bill Gardner, *Fracking Firm Stops Drilling in Balcombe After "Rattling" Noise Complaints*, THE ARGUS, (Sept. 9, 2013),

http://www.theargus.co.uk/news/10662407.%20Fracking_firm_ordered_to_stop_drilling_in_Balcombe_after_rattling_noise_complaints/.

²⁴ See generally William L. Ellsworth, *Injection-Induced Earthquakes*, 341 SCI. MAG. 1225942-1, (2013). Some of this induced seismicity is intentional during scouting operations. In the United States there has been one confirmed case of a significant earthquake caused by fracking operations (near Youngstown, Ohio), of a magnitude that could be felt by nearby residents. See Won-Young Kim, *Induced Seismicity Associated with Fluid Injection into a Deep Well in Youngstown, Ohio*, 118 J. GEOPHYSICAL RES.: SOLID EARTH 3506, 3516–17 (2013). Similar incidents caused by general underground mining activities have been suspected around the world. See Sharon Begley & Edward McAllister, *Earthquakes May Trigger Fracking Tremors*, ABC SCI. (July 12, 2013), <http://www.abc.net.au/science/articles/2013/07/12/3801578.htm>. In 2015, the United States Geological Survey speculated that a recent rash of small earthquakes in Oklahoma, an area not previously known for frequent seismic activity, could be connected to fracking. See Rong-Gong Lin II, Jon Schleuss & Thomas Suh Lauder, *Man-Made Earthquakes Increasing in Central and Eastern U.S., Study Finds*, L.A. TIMES (Apr. 23, 2015), <http://www.latimes.com/visuals/graphics/la-me-quake-frack-20150423-htmlstory.html>.

²⁵ See *infra* note 85 and accompanying text.

The fracking process by design requires enormous amounts of water (the primary component of fracking fluid), which is typically obtained from nearby natural sources, thus disrupting water flows and supplies.²⁶ The chemical composition of fracking fluid, which includes toxic substances (see below), raises further concerns. This fluid is forced down a well shaft under great pressure, and the rock formations targeted for fracturing are often below the water table. Although vertical well shafts are typically encased in concrete, some have been known to leak due to the downward pressure being forced upon the fluid, raising suspicions that fracking fluid can leak into groundwater supplies.²⁷

While the connection is still under scientific review, the majority of health problems that have been reported by citizens who live near fracking sites are related to contaminated water supplies.²⁸ Importantly, after fracking operations are complete, a significant percentage of the fracking fluid is left underground. There is little oversight of the fluid's future movement and the assumption is made that well shafts will remain impermeable (with no leaks into groundwater) in perpetuity.²⁹ On the other

²⁶ Suzanne Goldenberg, *Fracking is Depleting Water Supplies in America's Driest Areas*, *Report Shows*, THE GUARDIAN (Feb. 5, 2014), <http://www.theguardian.com/environment/2014/feb/05/fracking-water-america-drought-oil-gas>; Mark Koba, *Fracking or Drinking Water? That May Become the Choice*, CNBC (Sept. 12, 2014), <http://www.cnbc.com/id/101989915#>. According to Chesapeake Energy, a major fracking operator, the average fracking well in the Marcellus Shale region may use 6.1 million gallons of water over its operational lifespan. (Due to geological factors, this figure varies by region.) Chesapeake also claims to have recycled 246 million gallons of post-fracking water in 2013. CHESAPEAKE ENERGY, <http://www.chk.com/responsibility/environment/water> (last visited Oct. 29, 2015). That recycling figure is probably a tiny percentage of all water used in fracking operations, because recycling is not yet a widespread practice in the industry. See James Osborne, *Fracking Companies Begin Slow Shift to Recycling Wastewater*, DALL. MORNING NEWS, (Aug. 9, 2014), <http://www.dallasnews.com/business/energy/20140809-fracking-companies-begin-slow-shift-to-recycling-wastewater.ece>; Forrest Wilder, *Study: In Midst of Drought, Fracking Industry Does Little to Recycle Water*, TEX. OBSERVER (Feb. 4, 2014), <http://www.texasobserver.org/study-little-progress-made-recycling-water-fracking/>. Note that one million gallons of water would fill about twenty thousand bathtubs or nearly two Olympic-size swimming pools.

²⁷ See, e.g., Timothy T. Eaton, *Science-Based Decision-Making on Complex Issues: Marcellus Shale Gas Hydrofracking and New York City Water Supply*, 461-62 *SCI. TOTAL ENV'T* 158, 160-61 (2013); Wendy Koch, *Study: Faulty Gas Wells, Not Fracking, Pollute Water*, USA TODAY (Sept. 15, 2014), <http://www.usatoday.com/story/money/business/2014/09/15/faulty-gas-well-pollute-water/15631955/>.

²⁸ See generally M.L. Finkel & J. Hays, *The Implications of Unconventional Drilling for Natural Gas: A Global Public Health Concern*, 127 *PUB. HEALTH* 889 (2013); A. KIBBLE ET AL., *CTR. FOR RADIATION, CHEMICAL AND ENVTL. HAZARDS, REVIEW OF THE POTENTIAL PUBLIC HEALTH IMPACTS OF EXPOSURES TO CHEMICAL AND RADIOACTIVE POLLUTANTS AS A RESULT OF SHALE GAS EXTRACTION: DRAFT FOR COMMENT* (2013), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329744/PHE-CRCE-002_for_website_protected.pdf; R. D. Vidic, S. L. Brantley, J. M. Vandenbossche, D. Yoxtheimer & J. D. Abad, *Impact of Shale Gas Development on Regional Water Quality*, 340 *SCI. MAG.* 1235009-1 (2013); Katie Valentine, *Study Links Water Contamination to Fracking Operations in Texas and Pennsylvania*, THINK PROGRESS: CLIMATE PROGRESS (Sept. 15, 2014, 1:22 PM), <http://thinkprogress.org/climate/2014/09/15/3567369/fracking-water-contamination-casing/>.

²⁹ The percentage of fracking fluid left underground is "significant" but speculative due to a paucity of research into the issue. A 2009 article reported that as much as 85 percent of fracking fluid is left underground, based on anonymous interviews with three company spokespeople and one regulatory

hand, some used fracking fluid is pumped back up the well for disposal, and while it is sometimes shipped away in tanker trucks, more commonly it is stored in nearby evaporation ponds. Despite liners (similar to those used in landfills) and other infrastructure, these ponds are also suspected of leaking chemicals into nearby water supplies.³⁰

The carefully-formulated composition of the fluid used during the fracking process is crucial to this discussion. The fluid must be able to maintain its integrity when being forced underground at great pressure, it must be strong enough to actually break open tough rock formations, and it must remain strong enough to keep a new artificial fracture open; but all the while it must be conducive to the ability of newly released natural gas to float back up the well.³¹ Simple water is not sufficient, so fuel companies have adopted solid *proppants* (typically mineral materials with the consistency of sand) to be mixed with water, resulting in a fracking fluid that is stronger and more viscous.³² The fluid must also enable or inhibit various other chemical processes that become relevant during fracking, which in turn creates the need for chemical additives that are poorly understood by the public and regulators alike.³³

While most fracking fluid is still about 99 percent water,³⁴ and most proppants are not particularly controversial, the chemical additives are perhaps the biggest sources of controversy surrounding modern fracking practices. For a variety of reasons to be discussed herein, fracking companies have not reported transparently on their usage of chemical

official. The same article reported that federal lawmakers, after their own apparent fact-finding process, had arrived at the assumption that about 30 percent of fracking fluid is left underground. See Abraham Lustgarten, *In New Gas Wells, More Drilling Chemicals Remain Underground*, PROPUBLICA, (Dec. 27, 2009, 8:12 AM), <http://www.propublica.org/article/new-gas-wells-leave-more-chemicals-in-ground-hydraulic-fracturing>.

³⁰ Daniel J. Rozell & Sheldon J. Reaven, *Water Pollution Risk Associated with Natural Gas Extraction from the Marcellus Shale*, 32 RISK ANALYSIS 1382, 1382–83 (2012).

³¹ These are just a few of the functions that fracking fluid must perform. For further discussion, see Theo Colborn, Carol Kwiatkowski, Kim Schultz & Mary Bachran, *Natural Gas Operations from a Public Health Perspective*, 17 HUM. & ECOLOGICAL RISK ASSESSMENT 1039, 1041 (2011).

³² See generally C.N. FREDD, S.B. MCCONNELL, C.L. BONEY & K.W. ENGLAND, SOC'Y OF PETROLEUM ENGINEERS, EXPERIMENTAL STUDY OF HYDRAULIC FRACTURE CONDUCTIVITY DEMONSTRATES THE BENEFITS OF USING PROPPANTS 1 (2000), <https://www.onepetro.org/download/conference-paper/SPE-60326-MS?id=conference-paper%2FSPE-60326-MS>. A fracking fluid consisting of water mixed with proppants is called “slickwater” in the industry. Note that some advanced fracking fluids are based on gels rather than water. See Luke Geiver, *The Slickwater Story*, BAKKEN MAG. (July 14, 2014), <http://www.thebakken.com/articles/711/the-slickwater-story>.

³³ See generally U.S. HOUSE OF REPRESENTATIVES, COMMITTEE ON ENERGY & COMMERCE, CHEMICALS USED IN HYDRAULIC FRACTURING, (Apr. 2011), <http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic-Fracturing-Chemicals-2011-4-18.pdf>. There are many chemical processes that must be enabled or inhibited during fracking; examples range from simple friction and corrosion to the growth of microflora and “acid etching” (the process in which acids dissolve rock).

³⁴ UNITED STATES EPA, OFFICE RESEARCH & DEV., HYDRAULIC FRACTURING RESEARCH STUDY 2, (June 2010).

substances in fracking fluid. So what exactly are these substances? Most are scientifically complex, and the precise number of distinct chemicals used during fracking processes (uniformly or as needed) is difficult to determine for reasons that will become apparent throughout this Article.

The U.S. Congress mandated a comprehensive list of fracking fluid chemicals in 2011.³⁵ The resulting document contained 753 substances, twenty-nine of which are (known or possible) carcinogens or are already regulated by the federal government because of their risks to human health.³⁶ The substances in the long list range from the fairly comprehensible benzene and formaldehyde to the inherently incomprehensible Ethanaminium, N,N,N-trimethyl-2-[(1-oxo-2-propenyl)oxy]-, chloride, homopolymer.³⁷ Furthermore, the Congressional report listed the number of “products” containing each particular chemical. There are 279 such products, but the report did not name a single one of them, much less provide information on which products are used by which companies and at which fracking locations.³⁸ The report noted that the twenty-nine items known to be carcinogens or other toxic hazards appeared in many products, but yet again, there was no description of what those products are, which companies use them, at which locations, or at what time.³⁹ The report did, however, make a half-hearted attempt to introduce a few of the maladies that can be caused by these chemicals.⁴⁰

In several places, the report mentioned that the missing product information was not forthcoming due to company requests for the protection of trade secrets, as further complicated by distribution networks and wholesale markets.⁴¹ As noted in the report, “in most cases the companies stated that they did not have access to proprietary information about products they purchased ‘off the shelf’ from chemical suppliers. The proprietary information belongs to the suppliers, not the users of the chemicals.”⁴² As the report drily remarked, “In these cases, the companies

35 U.S. HOUSE OF REPRESENTATIVES, *supra* note 33, at 13–30.

36 U.S. HOUSE OF REPRESENTATIVES, *supra* note 33, at 13–30; Nicholas Kusnetz, *Critics Find Gaps in State Laws to Disclose Hydrofracking Chemicals*, PROPUBLICA (June 20, 2011), <http://www.propublica.org/article/critics-find-gaps-in-state-laws-to-disclose-hydrofracking-chemicals>.

37 Despite all the commas, this is actually one substance.

38 U.S. HOUSE OF REPRESENTATIVES, *supra* note 33, at 13–30. For example, a substance called aliphatic alcohol polyglycol ether is noted as appearing in one product while isopropyl alcohol is noted as appearing in 274.

39 *Id.* at 8.

40 *Id.* at 10. The report did mention a couple of prominent examples of “extremely toxic” chemicals in the list, benzene and lead; while also noting trivia like the harmless salt and the surprising walnut hulls. *Id.* at 1.

41 *Id.* at 11–12.

42 *Id.* at 12.

are injecting fluids containing chemicals that they themselves cannot identify.”⁴³

It is important to remember that this list of 753 fracking fluid chemicals already exists and can be found easily online. However, it cannot be considered sufficiently transparent because it is merely a dry list that provides no context, which is especially troubling for those concerned about environmental damage and public health. There is no reason to be confident that this compilation of largely incomprehensible chemical names is complete because of trade secret-related obfuscation (these 753 items could be any percentage of the true total).⁴⁴ Further, there is no information on which of those chemicals are used where and when, whether they are mixed together in ways that could create even more toxicity, or how they behave over time. As the Congressional report concluded: “it appears that the companies are injecting fluids containing unknown chemicals about which they may have limited understanding of the potential risks posed to human health and the environment.”⁴⁵

This pattern of corporate and scientific uncertainty does not bode well for citizens and journalists who would like full disclosure of fracking fluid chemicals and their precise usages. Company requests for protection of trade secrets, as well as the incomprehensibility of chemical names for the interested layperson, have conspired against full disclosure at the true level of detail required. Transparency, of not just information but of *context*, is crucial in this instance. Some federal statutes and state regulations have attempted to alleviate these problems with largely disappointing levels of success; this is the topic to which we now turn.

III. FRACKING CHEMICAL DISCLOSURE REQUIREMENTS AT THE FEDERAL LEVEL

Most fracking operations take place on private or state lands (such as State Forests, as is very common in Pennsylvania) rather than federal lands, thus the process is usually governed by state regulations. However, state regulations are typically focused on land use issues such as permitting. Since water and air pollution are regulated at the federal level,⁴⁶ there is the

⁴³ *Id.* at 2.

⁴⁴ The Department of Energy has found that for 84 percent of all fracking wells in the United States, the operating company has claimed a trade secrets exemption for at least one of the chemicals used therein. See U.S. DEP’T OF ENERGY, SECRETARY OF ENERGY ADVISORY BOARD, TASK FORCE REPORT ON FRACFOCUS 2.0 11 (Feb. 24, 2014),

<http://energy.gov/sites/prod/files/2014/03/f8/FracFocus%20TF%20Report%20Final%20Draft.pdf>.

⁴⁵ U.S. HOUSE OF REPRESENTATIVES, *supra* note 33, at 12.

⁴⁶ The predominant federal statutes (though there are many others) are the Clean Water Act, 33 U.S.C. §§ 1251–1387 (1972); and the Clean Air Act, 42 U.S.C. §§ 7401–7671 (1977). Of interest for the present discussion is that both of these acts include information disclosure requirements, mostly

procedural possibility for federal regulations of fracking, although the industry and its allies have thus far stymied any significant progress. In 2013 the U.S. Department of the Interior proposed a set of federal fracking regulations,⁴⁷ but in November of that year the House of Representatives passed a bill to prohibit any federal fracking regulation in states that already have their own such regulations. The bill's title, the "Protecting States' Rights to Promote American Energy Security Act," is ripe with key words that reflect the fractious politics behind this issue.⁴⁸ The bill has not proceeded to the Senate or the President, though its passage in the House shows the prevailing political resistance to any forthcoming federal regulation of fracking practices.⁴⁹

Another reason for federal involvement is that the federal government does own the land at many other fracking locations, most notably the hundreds of millions of acres in the American West that are overseen by the Bureau of Land Management (BLM). Prior to 2013, the BLM generally acted more like a typical landowner that negotiated with energy firms and included rules as part of the contractual negotiations at particular sites.⁵⁰ In 2013, the BLM for the first time proposed a more robust set of regulations targeted uniformly at fracking on all federal lands. Notably, this includes a proposal for disclosure of the chemicals in fracking fluid (with a trade secrets exemption).⁵¹ The BLM rules are unlikely to supersede state regulations.⁵² In March 2015, the Bureau promulgated the new rules, which included increased requirements for the disclosure of fracking fluid chemicals. As of the time of writing, the rules had not yet been enforced because of legal challenges from several states.⁵³

related to the permitting process for industrial or agricultural operations that may contribute to water or air pollution.

⁴⁷ Hydraulic Fracturing on Federal and Indian Lands, 43 C.F.R. § 3160 (2015).

⁴⁸ Protecting States' Rights to Promote American Energy Security Act, H.R. 2728, 113th Cong. (2013).

⁴⁹ Pete Kasperowicz, *House Votes to Block Federal Fracking Rules*, THE HILL: FLOOR ACTION (Nov. 20, 2013, 5:41 PM), <http://thehill.com/blogs/floor-action/votes/190977-house-votes-to-block-federal-fracking-rules>.

⁵⁰ See MOLLY FEIDEN, MADELINE GOTTLIEB, ALAN KRUPNICK & NATHAN RICHARDSON, RES. FOR THE FUTURE, HYDRAULIC FRACTURING ON FEDERAL AND INDIAN LANDS: AN ANALYSIS OF THE BUREAU OF LAND MANAGEMENT'S REVISED PROPOSED RULE 2-3 (Aug. 2013), <http://www.rff.org/RFF/Documents/RFF-DP-13-26.pdf>. The industry estimates that about 38 percent of possible fracking sites are on federal land. See Brad Plumer, *How States are Regulating Fracking (In Maps)*, WASH. POST (July 16, 2012), <http://www.washingtonpost.com/blogs/wonkblog/wp/2012/07/16/how-states-are-regulating-fracking-in-maps/>.

⁵¹ FEIDEN ET AL., *supra* note 50, at 4.

⁵² *Id.* at 20.

⁵³ Julie Applegate, *Utah Joins Lawsuit Challenging New BLM Fracking Rule; Fracking in Utah*, ST. GEORGE NEWS (May 22, 2015), <http://www.stgeorgeutah.com/news/archive/2015/05/22/jla-utah-joins-lawsuit-challenging-new-blm-fracking-rule-fracking-in-utah/#.VYClEa2o4F>.

More specifically, as to the disclosure of chemical information, the House of Representatives has made two feeble attempts to require energy firms to disclose all chemical additives used in fracking fluid, including their names and the concentrations used, regardless of supposed trade secrets. Another strategically-titled bill, the “Fracturing Responsibility and Awareness of Chemicals (FRAC) Act” was introduced in 2009 by Democratic Representatives and Senators exclusively. After a period of disinterest, the bill was reintroduced in 2011. The later version died in committee.⁵⁴ The Environmental Protection Agency (EPA) also proposed a plan in 2011 which would require the disclosure of fracking fluid chemicals under the Toxic Substances Control Act.⁵⁵ As of the time of writing, the EPA is proceeding slowly with this plan, claiming that it is still analyzing public comments.⁵⁶

One goal of the failed FRAC Act was to overturn a crucial exemption in a different federal statute. The FRAC Act would have codified fracking as a process to be regulated under the Safe Drinking Water Act (SDWA) of 1974.⁵⁷ In 2005, fracking was specifically exempted from all requirements of the SDWA through the political maneuvering of the industry’s supporters in Congress.⁵⁸ The SDWA generally regulates the protection of above- and below-ground water supplies to be consumed by humans, including the “subsurface emplacement of fluids by well injection,” which would apparently describe the basic fracking process.⁵⁹ In 1997 the 11th Circuit Court of Appeals agreed that “hydraulic fracturing activities constitute ‘underground injection’ according to Section C of the SDWA,” and ordered the Environmental Protection Agency to regulate fracking operations accordingly.⁶⁰ The EPA then spent several years studying the process, and announced in 2004 that “the injection of hydraulic fracturing

54 Fracturing Responsibility and Awareness of Chemicals Act, H.R. 1084, 112th Cong. (2011).

55 Letter from Stephen A. Owens, Assistant Administrator, U.S. Environmental Protection Agency, to Deborah Goldberg, EarthJustice (Nov. 23, 2011). The Toxic Substances Control Act, 53 U.S.C. §§ 2601–2692 (1976), requires the maintenance of an “inventory” (in the form of a publicly-accessible list) of toxic chemicals to be controlled, with the EPA regulating the manufacture, sale, and transport of the listed substances. *See also infra* notes 71–73 and accompanying text.

56 Valerie Volcovici, *U.S. Considers Fracking Fluid Disclosure Rules*, REUTERS (May 9, 2014), <http://www.reuters.com/article/2014/05/09/us-usa-fracking-epa-idUSBREA480FS20140509>; Peggy Otum, *EPA Moves Toward National List of Fracking Chemicals*, LAW360, (June 23, 2014), <http://www.law360.com/articles/550291/epa-moves-toward-national-list-of-fracking-chemicals>. For information on the comment-gathering process, *see also Hydraulic Fracturing Chemicals and Mixtures*, REGULATIONS.GOV, <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPPT-2011-1019-0001> (last visited Oct. 29, 2015).

57 Safe Drinking Water Act of 1974, Pub. L. 93-523, 88 Stat. 1660 (codified as amended in scattered sections of 21, 42 U.S.C.); 42 U.S.C. § 300f (1974).

58 Plumer, *supra* note 50. *See also* Lustgarten, *supra* note 21.

59 Safe Drinking Water Act, 42 U.S.C. § 300h(d)(1)(A) (2012).

60 Legal Envtl. Assistance Found. v. United States EPA, 118 F.3d 1467, 1478 (11th Cir. 1997) (determining whether the EPA should approve or reject an Alabama underground injection program per the statutory meaning of “underground injection” in the SDWA).

fluids into CBM [coalbed methane] wells poses minimal threat to USDWs [underground sources of drinking water].” Further, it concluded that “additional or further study is not warranted at this time.”⁶¹ Fracking supporters in Congress seized the opportunity to extend this imperfect conclusion into an amendment to the SDWA, via the Energy Policy Act of 2005, in which “hydraulic fracturing operations” were specifically exempted from safe drinking water rules.⁶²

There is a similar (in intent and effect) exemption to the Clean Water Act, which already had an exemption for the effluents emanating from oil and gas production in storm water runoff. This exemption was expanded to include oil and gas construction activities via the Energy Policy Act.⁶³ The water-related exemptions resulting from the Energy Policy Act have been a great benefit to the fracking industry, with one of the biggest beneficiaries being Halliburton, which was closely tied to Vice President Dick Cheney when the act was passed.⁶⁴

The fracking industry has also benefited from an existing exemption in the Clean Air Act, which is equipped to enforce restrictions against many small sources of air pollution that combine to form large amounts of emissions (this “aggregation” process is typically applied to cities that have many small factories). Oil and gas production, despite the fact that gases are vented from wells accidentally or purposely and thus make their small contributions to air pollution,⁶⁵ were specifically exempted from this “aggregation” requirement because at the time, such emissions were considered accidental and insignificant.⁶⁶

The Safe Drinking Water, Clean Water, and Clean Air Acts are focused more on treating pollution, and not necessarily on public disclosure of information related to that pollution, which is the true focus of this Article.

61 U.S. EPA, EVALUATION OF IMPACTS TO UNDERGROUND SOURCES OF DRINKING WATER BY HYDRAULIC FRACTURING OF COALBED METHANE RESERVOIRS; NATIONAL STUDY FINAL REPORT 1 (June 2004). It should be noted that this statement by the EPA, on its own terms, is not scientifically conclusive and does not include all types of fracking operations. It should also be noted that the science of fracking’s influence on water supplies has developed greatly in the years since.

62 Energy Policy Act of 2005, Pub. L. No. 109-58, §§ 322(1)(B)(i)–(ii), 119 Stat. 594 (2005). Per this amendment, the only fracking material that is *not* exempted from the SDWA is diesel. 42 U.S.C. § 300h(d)(1)(B) (2012).

63 The previously existing storm water exemption in the Clean Water Act is at 33 U.S.C. § 1342(l)–(2) (2012). The amendment per the Energy Policy Act is at Pub. L. No. 109-58, § 323, 33 U.S.C. § 1362(6), (24) (2014). This exemption was vacated as unlawful in *Natural Res. Def. Council v. United States EPA*, 526 F.3d 591 (9th Cir. 2008), but it remains in effect as of this writing because the EPA has not yet promulgated a replacement rule.

64 Susan Phillips, *Burning Question: What Would Life Be Like Without the Halliburton Loophole?*, STATEIMPACT (Dec. 5, 2011), <http://stateimpact.npr.org/pennsylvania/2011/12/05/burning-question-what-would-life-be-like-without-the-halliburton-loophole/>.

65 Colborn et al., *supra* note 31, at 1042.

66 Clean Air Act, 42 U.S.C. § 7412(n)(4). See also RENEE LEWIS KOSNIK, EARTHWORKS, THE OIL AND GAS INDUSTRY’S EXCLUSIONS AND EXEMPTIONS TO MAJOR ENVIRONMENTAL STATUTES 13 (Oct. 2007), http://www.shalegas.energy.gov/resources/060211_earthworks_petroleumexemptions.pdf.

Unfortunately, those in favor of disclosure of the potentially harmful chemicals in fracking fluid can expect little help from existing federal environmental statutes that have actual transparency requirements built into their statutory language. Thanks to its political allies in Congress, the energy industry has secured fracking-specific exemptions from the Emergency Planning and Community Right-to-Know Act (EPCRA), which requires industrial operations to publish their releases of pollutants proactively and regularly, in the form of reports furnished to the EPA,⁶⁷ the Resource Conservation and Recovery Act (RCRA), which regulates the storage and disposal of hazardous waste and requires public disclosure of the permits for all such operations,⁶⁸ and the Superfund Act, which sets aside funds for the cleanup of toxic sites and requires a publicly-accessible list of all such sites.⁶⁹

Due to bureaucratic inertia and political maneuvering, fracking fluid chemicals are also not regulated under the Toxic Substances Control Act (TSCA), of which transparency and disclosure are major goals. This act requires companies to contribute to a publicly accessible database of dangerous chemicals, after which the EPA takes regulatory action as appropriate against the listed substances. The TSCA only mandates that manufacturers self-report information about their chemicals, which the energy industry has not done for fracking fluid. Alternatively, interested citizens can petition the EPA to add certain chemicals to the list. Environmental activists have been petitioning for the addition of fracking

⁶⁷ Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. §§ 11001–50 (2012). Pub. L. 99-499, § 313, 100 Stat. 1728 (1986). This act empowers the EPA to determine which categories of industrial operators are required to observe the act's disclosure rules. The oil and gas industry, to which fracking operators belong, has never been named by the EPA for observation of those rules. Therefore, periodic EPCRA reports about any releases of pollutants by these operators into the environment are not required under the statute. See WILLIAM J. BRADY, UNIV. OF DENVER STURM COLL. OF LAW, HYDRAULIC FRACTURING REGULATION IN THE UNITED STATES: THE LAISSEZ-FAIRE APPROACH OF THE FEDERAL GOVERNMENT AND VARYING STATE REGULATIONS 7 (2012), <http://www.law.du.edu/documents/faculty-highlights/Intersol-2012-HydroFracking.pdf>.

⁶⁸ Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992 (2012). Thanks to an amendment in 1980, regulation of “drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas” were no longer regulated under RCRA after 1982. 42 U.S.C. § 6921(b)(2)(A) (2012). Therefore, permit information for oil and natural gas drilling operations (including fracking) will not be disclosed to the public under RCRA rules.

⁶⁹ The Superfund Act is known formally as the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Pub. L. 96-510, 94 Stat. 2767 (codified as amended in scattered sections of 26, 33, 39, 42 U.S.C.). 42 U.S.C. §§ 9601–9675 (1980). In regards to fracking, the weakness of this law is that it specifically lists toxins that must be present at a site in order for that site to qualify for taxpayer-funded cleanup. That list does not include natural gas and associated substances, allowing energy firms to be largely exempt from the act's requirements. 42 U.S.C. § 9601(14) (2012). See also Kosnik, *supra* note 66, at 4–5. The practical result of this exemption will be in the future, after a given fracking well is abandoned. Regardless of the actual pollution at the abandoned site, it will not qualify for Superfund cleanup and therefore its existence and toxic risks will not be disclosed to the public through the act's informational requirements.

fluid chemicals to the TSCA list since 2011,⁷⁰ but as of mid-2015, the EPA claims to still be reviewing public comments,⁷¹ which happen to include vigorous opposition from the energy industry.⁷²

The Energy Policy Act of 2005 also created a specific fracking exemption in what is arguably the most powerful environmental disclosure rule in American environmental law. The National Environmental Policy Act (NEPA)⁷³ requires every agency in the U.S. government to mandate an Environmental Assessment for any construction-oriented activity by any party that it regulates, and if significant environmental damage is expected, the regulated party must prepare an Environmental Impact Statement. This document must then be submitted to the EPA (which was created by the NEPA) and made available for public review in perpetuity.⁷⁴ The Energy Policy Act created, out of whole cloth, an alternative to this process in the form of the less stringent Categorical Exclusion, along with a “rebuttal presumption” that any oil or gas-related operation will be evaluated under this new process. Public comments are not required during the formulation of a Categorical Exclusion, as they are for an Environmental Impact Statement.⁷⁵ In effect, as opposed to the requirements elsewhere in the NEPA that environmental impacts of any kind be discussed before operations commence, this new process assumes *ex ante* that specific oil and gas drilling operations will not create any environmental impact. This amendment also institutes a new burden of proof on concerned citizens, who must now provide solid evidence of potential pollution proactively and convince regulatory agencies to initiate the environmental review process that is required for all other industries per the NEPA.⁷⁶

With respect to public knowledge of the potential toxic risks from fracking and its fluids, this is the current dismal state of disclosure rules at the federal level. With various levels of success, states have been enacting disclosure rules for fracking fluid chemicals, but are often stymied by political opposition from the industry and claims of trade secrets.

⁷⁰ See Owens, *supra* note 55.

⁷¹ Valerie Volcovici, *supra* note 56; Otum, *supra* note 56. For information on the comment-gathering process, see also Hydraulic Fracturing Chemicals and Mixtures, 79 Fed. Reg. 28,664 (proposed May 19, 2014), <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPPT-2011-1019-0001>.

⁷² Pat Rizzuto, *Chemical Makers, Energy Companies Tell EPA Not to Mandate Fracking Fluid Disclosure*, BLOOMBERG BNA (Sept. 29, 2014), <http://www.bna.com/chemical-makers-energy-n17179895509/>.

⁷³ National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321–4347 (2012).

⁷⁴ 42 U.S.C. § 4332(a)(2)(G) (2012).

⁷⁵ The amendment per the Energy Policy Act is at Pub. L. 109-58, § 390. 42 U.S.C. § 15942(a) (2012).

⁷⁶ Kosnik, *supra* note 66, at 15–16.

IV. FRACKING CHEMICAL DISCLOSURE REQUIREMENTS AT THE STATE LEVEL

As noted in the last section, it is important to remember that a general list of 753 fracking fluid chemicals already exists at the federal level, but this Article argues that the list cannot be considered sufficiently transparent because it is merely a dry compendium of chemical names with no context. Further, it is unknown if the list is complete or even what percentage of reality that it represents. Because different fracking companies operate in various states, and geological conditions require that local decisions be made on what chemical formulations are required for the fracking fluids, there is an even greater need for full transparency and context at the local level. In this Section we will find that states have managed to obtain lists of fracking fluid chemicals as used within their borders, but with a continuing shortage of context on precisely where and when they are used, and (perhaps most importantly) in what amounts.

The number of fracking wells in the United States, and even the number of different states in which they have been drilled, is difficult to determine for various reasons, including inconsistent data collection methods in various states, and difficulty in distinguishing various unconventional fracking methods.⁷⁷ In 2012, the Environment America Research & Policy Center utilized a precise definition of high-volume hydraulic fracturing with horizontal drilling, and determined that such operations were taking place in seventeen states. Using that same definition, the total has since risen to nineteen states as of mid-2015.⁷⁸ On

⁷⁷ Ridlington & Rumpler, *supra* note 19, at 29. As of this writing, one state, Vermont, has completely banned fracking by law. Vermont, An Act Relating to Hydraulic Fracturing Wells for Natural Gas and Oil Production, Vt. Act No. 0152 (H. 464) (2012). Vt. Stat. Ann. tit. 29 § 57(a). See also Associated Press, *Vermont Fracking Ban: Green Mountain State is First in U.S. to Restrict Gas Drilling Technique*, HUFFINGTON POST (May 16, 2012), http://www.huffingtonpost.com/2012/05/17/vermont-fracking-ban-first_n_1522098.html. In late 2014, New York Governor Andrew M. Cuomo issued an executive order to ban fracking in that state, but this order could be rescinded by future administrations. Thomas Kaplan, *Citing Health Risks, Cuomo Bans Fracking in New York State*, N.Y. TIMES (Dec. 17, 2014), <http://www.nytimes.com/2014/12/18/nyregion/cuomo-to-ban-fracking-in-new-york-state-citing-health-risks.html>. There have been fracking bans in dozens of localities in 25 different states, some of which have only experienced discussions of possible future fracking. The ability of local bans to withstand the supremacy of state fracking regulations will vary by state. For a list, see *Local Actions Against Fracking*, FOOD & WATER WATCH, <http://www.foodandwaterwatch.org/water/fracking/anti-fracking-map/local-action-documents/> (last visited Oct. 29, 2015).

⁷⁸ Ridlington & Rumpler, *supra* note 19, at 20. The seventeen states identified in 2012 are Arkansas, Colorado, Kansas, Louisiana, Mississippi, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, West Virginia, and Wyoming. Since the 2012 report, fracking has commenced in Alabama and Georgia, for a total of nineteen states. See David Whiteside, *Fracking Goes South: Oil and Gas Industry (and NFL Owner) Lick Their Chops Over Chattanooga Shale*, ECOWATCH (Feb. 20, 2013), <http://ecowatch.com/2013/02/20/fracking-goes-south/>; Associated Press, CHATTANOOGA TIMES FREE PRESS (Mar. 10, 2013), <http://www.timesfreepress.com/news/2013/mar/10/gas-drillers-turn-northwest-georgia/>. This calculation uses Environment America's precise definition of "fracking" from 2012 and has simply updated the quantity of states to nineteen in 2015, based on the same definition. The author's research on the

the other hand, as of mid-2015, the voluntary fracking industry clearinghouse website FracFocus, (which will be discussed in detail below),⁷⁹ includes fracking chemical reports from twenty-seven different states under less stringent definitions of “fracking.”⁸⁰ However, the number of states might be greater than this because industry usage of the website is voluntary.⁸¹ One could argue that the transparency of this industry is affected by uncertain definitions of what exactly fracking is and where it takes place. In any event, this Article does not attempt to determine the precise number of states where fracking occurs,⁸² but instead compares and contrasts exemplary fracking fluid disclosure regulations in particular states. However, it is interesting to note that whatever the total, more states than that have regulations for the disclosure of fracking fluid chemicals. These include states that are merely preparing for near-future fracking operations, such as Maryland.⁸³

These several states have regulations with various levels of specificity that are targeted at many different aspects of the fracking process, such as site selection (permitting), drilling operations, wastewater storage and disposal, and taxes.⁸⁴ Most of these are beyond the scope of the present Article, which focuses on regulations for the disclosure of the chemicals used in fracking fluid. The disclosure issue is pertinent because the fluid is

quantity of states in which fracking takes place revealed several different results, some as high as thirty, due to inconsistent definitions of the practice.

⁷⁹ See *infra* notes 123–154 and accompanying text. The additional states listed at FracFocus, beyond those listed in note 78 *supra*, are Alaska, California, Illinois (exploratory only), Michigan, Minnesota (exploratory only), Missouri (exploratory only), Nebraska, Nevada, and South Dakota (exploratory only).

⁸⁰ For instance, some minor operations (not high-volume) are included.

⁸¹ See *infra* note 131–134 and accompanying text. For instance, fracking recently commenced in Georgia but no records from fracking companies in that state have been posted to FracFocus as of mid-2015.

⁸² Regardless, the number of states in which fracking takes place will rise further in the very near future. California, Illinois, and Maryland all passed regulations in late 2014 to allow fracking to proceed, after having studied the potential environmental impacts for years. See Julie Cart, *Fracking Report Clears Way for California Oil, Gas Leasing to Resume*, L.A. TIMES (Aug. 28, 2014), <http://www.latimes.com/local/la-me-fracking-report-20140829-story.html>; Julie Wernan, *Fracking Can Begin in Illinois*, CHI. TRIB. (Nov. 6, 2014), <http://www.chicagotribune.com/business/breaking/ct-fracking-decision-1107-biz-20141105-story.html#page=1>; Timothy B. Wheeler, *O'Malley Administration Sets out Path to Fracking in Md.*, BALT. SUN (Nov. 25, 2014), <http://www.baltimoresun.com/features/green/blog/bs-md-fracking-regulation-20141125-story.html>. Also of note is New York, where energy companies have estimated that sixty thousand successful fracking wells could be drilled. Since 2008, legislators in that state have passed a variety of local and statewide moratoriums on the practice amidst significant political wrangling. See Marie Cusick, *New York “Extremely Unlikely” to Allow Fracking Before 2015*, STATEIMPACT (Jan. 29, 2014), <http://stateimpact.npr.org/pennsylvania/2014/01/29/new-york-extremely-unlikely-to-allow-fracking-before-2015/>; Thomas Kaplan, *Millions Spent in Albany Fight to Drill for Gas*, N.Y. TIMES (Nov. 25, 2011), <http://www.nytimes.com/2011/11/26/nyregion/hydrofracking-debate-spurs-huge-spending-by-industry.html?pagewanted=all>. New York’s governor has since banned fracking; see *supra* note 77.

⁸³ See WILDERNESS SOC’Y, DISCLOSURE OF HYDRAULIC FRACTURING FLUIDS: ARE STATES DOING A GOOD ENOUGH JOB? 2–3 (Apr. 2011), http://www.shalegas.energy.gov/resources/tws_state_chemical_disclosure_requirements.pdf.

⁸⁴ See Plumer, *supra* note 50.

widely believed to present risks to drinking water supplies, which in turn is arguably the greatest source of controversy among activists, journalists, and the general public due to the perceived health risks.⁸⁵ Meanwhile, (for reasons to be discussed herein) such disclosures of chemical information are often lacking in transparency due to scientific uncertainty and the desire of energy companies to protect trade secrets.

Of the states identified above in which fracking is taking place, three (Georgia, Virginia, and West Virginia) have no regulations for fracking fluid chemical disclosures.⁸⁶ All others have some sort of requirement in this area, but have various exemptions. Notable examples will be discussed in the remainder of this Section.

Many of these states do not require disclosure of *all* chemicals used in fracking fluid, and merely default to existing rules from the Occupational Safety and Health Administration (OSHA) for chemicals in the workplace that create an exposure risk for employees. OSHA requires such chemicals to be listed on official forms called “material safety data sheets,” but only chemicals that are stored in set locations and in quantities of more than 10,000 pounds. As designed, these OSHA forms would enable a vague substance called “fracking fluid” to be reported, but would not require disclosure of its chemical ingredients.⁸⁷ In addition, these data sheets are not available to the public, unless disclosure is approved by the company in question.⁸⁸ In 2010, Halliburton took advantage of this lack of specificity and transparency by submitting to OSHA a material safety data sheet for a substance known only as “frac fluid with additives,” but with no

⁸⁵ For a discussion of the causes and effects of the public’s focus on the connection between fracking and drinking water, see generally Michael H. Finewood & Laura J. Stroup, *Fracking and the Neoliberalization of the Hydro-Social Cycle in Pennsylvania’s Marcellus Shale*, 147 J. CONTEMP. WATER RES. & EDUC. 72 (2012). Water contamination was found to be the most common concern among the participants in a research study who had heard of fracking, although few of the subjects in that particular study had concerns of any type. See Hilary Boudet, Christopher Clarke, Dylan Bugden, Edward Maibach, Connie Roser-Renouf & Anthony Leiserowitz, “Fracking” Controversy and Communication: Using National Survey Data to Understand Public Perceptions of Hydraulic Fracturing, 65 ENERGY POL’Y 57, 63 (2014). A British study also found widespread but vague and unorganized public concerns about the effects of fracking on drinking water supplies. See Laurence Williams, Framing Fracking: Public Responses to Potential Unconventional Fossil Fuel Exploitation in the North of England (Jan. 7, 2014) (thesis, Durham University), at 62–78, http://etheses.dur.ac.uk/9444/1/Framing_Fracking_Complete_PDF.pdf?DDD14.

⁸⁶ WILDERNESS SOC’Y, *supra* note 83; NATHAN RICHARDSON, MADELINE GOTTLIEB, ALAN KRUPNICK & HANNAH WISEMAN, RES. FOR THE FUTURE, THE STATE OF STATE SHALE GAS REGULATION (2013), http://www.rff.org/centers/energy_and_climate_economics/Pages/Shale_Maps.aspx. The three states named have other fracking-related regulations to varying degrees, usually in regard to taxes and land use permits, but as of this writing they have not yet enacted regulations for the disclosure of the chemicals used in fracking fluid.

⁸⁷ Richardson et al., *supra* note 86 at 43.

⁸⁸ WILDERNESS SOC’Y, *supra* note 83, at 1.

information on what those additives were.⁸⁹ In the same year, ExxonMobil used the lack of required specificity in the OSHA forms as a reason to resist a stockholder proposal for more disclosure of fracking chemicals.⁹⁰

Due to this *de facto* lack of transparency for chemicals in fracking fluid as caused by weak federal requirements, by 2010 several states began to enact their own disclosure regulations. Arkansas, Michigan, Pennsylvania, Texas, and Wyoming were the first states to enact such regulations.⁹¹ The early regulations enacted by these five states have largely become templates for later regulations in other states.⁹² Thus, these five originals will be compared and contrasted in some detail here. Energy companies claimed to support the new measures, most likely to defuse public controversy, but also fought for the ability to withhold trade secrets. For example, a spokeswoman for Halliburton was quoted as saying, “[w]hile we support disclosing our ingredients, it is critical to our business that we protect our [fracking fluid] recipe.”⁹³ Trade secrets will be discussed in more detail below.⁹⁴

A crucial weakness of the five earliest state regulations is that they generally only require information on the percentage concentrations of chemicals within the particular fluid mixtures used at a fracking operation (which can, in fairness, be slightly more informative than a dry list of substances). None of them, however, require information on the *amount* of any particular chemical that was used in that particular round of fluid, which would offer much more context on local operations. Anyone interested in the cumulative use of chemicals at a certain fracking site over time would have to compile multiple periodic reports because there are no requirements for time-series data.⁹⁵ This is a particularly troublesome issue for public health advocates because many chemicals are benign in their

⁸⁹ Mike Soraghan, *In Fracking Debate, “Disclosure” is in the Eye of the Beholder*, N.Y. TIMES (June 21, 2010), <http://www.nytimes.com/gwire/2010/06/21/21greenwire-in-fracking-debate-disclosure-is-in-the-eye-of-19087.html?pagewanted=all>.

⁹⁰ *Id.*

⁹¹ Kusnetz, *supra* note 36.

⁹² Note that California, Illinois, and Maryland (which all decided to allow fracking in 2014) and New York (which may do so in the future) had already enacted some fracking fluid disclosure requirements by 2012. *See also supra* note 82. As of the time of writing, the most recent state to enact entirely new fracking fluid disclosure requirements is Kansas, which did so in late 2013. *See* Megan Hart, *New Fracking Regulations Spell Out What Companies Must Disclose: Kansas Corporation Commission Rules Allow Trade Secrets Exemption*, TOPEKA CAPITAL-JOURNAL (Oct. 24, 2013), <http://cjonline.com/news/business/2013-10-24/new-fracking-regulations-spell-out-what-companies-must-disclose>.

⁹³ Kusnetz, *supra* note 36.

⁹⁴ *See infra* notes 106–111 and accompanying text.

⁹⁵ *See* Kusnetz, *supra* note 36. For example, most states would require a fracking company to disclose that chemical X makes up 0.02 percent of the fracking fluid used at location Y, but would not require the company to disclose that thousands of gallons of the chemical may have appeared in millions of gallons of fracking fluid used at that location over the course of several years.

initial states or in miniscule amounts, but raise toxic dangers when later mixed with other chemicals, or when people are exposed to them in higher concentrations in either one incident or over longer stretches of time.⁹⁶

The state that has become most active in demanding maximum transparency for fracking fluid chemicals is Wyoming, perhaps surprisingly given the well-known political influence of that state's fossil fuel industries.⁹⁷ Wyoming's regulation requires disclosure of *all* fracking chemicals to the state authorities, including percentage concentration, but not the amounts of each that are used (no state requires the disclosure of the amounts used). Trade secrets will be withheld by the regulators.⁹⁸ Wyoming requires company disclosure of planned chemical usage when applying for drilling permits,⁹⁹ as does Michigan to a limited extent, while the other states require this information only after a particular fracking operation is complete. Texas and Arkansas require disclosure of fracking chemicals (minus trade secrets), but only Texas requires percentage concentration information for those particular chemicals that OSHA has listed as "hazardous."¹⁰⁰ Arkansas initially did not require percentage concentration data but added such a requirement in 2014.¹⁰¹ Pennsylvania only requires disclosure of predefined hazardous chemicals used in fracking fluid.¹⁰²

96 Pesticides are an illustrative example of this effect, with "tolerance value" for humans being a key concern among researchers. Small amounts of household pesticides, when used in isolation, are typically harmless for most people, but health effects arise when such substances are used in large amounts over time, or are mixed with others. *See, e.g.*, M. Margni, D. Rossier, P. Crettaz & O. Jolliet, *Life Cycle Impact Assessment of Pesticides on Human Health and Ecosystems*. 53 *AGRIC., ECOSYSTEMS & ENV'T* 379, 384 (2002); JAMES SALZMAN & BARTON H. THOMPSON, JR., *ENVIRONMENTAL LAW AND POLICY* 148 (2009).

97 *See, e.g.*, Rebecca Klein, *Did This Governor Reject New Science Standards Because He's Skeptical of Climate Change?*, *HUFFINGTON POST* (Apr. 21, 2014), http://www.huffingtonpost.com/2014/04/21/wyoming-next-generation-science-standards_n_5187000.html; Gregory Nickerson, *Halliburton Joins University of Wyoming's List of Energy Donors*, *WYOFILE* (Mar. 20, 2014), http://wyofile.com/gregory_nickerson/halliburton-joins-university-of-wyomings-list-of-energy-donors/; Marian Wang, *Under Cheney's Influence, Wyoming's Oil Ties Flooded MMS*, *PROPUBLICA* (June 2, 2010), <http://www.propublica.org/blog/item/under-cheney-s-influence-wyomings-oil-ties-flooded-mms>.

98 55-3 WYO. CODE R. § 8(c)(ix) (LexisNexis 2014). The Wyoming regulation requires the disclosure of (among other things) the chemical additives, compounds, and concentrations to be mixed and injected, including chemical compound names and additive concentrations. An operator must provide this information when applying for a well-drilling permit.

99 *Id.* at § 8(c).

100 16 TEX. ADMIN. CODE § 3.29(c)(1) (2012). The Texas regulation requires disclosure of (among other things) "each additive used in the hydraulic fracturing fluid and the trade name, supplier, and a brief description of the intended use or function of each additive in the hydraulic fracturing treatment" and "the actual or maximum concentration of each chemical ingredient." As noted in the main text, this is only true for predefined hazardous materials, with the Texas regulation citing the OSHA list of such substances at 29 C.F.R. § 1910.1200(g)(2) (2012).

101 178-00-01 ARK. CODE R. § B-19 (2014). The Arkansas regulation requires disclosure of (among other things) "A list of all Additives used during the Hydraulic Fracturing Treatment specified by general type," and "the actual rate or concentration for each such Additive expressed as pounds per thousand gallons or gallons per thousand gallons."

102 78 PA. CODE § 78.122(b)(6)(i) (2011). Pennsylvania's regulation requires an operator to provide a "stimulation record" which should include "descriptive list of the chemical additives in the stimulation fluid." The regulation has a precise list of chemical categories to be included, such as

Michigan at first only required the aforementioned OSHA material safety data sheets, but now requires companies to test for a limited list of pre-named chemicals.¹⁰³ After determining the particular chemicals to be disclosed, Pennsylvania and Michigan require percentage concentration information for those particular chemicals, but not for others that might be used in the same fracking operations.¹⁰⁴ Four of these states publish the resulting information on state government websites. The exception is Pennsylvania, which does not proactively publish the information, but will disclose it upon request.¹⁰⁵

Another pressing issue involves a lack of disclosure for any chemical that a company self-reports as “proprietary.” This tendency foments trade secrets exemptions in many access-to-information statutes, such as the federal Freedom of Information Act.¹⁰⁶ If any concerned citizen believes that a particular item should *not* be considered proprietary or a trade secret, the only realistic option is a court challenge after the item has already been exempted from transparency requirements.¹⁰⁷ While the exact procedures will be different per the various state access-to-information statutes, when a company self-reports an item as a propriety trade secret, it gives itself an automatic advantage over interested citizens who now have even less public information upon which to act.

Each of the five states under discussion here has an access-to-information statute, and each of those contains a typical exemption for trade secrets or related matters. For example, the Arkansas statute allows an exemption for “[f]iles which, if disclosed, would give advantage to [business] competitors or bidders.”¹⁰⁸ Wyoming’s statute is particularly specific concerning the nature of that state’s industries, allowing an exemption for “[t]rade secrets, privileged information and confidential commercial, financial, geological or geophysical data furnished by or

biocides or surfactants, but with no indication of whether this list is all-inclusive or if it can be amended.

103 MICH. ADMIN. CODE r. 324.201 (2011). Michigan’s regulation requires fracking companies to perform “a chemical analysis [that] shall be prepared for each type of fluid to be injected showing specific conductance as an indication of the dissolved solids and a determination of the concentration of the following parameters for chemical balance and indicators for comparison of water quality,” and for the results to be disclosed to regulators.

104 See Kusnetz, *supra* note 36.

105 *Id.*

106 Exemption 4 of the federal Freedom of Information Act allows a government agency to withhold trade secrets from a citizen who has requested documents. This is so because otherwise companies would not be willing to furnish such information to agencies for regulatory purposes if there was a risk that business-sensitive information would be disclosed, possibly to competitors. 5 U.S.C. § 552(b)(4) (2009).

107 See Benjamin W. Cramer, “The Nation’s Broadband Success Story”: *The Secrecy of FCC Broadband Infrastructure Statistics*, 31 HASTINGS COMM. & ENT. L.J. 339, 357–64 (2009).

108 Arkansas Freedom of Information Act, ARK. CODE ANN. § 25-19-205(b)(9)(a) (1967).

obtained from any person.”¹⁰⁹ In the only state court dispute to date over fracking fluid disclosure requirements, the Wyoming Supreme Court ruled unanimously in 2014 that *all* the chemical ingredients of fracking fluids must be reported to the state.¹¹⁰ Per that state’s access-to-information statute, regulators can be relied upon to withhold trade secrets while disclosing everything else to the public.¹¹¹

On the other hand, the fracking-specific regulations in these original states (except Wyoming) tend to supersede their access-to-information statutes. Proprietary chemical information is completely exempted from the fracking fluid disclosure regulations in Arkansas and Michigan, despite nothing being said to that effect in their respective access-to-information statutes; and rules for whether this situation should be managed under fracking-specific regulations or the state access-to-information statute are currently unclear in Texas and Pennsylvania.¹¹² In any case, this situation is exacerbated by the fact that fracking firms are usually allowed to self-report which substances are proprietary. For instance, Pennsylvania’s fracking regulation states that an operator “may designate specific portions of the stimulation record as containing a trade secret or confidential proprietary information. The Department [of Environmental Protection] will prevent disclosure of the designated confidential information to the extent permitted under the [Pennsylvania] Right-to-Know Law.”¹¹³

The five original state regulations have largely served as models (though perhaps not intentionally) for those states that later enacted similar regulations. In some of the newer state regulations there are some interesting distinctions and specificities. For public health advocates, the fracking fluid disclosure regulation in Tennessee is unusually strong on the

¹⁰⁹ Wyoming Sunshine Law, WYO. STAT. ANN. § 16-4-203(d)(v) (1977).

¹¹⁰ Powder River Basin Res. Council v. Wyo. Oil and Gas Conservation Comm’n, 320 P.3d 222, 224 (2014). This was a procedural decision based on the statutory language of the Wyoming Sunshine Law, *see supra* note 109. *See also* Benjamin Storrow, *Wyoming Supreme Court Reverses District Court Decision on Fracking Fluids*, CASPER STAR-TRIBUNE (Mar. 12, 2013), http://trib.com/business/energy/wyoming-supreme-court-reverses-district-court-decision-on-fracking-fluids/article_7d15a01f-df71-5786-99fb-f4685d0c7279.html.

¹¹¹ *Id.*

¹¹² Kusnetz, *supra* note 36. Note that the cited article, on which the accompanying text is based, is from 2011. However, as of the date of this writing there has been no discernible change in the disclosure rules for proprietary substances in these five states. Regulations toward fracking fluid chemicals are enforced by agencies and can be enacted or updated relatively quickly, but potential disputes over proprietary trade secrets will be applied to the respective access-to-information statutes, which by nature are amended far more slowly by state legislatures. Also, conflicts in language between regulations and statutes must often be resolved via judicial review in the courts, which is another time-consuming process.

¹¹³ Pennsylvania’s New Right to Know Law, 65 PA. CONS. STAT. §§ 67.101–67.3104 (2008). This Pennsylvania statute is quite lenient on types of information to be withheld for this reason: the requirements simply include information “which is privileged or confidential; and [the] disclosure of which would cause substantial harm to the competitive position of the person that submitted the information.” No further definitions of these terms are given.

details of chemicals used, as well as their potential interaction with drinking water supplies and sensitive environmental areas, with reference to EPA chemical toxicity guidelines.¹¹⁴

However, most of the newer state regulations result in less transparency in comparison to the original five, especially Wyoming. For example, California requires monthly reports from ongoing fracking operations, but only for the volume and pressure of the fluid itself; otherwise only a vaguely-defined “chemical analysis” is required at sporadic intervals.¹¹⁵ Louisiana requires robust information on the volume of fracking fluid used and its methods of injection, but requires no information on the actual chemicals used in the fluid.¹¹⁶ Colorado requires operators to record fairly robust chemical information but does not require disclosure to state authorities, except by request.¹¹⁷ Colorado also has a *de facto* gag order on precise information on the chemical composition of fracking fluid used at a particular time and location. This information is not required except in a medical emergency, and even then medical personnel must sign a nondisclosure agreement.¹¹⁸ Illinois only requires the disclosure of chemicals used at specifically defined high-volume horizontal hydraulic fracturing operations, with no indication of whether the rule applies to other operations that do not meet that specific criterion.¹¹⁹ Finally, Indiana only requires fracking operators to disclose the usage of chemicals that are already listed on the aforementioned OSHA material safety data sheets.¹²⁰

With all of these differences in state requirements, it could be difficult for the interested journalist or watchdog to compare the information that has been released by the operators in the various states. This is another manifestation of the issue of context in transparency regulations, especially because environmental problems, such as those related to the above- or below-ground movement of water, do not observe political boundaries. From the point of view of transparency advocates, an ungratifying attempt has been made to collect all of this information from operators nationwide in a clearinghouse-style database called FracFocus.¹²¹ This nonprofit service is operated by the Ground Water Protection Council (a group of

114 Tennessee Department of Environment and Conservation, Rules of Water Quality Control Board, TENN. COMP. R. & REGS. § 1200-04-06-.05 (2010).

115 California Code of Regulations, 26 CAL. CODE REGS. tit. 14 §§ 1724.10(c)–14-1724.10(d).

116 Louisiana Administrative Code, LA. ADMIN. CODE tit. 43, § 3307(E)(7).

117 COLO. CODE REGS. § 404-1(205.A) (2012).

118 *Id.* at § 205(A)(b)(5). This type of medical nondisclosure agreement is not exclusive to Colorado. The stated purpose is to prevent medical personnel from disclosing fracking trade secrets to the public. This type of requirement will be discussed in the next Section *infra*.

119 Illinois Department of Natural Resources, Oil and Gas Division, Hydraulic Fracturing Regulatory Act, ILL. ADMIN CODE tit. 62, §§ 245.700, 245.710, 245.715 (2014).

120 IND. CODE § 14-37-3-8 (2012).

121 FRACFOCUS CHEMICAL DISCLOSURE REGISTRY, *supra* note 20.

state water officials) and the Interstate Oil and Gas Compact Commission (a multi-state government agency consisting of regulators from states where the energy industry is active) with a stated mission of protecting groundwater.¹²² Several states use this website as a repository for the information about fracking fluid chemicals that they require by mandate from regulated companies; and some companies operating in other states post information to the site voluntarily.¹²³

The FracFocus website allows the user to search for information by fracking well location or permit number, eventually revealing a document titled “*Hydraulic Fracturing Fluid Product Component Information Disclosure*,” in which that well’s operator has disclosed, per the prevailing state regulations, the chemicals used at that particular well, including their concentrations as percentages of the fracking fluid.¹²⁴ For example, a fracking well called Ferguson-Keisling G U #1H, operated by Southwestern Energy in Bradford County, Pennsylvania, makes use of (among other things) hydrochloric acid, sodium hydroxide, ethylene glycol, and propargyl alcohol, which may or may not be found in proprietary products with names like Alpha 1427 and FRW-18.¹²⁵ These are typically one-page reports that do not state the actual *amounts* of each chemical (or the fracking fluid itself) used over the operational lifespan of the well in question, nor do they contain any information on the companies from which products like FRW-18 are obtained.¹²⁶

FracFocus states that its primary purpose is to “provide factual information concerning hydraulic fracturing and groundwater protection,” and it is “not intended to provide a scientific analysis of risk associated with hydraulic fracturing.”¹²⁷ Impressively, documents like the one described in the last paragraph are available for nearly 100,000 fracking wells as of the time of writing. In fairness, this is relatively robust information that can at least be a starting point for the interested citizen or journalist, if one is willing to look beyond the lack of context. However, researchers have exposed some ruinous political and corporate weaknesses in this supposed public information tool.

122 Jim Polson, *FracFocus Fails as Fracking Disclosure Tool, Study Finds*, BLOOMBERG (Apr. 23, 2013, 2:55 PM), <http://www.bloomberg.com/news/articles/2013-04-23/fracfoc-fails-as-fracking-disclosure-tool-study-finds>.

123 *Id.* As of mid-2015, FracFocus includes information on fracking wells in 27 states.

124 *Find a Well*, FRACFOCUS CHEMICAL DISCLOSURE REGISTRY, <http://www.fracfocdata.org/DisclosureSearch/StandardSearch.aspx> (last visited Oct. 29, 2015).

125 *Id.*

126 *See supra* notes 95–96 and accompanying text for discussion on percentage concentrations and *supra* the text accompanying notes 42–43 for discussion on supplying firms.

127 *About Us*, FRACFOCUS CHEMICAL DISCLOSURE REGISTRY, <http://www.fracfocdata.org/welcome> (last visited Oct. 29, 2015).

Although the site existed previously, FracFocus came to prominence in 2012 after receiving a \$1.5 million grant from the U.S. Department of Energy, with the money going toward significant expansion of the website and its functionality.¹²⁸ The Department also said that state regulators should use FracFocus as a repository for the information obtained via their own fracking fluid disclosure requirements, while admitting that this would be a voluntary process.¹²⁹ In 2011, Texas became the first state to officially require its regulated companies to post information to the FracFocus database. Most other states with fracking fluid disclosure regulations add documents to the database themselves or encourage companies to do so voluntarily, especially after the 2012 request from the Department of Energy.¹³⁰

Unfortunately, “voluntarily” has become the operational term, significantly damaging perceptions amongst citizens and regulators of the site’s utility.¹³¹ First, the management of FracFocus has come under suspicion.¹³² The web domain name is registered to a public relations firm called Brothers & Company, whose clients include pro-fracking industry coalitions like America’s Natural Gas Alliance and the disingenuously-named American Clean Skies Foundation.¹³³ The Ohio House of Representatives, while investigating the potential usefulness of FracFocus for its own disclosure regulations, concluded that the site was a fracking industry ally that was involved in political subterfuge to convince the state house to authorize fracking.¹³⁴

Meanwhile, a major journalistic investigation by Bloomberg found that in 2011, despite the various state requirements to do so, energy companies decided not to list at least 40 percent of fracking wells on FracFocus.¹³⁵ Chesapeake Energy was relatively cooperative, posting information for about 85 percent of its fracking sites, while Concho Resources reported on

128 Steve Horn, *Obama Admin. Approves ALEC Model Bill for Fracking Chemical Fluid Disclosure on Public Lands*, COMMON DREAMS (May 21, 2013), <http://www.commondreams.org/news/2013/05/21/obama-admin-approves-alec-model-bill-fracking-chemical-fluid-disclosure-public-lands>.

129 U.S. DEP’T OF ENERGY, *supra* note 44, at 8–9.

130 Horn, *supra* note 128.

131 Steve Horn, *The Florida Test Ground: ALEC’s Fracking Chemical Disclosure Bill*, COUNTERPUNCH (Feb. 20, 2014), <http://www.counterpunch.org/2014/02/20/alecs-fracking-chemical-disclosure-bill/>.

132 *Id.*

133 *Id.*

134 Sam Howard, *NE Ohio Reps. Call for House Investigation on 2012 Fracking Plan*, CLEVELAND PLAIN DEALER (Feb. 18, 2014), http://www.cleveland.com/open/index.ssf/2014/02/ne_ohio_reps_call_for_house_in.html.

135 Benjamin Haas et al., *Fracking Hazards Obscured in Failure to Disclose Wells*, BLOOMBERG (Aug. 14, 2012), <http://www.bloomberg.com/news/articles/2012-08-14/fracking-hazards-obscured-in-failure-to-disclose-wells>.

none of its sites.¹³⁶ The same report quoted Representative Diana DeGette (D-Colo.), who said “FracFocus is just a fig leaf for the industry to be able to say they’re doing something in terms of disclosure.”¹³⁷ Bloomberg also found that some fracking firms helped to design the website itself.¹³⁸ State Representative Lon Burnham of Texas, who sponsored the first bill mandating state usage of FracFocus, said later that all of the self-determined trade secrets exemptions, the industry control of the site, and the voluntary nature of posting to the site had damaged the effectiveness of any law that mandates usage of it. In Burnham’s words, “[t]his disclosure bill has a hole big enough to drive a Mack truck through.”¹³⁹

The situation had not improved by 2013, when a Harvard University study found that states had largely failed to follow up after requiring companies to use FracFocus, and concluded that faith in the site as a useful source of information about fracking fluid is “misplaced or premature” because of its voluntary nature and “overly broad” allowance for trade secrets claims at the state level.¹⁴⁰ The Harvard report proclaimed with finality that “FracFocus is not an acceptable regulatory compliance method for chemical disclosures,” because states generally do not mandate *when* companies should post information to the site, a lack of site-specific forms eliminates necessary details, states rarely investigate whether companies fulfill their regulatory responsibilities to post to the site, and states typically do not investigate whether trade secrets claims are valid.¹⁴¹ Therefore, one can conclude that FracFocus is merely an extension of the already-known problems of fracking fluid chemical information: ineffectiveness at the high level due to a focus on isolated low-level trivia with no context.

The political power of the industry, which has damaged the effectiveness of the FracFocus disclosure tool that has been touted by regulators, has also led to some state-level political developments that are particularly troubling for transparency.¹⁴² In 2014, the Senate of North

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.*

¹³⁹ Ben Elgin et al., *Fracking Secrets by Thousands Keep U.S. Clueless on Wells*, BLOOMBERG (November 29, 2012), <http://www.bloomberg.com/news/articles/2012-11-30/frack-secrets-by-thousands-keep-u-s-clueless-on-wells>.

¹⁴⁰ Polson, *supra* note 122.

¹⁴¹ KATE KONSCHNIK, MARGARET HOLDEN & ALEXA SHASTEEN, HARVARD LAW SCH., ENVTL. LAW PROGRAM, LEGAL FRACTURES IN CHEMICAL DISCLOSURE LAWS: WHY THE VOLUNTARY CHEMICAL DISCLOSURE REGISTRY FRACFOCUS FAILS AS A REGULATORY COMPLIANCE TOOL 1–2 (2013), <http://blogs.law.harvard.edu/environmentallawprogram/files/2013/04/4-23-2013-LEGAL-FRACTURES.pdf>.

¹⁴² Mica Rosenberg, *North Carolina Senate Outlaws Disclosure of Fracking Fluid Secrets*, REUTERS (May 22, 2014, 1:49 PM), <http://www.reuters.com/article/2014/05/22/us-usa-fracking-secrets-idUSBREA4L0YC20140522>.

Carolina (where fracking had not yet even developed past the exploratory stage) passed legislation that would make it a *crime* for anyone to reveal the chemical ingredients of fracking fluid to the public.¹⁴³ This legislation ignores the fact that fracking operators in most other states are required to disclose such information (except for trade secrets) at the various levels of specificity discussed above, and often do so voluntarily in the interests of public relations and dispelling controversy.¹⁴⁴ It also directly contradicts the North Carolina access-to-information law, which states that public records may be requested by “any person” and has no specific exemption, beyond trade secrets, for fracking or mining-related information.¹⁴⁵

Meanwhile, standard claims of the need for trade secret protection have resulted in significant lobbying of state lawmakers by the industry.¹⁴⁶ The shadowy lobbying group American Legislative Exchange Council (ALEC), which is also behind Florida’s infamous “Stand Your Ground” law, adopted a “Resolution to Retain State Authority over Hydraulic Fracturing” in 2009 as a pro-industry manifesto against any federal regulation under the guise of states’ rights.¹⁴⁷ While claiming to promote “Limited Government, Free Markets, [and] Federalism,”¹⁴⁸ ALEC has become well known for partnering with industries that desire deregulation and for writing model legislation to be lobbied to state legislatures.¹⁴⁹ In 2012, when the trend of new state fracking fluid disclosure regulations had picked up speed,

143 *Id.* This North Carolina legislation would still require companies to deliver such information to state officials, but only during a medical emergency or public safety disaster. The penalty was originally a felony charge, but was reduced to a misdemeanor charge after debate. It is uncertain whether the penalty would be applied to a regulator who “illegally” released the information to a public person, or to that person if he/she forwarded it further.

144 *Id.*

145 N.C. Gen. Stat. § 132-6(a) (2014).

146 See *Resolution to Retain State Authority over Hydraulic Fracturing*, AM. LEGIS. EXCHANGE COUNCIL (Jan. 9, 2015), <http://www.alec.org/model-legislation/resolution-to-retain-state-authority-over-hydraulic-fracturing/>.

147 *Id.*

148 AM. LEGIS. EXCHANGE COUNCIL, www.alec.org (last visited Oct. 29, 2015).

149 U.S. Representative Mark Pocan (D-Wisc.) has called ALEC a “corporate dating service” when discussing the group’s primary funding from large corporations, for which it often writes draft legislation, while allying with conservative politicians through a guise of social conservatism. See Mark Pocan, *Inside the ALEC Dating Service*, THE PROGRESSIVE (Sept. 14, 2011), http://www.progressive.org/inside_alec.html. See also Mike McIntire, *Conservative Nonprofit Acts as a Stealth Business Lobbyist*, N.Y. TIMES (Apr. 21, 2012), http://www.nytimes.com/2012/04/22/us/alec-a-tax-exempt-group-mixes-legislators-and-lobbyists.html?ref=politics&_r=0.

It should be noted that many of ALEC’s corporate partners may have willingly overlooked the group’s socially conservative political goals until 2013 when the ALEC-sponsored “Stand Your Ground” law in Florida became a matter of great national controversy during the trial of George Zimmerman. Zimmerman used that law as a defense when charged with shooting and killing 17 year-old Trayvon Martin, and was ultimately acquitted. After these developments, many of ALEC’s corporate partners, who had previously made use of the group’s assistance in writing deregulatory and pro-industry state legislation, left the group in protest. See Lisa Graves, *More Corporations Flee as ALEC Rolls Out Its Legislative Agenda*, PRWATCH (Dec. 3, 2014), <http://www.prwatch.org/news/2014/12/12685/more-alec-corporations-flee-alec-rolls-out-2015-legislative-agenda>.

ProPublica reported that ALEC had partnered with ExxonMobil and its natural gas subsidiary XTO Energy to formulate “model legislation” for stringent trade secret protection of fracking fluid chemicals.¹⁵⁰ Drawing inspiration from the Texas regulation on fracking fluid disclosure, which has some fairly precise, and not particularly opaque, procedures for the protection of trade secrets,¹⁵¹ the ALEC model limits the disclosure request procedure to nearby landowners, with additional burdens of proof and strict deadlines for the person requesting information.¹⁵² ALEC claims that its allies in the state legislatures of Illinois, Indiana, New York, Ohio, and Pennsylvania have introduced bills based wholly or partially on its model legislation.¹⁵³ Also, the Florida state legislature tried to implement the ALEC model legislation in 2013 and again in 2014 but was unsuccessful.¹⁵⁴

These developments indicate that the wave of fracking fluid disclosure regulations that commenced in 2010 is being slowed down or even reversed by vigorous industry pressure on state lawmakers. There is also a trend in some states to prohibit discussion of fracking chemicals by certain professions or individuals, regardless of whether they obtained that information via state regulations that purportedly increase transparency. This is the topic of the next Section.

V. GAG RULES AND NONDISCLOSURE AGREEMENTS

The state-level fracking fluid disclosure regulations do enable the acquisition of information that could be partially useful to journalists, watchdogs, environmental activists, or public health advocates. However, some states have instituted further rules that may damage the usefulness of the disclosure regulations from which they originated. This is a topic that should be especially troubling for those concerned about health issues arising from contaminated drinking water because a few states have instituted so-called “gag rules” for doctors and emergency personnel who respond to the effects of water contamination.

Some of the states analyzed in the previous Section have specific rules for doctors and emergency personnel; one example is Texas, which has a

¹⁵⁰ Currier, *supra* note 1.

¹⁵¹ See 16 Tex. Admin. Code § 3.29(c)(2)(c) (2015).

¹⁵² Currier, *supra* note 1. The ALEC model legislation has a space reserved for “{insert relevant state agency}.” *The Disclosure of Hydraulic Fracturing Fluid Composition Act*, AM. LEGIS. EXCHANGE COUNCIL (Jan. 15, 2012), <http://www.alec.org/model-legislation/the-disclosure-of-hydraulic-fracturing-fluid-composition-act/>.

¹⁵³ Currier, *supra* note 1.

¹⁵⁴ Horn, *supra* note 131. In 2013, the Obama Administration announced that the ALEC model legislation would be a key component of new fracking fluid disclosure rules for the Federal Bureau of Land Management. Horn, *supra* note 128. See also *supra* notes 50–53 and accompanying text.

statute that states that “[a] supplier, service company or operator may not withhold information related to chemical ingredients used in a hydraulic fracturing treatment, including information identified as a trade secret, from any health professional or emergency responder who needs the information for diagnostic, treatment or other emergency response purposes.”¹⁵⁵ In states such as Texas, these professionals are not permitted to forward the trade-secret-related portions of this information to anyone else, but they are never restricted from receiving the information during an emergency and can make later use of the non-proprietary portions as they see fit.¹⁵⁶

Doctors in some other states face stricter requirements.¹⁵⁷ In 2013, Colorado created a confidentiality agreement, known as Form 35, and proposed a requirement for all practicing doctors to sign it.¹⁵⁸ Form 35 states that the “Health Professional agrees to hold confidential all Trade Secret Information provided by the Custodian [of a fracking operator] and not to make use of it for purposes other than medical diagnosis, treatment, or other health needs asserted in the statement of need.”¹⁵⁹ This form will be required for each particular request for information by a doctor to a fracking firm, and must be signed before the doctor receives any information from the company operating the fracking well (which may or may not have caused the health problem that the doctor is treating).¹⁶⁰ The statement of need must be written even before that, describing why the information is needed for the patient being treated; then the fracking company can determine whether there is truly an emergency that requires disclosure of the information.¹⁶¹ Despite the fairly routine language about protecting trade secrets, Colorado doctors fear that a lack of precise definitions in the form could lead to confusion over whether each doctor can share the obtained information with other doctors or public health authorities.¹⁶² Meanwhile, beyond requiring extensive paperwork during a possible emergency, Form 35 also lacks any definition of what will happen to a doctor who violates it, creating uncertainty over government reprisals,

155 16 Tex. Admin. Code § 3.29(c)(2)(c) (2015).

156 *Id.*

157 *See, e.g., Form 35 Confidentiality Agreement*, COLO. OIL & GAS COMMISSION (Mar. 5, 2012), http://cogcc.state.co.us/forms/PDF_Forms/form35.pdf.

158 *Id.*

159 *Id.*

160 *Id.*

161 *Id.*

162 Bruce Finley, *Colorado Docs Chafe at Secrecy Oath Needed for Access to Chemical List*, DENVER POST (Mar. 20, 2013, 12:01 AM), http://www.denverpost.com/environment/ci_22827696/colorado-docs-chafe-at-secrecy-oath-needed-access#ixzz2O6YYrCkU.

which is an obvious component of the chilled speech effect.¹⁶³ This confidentiality oath was derisively called a “gag order” by Colorado doctor Mitchell Gershten.¹⁶⁴

In 2013, California regulators also proposed a fracking information-withholding rule that has been condemned as a gag order by the medical community.¹⁶⁵ The California rule would prohibit doctors from sharing fracking-related data with colleagues and from contributing that information to public health reports. In the estimation of the medical community, it would also violate doctor-patient privilege.¹⁶⁶ The proposed rule would first require a doctor to determine that the patient has been exposed to a toxic fracking chemical, and that an emergency is extant, before figuring out which fracking company to ask for information.¹⁶⁷ The company must then provide the information, but has the option to demand that the doctor sign a confidentiality agreement to preserve trade secrets.¹⁶⁸ All of this must be arranged before the doctor receives the information that is likely crucial for treating the patient.¹⁶⁹ According to doctors, this rule would prevent them from giving crucial chemical information even to the patient being treated, and it would prohibit the tracking and understanding of fracking chemical risks over time and in multiple locations—a crucial loss of the context that is central to this Article’s argument.¹⁷⁰

So far, the Colorado and California rules have not yet been codified. However, at least one state has completed that process with results that should be troubling for anyone concerned about transparency.¹⁷¹ In 2012, Ohio passed a new state energy bill in which a prohibition on sharing fracking fluid trade secrets was targeted specifically at doctors and emergency personnel.¹⁷² In addition to prohibiting collaboration with colleagues when treating a patient, the provision would also prevent

¹⁶³ Leslie Kendrick, *Speech, Intent, and the Chilling Effect*, 54 WM. & MARY L. REV. 1633, 1652 (2013).

¹⁶⁴ Finley, *supra* note 162.

¹⁶⁵ *Stop the Doctor Gag Rule Proposed in CA Fracking Regulations!*, PHYSICIANS FOR SOC. RESP. L.A. (Feb. 13, 2013), <http://www.psr-la.org/stop-the-doctor-gag-rule-proposed-in-ca-fracking-regulations/>.

¹⁶⁶ CAL. DEP’T OF CONSERVATION, PRE-RULEMAKING DISCUSSION DRAFT FOR CAL. CODE REGS. 14, § 1780–88 (Feb. 15, 2013), <http://www.psr-la.org/wp-content/uploads/2013/02/DOGGR-draft-regs-w-gag-rule-highlighted.pdf>. Note that the organization provides no details, at least in the cited document, on how the regulation may violate doctor-patient privilege.

¹⁶⁷ *Id.*

¹⁶⁸ *Id.*

¹⁶⁹ *Id.* See *Stop the Doctor Gag Rule Proposed in CA Fracking Regulations!*, *supra* note 165.

¹⁷⁰ *Stop the Doctor Gag Rule Proposed in CA Fracking Regulations!*, *supra* note 165.

¹⁷¹ Julie Carr Smyth, *Ohio Drilling Regulations Would Bar Doctors From Publicly Revealing Chemicals*, HUFFINGTON POST (July 23, 2012), http://www.huffingtonpost.com/2012/05/23/ohio-drilling-regulations-doctors_n_1538982.html.

¹⁷² *Id.*

doctors from fulfilling their pre-existing legal responsibilities to contribute to public health reporting in that state.¹⁷³ Governor John Kasich signed this bill into law.¹⁷⁴

The real-world effects of Ohio's *de facto* gag order were illustrated soon thereafter.¹⁷⁵ In June 2014 a Halliburton fracking installation in Clarington, Ohio caught fire and emergency personnel fought the blaze for an entire week, during which there were twenty explosions, releasing fracking fluids that killed most of the aquatic life in a nearby creek for five miles downstream.¹⁷⁶ During the crisis, for five days Halliburton refused to disclose any information about the chemicals present at the site, which may have helped with fighting the fire and informing residents about the threats to their water supply.¹⁷⁷ Trade secrets were absent from the information when it was finally furnished.¹⁷⁸ According to the Union of Concerned Scientists, the problem was Ohio's 2012 energy statute and its fracking fluid gag rule preventing the disclosure. Governor Kasich publicly proclaimed that it was unacceptable for emergency responders to be unaware of the full list of chemicals present at the disaster, perhaps forgetting that he had signed the controlling bill into law.¹⁷⁹

The only state in which a fracking information gag rule has been both passed and challenged in court is Pennsylvania. In 2012, Pennsylvania overhauled its general fracking regulations by passing "Act 13."¹⁸⁰ This act largely consisted of procedural minutiae that had no major impact on Pennsylvania's fracking fluid chemical disclosure requirements, which activists have noted "are some of the most multi-layered and comprehensive [general fracking regulations] in the country."¹⁸¹ However, Act 13, which otherwise dealt mostly with permitting and land use, added a troubling new requirement that restricts the usage of fracking fluid

¹⁷³ *Id.*

¹⁷⁴ Julie Carr Smyth, *Ohio Bill Revisits Kasich's 2012 Clean-Energy Plan*, WASH. TIMES (June 7, 2014), <http://www.washingtontimes.com/news/2014/jun/7/ohio-bill-revisits-kasichs-2012-clean-energy-plan/?page=all>.

¹⁷⁵ Seth Shulman, *Got Science? Ohio Wake-up Call on Fracking Disclosure Laws*, HUFFINGTON POST (July 31, 2014), http://www.huffingtonpost.com/seth-shulman/got-science-ohio-wake-up_b_5639164.html.

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

¹⁷⁹ *Id.* See also Jennifer Smith Richards, *Glitch Sparks Smoky Fire at Gas Well*, THE COLUMBUS DISPATCH (June 29, 2014), <http://www.dispatch.com/content/stories/local/2014/06/29/glitchsparks-smoky-fire-at-gas-well.html>.

¹⁸⁰ 2012 Pa. Legis. Serv. 1950 (West).

¹⁸¹ Kendall Gurule, *Pennsylvania Fracking Regulations*, FRACKWIRE (July 15, 2013), <http://frackwire.com/pennsylvania-regulations-on-fracking/>.

information after it is furnished by energy companies.¹⁸² This is yet another gag rule targeted at doctors.¹⁸³

Similar to the proposed Colorado rule described above, this now-enforceable statutory requirement in Pennsylvania requires doctors to sign a nondisclosure form with a fracking company before receiving trade-secret chemical information with which to diagnose a patient.¹⁸⁴ Doctors claim that the rule prevents them from discussing the information with other doctors or even with the patient.¹⁸⁵ Barry Furrow, director of the health law program at Drexel University in Philadelphia, noted that “doctors are properly nervous” about the order’s vague statutory language. In Furrow’s estimation, doctors would be forced to focus on information relevant only to each patient complaint in isolation, and to worry about disclosing or not disclosing that small body of knowledge. Without clearer rules on what can be disclosed to state public health officials or shared with communities, the larger context of fracking fluid chemical information as enhanced by medical knowledge would be lost.¹⁸⁶

Dr. Alfonso Rodriguez of Wilkes-Barre sued the state, claiming that the new disclosure requirement for doctors in Act 13 was a “medical gag rule” that would force him “to violate ethical rules imposed upon him by the medical profession that could cost [him] his license to practice medicine within the Commonwealth.” Dr. Rodriguez also made a strong First Amendment argument, calling the rule a “gross and content-based intrusion on speech.”¹⁸⁷ Dr. Rodriguez filed suit in both federal court, claiming First Amendment violations, and in Pennsylvania Commonwealth Court, claiming ethical rule violations.

For the federal case, in June 2014, U.S. District Court Judge A. Richard Caputo mostly avoided the Constitutional questions and dismissed the case because Dr. Rodriguez was unable to provide evidence of injury-in-fact.¹⁸⁸

182 58 PA. CONS. STAT. § 3222.1(b)(11) (2012).

183 *Id.*

184 *Id.*

185 *Pennsylvania's Disclosure Rules: What the Frack's in the Ground?*, STATEIMPACT, <http://stateimpact.npr.org/pennsylvania/tag/fracking-disclosure/> (last visited Oct. 29, 2015). The general claim by Pennsylvania doctors that they would be unable to discuss the information with each other or with patients is largely speculative at the time of writing because no penalties have yet been enacted under the regulation in question. However, a judge has agreed with the general sentiment. See *Robinson Township v. Commonwealth*, 96 A.3d 1104, 1117 (Pa. Commw. Ct. 2014). This case was a consolidation of several challenges to Pennsylvania’s Act 13.

186 See Susan Phillips, *Pennsylvania Doctors Worry Over Fracking ‘Gag Rule’*, NPR (May 17, 2012), <http://www.npr.org/2012/05/17/152268501/pennsylvania-doctors-worry-over-fracking-gag-rule>.

187 Erin McAuley, *State’s ‘Medical Gag Rule’ Called an Illegal Gift to Gas Drillers*, COURTHOUSE NEWS SERV. (July 31, 2012), <http://www.courthousenews.com/2012/07/31/48847.htm>.

188 *Rodriguez v. Abruzzo*, 29 F. Supp. 3d 480, 486 (M.D. Pa. 2014). This proceeding examined a modified federal complaint; Rodriguez’s original complaint met the same fate in *Rodriguez v. Krancer*, 984 F. Supp. 2d 356, 362 (M.D. Pa. 2013).

(His professional obligations had not been restricted by the regulation and he had, to date, never attempted to obtain information from a fracking firm, and thus had never been subjected to a confidentiality agreement.)¹⁸⁹ Therefore, he lacked standing to sue and his complaint was merely conjectural.¹⁹⁰ The following month, Dr. Rodriguez's case in state court was also dismissed for reasons of conjecture, with President Judge Dan Pellegrini adding that, under his reading of the statute, there was no prohibition against doctors receiving information or sharing it with colleagues.¹⁹¹

After the federal and state court dismissals, doctors in Pennsylvania noted that the respective courts had ignored the issue of not being permitted to discuss chemical information with the patient, and the rulings did nothing to clear up the chilling effects of confusing language in the state's nondisclosure rule and its lack of specificity about potential punishments.¹⁹² In an allusion to the scientific uncertainty caused by the contentious politics of fracking, Commonwealth Court Judge Patricia McCullough, in a dissenting opinion, stated:

While the range and precise language of the confidentiality agreement is not known, it is a fair inference that a health professional will be unable to share the information in the peer-review setting, publish the clinical findings and proposed treatment plans in medical journals, or coordinate the outcome and treatment plans with other hospitals who later experience the same or a similar case.¹⁹³

Finally, there have been other troubling incidents showing that gag orders can extend beyond particular professions and do not necessarily have to be written into regulations. In Arkansas, Texas, and Wyoming, fracking firms agreed to cash settlements or property buyouts in return for nondisclosure agreements in which the plaintiffs were prohibited from talking about the case, including the damage that had been done to their property by fracking operations.¹⁹⁴ Due to the nature of nondisclosure agreements, and the fact that some of these disputes did not make it to court, it is impossible to determine how many times this has happened and

189 *Id.*

190 *Id.*

191 *Robinson Township*, 96 A.3d at 1117. Rodriguez's initial complaint was included in this consolidation of several cases.

192 Katie Colaneri & Susan Phillips, *Commonwealth Court Throws Out Several Challenges to Act 13, Including 'Doctor Gag Rule'*, STATEIMPACT (July 17, 2014), <https://stateimpact.npr.org/pennsylvania/2014/07/17/commonwealth-court-throws-out-several-challenges-to-act-13-including-doctor-gag-rule-updated/>.

193 *Robinson Township*, 96 A.3d at 1125.

194 Jim Efstathiou Jr. & Mark Drajem, *Drillers Silence Fracking Claims with Sealed Settlements*, BLOOMBERG (June 5, 2013), <http://www.bloomberg.com/news/articles/2013-06-06/drillers-silence-fracking-claims-with-sealed-settlements>.

how many plaintiffs have been forbidden from speaking about their fracking experiences.¹⁹⁵

It must be noted that these types of nondisclosure agreements are common in lawsuits and are not necessarily admissions of guilt by the defendants; plaintiffs often sign such agreements voluntarily in return for financial compensation. Regardless, the nature of fracking and its chemicals create additional public interest concerns when particular plaintiffs do not or cannot discuss their experiences. According to Aaron Bernstein, associate director of the Center for Health and the Global Environment at the Harvard School of Public Health, nondisclosure agreements “have interfered with the ability of scientists and public health experts to understand what is at stake here.”¹⁹⁶ One particularly creative use of this strategy occurred in Colorado. The company Encana had already reached a settlement, consisting of financial compensation and a nondisclosure agreement, with a woman who believed that its fracking operations near her home were to blame for a tumor. Encana later threatened to sue the woman and the state of Colorado after she was called to testify about matters prohibited by her nondisclosure agreement before a state commission that was considering new fracking regulations.¹⁹⁷ In another illustrative case, Aruba Petroleum, as part of a settlement with a Texas couple who claimed that fracking had polluted their water well, ordered the couple to take down the website on which they had documented the progress of their case.¹⁹⁸

This pattern of nondisclosure agreements reached Orwellian proportions in Pennsylvania in 2011, when two young Pennsylvanian children were (initially) banned for the rest of their lives from talking about their family’s unhappy experiences with fracking. The Hallowich family had accused several energy companies of destroying their farm near Mount Pleasant with practices that contaminated their water supply. One of the companies, Range Resources Corporation, paid the family \$750,000 to settle the matter. As part of the settlement, the company demanded a gag order to be enforced in perpetuity that would apply to the entire family,

¹⁹⁵ *Id.*

¹⁹⁶ *Id.*

¹⁹⁷ Cathy Proctor, *Colorado Case Featured in Report on Oil and Gas Deals with Landowners*, DENVER BUS. J. (June 7, 2013), http://www.bizjournals.com/denver/blog/earth_to_power/2013/06/battle-over-witness-in-oil-gas.html.

¹⁹⁸ See Jim Fuquay, *Wise County Pair Wins \$3 Million Jury Award in Drilling Lawsuit*, STAR-TELEGRAM (Apr. 23, 2014), <http://www.star-telegram.com/news/business/article3854920.html>. See also Efsthathiou Jr. & Drajem, *supra* note 194.

including the two Hallowich children, then aged ten and seven.¹⁹⁹ This settlement order remained confidential until an appeal attempt was reported by journalists in 2013.²⁰⁰ After unfavorable international attention, the company abandoned some terms of its own settlement and promised not to enforce the nondisclosure agreement against the children in the future. In fact, the company claimed, disingenuously and against all evidence, that this was never its intention.²⁰¹

These various strategies for gag orders and nondisclosure agreements are not only possible restrictions on free speech, but they also restrict public knowledge of dangerous chemicals and toxic industrial practices by silencing the people who have experienced them most directly—doctors who have treated patients sickened by fracking fluid chemicals, emergency personnel who have responded to toxic leaks, and residents who have experienced environmental damage to their personal property. Critics contend that this secrecy has helped the fracking industry avoid more stringent regulations, perhaps through the very act of inhibiting discussion among citizens who could then demand change from their political representatives.²⁰²

On the other hand, politicians hear from the companies engaged in fracking far more often, and are regularly subjected to arguments against fracking regulations of any kind, including those related to fracking fluid chemical disclosure. The industry's lobbyists have written best practices for talking to state legislators and skeptical citizens, known as the "Community Engagement Guidelines," which tend to focus on job creation while assuaging worries about environmental damage.²⁰³ Finally, while total lobbying expenditures nationwide appear to be unavailable, journalists have found that the industry spent \$64.3 million on lobbying in New York State from 2007 to 2013 during that state's contentious rounds of recurring

199 Suzanne Goldenberg, *Children Given Lifelong Ban on Talking About Fracking*, THE GUARDIAN (Aug. 5, 2013), <http://www.theguardian.com/environment/2013/aug/05/children-ban-talking-about-fracking>.

200 *Hallowich v. Range Res. Corp.*, 30 Pa. D. & C. 5th 91 (Ct. Com. Pl. Pa. 2013). The original settlement had also barred investigation by journalists. See also Don Hopey, *Hallowich Children Not Part of Marcellus Shale Gag Order Agreement*, PITTSBURGH POST-GAZETTE (Aug. 7, 2013), <http://www.post-gazette.com/local/washington/2013/08/07/Hallowich-children-not-part-of-Marcellus-Shale-gag-order-agreement/stories/201308070133>.

201 Hopey, *supra* note 200. The original settlement did in fact include the children since the court had to explicitly approve that settlement term. Also, the *Pittsburgh Post-Gazette* obtained a document in which the company's attorney stated that the nondisclosure settlement applied to the children and that the company planned to enforce it.

202 See Goldenberg, *supra* note 199.

203 Alan Neuhauser, *Oil and Gas Lobby Unveils "Best Practices" for Talking Fracking*, U.S. NEWS (July 9, 2014), <http://www.usnews.com/news/articles/2014/07/09/oil-and-gas-lobby-unveils-best-practices-for-talking-fracking>.

fracking bans,²⁰⁴ and an estimated \$15 million during recent political maneuvers to allow fracking in California.²⁰⁵

VI. CONCLUSION

While this Article has covered many political developments in various states and at the federal level concerning rules for the disclosure of fracking fluid chemical information, the underlying argument concerns the context of the information that is ultimately disclosed. Lists of chemical substances actually exist in various forums, such as the U.S. Congressional Report and the FracFocus clearinghouse website.²⁰⁶ However, this Article argues that simple lists of chemicals provide no context on how they accumulate in quantity or interact with each other, immediately or over time. This eliminates the possibility of understanding the effects of fracking fluid chemicals at a higher level of comprehension.

As discussed herein, several states have required energy firms to disclose the percentage concentrations of chemicals used in particular rounds of fracking fluid, but do not require information on the actual amounts used or on how many rounds of fluid were used at a particular fracking location over what amount of time. The lists of chemicals furnished by companies almost never include trade secrets, so there is no way to know what percentage of the actual chemicals used has been disclosed, or if those that have not been disclosed are dangerous. Some states also have specific gag rules targeted at certain professions, while fracking companies have secured nondisclosure agreements against plaintiffs who have sued them for damages.

State legislatures are very susceptible to political pressure from the industry to allow more secrecy, and residents of various states tend to have different beliefs on job creation and environmental or public health risks. This has manifested in the inconsistencies among the various state regulations analyzed herein. Deborah Goldberg, an attorney with the environmental activist group EarthJustice, notes that “[s]ome of the states do something. Some don’t. A lot of the disclosure they require is enforced rarely and poorly.”²⁰⁷ These patterns restrict higher-level understanding of

204 Matthew Dondiego, *Report Shows Heavy Lobbying Efforts, Campaign Contributions by Pro-Fracking Interests*, LEGIS. GAZETTE (Jan. 14, 2014), <http://www.legislativegazette.com/Articles-Top-Stories-c-2014-01-14-86386.113122-Report-shows-heavy-lobbying-efforts-campaign-contributions-by-profracking-interests.html>.

205 Emily Atkin, *Oil Lobby Overpowers Voters to Kill Statewide Fracking Ban in California*, Climate Progress (May 30, 2014), <http://thinkprogress.org/climate/2014/05/30/3443332/california-fracking-ban-fails/>.

206 U.S. HOUSE OF REPRESENTATIVES, *supra* note 33. FRACFOCUS CHEMICAL DISCLOSURE REGISTRY, *supra* note 20.

207 Volcovici, *supra* note 56.

widespread industrial practices that are far from limited to a single state, and which may very well cause cross-border environmental or public health problems.

Context is sorely lacking from the information disclosures mandated by these regulations. In the words of early computer scientist Herbert A. Simon:

In an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence, a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.²⁰⁸

For this Article's arguments about fracking fluid chemicals, perhaps Simon's "wealth of information" and its attendant "poverty of attention" could be reconsidered as a wealth of information at the wrong level that deflects attention away from the true contextual understanding that is needed.

A resident of Bradford County, Pennsylvania, who believes that his personal property might be damaged by water contamination from a nearby fracking well called Ferguson-Keisling G U #1H, is unlikely to be enlightened by a state-mandated document reporting that the well uses hydrochloric acid and sodium hydroxide as tiny portions of a fluid mixture that also includes a product called FRW-18 from an unknown company, with no information on the actual volume of these chemicals that appear in an unknown volume of fracking fluid over an unknown stretch of time.²⁰⁹ This resident would be forced to search for further contextual information on total amounts used and the well's operational lifespan without any guarantee that such information even exists in forms that are accessible to the public. In Simon's terms, there is a "wealth" of information arising from the fracking fluid disclosure regulation in this person's state, but it is in piecemeal fragments that distract the citizen's attention away from the contextual knowledge that would be much more useful. The availability of many documents containing low-level trivial details can seem like full disclosure depending on one's point of view, thus offering regulators and companies an excuse for claiming that existing disclosure rules work and

²⁰⁸ OMRI BEN-SHAHAR & CARL E. SCHNEIDER, MORE THAN YOU WANTED TO KNOW: THE FAILURE OF MANDATED DISCLOSURE 94 (2014). Simon made this statement in 1969.

²⁰⁹ See *supra* text accompanying note 127.

that no further rules are needed, despite questions about the actual usefulness of the information gained.²¹⁰

There is also something to be said about the social context of information disclosure requirements. Specific gag orders have been targeted at the kind of professionals who would likely provide the most useful information to citizens, as well as journalists who are trying to assess the environmental and public health risks caused by fracking fluids. Meanwhile, residents often accept nondisclosure agreements in return for needed financial compensation, preventing them from discussing their personal experiences with those chemicals. These experiences could be instructive for other citizens in communities who live near fracking operations, or who are considering allowing such operations on their own land.²¹¹

Meanwhile, fracking firms have been allowed to self-report trade secrets, with little regulatory oversight of whether such claims are valid or if the substances in question really are proprietary. This engenders overuse of trade secret exemptions in access-to-information statutes and fracking fluid disclosure regulations. While these firms, from a business point of view, surely have valid reasons to want to protect trade secrets, modern overuse of trade secret exemptions precludes any further discussion of whether the protection of business interests really should supersede the interests of the general public, which in turn are supposed to be protected by regulators.²¹² A fundamental conflict arises when a business phenomenon is heavily promoted as beneficial for the citizenry, as is the case for fracking in terms of jobs and energy security, but governments allow the industry in question to restrict information about the costs that come with those supposed benefits.²¹³ One can argue that when private business operations and proprietary materials have an impact on the public at large, trade secrets exemptions should not be allowed to restrict knowledge to businesspeople within one particular private company.²¹⁴

While the progress of fracking fluid disclosure rules in various states has been fairly impressive (though less so at the federal level), more needs

210 BEN-SHAHAR & SCHNEIDER, *supra* note 208, at 42–47.

211 Lynne Peoples, *Fracking's Toxic Secrets: Lack of Transparency Over Natural Gas Drilling Endangers Public Health, Advocates Say*, HUFFINGTON POST (Nov. 11, 2012), http://www.huffingtonpost.com/2012/11/21/natural-gas-fracking-chemicals-testing-disclosure_n_2170030.html; Bobby Magill, *Scientists: Lack of Data Means Fracking Impacts Unknown*, CLIMATE CENT. (Dec. 10, 2013), <http://www.climatecentral.org/news/scientists-call-for-more-fracking-data-transparency-16816>.

212 David S. Levine, *Secrecy and Unaccountability: Trade Secrets in Our Public Infrastructure*, 59 FLA. L. REV. 135, 176–77 (2007).

213 Cramer, *supra* note 107, at 365.

214 Levine, *supra* note 212, at 191–92.

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to be done, particularly as the energy industry organizes its efforts to sway legislators. Apparently everyone is in favor of disclosure, as citizens and journalists demand more information and companies claim to be interested in deflecting public criticism. But as stated by the *New York Times*, thus far there has been no real agreement on what exactly “disclosure” means in this industry, much less on what exactly should be disclosed.²¹⁵ It is unlikely that dry lists of incomprehensibly-named chemicals used at particular locations will achieve the transparency goals of the politicians who have enacted fracking fluid disclosure regulations, or the citizens who desire higher-level contextual insights into this rapidly spreading, but poorly understood industrial practice.

215 Soraghan, *supra* note 89.