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“Either Secrecy, or Legal Monopoly”: Why We Should Choose Fracking Patents

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“EITHER SECRECY, OR LEGAL MONOPOLY”:¹ WHY WE SHOULD CHOOSE FRACKING PATENTS

SARAH SPENCER*

*With axe at root he felled thee to the ground
And barked of freedom—O I hate the sound
Time hears its visions speak,—and age sublime
Hath made thee a disciple unto time.—
It grows the cant term of enslaving tools
To wrong another by the name of right,²*

INTRODUCTION

In June 2016, the media flooded with articles clamoring about the future of fracking and our environmental health in light of one Wyoming court’s decision.³ Fracking, a highly controversial modern drilling technique in a time of both increasing environmental awareness and energy demands, was center stage once again.⁴ In an age of increasing polarization, reaching mutually beneficial decisions for such controversies is difficult.⁵

¹ *Metallizing Eng’g Co. v. Kenyon Bearing & Auto Parts Co.*, 153 F.2d 516, 520 (2nd Cir. 1946).

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² John Clare, *The Fallen Elm*, POEMHUNTER, <https://www.poemhunter.com/best-poems/john-clare/the-fallen-elm/> [<https://perma.cc/S5YE-DVPE>] (last visited Jan. 21, 2018).

³ *Wyoming v. Dep’t of the Interior*, No. 2:15-CV-043-SWS, 2016 U.S. Dist. LEXIS 82123 (D. Wyo. June 21, 2016) (holding that the Bureau of Land Management does not have the authority to regulate fracking). See Ellen M. Gilmer, *Federal court kills BLM fracking rule*, E&E NEWS (June 22, 2016), <https://www.eenews.net/stories/1060039204> [<https://perma.cc/N869-UCE2>] (discussing *Wyoming v. Dep’t of the Interior* and the notion that states are better equipped to regulate fracking); see also Norman F. Carlin et al., *BLM Fracking Decision Is Narrow, But With A Vast Impact*, LAW360 (July 1, 2016), <https://www.law360.com/articles/812000> [<https://perma.cc/72XM-4JT7>].

⁴ Robert Rapier, *Fracking Has Been around since 1949, Why the Recent Controversy?*, GLOBAL ENERGY AFFAIRS, <http://globalenergyinitiative.org/insights/58-fracking-has-been-around-since-1949-why-the-recent-controversy.html> [<https://perma.cc/R2UX-BEQ7>] (last visited Jan. 21, 2018).

⁵ James E. Campbell, *The source of America’s political polarization? It’s us*, L.A. TIMES (June 30, 2016, 6:00 AM), <http://www.latimes.com/opinion/op-ed/la-oe-campbell-political>

So how do we balance the competing intellectual property and environmental rights in the case of fracking? To what extent can companies use these rights to protect their economic interests in disregard of the corresponding impact on public health and the environment? Through the lens of hydraulic fracturing, and particularly the issues raised by the District Court decision in *Wyoming v. Dep't of the Interior*, I will explore how patents offer a better compromise between property rights and environmental protection than trade secrets—especially in the face of ever strengthening trade secret laws.

The 2016 Wyoming District Court decision effectively removed the Obama administration's new protections that made it harder for trade secrets to qualify for disclosure exemptions.⁶ Consequently, this revocation of weakened trade secret protections dealt another blow against anti-fracking groups and communities adversely affected by fracking.⁷ However, the District Court's decision was only the most recent development in a distinct trend.

I argue that these recent legislative, regulatory, and legal developments illustrate disquieting problems with using trade secrets to protect products with potentially dangerous environmental ramifications. Instead, we should turn to patents. Particularly in the case of fracking, the environmental and health concerns could be diminished by an increased use of fracking patents rather than trade secrets. While patents are not exempt from their share of problems, the current patent system would inherently provide for the disclosure of fracking chemical compounds and concentrations in a way that is lacking under trade secret monopolies. Consequently, patents offer the best middle ground between property rights and environmental, community, and public health protection.

This argument can translate to other trade secret protected products with similar environmental impacts and concerns. Moreover, the field of pharmaceuticals illustrates the beneficial power of this argument in action. While pharmaceuticals have a similar potential for causing environmental damage (i.e., pharmaceuticals with undisclosed chemical

-polarization-20160627-snap-story.html [https://perma.cc/ZJY5-KU2M].

⁶ Paul J. Larkin, Jr. & Nicolas D. Loris, *The Regulation of Hydraulic Fracturing on Federal and Indian Land: Wyoming v. Department of the Interior*, THE HERITAGE FOUNDATION (Sept. 9, 2016), <http://www.heritage.org/environment/report/the-regulation-hydraulic-fracturing-federal-and-indian-land-wyoming-v-department> [https://perma.cc/4SGJ-2HXF].

⁷ See Camila Domonoske, *Federal Judge Strikes Down Obama Administration's Fracking Rules*, NPR (June 22, 2016), <http://www.npr.org/sections/thetwo-way/2016/06/22/483061014/federal-judge-strikes-down-obama-administrations-fracking-rules> [https://web.archive.org/web/*/http://www.npr.org/sections/thetwo-way/2016/06/22/483061014/federal-judge-strikes-down-obama-administrations-fracking-rules].

compositions that end up in our drinking water or infiltrate our wildlife habitats with devastating effects), those issues are significantly mitigated through the disclosure provided by pharmaceutical patents—all without harming a corporation's bottom line. The stricter, guaranteed monopolistic protections offered by patents can preserve the economic interests of those pharmaceutical companies while the inherent disclosure of patents aids responders in more effectively and informatively combating environmental and health concerns.

So, where do we draw the line between intellectual property rights and environmental law? To answer this question, I will first discuss the policies behind intellectual property and how intellectual property laws are currently used by companies to protect the details of their fracking fluids. Then I will discuss how the recent *Wyoming* decision illuminates a growing trend of increased protection afforded trade secrets. Lastly, I will analyze the benefits and difficulties accompanying a switchover from trade secret law to fracking patents, and how this policy argument effectively plays out in other markets and arenas such as pharmaceuticals. I conclude that despite some continuing transparency issues and increased costs to companies, patents achieve a superior balance between intellectual property rights and environmental protection. In fact, patents are currently the only viable option that offers each side of the debate significant, or perhaps even sufficient, protection.

I. SECRET VERSUS LEGAL MONOPOLIES IN MODERN FRACKING

A. *Trade Secrets, Patents, and the Policies Behind Intellectual Property Rights*

Our intellectual property laws, from the Copyright Act of 1790 to the 2011 Leahy-Smith America Invents Act, stem from the idea of incentivizing creation.⁸ Article I Section 8 of the United States Constitution (“the Constitution”) empowers Congress “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”⁹ The idea underpinning this provision is that granting temporary monopolies

⁸ Copyright Act of 1790, 1 Stat. 124; Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (amending 35 U.S.C. §§ 101 et seq.). For further discussion on the origins of the patent system, see ROBERT H. RINES, *CREATE OR PERISH: THE CASE OF INVENTIONS AND PATENTS* (1964) (discussing the history, origin, statutory provisions, and innovation present within the American patent system).

⁹ U.S. CONST. art. I, § 8.

encourages people to either make a creative contribution (e.g., copyrights) or disclose the type of information we want to be in the public domain (e.g., patents).¹⁰ Indeed, Robert Rines claims that “incentives that make a person fight to be an individual promote the welfare of the whole state.”¹¹ Therefore, the underlying policy behind most intellectual property law is to stimulate growth of the public domain and, ultimately, to benefit and advance society.

Particularly, the purpose of patents is to promote disclosure, which increases the amount of original and novel information available to the public. This in turn sparks downstream innovation while allowing inventors to still obtain financial rewards through licensing. Thus, the object of the patent acts was not to just grant patents to benefit the creating individual, but to encourage inventors to take risks “for the ultimate benefit of the many.”¹²

In the same vein, the U.S. legislature removed certain types of technology from patent law’s scope when a particular monopoly countered public policy. In 1946, the United States (“U.S.”) government passed the Atomic Energy Act, which increased government control and regulation of fission technology.¹³ Inventions for “the production, refining or other processing of fissionable material” were to be issued or assigned to a Commission “subject to a right to fair compensation of the inventor.”¹⁴ When a monopoly hindered public safety, an exception to intellectual property laws was made.¹⁵ Patent law was meant to promote disclosure, so the law was altered when it did not live up to that objective.¹⁶

Trade secrets, unlike patents, work against disclosure.¹⁷ Trade secrets act as secret monopolies rather than the legal monopolies granted through copyrights or patents. So why then does our legal system allow for this option? Yeh argues that:

Trade secret law will encourage invention in areas where patent law does not reach, and will prompt the independent

¹⁰ *See id.*

¹¹ RINES, *supra* note 8, at 1.

¹² *Id.* at 12.

¹³ Stefan A. Riesenfeld, *Patent Protection and Atomic Energy Legislation*, 46 CAL. L. REV. 40, 40 (1958).

¹⁴ *Id.* at 40–41.

¹⁵ *Id.* at 41–42.

¹⁶ *Id.* at 42.

¹⁷ Brian T. Yeh, *Protection of Trade Secrets: Overview of Current Law and Legislation*, CONG. RESEARCH SERV. 3 (Apr. 22, 2016).

innovator to proceed with the discovery and exploitation of his invention. Competition is fostered and the public is not deprived of the use of [a] valuable, if not quite patentable, invention.¹⁸

Moreover, Yeh's argument plays into Posner and Landes' suggestion that the patent system is actually a response to "economic problems inherent in trade secrecy and market structure."¹⁹ This simultaneously complementary and competing relationship between patent and trade secret law is perfectly highlighted in cases of new technology with controversial environmental impacts, such as hydraulic fracturing.

B. *Hydraulic-Fracturing or "Fracking"*

Hydraulic fracturing ("fracking") is the post-drilling technique of blasting high-pressure water mixtures into subterranean rock to release trapped natural gas, crude oil, or to enlarge existing pathways.²⁰ Essentially, it is fracturing rocks with water, which is where the term hydrofracking derives.²¹ The high-pressure stream of water, along with sand and chemicals, directs the gases to flow out of the wellhead.²² These chemicals, known as "proppants," constitute the "frack fluid."²³

While some form of fracking has existed for the last seventy years,²⁴ it is just recently becoming an increasingly widespread method of oil and natural gas extraction in the United States.²⁵ As of March 2016, fracking accounted for over half of the United States' entire oil output, compared to the mere two percent it accounted for in 2000.²⁶ However, this rapid

¹⁸ *Id.* at 5 (quoting *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 484–85 (1974)).

¹⁹ WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW*, 294 (Harv. U. Press 2003).

²⁰ BBC NEWS, *What is fracking and why is it controversial?* (Dec. 16, 2015), <http://www.bbc.com/news/uk-14432401> [<https://perma.cc/J9HR-6CVT>].

²¹ *Id.*

²² *Id.* (this technique can be used to drill either vertically or horizontally (the more common method)).

²³ *North Dakota's Black Gold: Preventing America's Newest Boomtown From Becoming America's Next Ghost Town*, 62 OIL, GAS & ENERGY Q. 1, 4 (2013) [hereinafter *North Dakota's Black Gold*].

²⁴ *Id.*

²⁵ Ronald E. Bishop, "Fracking:" A Roundtable, 18 J. APPALACHIAN STUD. 31, 31 (2012).

²⁶ Matt Egan, *Oil milestone: Fracking fuels half of U.S. output*, CNN MONEY (Mar. 24,

integration is accompanied by a corresponding increase in concern and controversy over the fracking method. So why this increased use of the fracking method, and what are the potential hazards associated with its use?

Fracking dramatically expands what is possible for drilling projects. This technology permits “well projects which are orders of magnitude larger than traditional gas wells,” and allows companies to delve into historically unviable locations.²⁷ Not only is fracking a more efficient use of wells than traditional methods, but it also unlocks massive new oil and natural gas reserves in shale deposits.²⁸ Many advocates see the rise of fracking—this more efficient drilling method—as the way to make the United States “a center of energy production again.”²⁹

Similarly, increased domestic energy production corresponds to increased energy security for the U.S. Fracking not only represents a response to growing demands for energy, but also can be considered a “bridge fuel” transitioning our economy from coal to renewable resources.³⁰ In fact, the U.S. Energy Information Administration estimates that the total U.S. gas production will increase by fifty-six percent between 2012 and 2040, with shale natural gas playing a prominent role.³¹ As a recent article claimed, “America’s recent natural-gas bonanza owes a lot to fracking.”³²

Fracking fans also argue that fracking boosts local economies by bringing in big businesses.³³ For example, “oil exploitation in North Dakota has exploded” because of fracking; production rose a dramatic 222,000 barrels a day within just two years once fracking came to town.³⁴ Some

2016), <http://money.cnn.com/2016/03/24/investing/fracking-shale-oil-boom/> [https://perma.cc/D2PM-4JCD].

²⁷ Bishop, *supra* note 25, at 31.

²⁸ Thomas W. Merrill & David M. Schizer, *The Shale Oil and Gas Revolution, Hydraulic Fracturing, and Water Contamination: A Regulatory Strategy*, 98 MINN. L. REV. 145, 157–70 (2013).

²⁹ *North Dakota’s Black Gold*, *supra* note 23.

³⁰ Stephen G. Osborn et al., *Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing*, 108 PROC. NAT’L ACAD. SCI. U.S. OF AM. 8172, 8172 (2011).

³¹ *What is Fracking?*, ENERGYFROMSHALE.ORG, <http://www.what-is-fracking.com/what-is-hydraulic-fracturing/> [https://perma.cc/3ZEP-DWHS] (last visited Jan. 21, 2018).

³² J.P., *Fire water*, ECONOMIST (June 25, 2013), <http://www.economist.com/blogs/babbage/2013/06/fracking> [http://web.archive.org/web/*/https://www.economist.com/blogs/babbage/2013/06/fracking] (the U.S. pumped approximately two billion cubic meters of natural gas per day in 2013).

³³ *North Dakota’s Black Gold*, *supra* note 23.

³⁴ *Id.* However, that boom subsequently collapsed with “oil prices down more than 70 percent,” which left behind a difficult economic environment in North Dakota. Ernest

analysts even estimate that production will have increased to a million barrels per day by 2020.³⁵

But despite all these potential benefits, the fracking process raises some serious concerns—particularly regarding fracking’s potential environmental and health impacts on communities with neighboring drill sites.³⁶ While fracking advocates argue that fracking’s environmental impacts are “yet unknown,” opponents claim significant risks of ground water contamination, increased air pollution, and surface contamination.³⁷ These safety concerns have sparked widespread debate and even led some states to completely ban fracking.³⁸

Moreover, these concerns are receiving ever increasing scientific scrutiny. In a recent 2012 study of fracking’s effects, scientists analyzed local drinking water supplies for data concerning the presence of methane, ethane, propane, etc.³⁹ The study detected: (1) dissolved methane in the water of eighty-two percent of the sampled houses and (2) that methane concentrations were an average of six times higher in homes less than one kilometer away from a natural gas well versus homes farther away.⁴⁰ The study concluded that the homeowners’ drinking water had been contaminated by fracking, “likely through poor well construction.”⁴¹ Significantly, the levels of methane, ethane, and propane discovered in *all* the homes sampled were above the safe levels set by the Department of the Interior.⁴²

Scheyder, *In North Dakota’s oil patch, a humbling comedown*, REUTERS INVESTIGATES (May 18, 2016), <http://www.reuters.com/investigates/special-report/usa-northdakota-bust/> [<https://perma.cc/SUH7-2ZSV>].

³⁵ *North Dakota’s Black Gold*, *supra* note 23; see Travis H. Brown, *Fracking Fuels An Economic Boom in North Dakota*, FORBES (Jan. 29, 2014), <https://www.forbes.com/sites/travisbrown/2014/01/29/fracking-fuels-an-economic-boom-in-north-dakota/#7d08330e2e1b> [<https://perma.cc/5NHV-RWXX>].

³⁶ Osborn et al., *supra* note 30.

³⁷ *North Dakota’s Black Gold*, *supra* note 23.

³⁸ *Id.*

³⁹ Robert B. Jackson et al., *Increased stray gas abundance in a subset of drinking water wells near Marcellus shale gas extraction*, 110 PNAS 11250, 11250 (2013).

⁴⁰ *Id.*

⁴¹ *Id.* at 11254.

⁴² *Id.* at 11251. The study also notes that these high levels, “cannot be put down to gasmen’s penchant for plonking their drills in spots where natural gas is most abundant in the first place. In the absence of drilling the gas, being trapped in the shale beds 1,500–2,500 metres beneath the countryside, would stay put; concentrations nearer to the surface would remain unaffected.” J.P., *supra* note 32.

Less scientifically rigorous, but perhaps more dramatic, are the fracking horror stories circulating like wildfire. Indeed, many of these stories are about fire, including tales of flaming drinking water in homes located near fracking sites.⁴³ But these accounts help illustrate the flip side of fracking's power to bring businesses into local economies. Fracking can simultaneously hurt local economies by poisoning groundwater and impacting local agriculture, tourism, fishing, hunting, and manufacturing.⁴⁴

However, one major concern with fracking (and the focus of this Note's debate between trade secrets and patents) is the chemicals added to the blasting mixture of water and sand.⁴⁵ These chemicals are added "to prevent microbe growth (biocides), swelling of clay components (floculents), inhibit corrosion and scale formation, or to provide lubrication (lubricants)."⁴⁶ Unfortunately, both the frack fluids and the resulting chemicals released as "flowback" from the rock during the fracking process can be highly hazardous—particularly if they find their way into the groundwater.⁴⁷ Some of these hazardous chemicals include arsenic, lead, barium, 2-butoxyethanol, and natural radioactive materials.⁴⁸ And often, the additive chemical spray and flowback chemicals combine to create unknown toxic "sludges."⁴⁹ In response, the U.S. House of Representatives Committee on Energy and Commerce has recently begun investigating fracking chemicals and their impact both on "the environment and human health."⁵⁰ Moreover, this puzzle is made even more confusing by the fact that these mixtures are often not disclosed due to intellectual property protections.⁵¹ How can communities, activists, and environmental

⁴³ *Does fracking cause flaming water faucets?*, ENERGYFROMSHALE.ORG, <http://www.what-is-fracking.com/does-fracking-cause-flaming-water-faucets/> [<https://perma.cc/XJ78-62QC>] (last visited Jan. 21, 2018); J.P., *supra* note 32; Zoe Schlanger, *Fracking Wells Tainting Drinking Water in Texas and Pennsylvania, Study Finds*, NEWSWEEK (Sept. 15, 2014), <http://www.newsweek.com/fracking-wells-tainting-drinking-water-texas-and-pennsylvania-study-finds-270735> [<https://perma.cc/4D6Q-5HGV>]; Osborn et al., *supra* note 30.

⁴⁴ *Natural Gas Fracking—Introduction*, GRACE COMM'NS FOUND., <http://www.gracelinks.org/191/natural-gas-fracking-introduction> [<https://perma.cc/H5ZF-TZVU>] (last visited Jan. 21, 2018).

⁴⁵ See generally Osborn et al., *supra* note 30.

⁴⁶ Bishop, *supra* note 25, at 32.

⁴⁷ *Id.* at 36–37.

⁴⁸ *Id.* at 32.

⁴⁹ *Id.*

⁵⁰ MINORITY STAFF OF COMM. ON ENERGY & COM., 112TH CONG., CHEMICALS USED IN HYDRAULIC FRACTURING at 4 (Comm. Rep. Apr. 2011), http://www.conservation.ca.gov/dog/general_information/Documents/Hydraulic%20Fracturing%20Report%204%2018%2011.pdf [<https://perma.cc/MAB9-S825>].

⁵¹ Bishop, *supra* note 25, at 32.

or health responders deal with the problems caused by fracking chemicals if they are unarmed with adequate information?

This problem with information accessibility is further exacerbated by the Environmental Protection Agency's ("EPA") limited regulatory authority concerning shale gas development⁵² under the so-called "Halliburton Loophole," which exempts natural gas drilling from the Safe Drinking Water Act:

The oil and gas industry is the only industry in America that is allowed by EPA to inject known hazardous materials—unchecked—directly into or adjacent to underground drinking water supplies . . . Nor do companies have to monitor water quality when there are drinking water formations in close proximity to areas where hydraulic fracturing occurs.⁵³

While some states do regulate some aspects of fracking, those regulations seldom disrupt trade secret law sufficiently to require disclosure of the detailed or specific information necessary to determine the type and concentration of frack fluid chemicals.⁵⁴ Because of this limited governmental regulation concerning such potentially dangerous technology, intellectual property laws may have to pick up the slack.

⁵² Charles W. Schmidt, *Blind Rush?: Shale Gas Boom Proceeds amid Human Health Questions*, 119 ENVTL. HEALTH PERSP. A348, A351 (2011). See Osborn et al., *supra* note 30, at 8172. See generally Merrill & Schizer, *supra* note 28; Ashley Leonard-Roche, *Legal Causation: Hydraulic Fracturing and Groundwater Contamination*, 18 SMU SCI. & TECH. L. REV. 279, 283 (2015); Terry W. Roberson, *Environmental Concerns of Hydraulically Fracturing a Natural Gas Well*, 32 UTAH ENVTL. L. REV. 67, 132–33, 135 (2012).

⁵³ EARTHWORKS, *The Halliburton Loophole*, https://www.earthworksaction.org/issues/detail/inadequate_regulation_of_hydraulic_fracturing#.WKtGTBjMxE4 [<https://perma.cc/P9FQ-VAJC>] (last visited Jan. 21, 2018). Garmezy explains the exclusions as follows:

Section 322 of the Energy Policy Act of 2005 amended the Safe Drinking Water Act (SDWA)—which purports to protect public water supplies from hazardous substances and underground injection—to exclude “the underground injection of natural gas for purposes of storage,” and “the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities.

Adam Garmezy, *Balancing Hydraulic Fracturing's Environmental and Economic Impacts: The Need for a Comprehensive Federal Baseline and the Provision of Local Rights*, 23 DUKE ENVTL. L. & POL'Y F. 405, 408–09 (2013) (citing 42 U.S.C. § 300h(d)(1)(B)(i) (2006)).

⁵⁴ *The Halliburton Loophole*, *supra* note 53. See my discussion on fracking exemptions to EPCRA (SARA Title III) as well as the failed FRAC Act in later sections.

C. *Intellectual Property Rights in the Fracking Process*

1. Trade Secrets

Unlike patents, trade secrets are a product of nineteenth century state common law.⁵⁵ Trade secrets are “confidential business information which provides an enterprise a competitive edge,” and often are the key to a business’ success (think Coca-Cola).⁵⁶ While there is no precise definition of a trade secret,⁵⁷ such a secret must be comprised of both private and commercially significant information.⁵⁸ Helpfully, the court in *ConFold Pac. v. Polaris Indus.* described trade secrets as:

really just a piece of information (such as a customer list, or a method of production, or a secret formula for a soft drink) that the holder tries to keep secret by executing confidentiality agreements with employees and others and by hiding the information from outsiders by means of fences, safes, encryption, and other means of concealment, so that the only way the secret can be unmasked is by a breach of contract or a tort.⁵⁹

However, trade secret protection may be irreversibly destroyed if a company intentionally or even accidentally discloses the information.⁶⁰ Essentially, trade secrets only remain protected as long as they remain *secret*. Competitors may also discover the secret without repercussions through reverse engineering.⁶¹ The law only provides remedies if the secret is lost through a tort, such as trespass or breach of contract.⁶²

Drilling companies successfully use this legal construct to protect frack fluid compositions. For example, the court in *Robinson Twp. v.*

⁵⁵ Yeh, *supra* note 17, at 5.

⁵⁶ WIPO, *What is a Trade Secret?*, http://www.wipo.int/sme/en/ip_business/trade_secrets/trade_secrets.htm [<https://perma.cc/73D9-ZPRU>] (last visited Jan. 21, 2018); Deepa Varadarajan, *Trade Secret Fair Use*, 83 *FORDHAM L. REV.* 1401, 1401 (2014); *Trade Secrets are Gold Nuggets: Protect Them*, *WIPO MAG.* at 12 (Apr. 2002), http://www.ollip.com/wp-content/uploads/2008/08/04_2002.pdf [<https://perma.cc/SHH9-PQMG>].

⁵⁷ *RESTATEMENT (FIRST) OF TORTS* § 757 cmt. b.

⁵⁸ *Uniform Trade Secrets Act*, 14 *U.L.A.* 539–40 § 1(4) (1980).

⁵⁹ Yeh, *supra* note 17, at 2 (quoting *ConFold Pac. v. Polaris Indus.*, 433 F.3d 952, 959 (7th Cir. 2006)).

⁶⁰ *See* Yeh, *supra* note 17, at 3 (citing *Religious Tech. Ctr. v. Netcom On-Line Comm. Servs.*, 923 F. Supp. 1231, 1256 (N.D. Cal. 1995)).

⁶¹ LANDES & POSNER, *supra* note 19, at 355.

⁶² *Id.*

Commonwealth upheld 58 Pa. C.S. Section 3222's limitations on disclosures, even to health care professionals, and maintained trade secret protection of fracking chemicals.⁶³

Similarly, companies and facilities can use trade secrets as a barrier to disclosure even in the face of legislation such as the Emergency Planning and Community Right-to-Know Act ("EPCRA").⁶⁴ The EPCRA was enacted in 1986 as part of the Superfund Amendments and Reauthorization Act (known as SARA Title III) to "promote emergency planning for chemical accidents and provide local governments and the public with information on potential chemical dangers in the community."⁶⁵ While trade secret protection normally prevents disclosure of the chemical compositions, under Title III, public petitioners can request disclosure of chemical identities claimed as trade secrets.⁶⁶ However, access under Title III is significantly restricted. For example, health care providers must fill out forms explaining the particular need (a high burden), and once the information is disclosed, the doctor is limited to using that information to the applicant patient.⁶⁷ But when it comes to fracking, even this trade secret loophole has been closed. Fracking is *specifically exempted* from both EPCRA and the Resource Conservation and Recovery Act ("RCRA"), which "regulates hazardous-waste disposal."⁶⁸

In short, trade secrets can allow companies to maintain a competitive edge against other drilling companies, free from the normal safety and environmental regulations. Trade secrets also allow companies to avoid federal court (because most trade secret laws are state law), which might be less favorable to sources of local jobs and income than local courts.⁶⁹ There is also an indefinite, temporal period of protection.⁷⁰ Indeed,

⁶³ *Robinson Twp. v. Commonwealth*, 147 A.3d 536 (Pa. 2016).

⁶⁴ 4A-28 ENVIRONMENTAL LAW PRACTICE GUIDE § 28.02 (citing EPCRA § 313—Toxic Chemical Release Reporting Requirement).

⁶⁵ *Id.*; 3-4C TREATISE ON ENVIRONMENTAL LAW § 4C.01.

⁶⁶ See Emergency Planning and Community Right-to-Know Act, 42 U.S.C. § 11042 (1986) (amending Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601–28, 9631–33, 9641, 9651–62, 9671–75 (2012)).

⁶⁷ See *id.* at § 11043; see also Michael H. Levin & David B. Spence, *SARA Title III: Pitfalls and Practicalities*, 39 JAPCA 29, 29 (1989) (Figure 1). See Leonard-Roche, *supra* note 52, at 283–84; Schmidt, *supra* note 52, at A351.

⁶⁸ Garmezy, *supra* note 53, at 409.

⁶⁹ Ronald T. Coleman et al., *Trade Secrets—The Basic Principles and Issues*, ABA LITIG. SEC. "CORE KNOWLEDGE" PROJECT at 1 (Nov. 2014), http://www.americanbar.org/content/dam/aba/publications/litigation_committees/intellectual/trade-secrets-the-basic-principles-and-issues.authcheckdam.pdf [<https://perma.cc/2TBR-FS25>].

⁷⁰ *Id.* at 3.

trade secret protection could theoretically last forever. There are also no registration or processing fees as there are when dealing with other forms of intellectual property.⁷¹

However, trade secret law is not the only option by which companies may obtain monopolies over frack fluid compositions. There is another form of IP protection available to fracking companies—patents.

2. Patents

Patent law protects objects, methods, or procedures that are useful, novel, and non-obvious.⁷² This protection can apply to everything from bottle designs (design patents) to chemical compounds (utility patents).⁷³ However, a patent cannot be a mere “hunting license.”⁷⁴ In other words, the government will not grant a patent without the required “quid pro quo” of disclosure.⁷⁵

Only certain types of information can be patented, and even qualifying subject matter must pass through additional application hurdles before a patent can be issued.⁷⁶ Patent applications must follow the correct formatting rules, include properly drafted claims and written descriptions, and conform to other statutory requirements such as utility and enablement.⁷⁷ There are also application and maintenance fees that patentees must pay to retain patent protection, and the examination process by the Patent and Trademark Office often lasts upwards of two years.⁷⁸

Despite these hurdles, many companies *do opt* for fracking patents. Since Stanoin's fracking-related patents in 1948, the use of fracking patents has only grown more prominent.⁷⁹ For example, one recent fracking fluid patent application (WO2013154926 A1) claims, “[a] fluid for treating a subterranean formation comprising: a solvent; and a composition

⁷¹ *Id.* at 5.

⁷² USPTO, *General information concerning patents* (Oct. 2015), <https://www.uspto.gov/patents-getting-started/general-information-concerning-patents#heading-5> [<https://perma.cc/ZL7J-4XXT>].

⁷³ *Id.*

⁷⁴ *Brenner v. Manson*, 383 U.S. 519, 536 (1966).

⁷⁵ *Id.* at 534–35.

⁷⁶ *See* 35 U.S.C. § 101 et seq.

⁷⁷ *See id.*

⁷⁸ Rich Stim, *The Patent Application Process*, NOLO, <http://www.intellectualpropertylawfirms.com/resources/intellectual-property/patents/patent-registration-process.htm> [<https://perma.cc/K4UH-BSF3>] (last visited Jan. 21, 2018).

⁷⁹ Daniel R. Cahoy et al., *Fracking Patents: The Emergence of Patents as Information-Containment Tools in Shale Drilling*, 19 MICH. TELECOMM. & TECH. L. REV. 279, 289 (2013).

comprising a nanocrystalline cellulose, wherein the nanocrystalline cellulose comprises rod-like nanocrystalline cellulose particles (NCC particles) having a crystalline structure.”⁸⁰ This patentee would consequently gain a temporary but assured legal protection over that claimed fracking mixture. Additionally, patents benefit the public through their inherent disclosures. Once issued, the contents of patents are freely available to the public. Moreover, because patents must be sufficiently described so as to enable persons of ordinary skills in the art to recreate the patented invention, patents must theoretically disclose all the information that researchers and responders would require.⁸¹ And a patent’s element of disclosure is particularly pertinent in the face of recent legislative changes to intellectual property law, as illuminated by the *Wyoming* decision.

II. THE CONTINUING TREND OF DEFENDING TRADE SECRETS

On June 1, 2016, a Wyoming District Court determined that “[h]aving explicitly removed the only source of specific federal agency authority over fracking, it defies common sense for the Bureau of Land Management (“BLM”) to argue that Congress intended to allow it to regulate the same activity under a general statute that says nothing about hydraulic fracturing.”⁸² Journalists poured out a spectrum of opinions and reported this decision as everything from a check on agency overreach to an “environmental disaster.”⁸³

At issue were certain new Obama administration BLM regulations concerning fracking on federal and Indian lands.⁸⁴ These BLM regulations were part of Obama’s recent efforts to “curtail environmental damage from fossil fuels.”⁸⁵ Prior to the passage of the new BLM regulations, Congress had expressly barred the EPA from regulating most fracking.⁸⁶ Subsequently, the BLM regulations were interpreted to imply some federal

⁸⁰ U.S. Patent Application No. WO2013154926 A1 (filed Apr. 5, 2013).

⁸¹ See 35 U.S.C. § 112; *In re Wands*, 858 F.2d 731, 735 (Fed. Cir. 1998).

⁸² Carlin et al., *supra* note 3 (quoting *Wyoming v. Dep’t of Interior*, 2016 U.S. Dist. LEXIS at *38).

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ Elizabeth Shogren, *BLM fracking rule is struck down in Wyoming federal court*, HIGH COUNTRY NEWS (June 27, 2016), <http://www.hcn.org/articles/judge-strikes-down-blm-fracking-rule> [<https://perma.cc/HH6F-KVHX>].

⁸⁶ *Id.*

agency authority over fracking regulation.⁸⁷ This interpretive issue then came before the Wyoming District Court in 2015.⁸⁸

At first glance, the decision does not seem to have much to do with trade secret protections for fracking. However, the consequences of this decision certainly did. It effectively limited governmental agencies in forcing disclosure of utilized chemical compounds as well as in curtailing some trade secret protection due to public health and environmental concerns (the new BLM regulations would have included new protections against fracking such as “requirements for well construction, water management, and chemical disclosure”).⁸⁹ For example, per the new state rules effective since Sept. 15, 2010, companies must disclose their fracking chemical concentrations once the drilling operation is complete.⁹⁰ However, state courts could designate the information as a trade secret and, thus, limit the scope of a company’s required disclosure to state agencies, leaving the public still in the dark.⁹¹ Nevertheless, this decision is merely the most recent link in the chain of progressively strengthened intellectual property rights.

Throughout the twentieth century, and particularly in recent decades, there has been a general and overarching trend of reforming and strengthening our domestic intellectual property laws. In particular, both patent and trade secret laws have received increased attention and protection.⁹²

In the 1980s, the U.S. created a new, specialized patent court to increase expertise and efficiency in a difficult, niche legal area.⁹³ Furthermore, Congress passed multiple acts, such as the 1970 Plant Variety

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Federal environmental regulatory outlook for the oil and gas industry*, VINSON & ELKINS LLP, http://www.velaw.com/uploadedFiles/Velawcom/Assets/PDFs/Insights_PDFs/What%20to%20Expect%20in%202016_021016.pdf [https://perma.cc/SBL8-JGUF] (last visited Jan. 21, 2018).

⁹⁰ Marie C. Baca, *Two Companies Seek Trade Secret Status for Fracking Fluids in Wyoming*, PROPUBLICA (Nov. 2, 2010), <https://www.propublica.org/article/two-companies-seek-trade-secret-status-for-fracking-fluids-in-wyoming> [https://perma.cc/7T5F-GPCM].

⁹¹ *Id.*; see Benjamin Storrow, *Wyoming Supreme Court reverses district court decision on fracking fluids*, STAR-TRIBUNE (Mar. 12, 2014), http://trib.com/business/energy/wyoming-supreme-court-reverses-district-court-decision-on-fracking-fluids/article_7d15a01f-df71-5786-99fb-f4685d0c7279.html [https://perma.cc/ZTJ3-CS8J].

⁹² For an example of this trend with respect to copyright, see 1998 Sonny Bono Copyright Term Extension Act, Pub. L. 105-298 (1998) (amending 17 U.S.C. §§ 101 et seq.).

⁹³ Donald R. Dunner, *The U.S. Court of Appeals for the Federal Circuit: Its Critical Role in the Revitalization of U.S. Patent Jurisprudence, Past, Present, and Future*, 43 LOY. L.A. L. REV. 775, 775 (2010).

Protection Act, which more clearly defined and expanded the scope of patentable subject matter.⁹⁴ Moreover, in 2010, the court in *Bilski v. Kappos* held that business methods were not barred from patent protection.⁹⁵ Also, the biotech field has received expanded protection through cases such as *Diamond v. Chakrabarty*⁹⁶ and *Association for Molecular Pathology, Inc. v. Myriad Genetics, Inc.*⁹⁷ And in 2011, Congress passed the Leahy-Smith America Invents Act, which brings our current patent laws into conformity with international standards and provides for such alterations as earlier publication of applications (increased disclosure) and removal of geographical bars.⁹⁸

Similarly, state and federal laws have recently placed particular emphasis on bolstering trade secret protections—especially in the face of environmental laws and policies. The first federal legislation on trade secrets was the 1948 Trade Secrets Act, with “narrow applicability.”⁹⁹ Then, the Uniform Trade Secrets Act (“UTSA”) codified the general existing common law trade secret protections, still with limited application, which has been adopted by forty seven states and D.C.¹⁰⁰ In 1996, Congress enacted “a far broader piece of legislation pertaining to trade secrets”—the Economic Espionage Act.¹⁰¹ This legislation was in response to growing concerns over international espionage and intended to create an increasingly comprehensive federal trade secret scheme.¹⁰² In 2013, the White

⁹⁴ Paul Goeringer, *Understanding the Plant Variety Protection Act*, CTR. FOR AGRIC. & NAT. RES. POL’Y (Mar. 8, 2013), https://agresearch.umd.edu/sites/agresearch.umd.edu/files/_docs/programs/canrp/PaulPVPA.pdf [https://perma.cc/AFU6-8TBH].

⁹⁵ See *Bilski v. Kappos*, 561 U.S. 593, 653–57 (2010). Similarly, Amazon’s “One-Click” Payment methods patent was both granted and upheld. See BUSINESS INSIDER, *Amazon’s patent on one-click payments to expire* (Jan. 5, 2017), <http://www.businessinsider.com/amazons-patent-on-one-click-payments-to-expire-2017-1> [https://perma.cc/8FJA-FE9F].

⁹⁶ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (holding that genetically modified organisms are patentable).

⁹⁷ *Ass’n for Molecular Pathology, Inc. v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013) (holding that non-naturally occurring DNA segments are patentable).

⁹⁸ Leahy-Smith America Invents Act, *supra* note 8.

⁹⁹ Yeh, *supra* note 17, at 7.

¹⁰⁰ *Id.* at 6.

¹⁰¹ *Id.* at 7; 18 U.S.C. § 1831 et seq.

¹⁰² Yeh, *supra* note 17, at 7.

American companies and the U.S. Government spend billions on research and development. The benefits reaped from these expenditures can easily come to nothing, however, if a competitor can simply steal the trade secrets without expending the development costs. . . . For years now, there has been mounting evidence that many foreign nations and their corporations have been seeking to gain competitive advantage by stealing the trade secrets, the intangible intellectual property of inventors

House issued *The Administration Strategy on Mitigating the Theft of U.S. Trade Secrets*, reporting on future plans to “vigorously . . . combat the theft of U.S. trade secrets.”¹⁰³

Finally, on May 11, 2016, Congress enacted the Defend Trade Secrets Act (“DTSA”)¹⁰⁴ to create “an additional layer of protection.”¹⁰⁵ The new DTSA increases potential economic sanctions, which were upped from a maximum fine of \$5 million to “the greater of \$5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided,”¹⁰⁶ as well as “provisions designed to better ensure that district courts treat trade secret disclosures in confidence.”¹⁰⁷

This increased arsenal of trade secret protection is most striking when compared to legislative failures in adjusting for necessary environmental exceptions. Not only are the emergency exceptions of EPCRA extremely limited, but they currently do not apply to fracking-related toxins. Furthermore, the proposed Fracturing Responsibility and Awareness of

in this country. . . . [S]ince the end of the cold war, foreign nations have increasingly put their espionage resources to work trying to steal American economic secrets.

Id. (quoting 142 CONG. REC. S12207, S12208 (daily ed. Oct. 2, 1996) (statement of Sen. Specter)).

¹⁰³ Yeh, *supra* note 17, at 16 (citing Executive Office of the President, *Administration Strategy on Mitigating the Theft of U.S. Trade Secrets*, 1–2 (Feb. 2013)).

¹⁰⁴ Patrick J. Coyne, *What You Should Know About The Defend Trade Secrets Act*, LAW360 (June 27, 2016), <http://www.law360.com/articles/806201/what-you-should-know-about-the-defend-trade-secrets-act> [<https://perma.cc/8AP5-NPNT>].

¹⁰⁵ Dennis Crouch, *The Economic Espionage Act as amended by the Defend Trade Secrets Act of 2016: Markup and Commentary* at 2 (May 11, 2016), <https://patentlyo.com/media/2016/05/DTSA-Mark-UP-CROUCH-2.0.pdf> [<https://perma.cc/WSG7-VWZX>].

¹⁰⁶ *Id.* at 4.

¹⁰⁷ *Id.* at 7; *see* Defend Trade Secrets Act, 18 U.S.C. § 1835 (2016). 18 U.S.C. § 1835(b): RIGHTS OF TRADE SECRET OWNERS.—The court may not authorize or direct the disclosure of any information the owner asserts to be a trade secret unless the court allows the owner the opportunity to file a submission under seal that describes the interest of the owner in keeping the information confidential. No submission under seal made under this subsection may be used in a prosecution under this chapter for any purpose other than those set forth in this section, or otherwise required by law. The provision of information relating to a trade secret to the United States or the court in connection with a prosecution under this chapter shall not constitute a waiver of trade secret protection, and the disclosure of information relating to a trade secret in connection with a prosecution under this chapter shall not constitute a waiver of trade secret protection unless the trade secret owner expressly consents to such waiver.

Chemicals Act (“FRAC Act”), which would have fixed the problem of the “Halliburton Loophole,” is essentially dead.¹⁰⁸ The FRAC Act would have allowed for federal regulation of fracking under the Safe Drinking Water Act, thus requiring companies to disclose the chemical additives in their frack fluids.¹⁰⁹ It was introduced in both houses in 2009, and reintroduced in 2011, 2013, and 2015.¹¹⁰ But as of November 20, 2012, the bill received the status “Died (Referred to Committee).”¹¹¹ Thus, environmental legislation has so far been unable to peel back suffocating trade secret protections as John Craven had optimistically predicted years ago.¹¹²

This increased protection over trade secret rights is a blow for those opposing the controversial fracking process—particularly in the face of our current political climate where the government is increasingly pro-business and dismissive of environmental issues.¹¹³ There is an unequal progression of protection for intellectual property rights and environmental

¹⁰⁸ See Garmezzy, *supra* note 53, at 412–13.

¹⁰⁹ *Id.*

¹¹⁰ See S. 785, 114th Cong. (2015); H.R. 1482, 114th Cong. (2015); S. 1135, 113th Cong. (2013); H.R. 1921, 113th Cong. (2013); S. 587, 112th Cong. (2011); H.R. 1084, 112th Cong. (2011); S. 1215, 111th Cong. (2009); H.R. 2766, 111th Cong. (2009).

¹¹¹ Fracturing Responsibility and Awareness of Chemicals Act of 2011, H.R. 1084, 112th Cong. (2011); FRAC Act, S. 587, 112th Cong. (2011).

¹¹² John Craven, *Fracking Secrets: The Limitations of Trade Secret Protection in Hydraulic Fracturing*, 16 VAND. J. ENT. & TECH. L. 395, 396 (2014). Craven promotes the use of fracking patents over trade secrets as well, but bases his argument on fears that trade secret laws were being weakened, particularly in relation to fracking procedures. However, the legislation he predicted would chip away at trade secret protection was wildly unsuccessful. Instead the trend, as I argue, is one of strengthened trade secret protection. Therefore, while I agree with his conclusion that fracking patents are the superior choice to trade secret protections, I disagree with his reasoning. Furthermore, Craven argues that the legislature “does not need to eliminate” the special loopholes carved out for fracking as patents can carry the entire burden. *Id.* at 397–98. I disagree, but argue that fracking patents are the best fix in light of problems with strong trade secret protections and legislative inaction (or action in the case of new legislation such as the Defend Trade Secrets Act, which was only passed in 2016).

¹¹³ See Robert Schmidt & Benjamin Bain, *Trump Wants a Pro-Business SEC. That Has Some Investors Worried*, BLOOMBERG (Feb. 23, 2017), <https://www.bloomberg.com/news/articles/2017-02-23/trump-wants-a-pro-business-sec-that-has-some-investors-worried> [https://perma.cc/M2LV-RSZP]; Derrick Z. Jackson, *Trump to environment: This is war*, BOSTON GLOBE (Jan. 20, 2017), <https://www.bostonglobe.com/opinion/columns/2017/01/20/trump-environment-this-war/OOjkMVQULhWmPIlp7xtO8N/story.html> [https://web.archive.org/web/*/https://www.bostonglobe.com/opinion/columns/2017/01/20/trump-environment-this-war/OOjkMVQULhWmPIlp7xtO8N/story.html]; Alessandra Potenza, *Trump signs executive order to roll back clean water rule*, THE VERGE (Feb. 28, 2017), <http://www.theverge.com/2017/2/28/14766462/trump-executive-order-clean-water-rule-epa-environment> [https://perma.cc/YV8E-MUF8].

rights. So how should we deal with the frustrations created by trade secret protections in these cases?

III. PROPERTY RIGHTS VERSUS ENVIRONMENTAL LAW & PUBLIC HEALTH

Our legal system is a complicated network of intertwined, interconnecting, and delicately interbalanced rights. The more important the right, the heavier the opposing right must be to tip the scales back in its favor. The issue is in determining the worth of each right. And there are many conflicting rights and policy concerns at play where property rights and public safety and environmental rights intersect. The primary motivation behind intellectual property protections is to incentivize the progress of culture, science, and knowledge. By empowering creators with the opportunity to derive economic benefits from their work, we in turn motivate the production of creative works. However, the societal benefits of scientific progress and cultural evolution must still be weighed against environmental and public safety concerns.

Ultimately, all these policy concerns must be grounded in a modicum of practicality—what protections can we effectuate and at what cost?

A. *Choosing a Legal Monopoly*

With recent judicial and legislative decisions trending towards strengthening trade secret laws, the problems caused by trade secret protection of fracking fluids are exacerbated. But is there a realistic way to improve or reform the current system to deal with potentially dangerous situations such as that posed by the undisclosed introduction of toxic fracking fluids into the environment?

Because the policy trend is towards arming trade secrets with more teeth, it seems unrealistic that trade secrets laws can and will be sufficiently modified to tackle the particular problem posed by fracking fluids. Thus, we must turn to the only other applicable form of intellectual property available—patents.

While fracking patents are still subject to transparency problems and other limitations (such as scope, duration, and cost), they constitute a more effective balance of protections.¹¹⁴ This becomes clear upon direct comparison between the currently strengthened trade secret law and patent law in the unique context of fracking.

¹¹⁴ John M. Golden & Hannah J. Wiseman, *The Fracking Revolution: Shale Gas as a Case Study in Innovation Policy*, 64 EMORY L. J. 955, 998 (2015).

The most obvious and relevant difference between trade secrets and patents are that patents inherently require a certain amount of disclosure. Patents must disclose enough to sufficiently “enable a person reasonably skilled in the art to practice the invention,” whereas trade secrets protection is contingent upon non-disclosure.¹¹⁵ Previously there was an interesting loophole in the patent disclosure process, as patent applications remained totally confidential until the patent was actually issued.¹¹⁶ However, this rule changed under the American Inventors Protection Act (“AIPA”) of 1999 to follow other international patent system practices.¹¹⁷ Now, “because patents are *intended to be widely disclosed* . . . [patent applications] have to be published after 18 months.”¹¹⁸

However, there is some conjecture that this enforced disclosure does little to actually aid industry transparency.¹¹⁹ For example, Cahoy noted that, “[a]s with agricultural technologies such as genetically modified crops, simply knowing the structure of the chemicals or the steps in a method of use is not sufficient. Field and laboratory experimentation are necessary to fully capture how the exploitation of shale gasses impacts the environment.”¹²⁰ So while patents may disclose information about the fracking fluids used at a particular drill site, this information might not be enough to effectively allow communities to counteract potential hazards. However, this limited disclosure still gives communities and environmental researchers more to go on than would trade secrets. Indeed, common sense dictates that something is better than nothing.

The protection, scope, and duration provided by fracking patents differs significantly from that of trade secrets. Trade secrets have no cap on how long those secrets may remain protected, and thus are potentially perpetual. However, trade secret protection only lasts as long as those

¹¹⁵ *Portfolio 43-3rd: Trade Secrets: Protection and Remedies, Differences Between Patents and Trade Secrets, E. Effect of Patent Application and Issuance on the Trade Secret*, BLOOMBERG BNA. Note that it is unresolved as to whether an inventor of a pending patent application could obtain injunctive relief for infringement.

¹¹⁶ Press Release 00-72, USPTO, USPTO Will Begin Publishing Patent Applications (Nov. 27, 2000), available at <https://www.uspto.gov/about-us/news-updates/uspto-will-begin-publishing-patent-applications> [<https://perma.cc/87AG-3QYY>].

¹¹⁷ *Id.*

¹¹⁸ *BondPro Corp. v. Siemens Power Generation, Inc.*, 463 F.3d 702, 707 (7th Cir. 2006) (citing 35 U.S.C. § 122(b)(i) (emphasis added)). See also LANDES & POSNER, *supra* note 19, at 362.

¹¹⁹ *Fracking patents are on the rise, but is transparency?*, SHALE GAS INT’L (May 27, 2014), <http://www.shalegas.international/2014/05/27/fracking-patents-are-on-the-rise-but-is-transparency/> [<https://web.archive.org/web/20160416022124/http://www.shalegas.international/2014/05/27/fracking-patents-are-on-the-rise-but-is-transparency/>].

¹²⁰ Cahoy et al., *supra* note 79, at 282.

secrets remain so.¹²¹ Conversely, a patent monopoly, once granted, only lasts for twenty years from the date the application was filed.¹²² While there is this definite temporal cap to a patent's economic protection, the time of that protection is *guaranteed*. Consequently, trade secrets are more of a gamble than patents. Moreover, there is no legal remedy under trade secret law against competitors reverse engineering or independently creating the same secret formula.¹²³ So, despite the comparative potential time limitations, patents are a safer bet.¹²⁴

Another difference is that trade secret protection potentially carries across international borders while patent protection is limited to the country of issuance.¹²⁵ However, this particular difference is not specifically relevant to the issue of fracking fluids. The practice of fracking has not taken off internationally as it has domestically despite the discovery of shale gas deposits in Poland, Argentina, China, Great Britain, etc.¹²⁶ This seems to be primarily attributable to the difference in economic circumstances between Europe/Asia and the United States, and particularly to the following six factors present in the U.S.: (1) advantageous natural gas prices; (2) pro-experimentation regulatory frameworks; (3) U.S. property rights allowing landowners to lease mineral rights; (4) pre-existing infrastructure facilitating production; (5) existence of areas where clean water is not such a premium; and (6) procedural expertise.¹²⁷ Furthermore, the America Invents Act has brought U.S. patent laws into harmony with existing international patent laws, which makes obtaining a patent in multiple countries much easier.¹²⁸ Consequently, trade secret law's potential advantage over patent law falls flat in the U.S.

¹²¹ Yeh, *supra* note 17, at 3.

¹²² 35 U.S.C. § 154(a)(2).

¹²³ Yeh, *supra* note 17, at 3–4.

¹²⁴ For a discussion on the issue of patents preempting state trade secret law, see *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 484–85 (1974). This debate is particularly relevant to my discussion on pharmaceutical patents in the next section.

¹²⁵ *Protecting Intellectual Property Rights (IPR) Overseas*, USPTO, <https://www.uspto.gov/patents-getting-started/international-protection/protecting-intellectual-property-rights-ipr> [<https://perma.cc/5MAL-K9K5>] (last visited Jan. 21, 2018).

¹²⁶ Jeff McMahon, *Six Reasons Fracking Has Flopped Overseas*, FORBES (Apr. 7, 2013), <http://www.forbes.com/sites/jeffmcmahon/2013/04/07/six-reasons-fracking-has-flopped-overseas/#1705a5ff2bd5> [https://web.archive.org/web/*/http://www.forbes.com/sites/jeffmcmahon/2013/04/07/six-reasons-fracking-has-flopped-overseas/#1705a5ff2bd5].

¹²⁷ *Id.*

¹²⁸ Braun argues that the America Invents Act, which replaced the 1952 Patent Act, made it much easier to obtain more international protection due to increased international harmonization. Richard G. Braun, *America Invents Act: First-to-File and a Race to the Patent Office*, 8 OHIO ST. ENTREPRENEURIAL BUS. L. J. 47, 47 (2013).

Moreover, patents, unlike trade secrets, can be expensive to acquire and require potential patent owners to go through a rigorous filing and approval process at the United States Patent & Trademark Office.¹²⁹ However, once the patent is acquired, maintenance costs remain relatively low.¹³⁰ To maintain patent protection for the entire twenty-year period, patentees must merely pay “maintenance fees of \$880 at 3.5 years, \$2,020 at 7.5 years, and \$3,100 at 11.5 years after the patent has been issued.”¹³¹ While these fees are relatively low, studies do suggest that they deter patentees because approximately eighty-two percent of patentees followed through with the first “renewal,” but only thirty-seven percent of patentees maintained after twelve years.¹³² Furthermore, patent litigation can be very costly and comes with a significant risk that the patentee’s patent will be revoked (held invalid).¹³³ Indeed, Posner argues that a good way to avoid infringement is to also avoid patenting in the first place.¹³⁴ Consequently, these costs associated with fracking patents are an extra expenditure lacking in the trade secret route and are one extra hoop companies must jump through. However, these costs are arguably insignificant, especially when compared to a company’s profits derived from using those patented fluids.

Additionally, the recent update to the Federal Rules of Civil Procedure seems to have increased the pleading standard for infringement allegations.¹³⁵ Previously, Rule 84 Form 18 required little detail and did not rise to the level of the *Twombly*¹³⁶ and *Iqbal*¹³⁷ pleading standards.¹³⁸ Then the 2015 FRCP update removed both Rule 84 and

¹²⁹ Gene Quinn, *The Cost of Obtaining a Patent in the US*, IPWATCHDOG (Apr. 4, 2015), <http://www.ipwatchdog.com/2015/04/04/the-cost-of-obtaining-a-patent-in-the-us/id=56485/> [<https://perma.cc/M2XE-UUYM>].

¹³⁰ For a complete list of potential fees in modifying or maintaining patents, see 37 C.F.R. § 1.20.

¹³¹ LANDES & POSNER, *supra* note 19, at 311.

¹³² *Id.*

¹³³ *Id.* at 357.

¹³⁴ *Id.*

¹³⁵ Leeron Morad, *3 Potential Consequences Of Losing Rule 84 And The Forms*, LAW360 (June 24, 2015), <https://www.law360.com/articles/665511/3-potential-consequences-of-losing-rule-84-and-the-forms> [<https://perma.cc/6PPR-JYX2>]. This FRCP update also supports my earlier argument that there is a trend of strengthening intellectual property rights.

¹³⁶ See *Bell Atlantic Corp. v. Twombly*, 550 U.S. 544, 555 (2007).

¹³⁷ See *Ashcroft v. Iqbal*, 556 U.S. 662, 664 (2009).

¹³⁸ Michelle Callaghan, *Patent Infringement Pleading Standards Since the Abrogation of Rule 84 and Form 18: A Year in Review*, IPWATCHDOG (Dec. 27, 2016), <http://www.ipwatchdog.com/2016/12/27/patent-infringement-pleading-standards-rule-84-form-18/id=76173/> [<https://perma.cc/3HWP-7PR9>].

Form 18, implying that *Twombly's* standard now applies to patent infringement pleadings as well.¹³⁹ However, legal recourse for violated trade secrets law is already much more limited than for patent infringement.¹⁴⁰ Although the DTSA has increased potential remedies and expanded the jurisdictions of both state and federal courts, the expansion only applies to limited circumstances.¹⁴¹

The bottom line remains that some companies do choose patents over trade secrets to protect their fracking formulas. In fact, there is currently a *rising trend* for companies engaged in fracking to use such patents.¹⁴² There was a threefold increase in issued fracking patents in 2004 to 2010 as compared to 1981 to 2003.¹⁴³ And between 2012 and 2013 there was a twenty-eight percent increase (550 filed applications rose to 706).¹⁴⁴ This rising trend in fracking patents is particularly significant because it indicates the feasibility of guiding companies towards fracking patents over trade secrets.¹⁴⁵

While the benefits of preferring patents seem straightforward when it comes to the environment and surrounding communities, the benefits for companies seem less so. However, the rise in fracking patent use suggests value for companies in choosing patent over trade secret protection for their fracking formulas. One such benefit is that intellectual property patents allow businesses to “secur[e] royalties from competitors by patenting vital technology,” a market impossible to access when using trade secrets.¹⁴⁶ Moreover, patentees can cripple competitors by preventing them from using patented technology and refusing to license the desired “frack fluids.”¹⁴⁷ As Posner puts it, “If [an inventor] takes the

Rather than *Twombly's* plausibility standard, the old Form 18 only required: “(1) a statement of jurisdiction; (2) a statement that the plaintiff owned the asserted patent; (3) a statement that the defendant had been infringing the patent by making, selling, and/or using an accused device; (4) a statement that the plaintiff had given the defendant notice of its infringement; and (5) a demand for injunctive and/or monetary relief.” *Id.* This different standard was set upheld after *Twombly* by the court in *McZeal v. Sprint Nextel Corp. Id.*; see *McZeal v. Sprint Nextel Corp.*, 501 F.3d 1354, 1355–58 (Fed. Cir. 2007).

¹³⁹ Callaghan, *supra* note 138.

¹⁴⁰ Yeh, *supra* note 17, at 4.

¹⁴¹ Tony Dutra, *New Trade Secret Law: More to Consider in Patent Trade-Off*, BLOOMBERG BNA (June 3, 2016), <https://www.bna.com/new-trade-secret-n57982073569/> [<https://perma.cc/HER8-97WF>].

¹⁴² *Fracking patents are on the rise, but is transparency?*, *supra* note 119.

¹⁴³ Cahoy et al., *supra* note 79, at 289–90.

¹⁴⁴ *Fracking patents are on the rise, but is transparency?*, *supra* note 119.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ LANDES & POSNER, *supra* note 19, at 320.

trade secret path and thus (after a year) forfeits his right to seek a patent, he cannot prevent a subsequent inventor from patenting the invention and knocking him out of the market.”¹⁴⁸

But, most importantly, there is a *real need* for patent disclosure despite transparency or transaction cost problems. EPCRA (SARA Title III) is ineffective for this purpose.¹⁴⁹ Congress created SARA in response to “the toxic cloud incidents at Bhopal, India and Institute, West Virginia,” *not* fracking.¹⁵⁰ It was not designed to deal with the particular implicated complications, and currently *does not even apply* to the field of fracking. Moreover, even if EPCRA were amended to include frack fluids, its scope of disclosure is extremely narrow.¹⁵¹ Furthermore, the failed FRAC Act indicates either Congressional disinclination to deal with the problem or an inability to reach consensus. Also, the “Halliburton Loophole” of the 2005 Energy Policy Act exempts fracking from the Safe Drinking Water Act.¹⁵² All this in light of Senator Cardin (of the Senate’s Water and Wildlife Subcommittee) statement that “[t]he [fracking] industry has failed to meet minimally acceptable performance levels for protecting human health and the environment. That is both an industry failure, and a failure of the regulatory agencies.”¹⁵³

Trade secrets do not rise to the occasion or effectively counter this regulatory gap. And although all intellectual property protections are generally being updated and strengthened, patent law (unlike trade secrets) does not do this at the cost of public disclosure and environmental health. As Scott Kieff concludes in his article, *Patents for Environmentalists*, “those who care about the environment ought to care about patents precisely because the present patent system may be so beneficial for the environment.”¹⁵⁴

B. *The Benefits of Patents Beyond Fracking*

Patents and their unique benefits for both companies and the public translate to other environmental issues beyond fracking. One significant example comes from the field of pharmaceuticals. While pharmaceuticals may have the same potential for negative environmental and

¹⁴⁸ *Id.* at 361.

¹⁴⁹ *See generally* 42 U.S.C. § 11001 et seq.

¹⁵⁰ Levin & Spence, *supra* note 67, at 29.

¹⁵¹ *See generally* 42 U.S.C. § 11001 et seq.

¹⁵² *The Halliburton Loophole*, *supra* note 53.

¹⁵³ Cahoy et al., *supra* note 79, at 288.

¹⁵⁴ F. Scott Kieff, *Patents for Environmentalists*, 9 WASH. U. J. L. & POL’Y 307, 319 (2002).

health impacts as fracking operations, pharmaceutical companies have overwhelmingly chosen patents to protect their products. Therefore, the field of pharmaceuticals effectively illustrates how patents allow consumers and environmentalists to more effectively respond to those potentially harmful impacts.

A steady stream of pharmaceuticals enter the market each year, but an equally steady stream of pharmaceuticals enter the environment in unplanned for and unfortunate ways.¹⁵⁵ According to current studies, *thirty to ninety percent* of the active ingredients in pharmaceuticals can pass back into the environment through sewage treatment works.¹⁵⁶ Furthermore, people frequently dispose of their drugs incorrectly, which also introduces unwanted pharmaceuticals into ecosystems.¹⁵⁷

The unplanned for presence of these drugs in various environments results in the suffering of natural wildlife.¹⁵⁸ Two of the “most notable” recent examples are anti-inflammatory pain killers resulting in the death of millions of vultures¹⁵⁹ and synthetic estrogens causing the “widespread feminisation of male fish.”¹⁶⁰ However, researchers can tackle these problems head on because, unlike with fracking, most pharmaceutical companies choose the disclosure rich path of patents.¹⁶¹

Pharmaceutical patents can be issued for either the method of production or the actual drug composition.¹⁶² While drug composition patents do not have to disclose the method for producing the drug, method

¹⁵⁵ *Drugs in the water*, HARVARD HEALTH PUBLISHING (June 2011), http://www.health.harvard.edu/newsletter_article/drugs-in-the-water [<https://perma.cc/J3DW-QCAL>].

¹⁵⁶ Gwynne Lyons, *Pharmaceuticals in the Environment: A Growing Threat to our Tap Water and Wildlife*, CHEM TRUST at 1 (2014), <http://www.chemtrust.org.uk/wp-content/uploads/CHEM-Trust-Pharma-Dec14.pdf> [<https://perma.cc/FC7M-TJHB>].

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*; Netherlands Inst. of Ecology, *Pharmaceutical residues increasingly disrupt aquatic life: A hidden global change*, SCIENCE DAILY (Feb. 2, 2016), <https://www.sciencedaily.com/releases/2016/02/160202143630.htm> [https://web.archive.org/web/*/https://www.sciencedaily.com/releases/2016/02/160202143630.htm]; Brian Owens, *Pharmaceuticals in the environment: a growing problem*, PHARMACEUTICAL J. (Feb. 19, 2015), <http://www.pharmaceutical-journal.com/news-and-analysis/features/pharmaceuticals-in-the-environment-a-growing-problem/20067898.article> [<https://perma.cc/B2HM-FGYD>].

¹⁶¹ Andy Sanderson & Ling Zhuang, *The value of secrecy for big pharma*, LIFE SCI. INTELL. PROP. REV. (June 23, 2016), <http://www.lifesciencesipreview.com/contributed-article/the-value-of-secrecy-for-big-pharma> [<https://perma.cc/L34S-DZZR>].

¹⁶² Lawrence M. Sung, *Drafting Biotechnology and Pharmaceutical Patent Claims*, AIPLA (Aug. 25, 2010), http://www.aipla.org/Test%20Document%20Library/2010/pppt/Sung_Paper.pdf [<https://perma.cc/X3ZN-2YYX>].

patents necessarily disclose both the method and the composition (due to enablement and utility requirements). Therefore, either way, pharmaceutical patents disclose the necessary chemical information to the public.

Moreover, pharmaceuticals must go through extensively more layers of regulation than fracking. Before drugs can come to market, new pharmaceuticals must pass rigorous FDA standards.¹⁶³ As of 2007, the FDA approval process, made up of two phases (clinical trials and new drug application approval), takes approximately ten to twelve years and one hundred to five hundred million dollars.¹⁶⁴ Another report suggests that the cost to develop a new drug is actually closer to \$2.6 billion.¹⁶⁵ Because obtaining FDA approval requires such significant time and financial investments, patents provide the financial return security that trade secrets cannot (especially since pharmaceuticals are so susceptible to reverse engineering and independent creation).¹⁶⁶

Pharmaceuticals demonstrate the beneficial quid pro quo of the patent system that could be true for fracking. And the heavy lifting shared between patent disclosure and FDA regulation merely highlights analogous deficiencies in the field of fracking. Because the commercial incentives have reached such high stakes in the pharmaceutical arena, trade secrets are too risky an option.¹⁶⁷ However, the fact remains that the patent system does and can work in these situations. Consequently, companies are guaranteed monopolistic benefits and securities while the public is, in turn, armed with the knowledge essential to better protect itself.¹⁶⁸

¹⁶³ Dennis S. Fernandez et al., *The Interface of Patents with the Regulatory Drug Approval Process and How Resulting Interplay Can Affect Market Entry*, IPHANDBOOK OF BEST PRACTICES (2007), <http://www.iphandbook.org/handbook/ch10/p09/> [<https://perma.cc/GV3S-28K7>].

¹⁶⁴ *Id.*

¹⁶⁵ Dylan Scott, *Why an obscure Supreme Court case is a big deal for prescription drugs*, STAT (Apr. 22, 2016), <https://www.statnews.com/2016/04/22/supreme-court-patent-case-drugs/> [<https://perma.cc/T7F6-8GBY>].

¹⁶⁶ Austin Frakt, *How Patent Law Can Block Even Lifesaving Drugs*, N.Y. TIMES (Sept. 28, 2015), <https://www.nytimes.com/2015/09/29/upshot/how-patent-law-can-block-even-life-saving-drugs.html> [https://web.archive.org/web/*/https://www.nytimes.com/2015/09/29/upshot/how-patent-law-can-block-even-lifesaving-drugs.html?_r=0]; Bruce Lehman, *The Pharmaceutical Industry and the Patent System* (2003), https://users.wfu.edu/mcfallta/DIR0/pharma_patents.pdf [<https://perma.cc/9EQK-NCBL>].

¹⁶⁷ Orly Lobel, *Filing for a Patent Versus Keeping Your Invention a Trade Secret*, HARVARD BUS. REV. (Nov. 21, 2013), <https://hbr.org/2013/11/filing-for-a-patent-versus-keeping-your-invention-a-trade-secret> [<https://perma.cc/6ETM-NHHT>].

¹⁶⁸ See Lyons, *supra* note 156.

CONCLUSION

Fracking is a method by which oil and gas is extracted from subterranean rock formations.¹⁶⁹ The mixture of water, sand, and chemicals is blasted into rocks to push out natural gas and crude oil.¹⁷⁰ Unfortunately, this process can cause methane leaks, earthquakes, and even explosions.¹⁷¹ Moreover, the additive chemicals in frack fluids can cause groundwater contamination in communities near fracking operations, which creates medical and environmental hazards that can cause cancer and result in the poisoning of vegetation, livestock, and family pets.¹⁷²

The impact of these potential hazards is exacerbated with respect to both the environment and public health because trade secret law protects most of these fracking chemical solutions from disclosure (at least during the drilling operation).¹⁷³ Trade secret laws allow drilling companies to block much of the dissemination of their fracking formulas, which in turn hinders environmental and public health responders from tackling potential dangers on an informed basis.¹⁷⁴

Furthermore, the normal routes for requesting trade secret disclosure have been specifically barred for fracking. Not only did the Energy Policy Act of 2005 introduce the “Halliburton Loophole,” which drastically reduced governmental oversight of fracking operations, but also fracking is exempt from both the RCRA *and* the EPCRA.¹⁷⁵

In 2016, a Wyoming Federal District Judge struck down Obama’s BLM requirements and protections aimed at increasing disclosure of fracking chemical compositions. However, this decision was only the most recent development in a much larger trend. *Wyoming*, the Defend Trade Secrets Act of 2016, and other recent developments (such as the new Commission on Enhancing National Cybersecurity)¹⁷⁶ collectively reveal a

¹⁶⁹ *What is fracking and why is it controversial?*, *supra* note 20.

¹⁷⁰ *Id.*

¹⁷¹ Jackson et al., *supra* note 39; James Conca, *Thanks To Fracking, Earthquake Hazards In Part Of Oklahoma Now Comparable To California*, FORBES (Sept. 7, 2016), <https://www.forbes.com/sites/jamesconca/2016/09/07/the-connection-between-earthquakes-and-fracking/#228811286d68> [<https://perma.cc/3FFP-GKTA>].

¹⁷² *Fracking and the food system*, FOOD & WATER EUR. (July 2016), <http://www.foodandwatereurope.org/wp-content/uploads/2016/08/FoodandWaterEuropeReportFrackingAndTheFoodSystem.pdf> [<https://perma.cc/TZS6-G94J>].

¹⁷³ See Coleman et al., *supra* note 69, at 2.

¹⁷⁴ See *id.* at 1–2.

¹⁷⁵ Garmezy, *supra* note 53, at 409–10.

¹⁷⁶ Kate M. Growly, *U.S. Chamber of Commerce Calls for Greater Trade Secrets Protections*,

trend towards strengthening trade secrets and closing loopholes that previously offered some respite against the environmental and public safety concerns posed by using unknown fracking fluid mixtures.¹⁷⁷

In light of this trend, hope for trade secrets to provide a balanced protection of intersecting rights seems bleak. Let the *Wyoming* decision be the link in the chain that sparks a policy turning point. Despite all the issues still present with the use of fracking patents, the decision in *Wyoming* indicates that a push for patents over trade secrets is the best policy course and compromise between protecting the intellectual property of companies while still providing a modicum of protection for the environment and the community's health.¹⁷⁸

Decided during the reign of Queen Elizabeth I, the famous Case of Monopolies states:

Where any man by his own charge and industry or by his own wit or invention doth bring any new trade into the Realm of any Engine tending to the furtherance of a trade that never was used before; And that for the good of the Realm; That in such cases the King may grant to him a monopoly patent for some reasonable time until the subjects may learn the same, *in consideration of the good that he doth bring by his Invention to the Commonwealth; otherwise not.*¹⁷⁹

Patents have always been meant as vehicles for public advancement. Not so with trade secrets. When it comes to the health of our environment and communities, we should push companies to use the protection that best protects *everyone*. Due to the current trend towards strengthening trade secret laws and our legislature's insistence on blocking frack fluid disclosures, our communities and environments are suffering. Patents may not be the perfect or ultimate answer for alleviating this suffering, but they are the solution at hand. Most importantly, patents, unlike trade secrets, do not "wrong another by the name of right."¹⁸⁰

CROWELL MORING (Sept. 20, 2016), <https://www.crowelltradesecretstrends.com/2016/09/us-chamber-of-commerce-calls-for-greater-trade-secrets-protection/> [https://perma.cc/62CL-6XJP].

¹⁷⁷ See Crouch, *supra* note 105, at 2.

¹⁷⁸ Golden & Wiseman, *supra* note 114, at 962, 1015.

¹⁷⁹ RINES, *supra* note 8, at 7 (quoting *D'Arcy v. Allen*, 11 Coke 86 (1602) (emphasis added)).

¹⁸⁰ Clare, *supra* note 2.

Figure 1¹⁸¹

SARA Title III: Duties and Deadlines					
	Initial notice of coverage	Notice of emergency release	MSDS/chemical list	Emergency and hazardous chemical inventory form	Toxic chemical release form
Regulated facilities	Facilities at which extremely hazardous substance present in threshold planning quantity	Facilities at which hazardous chemical produced, used or stored	Facilities subject to OSHA MSDS requirement	Facilities subject to OSHA MSDS requirement	Facilities (1) with 10 or more employees, (2) in SIC codes 20-39; (3) that manufactured, processed or otherwise used a toxic chemical (4) in excess of the toxic chemical threshold quantity
Regulated substances	Extremely hazardous substances	Extremely hazardous or Section 103 hazardous substances	Hazardous chemicals	Hazardous chemicals	Toxic chemicals
Reporting requirement	Notice that facility is a "covered facility"	Specified information about the release	MSDS or list of chemicals for which MSDSs available	Submit completed form	Submit completed form
Recipient of report	State Emergency Response Commission ("SERC")	SERC and Local Emergency Planning Committee ("LEPC")	SERC, LEPC, and fire department	SERC, LEPC and fire department	EPA and state officials designated by governor
Deadline	May 17, 1987	Immediately after release	October 17, 1987 (and update as necessary)	March 1, 1988 and thereafter on March 1	July 1, 1988 and thereafter on July 1

¹⁸¹ Michael H. Levin & David B. Spence, *SARA Title III: Pitfalls and Practicalities*, 39 JAPCA 29, 29 (1989).