THE ROLE OF NUISANCE IN THE DEVELOPING COMMON LAW OF HYDRAULIC FRACTURING

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Abstract: In 2012, the oil and gas industry created more than 1.2 million jobs. The industry expects this number to increase to more than 2.3 million in 2035 and expects revenues to exceed $1.9 trillion from 2012 to 2035. The development of hydraulic fracturing technology, a process by which natural gas under shale formations can be extracted, has allowed the oil and gas industry to experience this exponential growth. The economic benefits of hydraulic fracturing comes at a cost. Residents of Pennsylvania, Texas, and Ohio, among other states, have begun to experience the environmental harms and effects of hydraulic fracturing. In the wake of this technological development, citizens affected by hydraulic fracturing have begun to remedy their situations through the common law. This Note argues that common law nuisance provides a flexible alternative to other common law causes of action and distinguishes successful nuisance claims from unsuccessful ones.

INTRODUCTION

The Pennsylvania Department of Environmental Protection faced major opposition from residents and environmental groups on January 22, 2013 after it cancelled a meeting sought by environmental groups and citizens concerned about inadequate water testing in Pennsylvania.1 The meeting was scheduled to convene two days later.2 The citizens and environmental organizations sought the meeting after hearing the technical director of the Bureau of Laboratories testify that drinking water test results from a hydraulic fracturing site were inadequately reported.3


2 Id.

3 Id.
Pennsylvania residents, after filing a lawsuit against the hydraulic fracturing company that was drilling near their land, delivered drinking water samples to a local testing center. These residents claimed that hydraulic fracturing chemicals contaminated the water and caused them to suffer from nausea, breathing difficulties, bone pain, and other health problems. Similar cases related to hydraulic fracturing have arisen across Pennsylvania. Many Pennsylvania citizens consequently live in fear that a leak in storage facilities, a truck spill, or run-offs from hydraulic fracturing sites could not only contaminate their drinking water but also damage fields relied upon by their livestock.

The implementation of hydraulic fracturing technology has been controversial across the United States. Proponents of hydraulic fracturing argue that the United States should use the technology to stimulate the sagging economy. Other supporters predict that the exploration and extraction of natural gas and oil will lead to energy independence. Critics of hydraulic fracturing, however, opine that the widespread use of the technology will have serious environmental consequences and will harm humans and wildlife. Environmentalists oppose hydraulic fracturing and claim that it diminishes the availability of clean water and contaminates the surrounding air.

This Note delineates how citizens seeking legal redress for damages incurred by hydraulic fracturing must navigate murky legal territory mired with federal statutory loopholes and inadequate state regulation. Accordingly, this Note advocates for the use of nuisance lawsuits

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4 Id. Investigators had only reported eight out of twenty-four metals found in the residents' drinking water. Id.
5 Id.
9 See id.
10 See id.
12 See Berish, 763 F. Supp. 2d at 706–07; Davis, supra note 8, at 180–81.
13 See infra notes 68–117 and accompanying text.
as a plausible solution. Part I of this Note introduces the process of hydraulic fracturing and the attendant debate between politicians, citizens, and economists. Part II describes current federal and state regulation of hydraulic fracturing. Part III examines the common law nuisance cause of action. Finally, Part IV identifies the inadequacies of federal and state regulation, advocates nuisance law as a viable alternative, and distinguishes successful nuisance claims from unsuccessful ones.

I. The Geological, Economic, and Political Landscape of Hydraulic Fracturing

A. The Process of Hydraulic Fracturing

Gas and oil drilling companies use a process called hydraulic fracturing—commonly known as “fracing,” “fracking,” or “hydrofracking”—to extract oil and gas reserves trapped under shale formations. Companies have been using fracing to extract minerals for more than fifty years. Recent advances in fracing technology, however, have enabled companies to extract previously unreachable natural gas reserves from underground shale formations. Some refer to this process as “slickwater” fracturing.

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15 See infra notes 19–71 and accompanying text.
16 See infra notes 72–118 and accompanying text.
17 See infra notes 119–192 and accompanying text.
18 See infra notes 193–281 and accompanying text.
21 Wiseman, supra note 19, at 8.
22 Id.
The typical slickwater fracturing process has four stages. Contrary to popular belief, fracing is not the initial process of drilling a gas well. The first stage of fracing begins after a gas company has drilled, cased, and cemented an L-shaped wellbore along a shale formation. This initial stage, referred to as the acid stage, uses a small amount of water mixed with 15% hydrochloric acid to clear openings in the casing and dissolve impurities. During the second stage, called the pad stage, the gas company injects large volumes of fracing fluid into the wellbore under high pressure, which creates fractures along the shale that allow natural gas to seep out. The third stage, or the prop sequence stage, uses propping agents to hold open the fractures created along the shale. Finally, the fourth stage clears excess proppant from the wellbore. Once the first section of the well has been fraced using this method, the area is plugged before the process is repeated four to twenty times on each section of the well.

Once all the sections of the well are fraced, the plugs are drilled out. This causes pressurized natural gas to surge up the well. The initial surge spews out large amounts of fracing fluid and additives. This “flowback water” or “produced water” is collected and transferred to steel tanks or trucks for storage or transport. Roughly twenty to forty percent of the injected fluids flow back to the surface while the rest...
remain underground.\textsuperscript{36} Ninety-eight percent of the substance injected during slickwater fracturing is comprised of water and propping agents, or proppants.\textsuperscript{37} The proppants are typically not harmful to the environment.\textsuperscript{38} The remaining two percent of the injected fluid consists of a myriad of chemical additives.\textsuperscript{39} These chemicals are added to change the properties of the injected water, such as its viscosity, oxygen content, and density.\textsuperscript{40}

Although potentially harmful chemicals in the injected fluids comprise only two percent of the mixture, the volume of chemicals that are introduced into the environment can nevertheless be staggering.\textsuperscript{41} Typically, the fracing process requires two million to eight million gallons of fracing fluid, which means that between 40,000 and 160,000 gallons of chemical additives can be released into the environment at each well.\textsuperscript{42} Furthermore, an estimated 11,400 new wells are fractured each year.\textsuperscript{43} This adds up to 440 million to 1.6 billion gallons of chemicals


\textsuperscript{37} Chesapeake Energy, \textit{Hydraulic Fracturing: Fact Sheet 2} (2012), available at http://www.chk.com/Media/Educational-Library/Fact-Sheets/Corporate/Hydraulic_Fracturing_Fact_Sheet.pdf and http://www.perma.cc/0RF6583K.L2. Proppants, usually sand or other granular substances, which are not harmful to the environment, prop open the fractures created by the water and fracing fluids to allow the gas to escape. \textit{Id.}

\textsuperscript{38} See \textit{id.}

\textsuperscript{39} \textit{Id.; What Chemicals Are Used}, FracFocus Chemical Disclosure Registry, http://fracfocus.org/chemical-use/what-chemicals-are-used (last visited Nov. 6, 2013), available at http://www.perma.cc/0jV1dUchTFF. Typical additives include hydrochloric acid, biocides, breaker chemicals, clay stabilizers, corrosion inhibitors, crosslinkers, friction reducers, gelling agents, iron controllers, pH adjusting agents, scale inhibitors, and surfactants, but the precise composition of additives varies from site to site and depends on fracing requirements. \textit{What Chemicals Are Used, supra; see Hannah Wiseman, Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation}, 20 \textit{Fordham Envtl. L. Rev.} 115, 120 (2009).

\textsuperscript{40} Ramudo & Murphy, supra note 23, at 8.


\textsuperscript{42} See Chesapeake Energy, supra note 37, at 2; Ehrenberg, supra note 41; \textit{What Chemicals Are Used, supra note 39}.

\textsuperscript{43} See Chesapeake Energy, supra note 37, at 2; Ehrenberg, supra note 41; \textit{What Chemicals Are Used, supra note 39}.
released into the environment each year within the United States, only twenty to forty percent of which are recovered from flowback water.\footnote{44}{See Chesapeake Energy, supra note 37, at 2; Ehrenberg, supra note 41; What Chemicals Are Used, supra note 39.}

### B. Economic and Political Incentives for Fracing

Slickwater fracturing technology significantly lowers the cost of extracting gas from difficult-to-reach shale formations.\footnote{45}{See Bjørn Lomborg, A Fracking Good Story, Slate (Sept. 15, 2012), http://www.slate.com/articles/health_and_science/project_syndicate/2012/09/thanks_to_fracking_us_carbon_emissions_are_at_the_lowest_levels_in_20_years.html, available at http://www.perma.cc/0586MJs5ZNk; Wiseman, supra note 19, at 8.} Consequently, the technology has contributed significantly to stimulate the economy across the United States.\footnote{46}{See Info. Handling Serv., America’s New Energy Future: The Unconventional Oil and Gas Revolution and the US Economy, at vii (2012) [hereinafter IHS].} The unconventional oil and natural gas industry created more than 1.2 million jobs in 2012, a number that is estimated to exceed 2.3 million in 2035.\footnote{47}{Id. at 3} Government revenues from unconventional natural gas activity are expected to exceed $1.9 trillion from 2012 through 2035.\footnote{48}{Id. at 3}

Access to large natural gas deposits within United States borders also promotes energy independence, which is important considering increased turmoil the Middle East.\footnote{49}{See Davis, supra note 8, at 179.} Furthermore, catastrophic events such as the Deepwater Horizon oil spill and Japan’s Fukushima Daiichi nuclear meltdown have increased awareness of the need for energy independence.\footnote{50}{See id.}

The Energy Policy Act of 2005 demonstrates that such factors have led to political support for exploration, drilling, and fracting for natural gas.\footnote{51}{See id. at 3} Weighing these political and economic incentives against environmental concerns has been a central issue on state and federal levels.\footnote{52}{See 33 U.S.C. § 1342(l) (2006); 42 U.S.C. § 300h-4 (2006); IHS, supra note 46, at 3; Coman, supra note 14, at 139. Charles Davis, a professor at Colorado State University, has observed that policy makers debate the economic significance of hydraulic fracturing, including the boost to the economy, as well as the advantage gained by energy independence, against the environmental impact of the activity. See Davis, supra note 8, at 179–81.} On the federal level, the Energy Policy Act of 2005 has demonstrated congressional support for the fracting industry by creating loopholes in federal environmental statutes for the oil and gas indu-
try. On the state level, some states have opted to forbid fracing activity, whereas other states have actively encouraged it. On the municipal level, concerned citizens have provided significant political pressure to enact municipal bans on fracing. Some experts contend, however, that local bills will most likely face challenges from state governments asserting that the power to regulate fracing is vested solely within the state, rather than local municipalities.

C. Environmental Effects of Fracing

Although the EPA deemed the environmental and health effects of hydraulic fracing as insignificant in 2004, the EPA reopened its investigation in 2011. Some critics, however, have questioned the integrity of this renewed study and claimed that the gas industry heavily influences the EPA’s investigatory methods.

Numerous complaints from citizens near hydraulic fracing wells, who alleged that methane gas and fracing fluid additives had con-
taminated their drinking water, spurred the EPA to reinvestigate. For example, citizens in the Marcellus Shale region, which spans Pennsylvania and upstate New York, have raised numerous concerns about the safety of drinking water from their underground water supply. Documentaries show tap-water discoloration, the emission of unnatural odors, and even flammable tap water in affected regions. If fracking contaminates underground drinking water, the process could have severe detrimental impacts on surrounding ecosystems. Contaminated water could degrade the water supply for countless organisms, including the surrounding vegetation and animals. Some experts posit that contamination is caused by faulty casings near underground aquifers, intersections of old wells with new wells, seepage from fissures in the shale formation, or flowback water seeping back into the ground. Such contamination affects both present and future property owners. Although long-term health studies are generally unavailable because fracking is relatively new, exposure to contamination from fracking might have negative long-term effects on humans.

In addition to chemical additives within fracking fluid, flowback water also causes contamination because it contains dangerous chemicals, including alarming amounts of salt, mercury, arsenic, and other heavy metals. During storage, flowback water can release fumes or overflow, which can cause drinking water contamination, chemical cloud formation, or other hazardous consequences. Lastly, the operation of natural gas wells leads to air pollution. Blowouts, gas leaks, truck exhaust

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60 See 2004 Report, supra note 58, at 5; Davis, supra note 8, at 180.
61 See Keith B. Hall & Lauren E. Godshall, Hydraulic Fracturing Litigation, 57 ADVOCATE 13, 13 (2011); Coman, supra note 14, at 142.
62 FrackNation (Ann and Phelim Media 2013); GASLAND (New Video Group Jan. 24, 2010).
63 See Davis, supra note 8, at 180.
64 See id.; Ehrenberg, supra note 41.
65 See Ehrenberg, supra note 41.
66 See id.
67 Id. Chemicals from fracking could cause health complications in humans (such as nausea, bone pain, and stomach disorders) but could also cause damage to the surrounding ecosystem because studies have found that groundwater in fracking areas has methane concentrations as high as seventeen times that of unaffected areas. See Roth, 919 F. Supp. 2d at 480–81; Berish, 763 F. Supp. 2d at 704; Fiorentino, 750 F. Supp. 2d at 508.
68 See Ehrenberg, supra note 41.
69 Id.
70 See id.
from fracking fluid transportation, or emissions from flowback water can all contaminate the surrounding air.\textsuperscript{71}

II. \textsc{Federal and State Regulation of Hydraulic Fracturing}

A. \textit{Federal Regulation of Hydraulic Fracturing: How the Halliburton Loophole Leaves Waters Unprotected}

The Energy Policy Act of 2005 (“Act”) provides the fracking industry with certain exemptions from the Safe Drinking Water Act (SDWA) and the Clean Water Act (CWA).\textsuperscript{72} The Act’s primary objective is to ensure the creation and maintenance of jobs in the United States.\textsuperscript{73} To this end, Congress used the Act to insert certain exceptions within federal environmental statutes for the gas and oil industry.\textsuperscript{74} These exceptions came to be known collectively as the Halliburton Loophole.\textsuperscript{75}

1. The Safe Drinking Water Act Exemption

The SDWA, enacted in 1974, protects the quality of drinking water throughout the United States.\textsuperscript{76} The SDWA requires the regulation of all underground injections through the Underground Injection Control (UIC) program.\textsuperscript{77} If an underground injection falls within the UIC program’s reach, the injecting entity must acquire a permit by demonstrating that the underground injection will not endanger drinking water sources.\textsuperscript{78} If examined solely under the SDWA’s UIC program, the injection of fracking fluid would be considered an underground injection that requires a permit.\textsuperscript{79} The Act, however, has conclusively fore-

\begin{footnotesize}
\textsuperscript{71} Id. Furthermore, hydraulic fracturing has a potential to cause minor earthquakes. Id. This effect is rare, however, and can be avoided through monitoring. Id.
\textsuperscript{74} See 33 U.S.C. § 1342(l); 42 U.S.C. § 300h-4.
\textsuperscript{75} See 33 U.S.C. § 1342(l); 42 U.S.C. § 300h-4; Coman, \textit{supra} note 14, at 139.
\textsuperscript{76} \textsc{Earthworks & Oil and Gas Accountability Project, The Oil and Gas Industry’s Exclusions and Exemptions to Major Environmental Statutes 8} (2007) [hereinafter OGAP Report].
\textsuperscript{78} Legal Envtl. Assistance Found., 118 F.3d at 1474.
\textsuperscript{79} Id.
\end{footnotesize}
closed this possibility.\textsuperscript{80} The Act essentially codifies the EPA’s 2004 finding that the environmental effects of fracing were insignificant, and thus exempts the fracing industry from having to obtain UIC permits before beginning fracing activity.\textsuperscript{81}

In 2009, Democratic members of Congress sought to close the Halliburton Loophole\textsuperscript{82} through the proposed Fracturing Responsibility and Awareness of Chemicals Act (FRAC Act),\textsuperscript{83} which would have required the oil and gas industry to disclose chemicals used in drilling projects.\textsuperscript{84} Although the FRAC Act was introduced to Congress in 2009 and again in 2011, both efforts were unsuccessful.\textsuperscript{85}

2. Clean Water Act Exemption

The CWA regulates the quality of surface waters in the United States.\textsuperscript{86} It achieves this goal by making it unlawful to discharge any pollutant from a point source into navigable waters without a permit.\textsuperscript{87} In addition to point sources, the CWA also imposes restrictions on non-point sources such as stormwater runoffs.\textsuperscript{88}

The CWA exempts the oil, gas, and mining industry from the stormwater permit program as long as the runoff is not contaminated by contact with raw materials or waste.\textsuperscript{89} The EPA attempted to revise its CWA regulations to limit stormwater runoffs from fracing well sites,

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\item \textsuperscript{80} See 42 U.S.C. § 300h-4. First, the Energy Policy Act of 2005 stated that fracing operations were completely exempt from regulation under the SDWA. Id.; OGAP Report, supra note 76, at 8. Second, the Act called for voluntary discontinuance of diesel fuels in fracing operation. 42 U.S.C. § 300h-4; OGAP Report, supra note 76, at 8. Finally, the Act released the EPA from obligations to regulate threats to drinking water from fracing fluids even when gas producers use diesel fuels in their fracing operations. 42 U.S.C. § 300h-4; OGAP Report, supra note 76, at 8. The result allows the fracing industry to operate oil and gas wells without complying with SDWA requirements that ensure the safety of drinking water. 42 U.S.C. § 300h-4; OGAP Report, supra note 76, at 8.
\item \textsuperscript{81} See 2004 Report, supra note 58, at 128; Wiseman, supra note 39, at 128.
\item \textsuperscript{82} Coman, supra note 14, at 139.
\item \textsuperscript{83} Id.
\item \textsuperscript{84} Senators, Representatives Act to Close Halliburton Loophole in the Safe Drinking Water Act, Earthworks (June 9, 2009), http://www.earthworksaction.org/media/detail/senators_representatives_act_to_close_halliburton_loophole_in_the_safe_drink#.UPMar280WSo, available at http://www.permac.org/07CwK2uGog.
\item \textsuperscript{86} See 35 U.S.C. § 1251 (2006).
\item \textsuperscript{87} Id. § 1342(a)(2).
\item \textsuperscript{88} 40 C.F.R. § 130.6(c)(3)-(4) (2007).
\item \textsuperscript{89} 33 U.S.C. § 1342(l); OGAP Report, supra note 76, at 10.
\end{itemize}
once in 1990 and again in 1999, by asserting that large amounts of sediment discharged into surface waters constitutes a pollutant. The 1990 and 1999 EPA regulations would have required permits for site operators who were disturbing one to five acres of land through sediment discharges.

The Energy Policy Act of 2005 amended the CWA to provide that sediment is no longer considered a pollutant. This exemption applied to the construction of drilling sites, drilling waste management pits, access roads, in-field treatment plants, and the transportation infrastructure necessary for the operation of most oil and gas fields. Similar to the SDWA exemption, the CWA exemption allows the fracking industry to operate without complying with permits that implement National Pollutant Discharge Elimination System standards requiring the use of the best available technology to treat pollution outputs.

B. State Regulation Attempts

Since October 2010, at least nineteen state legislatures have passed, or at least considered, more than one hundred bills relating to fracking. The most prominent types of state regulation include disclosure requirement statutes, permitting statutes, and moratorium statutes. Although most oil producing states have some sort of regulatory framework, state regulators’ competence with respect to inspection and monitoring of wells has come under scrutiny.

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90 OGAP Report, supra note 76, at 10–11.
91 Id.
92 See id. The EPA has confirmed that this exemption applies to all oil and gas field construction activities by stating that “all covered oil and gas-related construction activities are eligible for the National Pollutant Discharge Elimination System permitting exemption for their uncontaminated stormwater discharges without regard to the amount of acreage disturbed.” Id.
93 Id. at 11.
97 See Earthworks, Breaking All the Rules: The Crisis in Oil & Gas Regulatory Enforcement 8 (2012) [Hetchhaffer Inspection Report].
1. Disclosure and Permitting Statutes

In September 2010, Wyoming became the first state to require full disclosure of fracking fluid chemicals as a condition to obtaining a fracking permit.98 Michigan and Texas soon followed Wyoming’s lead.99 Disclosure statutes vary in complexity by state.100 Presently, around fourteen states, including Pennsylvania, Texas, and Wyoming,101 require full disclosure of all chemicals.102 Other states such as Virginia, Tennessee, and Maryland103 have permit systems that might or might not require complete disclosure.104 These disclosure statutes appeal to the public because they require transparency by the gas industry.105

2. Moratorium Statutes

In 2012, Vermont’s governor, Peter Shumlin, signed into law the nation’s first ban on fracking activity.106 Shumlin said that other states should emulate Vermont’s ban and pass similar legislation because clean drinking water will become “more valuable than oil or natural gas.”107 In contrast, New York’s governor, Andrew Cuomo, lifted a moratorium on fracking in 2011 by allowing such activity on private lands.108 The New York State Senate praised the move because of the economic boost that the gas industry would bring to upstate New York.109 Maryland unsuccessfully tried to regulate fracking by prohibiting the process unless certain conditions were met.110 The failed bill would have required well operators to demonstrate that their drilling and well operation would not impair the sustainability, water quality, or potabil-

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98 Pless, supra note 95.
99 Id.
101 See id. Other states that require full disclosure include Michigan, Ohio, West Virginia, Louisiana, Arkansas, New Mexico, North Dakota, Wyoming, and Colorado. Id.
102 See id.
103 Other states that require compliance with specific permits are Indiana, Kentucky, Georgia, Alabama, Mississippi, South Dakota, Nebraska, and Kansas. Id.
104 See id.
105 See Davis, supra note 8, at 189–81.
106 Green Mountain State, supra note 54.
107 Id.
109 Id. at A21.
110 Pless, supra note 95.
ity of ground and surface water. The bill would have also required fracing fluid to contain only approved chemical additives.

3. Inspection and Enforcement

A recent report by Earthworks, a nonprofit organization dedicated to protecting the environment, found that 53% to 91% of wells in studied states were operating without inspections. Even when inspectors found rule violations, penalties had no deterring effect on the violators, and inspectors often neglected to record the violations formally. According to the report, state regulatory agencies failed to increase staffing in response to the surge in oil and natural gas activity, which handicapped the agencies’ ability to supervise the growing industry.

Furthermore, in most states citizens lack a statutory right to challenge companies that fail to comply with state oil and gas rules. Consequently, citizens often complain to state regulators about well site violations, which provides an impetus for eventual inspections. State regulators’ responses to citizen complaints, however, are rarely initiated immediately and tend not to be thorough.

III. Nuisance Law in Hydraulic Fracturing Cases

Because federal and state regulation of fracing is rife with loopholes and is accordingly difficult to enforce, citizens affected by fracing often use common law actions against oil and gas producers rather than federal or state statutory causes of action. Common law claims include trespass, negligence, strict liability, and private and public nuisance.

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111 Id.
112 Id. Maryland’s House Bill 1274 and Senate Bill 601, both addressing a fracking moratorium, were defeated by a single vote. All Bills to Ban, Place Moratorium on Fracking Dead, CUMBERLAND TIMES-NEWS (Mar. 7, 2013). All Bills to Ban, Place Moratorium on Fracking Dead, http://times-news.com/local/x986706374/All-bills-to-ban-place-moratorium-on-fracking-dead, available at http://www.perma.cc/0sx6TESBcW6.
113 Inspection Report, supra note 97, at 8.
114 Id.
115 Id. at 9.
116 Id. at 14.
117 See id. at 10.
118 See id.
120 See Berish, 763 F. Supp. 2d at 704; Fiorentino, F. Supp. 2d at 508; Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 11–12 (Tex. 2008).
A. Overview of Common Law Nuisance

According to the Restatement (Second) of Torts, a private nuisance is a non-trespassory invasion of another’s interest in the private use and enjoyment of land.\textsuperscript{121} The interests contemplated include not only the interests that a person might have in the current uses of the land—residential, agricultural, commercial, industrial, etc.—but also interests in the pleasure, comfort, and enjoyment of the land.\textsuperscript{122} Nuisance covers a broad spectrum of interests and allows plaintiffs to claim numerous types of invasions.\textsuperscript{123}

An entity is liable for private nuisance if “his conduct is a legal cause of an invasion . . . , and the invasion is either (a) intentional and unreasonable, or (b) unintentional and otherwise actionable under the rules controlling liability for negligent or reckless conduct, or for abnormally dangerous conditions or activities.”\textsuperscript{124} Thus, an entity can be liable for nuisance by acting intentionally and unreasonably, negligently or recklessly, or by engaging in abnormally dangerous activities.\textsuperscript{125}

An entity acts intentionally by acting “for the purpose of causing, or knows that it is resulting or is substantially certain to result in an invasion of another’s property interest.”\textsuperscript{126} The knowledge that the actor possesses at the time that he acts or fails to act separates intentional invasions from unintentional invasions.\textsuperscript{127} An actor who knowingly causes an invasion in the pursuit of a laudable enterprise, without any desire to cause harm, can still act intentionally.\textsuperscript{128} Intentional invasions must also be unreasonable.\textsuperscript{129} An invasion is unreasonable if the gravity of the harm is greater than the value of the actor’s conduct, or if the harm or financial burden would make the continuation of the conduct unfeasible.\textsuperscript{130}

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\textsuperscript{121} Restatement (Second) of Torts § 821D (1979).
\textsuperscript{122} Id. § 821D cmt. b; see Bader v. Iowa Metro. Sewer Co., 178 N.W.2d 305, 305 (Iowa 1970).
\textsuperscript{123} See Bader, 178 N.W.2d at 305; Restatement (Second) of Torts § 821D cmt. b.
\textsuperscript{124} Restatement (Second) of Torts § 822.
\textsuperscript{125} Id. § 822 cmt. a.
\textsuperscript{127} Restatement (Second) of Torts § 825; see McQuilken, 576 F. Supp. at 1030; Diess, 935 A.2d at 906.
\textsuperscript{128} Restatement (Second) of Torts § 825 cmt. c.
\textsuperscript{129} Id. § 822.
\textsuperscript{130} Id. § 826.
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Unintentional invasions must be negligent, reckless, or caused by abnormally dangerous activity.\textsuperscript{131} The rules for determining negligence and recklessness for unintentional nuisances parallel those governing negligence and recklessness for other harms.\textsuperscript{132} In nuisance, an actor’s conduct must involve an unreasonable risk of harm to a person’s ability to enjoy his or her land.\textsuperscript{133} In determining the unreasonable character of this risk, the law attaches value to the specific interest imperiled.\textsuperscript{134} Furthermore, the risk must outweigh the utility of the actor’s conduct.\textsuperscript{135} The actor’s conduct might have sufficient utility to outweigh a certain amount of risk to another’s use and enjoyment of land, but might not have sufficient utility to outweigh the risk of bodily harm.\textsuperscript{136} Courts have generally concluded that storage and transmission of gas and petroleum products are not abnormally dangerous activities, but a general consensus about the dangerousness of fracing has not been reached.\textsuperscript{137}

In both private and public nuisance, liability can exist only if the activity causes significant harm of a kind that would be suffered by a normal person in the community or by property in normal condition and used for normal purposes.\textsuperscript{138} Significant harm means harm involv-
...ing more than a slight inconvenience or minor annoyance.\textsuperscript{139} There must be a real and appreciable invasion of the plaintiff’s interests that interferes with the plaintiff’s use or enjoyment of land.\textsuperscript{140} For public nuisance, the plaintiff must show particular harm, of a kind different from that suffered by other members of the public.\textsuperscript{141}

The term “normal” seeks to impose an objective standard when measuring the significance of harm.\textsuperscript{142} When an invasion involves a detrimental change in a person’s enjoyment of land, the standard for determining significant harm is the standard of normal people or property in the particular locality.\textsuperscript{143} Thus, if the harm is not objectively significant to a normal person, a hypersensitive person that personally experiences harm that seems significant to him or her cannot successfully bring a private nuisance claim.\textsuperscript{144} Similarly, courts must consider the location, character, and habits of the particular community when determining what constitutes offensive or annoying conduct to a normal person.\textsuperscript{145} Courts must also consider fears and other mental reactions common to a given community.\textsuperscript{146} Finally, for a harm to be significant, the harm usually must be persistent or recur during some period of time.\textsuperscript{147}

\textbf{B. Distinguishing Negligence and Nuisance}

The historical development of nuisance led to some confusion between unintentional nuisances and negligence.\textsuperscript{148} In early tort law, an actor was liable for harm caused by his acts whether that harm was done intentionally, negligently, or accidentally.\textsuperscript{149} As tort law progressed, courts began to distinguish between intentional, negligent, and accidental acts and began to find that an actor should not be liable for acciden-
Nuisance, however, remained actionable whether or not the actor acted accidentally. When nuisance essentially “caught up” to other tort causes of action and became actionable only for intentional, negligent, reckless or abnormally dangerous acts, the distinction between negligence and nuisance blurred considerably.

The distinction lies in the type of harm suffered by plaintiffs. A negligent interference with the use and enjoyment of land is a private nuisance as to the interest infringed upon and negligence regarding the conduct that causes the invasion. A claim for nuisance can theoretically be brought by a plaintiff that suffered subjective harm rather than actual physical or pecuniary harm.

C. Trespass Compared to Nuisance: Coastal Oil & Gas Corp. v. Garza Energy Trust

A confusing overlap also exists between trespass and nuisance. Comments in the Restatement (Second) of Torts suggest that the actionable harms in nuisance claims can be quite subjective. By contrast, trespass requires an actual physical invasion of property by an unwelcomed person or thing. Furthermore, with nuisance, unlike trespass, there is “no general rule of law that one acts at his own peril with respect to interference with another’s use or enjoyment of land.” When the interferences are purely accidental, the actor incurs no liability.

The maxim “cujus est solum ejus est usque ad coelum et ad inferos” has been used to describe the property interests protected by trespass. It states that a man’s property extends to the heavens above and to the

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150 See id.
151 See id.
152 See id.
153 See id. cmt. c.
154 Restatement (Second) of Torts § 822 cmt. c.
155 See id.
156 See id. § 821D cmt. c.
157 See id. Comment e to § 821D of the Restatement states that a nuisance could be created by a dog barking in a neighbor’s yard. Id. The harm caused in this scenario is an invasion of the person’s pleasure in enjoying quietness in his or her property. See id. The decibel and frequency of loudness that gives rise to such an invasion most likely depends on a case by case analysis. See id.
158 See id. § 821D.
159 See id. § 822 cmt. i.
160 Id.
core of the earth below. More recently, this maxim has been disregarded as having no place in the modern world. For example, in 1936 the court in *Hinman v. Pacific Air Lines Transport Corp.* held that the *ad coelum* doctrine had narrow limits that simply meant that the landowner could use the space above his property to the extent that he was able to do so. Accordingly, the court refused to apply the *ad coelum* doctrine to airspace above the plaintiff’s property used by airplanes.

In 2010, court in the *Coastal Oil & Gas Corp. v. Garza Energy Trust* noted that the same narrow limits may apply to the subsurface extension of property. Although the court did not definitively rule that subsurface trespass cannot occur through fracing activities, it nevertheless implied as much. The court analogized underground drilling fractures far below the surface to airplanes passing two miles above a person’s land. In addition, the court imposed a “permanent harm” requirement as a condition for trespass relief. Thus, subsurface physical intrusion alone by fracing equipment or fluids might not be enough to sustain a trespass action.

Further, forced pooling or compulsory pooling statutes, which require certain landowners to unitize their property, have eliminated many trespass actions. These statutes require gas companies to compensate landowners with good faith royalties in exchange for mineral leases. Trespass actions are therefore unavailable for these landowners because they have leased away subsurface rights to gas companies.

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162 See id.
163 See Pierce, supra note 14, at 685; Anderson, supra note 161, at 253.
164 84 F.2d 755, 758–59 (9th Cir. 1936); Anderson, supra note 161, at 254.
165 *Hinman*, 84 F.2d at 758–59; Anderson, supra note 161, at 254.
166 268 S.W.3d at 11; Pierce, supra note 14, at 691–92.
167 See Coastal Oil, 268 S.W.3d at 11–12; Pierce, supra note 14, at 692. Rather than face the issue directly, the *Garza* court ruled that subsurface invasion by fracing was not an actionable trespass because the resulting damages were protected by the rule of capture. *Coastal Oil*, 268 S.W.3d at 11–12.
168 See id. at 12.
169 See id. at 10.
170 See id. at 10–12.
171 E.H. Schopler, *Validity of Compulsory Pooling or Unitization Statute or Ordinance Requiring Owners or Lessees of Oil and Gas Lands to Develop Their Holdings as a Single Drilling Unit and the Like*, 37 A.L.R.2d 434, § 1 (1954). Landowners within the unitization region are essentially forced to lease out their mineral rights to the gas producer and accept royalties in exchange. See Ronnie Blackwell, *Forced Pooling Within the Barnett Shale: How Should the Texas Mineral Interest Pooling Act Apply to Units with Horizontal Wells?*, 17 Tex. Wesleyan L. Rev. 1, 18–19 (2010).
172 Blackwell, supra note 171, at 18.
173 See id.
D. Nuisance in Hydraulic Fracturing Cases

Nuisance causes of action appear sparsely in hydraulic fracturing cases.\(^{174}\) In 2013, the U.S. District Court for the Middle District of Pennsylvania in *Roth v. Cabot Oil & Gas Corp.* denied the defendant’s motion to dismiss and ruled that the plaintiffs sufficiently alleged a valid private nuisance claim.\(^{175}\) The plaintiffs claimed that the defendant contaminated their water supply and that the plaintiffs incurred costs for water sampling, water quality monitoring, and purchasing alternative water sources for consumption and residential use.\(^{176}\) The court concluded that these potentially ongoing expenses could be deemed “seriously annoying or intolerable.”\(^{177}\) In their complaint, the plaintiffs described the various chemicals present in fracing fluid, described the changes in water quality before and after drilling activity, alleged that defective casing caused the contamination, and claimed that the defendants acted either intentionally and unreasonably or negligently.\(^{178}\)

In *Berish v. Southwestern Energy Production Co.*, a 2012 case involving fracing, the U.S. District Court for the Middle District of Pennsylvania held that the plaintiffs stated a valid claim and refused to grant the defendants’ motion to dismiss.\(^{179}\) The court stated in dicta that Pennsylvania recognizes a cause of action for inconvenience and discomfort caused by another’s interference with the peaceful possession of real estate.\(^{180}\) The court subsequently allowed the plaintiffs to file a third amended complaint, and the case ultimately settled.\(^{181}\) The fact that the defendants did not challenge the nuisance claims in their motion to


\(^{175}\) *Roth*, 919 F. Supp. 2d at 480. The court granted the defendant’s motion to dismiss for trespass, inconvenience and discomfort, and fraudulent misrepresentation. *Id.* at 497–98.

\(^{176}\) *Id.* at 484.

\(^{177}\) *Id.* at 491.

\(^{178}\) First Amended Complaint at 4–10, 18, *Roth v. Cabot Oil & Gas Corp.*, 919 F. Supp. 2d 476 (M.D. Pa. 2013) (No. 3:12-CV-00898-JEJ) [hereinafter *Roth Complaint*]. The plaintiffs alleged that the invasions of their property interests were intentional and unreasonable because the defendants knew that their drilling and operating of the wells was substantially certain to result in the discharge of various substances and hazardous chemicals. *Id.* at 18.

\(^{179}\) *Berish*, 763 F. Supp. 2d at 705–07. The court granted the defendants’ motion to dismiss for emotional distress, but the court refused to grant their motion to dismiss the strict liability claim and required the plaintiffs to amend their complaint as to damages for inconvenience and discomfort. *Id.*

\(^{180}\) *Id.* at 706; *Watson*, supra note 137, at 11.

\(^{181}\) *Watson*, supra note 137, at 11.
dismiss suggests that the nuisance cause of action might have possessed a strong likelihood of success.\textsuperscript{182} The plaintiffs’ complaint alleged that the defendant’s negligent conduct caused fracing fluid to be discharged into the ground or into the waters near the plaintiffs’ homes.\textsuperscript{183}

In 2012, the plaintiffs in \textit{Tucker v. Southwestern Energy Co.} also survived a motion to dismiss on the condition that they amend their complaint.\textsuperscript{184} The U.S. District Court for the Eastern District of Arkansas deduced that the plaintiffs might have had a valid nuisance claim from the relevant facts, including contamination of ponds and a water well forty feet from the plaintiffs’ property.\textsuperscript{185} The court went on to state that there is no feasible way to prove exactly what happens beneath the surface, which suggests that proof of direct causation might not be required in fracing cases.\textsuperscript{186} In the complaint, the plaintiffs described the fracing wells, listed specific chemicals in fracing fluid, listed specific chemicals found in their water supply, matched those chemicals with chemicals in fracing fluid, and alleged that the defendant knew or should have known that there was no way to control the fracturing process.\textsuperscript{187}

In contrast, in 1981 the U.S. District Court for the Eastern District of Pennsylvania ruled in \textit{O’Leary v. Moyer’s Landfill, Inc.}, that the plaintiffs failed to allege sufficient facts to support a public or private nuisance claim.\textsuperscript{188} The plaintiffs claimed that a neighboring landfill caused drinking water contamination, air pollution, and foul odor.\textsuperscript{189} The court reasoned that the reported incidents were too sporadic and insignificant to sustain a nuisance claim.\textsuperscript{190} In a similar case, the court in \textit{Berry v. Armstrong Rubber Co.} concluded in 1993 that the defendant’s past waste dumping activities did not create a nuisance.\textsuperscript{191} The court noted that although the level of toxins found on land did not have to

\begin{footnotesize}
\begin{itemize}
\item[\textsuperscript{182}] See Wiseman, supra note 19, at 10.
\item[\textsuperscript{184}] 2012 WL 528253, at *2; see Watson, supra note 137, at 4.
\item[\textsuperscript{185}] See Tucker, 2012 WL 528253, at *2.
\item[\textsuperscript{186}] See id.
\item[\textsuperscript{188}] 523 F. Supp. at 658.
\item[\textsuperscript{189}] Id.
\item[\textsuperscript{190}] Id.
\item[\textsuperscript{191}] 989 F.2d 822, 829 (5th Cir. 1993).
\end{itemize}
\end{footnotesize}
reach dangerous levels, the level of pollutants on the other hand must rise to a level that would cause significant harm to the public right.\textsuperscript{192}

IV. NUISANCE: FILLING STATUTORY GAPS

A. Inadequacies of Federal and State Regulation and the Need to Use Common Law Causes of Action

The fracturing process introduces an astounding amount of chemicals into a well’s surroundings.\textsuperscript{193} Consequently, one might reasonably believe that these underground injections would be regulated by the Safe Drinking Water Act (SDWA) or the Clean Water Act (CWA).\textsuperscript{194} The “Halliburton Loophole” created by the Energy Policy Act of 2005 (Act), however, exempts oil and gas companies from the SDWA and CWA’s respective mandates.\textsuperscript{195} A coalition consisting of oil and gas industry supporters succeeded in convincing Congress to create the exemptions.\textsuperscript{196}

Although the Fracturing Responsibility and Awareness of Chemicals Act (FRAC Act) would have eliminated the oil and gas industry’s exemptions from the SDWA,\textsuperscript{197} the political climate in the United States, dominated by the push for job creation and economic recovery, prevented the FRAC Act from being enacted.\textsuperscript{198} Congress concluded that the economic benefits of fracturing sufficiently outweighed the detrimental environmental effects.\textsuperscript{199} Thus, for the foreseeable future, the Halliburton Loophole will likely remain untouched by legislative action.\textsuperscript{200} Consequently, this leaves states to regulate fracturing activity on their own through legislation, and citizens to defend their own land by means of common law causes of action.\textsuperscript{201}

States have attempted to regulate fracturing through disclosure and permitting statutes, moratorium statutes, and inspection requirements,

\begin{footnotesize}
\textsuperscript{192} See id.
\textsuperscript{193} See supra notes 19–44 and accompanying text.
\textsuperscript{195} 33 U.S.C. § 1342(a)(1), (l); 42 U.S.C. §§ 300h(b)(1)(A), 300h-4.
\textsuperscript{196} See Davis, supra note 8, at 182.
\textsuperscript{198} See Davis, supra note 8, at 179–80.
\textsuperscript{199} See 33 U.S.C. § 1342(l); 42 U.S.C. § 300h-4; Davis, supra note 8, at 179–80.
\textsuperscript{200} See 33 U.S.C. § 1542(l); 42 U.S.C. § 300h-4; Davis, supra note 8, at 179–80.
\textsuperscript{201} See 33 U.S.C. § 1342(l); 42 U.S.C. § 300h-4; Inspection Report, supra note 97, at 14; Wiseman, supra note 39, at 146.
\end{footnotesize}
but these regulatory attempts have several shortcomings. First, not only do state regulators lack the power to enforce disclosure and permitting, but these statutes are also devoid of citizen enforcement provisions. Disclosure is only a first step toward full, comprehensive regulation, and the lack of citizen enforcement provisions leaves private parties without any statutory recourse against oil and gas companies.

Second, although moratorium statutes provide a complete ban on fracking activity, most states will be unlikely to enact such statutes. The economic benefits that fracking brings to states will be irresistible to most gas-producing states. These statutes might gain popularity, however, if fracking’s serious environmental consequences come to light. Governor Shumlin’s moratorium statute in Vermont exemplifies a state’s response to rising concern over fracking activity. Unfortunately, the prospect of bringing in billions of dollars in gross state product through hydraulic fracturing will likely diminish the popularity of similar state moratorium statutes.

Third, state inspection and enforcement measures are inadequate even with state regulations in place. Inspections occur sporadically and do not present a significant incentive for hydraulic fracturing companies to monitor their wells thoroughly for leaks or spillage.

The environmental effects of fracking can be mitigated through reducing the fracking “footprint.” Media pressure and public awareness of potential environmental effects have influenced some gas companies to reduce their fracking footprint through “green fracking” programs.

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202 See Inspection Report, supra note 97, at 8; Plumer, supra note 100; Green Mountain State, supra note 54.
204 See generally Pless, supra note 95.
206 See Davis, supra note 8, at 179-80; Green Mountain State, supra note 54.
207 See Davis, supra note 8, at 182-83.
208 See id. at 180-81.
209 See Green Mountain State, supra note 54.
210 See Davis, supra note 8, at 182-83.
211 Inspection Report, supra note 97, at 8.
212 See id.
213 See Ehrenberg, supra note 41.
Unfortunately, the lack of federal regulation governing fracking and the inadequacy of state regulations leave the hydraulic fracturing industry largely unregulated.\textsuperscript{215}

Federal and state regulations act as the backbone for preventative action against activities that negatively affect the environment.\textsuperscript{216} Without a proper regulatory structure for a potentially threatening activity, harmful effects to the environment are likely inevitable.\textsuperscript{217} Not surprisingly, aggrieved citizens, faced with a seemingly ineffectual regulatory structure, have brought common law actions against gas companies and well site operators to counteract the lack of regulation.\textsuperscript{218}

\textbf{B. Using Nuisance Against Hydraulic Fracturing Activity}

The law of nuisance with regard to hydraulic fracturing is less developed than the law of trespass,\textsuperscript{219} but recent cases have suggested that certain common law actions might be easier to pursue in this context than others.\textsuperscript{220} For example, the decision in \textit{Coastal Oil & Gas Corp. v. Garza Energy Trust} suggests that trespass might not be a promising option for plaintiffs pitted against oil and gas producers in contamination cases.\textsuperscript{221} Nuisance, however, remains a viable option for citizens seeking relief against companies that use hydraulic fracturing.\textsuperscript{222}

To recover under private nuisance, a plaintiff must show (1) causation, (2) intentional and unreasonable invasion, or an invasion that was unintentional and otherwise actionable under negligence, recklessness,

\textsuperscript{215} See Carroll, \textit{supra}.


\textsuperscript{217} See 42 U.S.C. § 7401(a).

\textsuperscript{218} See \textit{Coastal Oil & Gas Corp. v. Garza Energy Trust}, 268 S.W.3d 1, 4 (Tex. 2008). See generally Berish Complaint, \textit{supra} note 183.

\textsuperscript{219} See Wiseman, \textit{supra} note 19, at 10–11.

\textsuperscript{220} See Anderson, \textit{supra} note 161, at 259; Wiseman, \textit{supra} note 19, at 10. Plaintiffs in the Berish case claimed negligence, strict liability, trespass, and medical monitoring trust fund actions against gas companies in addition to nuisance claims. Berish Complaint, \textit{supra} note 183, at 11–18.

or strict liability, and (3) significant harm. This section applies the elements of nuisance to fracking activity and discusses why nuisance claims fit these cases better than other causes of action.

1. Causation

In almost all environmental tort cases, the most challenging element to prove is causation. The costs of scientific research and data analysis, coupled with the tenuous connection between drilling activities and pollution, presents an uphill battle for plaintiffs. Because the interests protected under nuisance include the pleasure and peace of mind associated with the plaintiff’s property, though, proving that fracking operations caused invasions of these interests might be easier compared to proving causation in trespass claims. For example, a nuisance action might be brought for invasion of a person’s interest in the peace of mind derived from having access to uncontaminated drinking water. The cause of such an invasion could be merely the presence of a fracking well near the plaintiff’s property. Nuisance applied in this context, therefore, might provide a flexible and useful tool for citizens concerned about fracking activity occurring around their property.

Furthermore, the court in Tucker v. Southwestern Energy Co. implied that the standard of proof for determining causation might be relaxed in fracking cases. The court noted that there is no feasible way to prove exactly what happens beneath the surface, which seems to imply that plaintiffs do not have to prove the exact cause of groundwater contamination. Therefore, plaintiffs can prove causation through drinking water testing or testing of the soil and bodies of water around the

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223 Restatement (Second) of Torts §§ 822, 821F; see Roth, 919 F. Supp. 2d at 490; Tucker, 2012 WL 528253, at *6.
224 See infra notes 225–256 and accompanying text.
226 See id.
227 See Restatement (Second) of Torts § 821D cmt. b.
228 See id. The interests covered encompass “not only the interests that a person may have in the actual present use of land for residential, agricultural, commercial, industrial and other purposes, but also his interests in having the present use value of the land unimpaired by changes in its physical condition.” Id. Interest in use and enjoyment also includes the pleasure, comfort, and enjoyment that a person normally derives from the occupancy of land. Id.
229 See id.
230 See id.
232 See id.
well site.\textsuperscript{233} The presence of fracing chemicals in the environment could be enough to prove causation through inferential reasoning and processes of elimination.\textsuperscript{234}

For example, in \textit{Roth v. Cabot Oil & Gas Corp.}, the plaintiffs alleged that their drinking water did not contain contaminants before the fracing activity started and that fracing fluid agents appeared soon after fracing commenced.\textsuperscript{235} The inference was that the drillers caused the contamination because the same chemicals used in the hydraulic fracturing were found in the surrounding environment, and there was no alternative explanation for their presence.\textsuperscript{236} Most jurors would not have to stretch their imaginations to reach this conclusion.\textsuperscript{237} Furthermore, courts applying the \textit{Tucker} standard are likely to refrain from forcing plaintiffs to prove the exact cause of contamination, such as faulty casings, intersections of old wells with new wells, or seepage from fissures in the shale formation.\textsuperscript{238}

2. Intentional or Unintentional Act

Secondly, plaintiffs must demonstrate that the invasion was either intentional and unreasonable, or unintentional and actionable under the rules governing negligence, recklessness, or abnormally dangerous activity.\textsuperscript{239} The actor’s knowledge at the time of the alleged invasion determines whether the act constituted an intentional or unintentional invasion.\textsuperscript{240}

Intentional invasions might be easier to prove than unintentional invasions in fracing cases.\textsuperscript{241} An actor acts intentionally “if he or she acts for the purpose of causing an invasion, or knows that their actions are resulting or is [sic] substantially certain to result in an invasion of another’s property interest.”\textsuperscript{242} Thus, at a minimum, the fracing company must have knowledge that its actions are resulting in contamination.\textsuperscript{243}

\textsuperscript{235} See \textit{Roth Complaint}, supra note 178, at 4–10, 18.
\textsuperscript{236} See id.
\textsuperscript{237} See id.
\textsuperscript{238} See \textit{Tucker}, 2012 WL 528253, at *2.
\textsuperscript{239} RESTATEMENT (SECOND) OF TORTS § 822.
\textsuperscript{240} Id. § 825 cmt. c.
\textsuperscript{241} See id. §§ 822, 825.
\textsuperscript{242} Id. § 825.
\textsuperscript{243} Id.
After the actor knows that his or her conduct resulted in an invasion, further invasions are automatically considered intentional.244 A plaintiff in a fracking case merely has to notify the defendant about the alleged invasion, or alternatively prove that the defendant had prior knowledge of the invasion through past complaints.245

In contrast, unintentional invasions require that the risk of invasion and the value of the invaded interest outweigh the utility of the action.246 Fracking activity has extremely high social utility because it creates jobs, boosts the economy, and promotes energy independence.247 The risks of drinking water contamination would most likely outweigh these socially desirous aspects of fracking, but the analysis would likely differ from case to case.248

Although both intentional and unintentional invasions could theoretically succeed, intentional invasions would perhaps be less burdensome for plaintiffs to establish because the invasion is presumed to be intentional after notification.249

3. Significant Harm

Finally, for a defendant to be liable for nuisance, the defendant must have caused significant harm to the plaintiff’s right to enjoy his property.250 The law of nuisance protects a wide array of property interests but does not meddle with trivial annoyances.251 The standard used to decide whether an annoyance is significant is that of a normal person with normal sensitivities,252 taking into account the surrounding community’s habits and expectations.253 Many plaintiffs, especially those in areas like the outskirts of Pennsylvania, rely on underground sources of water for their residences or businesses.254 Because of their reliance on underground water, these plaintiffs and their fellow community mem-

244 See id. § 825 cmt. d.
245 See Restatement (Second) of Torts § 825 cmt. d.
246 See id. § 822 cmt. i.
247 See IHS, supra note 46, at vii.
248 See Roth, 919 F. Supp. 2d at 490–91; IHS, supra note 46, at vii; Ehrenberg, supra note 41.
249 See Restatement (Second) of Torts §§ 822 cmt. i, 823 cmt. d; Ehrenberg, supra note 41.
250 See Restatement (Second) of Torts § 821F.
251 See id. § 821D.
252 See id. § 821F.
253 See id. § 821F cmt. c.
254 See Roth Complaint, supra note 178, at 4–10, 18; Berish Complaint, supra note 183, at 8.
bers expect their water supplies to be free of artificial chemicals. The presence of fracturing chemicals in these water supplies would therefore likely constitute a significant annoyance or harm to the property enjoyment of a normal resident within that geographic area.

C. Distinguishing Successful Nuisance Complaints from Unsuccessful Attempts and Recommendations for Potential Plaintiffs

Unfortunately, a lack of case law leaves the application of nuisance to fracturing largely undeveloped. Recent cases, however, provide a glimpse of how a plaintiff might effectively file a nuisance claim against fracturing activity. Furthermore, these cases inform citizens living near fracturing sites about low-cost methods of preparation for possible groundwater contamination cases.

In Roth v. Cabot Oil & Gas Corp., the plaintiffs’ complaint described the various chemicals present in fracturing fluid, described the changes in water quality before and after drilling activity (including specific measurements of chemicals in the water), alleged that defective casing caused the contamination, and claimed that the defendants acted either intentionally and unreasonably or negligently. The complaint showed causation by specific identifications of changes in water quality. Furthermore, it alleged that defective casings were the specific cause of the contamination. The plaintiffs alleged that the invasion was either intentional or negligent and claimed that the invasion constituted a substantial harm because they were forced to conduct water testing, buy replacement water for consumption, and incur healthcare costs. The court concluded that the costs incurred for water sampling, water quality monitoring, and the purchase of alternative sources of potable water were potentially “seriously annoying or intolerable.”

The Roth complaint succeeds because it alleges all of the necessary elements with specificity, claims both intentional and unintentional inva-
sions, and produces data on water quality from before and after the fracing activity commenced.265

Similarly, the plaintiffs in Tucker v. Southwestern Energy Co. defeated a motion to dismiss and ultimately settled.266 The plaintiffs matched specific chemicals in fracing fluid with chemicals found in their water supply and alleged that the defendant knew, or should have known that there was no way to control the fracturing process.267 Proof of causation mirrored that in Roth, but unlike Roth, the plaintiffs did not point to any part of the fracing process as a specific cause.268 This suggests that plaintiffs might not need to allege specific causation to satisfy the causation requirement of nuisance in fracing cases at least during the pre-discovery phase.269

Unlike Roth and Tucker, where the plaintiffs alleged both an intentional and unintentional invasion, the plaintiffs in Berish v. Southwestern Energy Production Co. only alleged that the defendant unintentionally invaded their property.270 The plaintiffs claimed that the defendant negligently caused releases, spills, and discharges of harmful substances into the plaintiffs’ water supply.271 The complaint stated that the contamination of underground water caused serious annoyance or discomfort given the plaintiffs’ daily reliance on groundwater wells.272 The plaintiffs did not present details such as the type of chemicals introduced by fracing fluid, or the process of fracing, but did mention costs for water samples and alternative water.273

In O’Leary v. Moyer’s Landfill, Inc. and Berry v. Armstrong Rubber Co., the courts completely dismissed the plaintiffs’ nuisance complaints.274 These unsuccessful plaintiffs merely pled general statements about the dangerous substances used in fracing, and made conclusory statements

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265 See id.; Roth Complaint, supra note 178, at 4–10, 18.
266 Tucker, 2012 WL 528253, at *5–6; Watson, supra note 137, at 10.
268 See Roth Complaint, supra note 178, at 4–10, 18; Tucker Complaint, supra note 187, at 4–11.
270 See Roth Complaint, supra note 178, at 4–10, 18; Tucker Complaint, supra note 187, at 4–11; Berish Complaint, supra note 183, at 16.
271 See Berish Complaint, supra note 183, at 16.
272 See id.
273 Id.
concerning the migration of those substances. The complaints contained no specific facts about the chemicals, water contamination levels, or costs of procuring alternative water.

A successful nuisance complaint will therefore list specific chemicals that the defendant uses during fracturing activity, connect those chemicals with contaminants found in their drinking water supply, procure comparative water or soil samples from before and after the start of fracturing activity, allege both intentional and unintentional invasion, and show that the parties have incurred costs for water replacement, testing, and healthcare. A prima facie case for nuisance does not require specific causation such as defective casing, or intersections of old and new wells, but general conclusory allegations will not suffice.

By following a few simple guidelines, citizens can prepare for a nuisance case against fracturing operators without incurring the exorbitant research costs normally associated with environmental cases. Potential plaintiffs living near a fracturing site or a future fracturing site can begin monitoring and saving samples of their drinking water immediately. Plaintiffs concerned about the ecosystem and the environmental integrity of their property should collect soil and water samples from ponds or streams that run through their property, even before any harmful effects are noticed.

Conclusion

Environmentalists and citizens face rough legal terrain when challenging hydraulic fracturing activity. Federal and state regulation provides little help, while the common law remains largely undeveloped due to the high incidence of settlement. Recent cases, however, have shown that nuisance provides plaintiffs with recourse for responding to

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275 See Berry, 989 F.2d at 829; O'Leary, 523 F. Supp. at 658.
276 See Berry, 989 F.2d at 829; O'Leary, 523 F. Supp. at 658.
277 See Roth, 919 F. Supp. 2d at 490–91; Tucker, 2012 WL 528253, at *6; Roth Complaint, supra note 178, at 4–10, 18; Tucker Complaint, supra note 187, at 4–11.
278 See Berry, 989 F.2d at 829; Roth, 919 F. Supp. 2d at 490–91; Tucker, 2012 WL 528253, at *6; O'Leary, 523 F. Supp. at 658.
279 See Berry, 989 F.2d at 829; Roth, 919 F. Supp. 2d at 490–91; Tucker, 2012 WL 528253, at *6; O'Leary, 523 F. Supp. at 658.
280 See Berry, 989 F.2d at 829; Roth, 919 F. Supp. 2d at 490–91; Tucker, 2012 WL 528253, at *6; O'Leary, 523 F. Supp. at 658; Roth Complaint, supra note 178, at 4–10, 18; Tucker Complaint, supra note 187, at 4–11.
groundwater contamination caused by fracking. Furthermore, courts have demonstrated a tendency to recognize that subterranean activities that cause invasions of property interests deserve a less stringent standard when it comes to proving causation and substantial harm. Although proper regulation, either nationally or state by state, would be the most effective way to monitor fracking activity, the common law nuisance doctrine promises to provide communities and citizens with some measure of assurance that their property interests will be protected.