Inverse Condemnation and Fracking Disasters: Government Liability for the Environmental Consequences of Hydraulic Fracturing Under a Constitutional Takings Theory

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INVERSE CONDEMNATION AND FRACKING DISASTERS: GOVERNMENT LIABILITY FOR THE ENVIRONMENTAL CONSEQUENCES OF HYDRAULIC FRACTURING UNDER A CONSTITUTIONAL TAKINGS THEORY

JOSEPH BELZA *

Abstract: The practice of hydraulic fracturing, more commonly known as fracking, risks a number of dangerous environmental consequences. Notably, fracking operations can contaminate the underlying water table. Contamination of groundwater can disrupt the access of a nearby property to both potable drinking water and viable commercial irrigation. Usually, when a fracking operation results in this kind of groundwater contamination, affected plaintiffs sue the operator of the rig. This Note proposes that similarly situated plaintiffs also name a new defendant in these actions: the state agency that granted the fracking permit. The governmental actor could bear liability under a constitutional theory of inverse condemnation. Where contamination interferes with an individual’s use and enjoyment of property, the government actor bears responsibility for orchestrating the activity that caused the interference. In short, the government should be more discerning when granting permits to frac, because it can be held financially responsible for the fallout.

INTRODUCTION

In the last decade, hydraulic fracturing, colloquially known as “hydrofracking” or “fracking,” has prompted an energy revolution.1 This technique, used to extract fossil fuel from the earth, ballooned in popularity over the last decade, and that popularity has generated significant national controversy.2 Proponents of fracking point to its potential to create jobs and reduce United States depend-
ence on foreign oil as reasons for their support. Environmental opponents of the practice decry hydrofracking because of the risk of dangerous environmental consequences. They highlight evidence that fracking rigs contribute to greenhouse gas emissions, create toxic air and water contamination, and trigger dangerous seismic events. Environmentalists have had mixed success using legal techniques to block fracking operations around the country because of numerous political and legislative obstacles. Since 2014, a sustained drop in the price of oil on the global market has stalled the fracking boom; however the method remains state-of-the-art and is likely here to stay.

Despite widespread concerns about the public health risks and environmental harms caused by hydrofracking, opponents of the practice find themselves with a limited legal toolkit. To some extent, opponents achieved success with new legislation banning fracking at the state level in New York and Vermont, and at more local levels in Colorado and California. These efforts are likely difficult to duplicate in many other parts of the country, where vocal political support for fracking precludes the success of such aggressive legislation.


5 Coman, supra note 4, at 135; Mike Malfenttone, Comment, A Nation Fractured: Drilling into the Debate over Fracking, 2 ARIZ. J. ENVTL. L. & POL’Y 1039, 1041 (2012); Carlos Romo & Colin Cox, Developments, Natural Resources, 45 TEX. ENVTL. L.J. 401, 402 (2015).


8 Friedlander, supra note 6, at 17, 20.


10 See Brian Weeks, Survey, New Jersey, 1 TEX. A&M L. REV. 185, 192–93 (2014) (printed in a separately paginated fifty state survey on hydraulic fracturing). For example, in 2011, the New Jersey state legislature passed an outright fracking ban similar to that of New York, but the law was vetoed by Republican Governor Chris Christie. See id.
Even when hydrofracking triggers environmental degradation and threatens public welfare, impacted communities can struggle to find success in the courtroom. In 2009, a group of lawsuits were filed in Dimock, Pennsylvania after a fracking accident caused widespread groundwater contamination. These suits are archetypical of how arduous and protracted litigation can be for communities impacted by fracking.

Dimock is a picturesque rural town in Susquehanna County. It is a town of wooded family homesteads, verdant forests, and a wildlife sanctuary. In 2009, however, a hydrofracking operation disrupted this idyllic image, and the once Picturesque town became synonymous with images of flaming tap water. A water well explosion caused by methane buildup in the wellhead spurred the first Dimock suit. A subsequent investigation by the Pennsylvania Department of Environmental Protection revealed dangerous levels of other chemicals also present in the Dimock groundwater and soil.

Nearly forty families sought redress by filing suit against Cabot Oil and Gas Corp. (“Cabot”), the operator of nearby gas well drilling and hydrofracking rigs. The plaintiffs alleged that Cabot’s fracking operation caused the contamination, and asserted causes of action including strict liability, negligence, private nuisance, breach of contract, fraudulent misrepresentation, and gross negligence. Over the next seven years, all but two of the original plaintiffs settled with Cabot. The two remaining plaintiffs pushed along to trial and in early 2016 their case, *Ely v. Cabot Oil & Gas Corp.*, became one of the first hydro-

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11 See Friedlander, *supra* note 6, at 17, 20.
18 See Amended Complaint, *supra* note 13, at 16.
19 See id.
fracking suits alleging water contamination to reach a jury.\(^{22}\) The lengthy and difficult narrative of the Ely litigation showcases the obstacles facing those who seek justice following a hydrofracking disaster.\(^{23}\)

This Note will suggest an additional avenue of redress for plaintiffs, like those in Dimock, against fracking operations.\(^{24}\) Plaintiffs who suffered harm by fracking operations may be able to succeed in suing the government for its role in allowing the various harms caused by fracking.\(^{25}\) Though such a strategy has not yet been utilized in a fracking contamination case, the government—specifically the state government and the administrative body that issues hydrofracking permits—faces potential liability under an inverse condemnation theory.\(^{26}\)

The doctrine of inverse condemnation arises out of the Fifth Amendment to the U.S. Constitution, which states that no property may be taken by the government without compensation.\(^{27}\) If a government action is deemed to rise to the level of a taking, then the affected individual can file an inverse condemnation suit, compelling the government to provide recompense for the impact of the action.\(^{28}\) This is potentially useful in a groundwater contamination case, like the one in Dimock because it provides a new, untested avenue of redress for those injured by a fracking operation.\(^{29}\)

In such a case, where the groundwater contamination interrupts an individual’s ability to consume well water or irrigate a commercial farm, the plaintiff could logically allege that the government interfered with the plaintiff’s property rights by granting a permit to operate a hydrofracking rig.\(^{30}\) Although the government was not the direct cause of the interference with the plaintiff’s property rights, case law suggests that the government’s role in permitting such activity is a sufficient link and thus rises to the level of a compensable taking.\(^{31}\)

Part I of this Note presents a background on the practice of hydraulic fracturing, including a historical overview and a breakdown of the technical process.\(^{32}\) It then explores the myriad environmental risks associated with this fossil

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\(^{22}\) Dekok, supra note 12; Wilber, supra note 17.

\(^{23}\) See Fiorentino, 750 F. Supp. 2d at 508; Dekok supra note 12. In 2016, after seven years of litigation, the remaining Dimock plaintiffs won a four million dollar judgment; however, this kind of trial victory is exceedingly rare. See David Dekok, Pennsylvania Families Win $4.2 Million Damages in Fracking Lawsuit, REUTERS (Mar. 10, 2016, 2:19 PM), http://www.reuters.com/article/pennsylvania-fracking-idUSL1N16I11VC [https://perma.cc/GW7B-PMHS].

\(^{24}\) See infra notes 224–273 and accompanying text.

\(^{25}\) See infra notes 224–273 and accompanying text.

\(^{26}\) See infra notes 224–273 and accompanying text.

\(^{27}\) U.S. CONST. amend. V; see infra notes 105–155 and accompanying text.

\(^{28}\) See infra notes 105–155 and accompanying text.

\(^{29}\) See infra notes 224–273 and accompanying text.

\(^{30}\) See infra note 275 and accompanying text.

\(^{31}\) See infra notes 189–215 and accompanying text.

\(^{32}\) See infra notes 43–75 and accompanying text.
fuel extraction technique. Part II provides a legal background. First, it examines the laws that enable hydrofracking, including state-run permitting programs. Second, it analyzes how hydrofracking fits in a broader web of federal environmental statutes and highlights the explicit loopholes in environmental statutes that make it more difficult for an individual harmed by a fracking operation to seek redress in a court. Part II then introduces the Takings Clause of the Fifth Amendment of the U.S. Constitution and provides background on inverse condemnation jurisprudence. Part II concludes with an examination of the requirements of standing, focusing on the three elements established by the Supreme Court in *Lujan v. Defenders of Wildlife*.

Part III of this Note proposes that individuals impacted by a hydrofracking disaster sue the government permitting agency for its role in allowing the placement of the hydrofracking operation. Part III examines the likelihood that such a case would succeed in court. It first examines standing and then discusses the merits of an inverse condemnation claim. Finally, Part IV explores the potential impact that a successful inverse condemnation suit would have on the hydrofracking industry.

I. INTRODUCTION TO THE MECHANICS AND CONSEQUENCES OF HYDRAULIC FRACTURING

A. What Is Fracking?

Hydraulic fracturing (“hydrofracking” or “fracking”) was developed in the 1940s and for the last seventy years has been utilized to some extent by energy companies across the globe to extract natural gas from deep beneath the surface of the earth. The technique did not assume its modern form until the 1990s with the development of horizontal drilling. By directing wells laterally after first drilling straight down to the target depth, hydrofracking operations are able to fracture a much larger area of shale rock, and therefore are able to procure

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33 See infra notes 51–75 and accompanying text.
34 See infra notes 76–223 and accompanying text.
35 See infra notes 76–85 and accompanying text.
36 See infra notes 86–104 and accompanying text.
37 See infra notes 105–155 and accompanying text.
38 See infra notes 156–223 and accompanying text.
39 See infra notes 224–273 and accompanying text.
40 See infra notes 224–273 and accompanying text.
41 See infra notes 224–273 and accompanying text.
42 See infra notes 274–286 and accompanying text.
more natural gas.\footnote{See id. at 921.} With each rig made more productive by this technological advancement, hydrofracking is more profitable than ever before resulting in the rapid proliferation of fracking operations across the United States.\footnote{See Monika Ehrman, The Next Great Compromise: A Comprehensive Response to Opposition Against Shale Gas Development Using Hydraulic Fracturing in the United States, 46 TEX. TECH L. REV. 423, 425 (2014); Golden & Wiseman, supra note 1, at 957–58; Powers, supra note 43, at 921.}

The modern hydrofracking process begins by drilling a well down into the earth.\footnote{Coman, supra note 4, at 134.} Typically, the drillers direct the well horizontally and then inject the well with highly pressurized fluid; this fluid causes the surrounding subsurface rock to crack and release natural gas that has been trapped beneath the earth’s surface.\footnote{Id.} The driller then injects the well with chemically treated sand or clay—known as proppants—to physically keep the newly formed fractures open, allowing the escaping gas to flow freely.\footnote{Ehrman, supra note 46, at 433; Coman, supra note 4, at 134.} The natural gas flows out with immense pressure back up through the wellhead, where it is collected.\footnote{Ehrman, supra note 46, at 427, 468; Coman, supra note 4, at 135; David Giller, Note, Implied Preemption and Its Effect on Local Hydrofracking Bans in New York, 21 J. L. & POL’Y 631, 631 (2013).}

B. The Environmental Consequences of Fracking

Though supporters praise hydrofracking as the future of American energy, its viability comes at a severe environmental cost.\footnote{See Ehrman, supra note 46, at 427; Coman, supra note 4 at 135; David Giller, Note, Implied Preemption and Its Effect on Local Hydrofracking Bans in New York, 21 J. L. & POL’Y 631, 631 (2013).} Every step in the life cycle of a fracking operation risks triggering environmental disasters, such as radiation leaks, exploding water wells, poisoned groundwater, and earthquakes.\footnote{See Coman, supra note 4 at 135; Steve Krejci, Note, Is the Human Right to Water in Pennsylvania Fracked? An Analysis of the Pennsylvania Right to Water in the Hydraulic Fracturing Context and a Proposal for Reform Based on French and Ontario Environmental Rights Statutes, 8 APPALACHIAN NAT. RES. L.J. 175, 175–76 (2014); Samuel C. Stephens, Comment, Poison Under Pressure: The EPA’s New Hydraulic Fracturing Study and the Case for Rational Regulation, 43 CUMB. L. REV. 63, 68, 70 (2013); Jeff McMahon, Fracking Truck Sets Off Radiation Alarm at Landfill, FORBES (Apr. 24, 2013, 2:44 PM), http://www.forbes.com/sites/jeffmcmahon/2013/04/24/fracking-truck-sets-off-radiation-alarm-at-landfill/#37e3fe403f83 [https://perma.cc/SW48-EM9S]; Peter Moskowitz, Utah Fracking Fine Highlights Wastewater Pond Threat, AL JAZEERA AM. (Aug. 31, 2014, 5:00 AM), http://america.aljazeera.com/articles/2014/8/31/fracking-wastewaterutah.html [https://perma.cc/79HZ-YSTU].} The very act of drilling the well produces a potentially dangerous waste product.\footnote{Stephens, supra note 52, at 71; McMahon, supra note 52.} The drill cuttings, along with a lubricating chemical mud, can contain unsafe levels of radioactive material.\footnote{McMahon, supra note 52. “Drill cuttings” are a mixture of lubricating mud and the physical waste brought up from the underlying strata as the drill cuts into the earth. Austin C. Whitmore, Note,
In 2013, for example, a disposal truck carrying drill cuttings from a hydrofracking facility in Pennsylvania triggered a radiation alarm at a local landfill.\textsuperscript{56} The landfill could accept some amount of slightly radioactive material, but the truck’s contents exceeded that threshold by a factor of ten.\textsuperscript{57} Further inspection revealed the cuttings emitted gamma radiation from radium 226 at a rate eighty-four times higher than the Environmental Protection Agency (EPA) standard for harmful air pollution.\textsuperscript{58} Inhalation of radium 226, a naturally occurring isotope, is known to increase the risk of cancer in all tissues and organs, even at low levels of exposure.\textsuperscript{59} Radium 226 is especially prevalent in the drill cutting byproducts taken from the Marcellus shale region, a 104,000 square mile natural gas deposit stretching across New York, Pennsylvania, Ohio, and West Virginia.\textsuperscript{60}

Hydrofracking also creates a very real possibility of water contamination.\textsuperscript{61} Many of the compounds used in injection fluids and proppants are toxic or carcinogenic.\textsuperscript{62} Likewise, methane and natural gas can be released from the rock after fracturing and escape uncontrolled.\textsuperscript{63} These toxins have the potential to leach into and contaminate groundwater.\textsuperscript{64} Though proponents of hydrofracking often diminish the likelihood of groundwater contamination, such occurrences are not uncommon.\textsuperscript{65}

For instance, in 2006, a blown hydrofracking gas well in Clark, Wyoming released over seven million cubic feet of methane, contaminating nearby

\textsuperscript{53} McMahon, supra note 52; Moskowitz, supra note 52.
\textsuperscript{54} McMahon, supra note 52.
\textsuperscript{55} \textit{Id}.
\textsuperscript{56} \textit{Id}.
\textsuperscript{57} \textit{Id}.
\textsuperscript{58} \textit{Id}.
\textsuperscript{59} \textit{Id}.
\textsuperscript{62} See Coman, supra note 4, at 135, 137; Quarré, supra note 61, at 447.
\textsuperscript{64} See id.
\textsuperscript{65} See Blake A. Watson, \textit{Fracking and Cracking: Strict Liability for Earthquake Damage Due to Wastewater Injection and Hydraulic Fracturing}, 11 TEX. J. OIL GAS & ENERGY L. 1, 3 (2016) (asserting hydrofracking’s “relatively low risk to water supplies”); Quarré, supra note 61, at 444, 447 (describing the frequency of water contamination caused by fracking in California, highlighting a massive spill in excess of ninety-six million gallons).
groundwater with benzene and other hydrocarbons.66 A similar tragedy befell Dimock, Pennsylvania in 2009, when high levels of combustible gas leaked into groundwater and caused a water well to explode.67 Investigators found that the leaking fracking rig also contaminated the drinking water with threatening levels of arsenic, barium, glycol compounds, manganese, phenol, methane, and sodium.68

Hydrofracking operations also have the potential to contaminate surface water, either from accidental spills or by intentional discharge of waste fluid.69 Surface pollution can leach into the soil and potentially travel to the subsurface water table, compounding the risk of compromising drinking water.70

There is also a growing concern about fracking’s contribution to seismic activity.71 The fracturing process itself can trigger a seismic event, though these events are usually insignificant.72 Of greater concern is the disposal of fracking wastewater through underground injection, a common technique whereby drillers deposit wastewater into underground strata of porous rock or soil.73 Researchers linked one such disposal well to a five-point-seven magnitude Oklahoma earthquake in 2011, the largest in the state’s history.74

Other environmental concerns from hydrofracking include air pollution from methane and volatile organic compounds, high emissions of greenhouse gases that contribute to climate change, worker exposure to volatile compounds,

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70 See Howard, supra note 63, at 134; Moskowitz, supra note 52.
71 See Howard, supra note 63, at 136–37.
72 See id.
and the clear-cutting of trees by developers preparing a site for rig construction.  

II. LEGAL BACKGROUND

A. Legislation and Laws Enabling Fracking

Hydraulic fracturing ("hydrofracking" or "fracking") is mostly regulated at the state level. Most states follow a standard base model involving drilling permits issued by a state-level regulatory authority, whereas other states take a different approach and regulate at a more local level. These jurisdictional variations have created a veritable patchwork of regulation.

The most common version of the permitting process requires an operator to first apply for and receive a preliminary permit to drill an exploration well. If the site is viable, then the initial permit can be converted into a full mineral well permit, and the operator can complete construction of the rig onsite. Generally, this process cuts out public participation and requires no public notice. In fact, in some states, the permit itself omits details about the placement and operation of the gas well, ostensibly to protect the trade secrets of the driller. Under these circumstances, the surrounding community is left unaware that a fracking operation is planned until the drillers commence construction of the rig. Though most states allow for appeal of a permitting decision before a board, they limit the right to appeal to owners and operators of hydrofracking rigs; third parties,


78 See Baker, supra note 7, at 255–56; Coin, supra note 77.

79 Topp, supra note 76, at 33–34.

80 Id.

81 See id.


83 O’REILLY, supra note 76.
like affected community members, have no standing to challenge a board’s decision to grant a permit. This further blocks the public’s ability to intervene in the early stages of hydrofracking, limiting it to after-the-fact litigation.

B. Statutory Exemptions and Legal Challenges to Fracking

Ordinarily, an industry that utilizes hazardous compounds and produces hazardous waste would fall within the regulatory web of environmental statutes in the United States. The “iron triangle” of friendly lawmakers, however, has carved out a haven, for the oil and gas industry. In fact, many of the flagship environmental protection statutes explicitly exempt hydrofracking and other petroleum extraction operations from their respective purviews. These exemptions, paired with political industry pressure, make it exceedingly difficult to bring a hydrofracking operation to task.

The loopholes stem from the Energy Policy Act of 2005 (“EPAct”), which amended a number of existing environmental statutes. The most critical amendment was to the Safe Drinking Water Act (“SDWA”), a law passed to pro-

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84 See Topp, supra note 76, at 33–34.
85 See O’REILLY, supra note 76; Topp, supra note 76, at 33–34.
87 See ZYGMUNT PLATER ET AL., ENVIRONMENTAL LAW AND POLICY : NATURE, LAW, AND SOCIETY 239 (Vicki Been et al. eds., 4th ed. 2009); Brady, supra note 86, at 3–4. The iron triangle is a term that refers to web of private and public sector interests that surround a regulated industry and present an obstacle to environmentalist actions. See PLATER ET AL., supra. Iron triangle is more specifically defined as the “the interlocking structure and political process linking private construction and industrial interests, government agencies that service the industry, and congressional delegations that want to attract particular public expenditures into their backyards.” Id.
89 See Friedlander, supra note 6, at 17, 20. See generally, Brady, supra note 86, at 6–7 (discussing the numerous legal hurdles presented by the legislative framework).
tect public drinking water and both surface and ground sources of water.91 Significantly, the SDWA contains the Underground Injection Control Program, which regulates the operation of underground injection wells through a permitting scheme.92 The EPAct carried a targeted amendment for the SDWA, specifically excluding the injection of fluids during a hydrofracking operation from the definition of “underground injection.”93

The EPAct amendments also carved out petroleum industry protections in the National Environmental Policy Act (“NEPA”), the legislation that requires federal agencies to conduct an environmental assessment before engaging in any major action that could affect the environment.94 NEPA further requires an agency to prepare an environmental impact statement, if the first assessment indicates any potential environmental consequences.95 The EPAct, however, created a rebuttable presumption that certain activities conducted by the oil and gas industry are categorically exempt from NEPA and do not require an environmental impact statement.96

The EPAct amendments also included an attempt to exempt certain petroleum activities from coverage under the Clean Water Act (“CWA”), which outlaws the unpermitted discharge of pollutants into waterways.97 Specifically, language in the EPAct exempted oil and gas construction activities from the CWA’s permitting scheme that regulates storm water runoff.98 The National Resource Defense Council successfully limited this exemption in 2008 by challenging a rule promulgated by the Environmental Protection Agency (EPA) supporting the exemption.99

Additionally, pro-petroleum exemptions protect hydrofracking operations from other statutes.100 The Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), for example, explicitly excludes natural gas liquids from its definition of hazardous waste.101 Other loopholes are more implicit.102 For instance, hydrofracking has avoided coverage under the Emergency Planning and Community Right-to-Know Act (“EPCRA”) by staying off

91 See 42 U.S.C. § 300h(d)(1)(B)(ii) (explicitly exempting fracking activity from the SDWA definition of “underground injection”); Kron, supra note 90, at 610 (describing the legal background and mechanics of the fracking exemptions of the SDWA).
92 42 U.S.C. § 300h(b)(1).
93 Id. § 300h(d)(1)(B)(ii); Coman, supra note 4, at 138–39.
95 Id.; Brady, supra note 86, at 10.
96 42 U.S.C. § 15942; see Brady, supra note 86, at 10.
101 See id.
102 See Brady, supra note 86, at 6–7.
the list of covered industries. If included on the coverage list, EPCRA would compel a hydrofracking operation to inform the public of the presence of hazardous chemicals in the community, and establish an emergency plan in the instance of contamination.

C. Inverse Condemnation Law

Inverse condemnation is rooted in the Takings Clause of the Fifth Amendment of the U.S. Constitution, which prohibits state and federal governments from taking private property for public use without just compensation. The Fifth Amendment acts as a limit on the government’s inherent police power. While the government has the power to seize privately owned property and convert it for public use, the Takings Clause of the Fifth Amendment guarantees that the property owner must be fairly compensated for the seizure. This principle is also known as the doctrine of eminent domain. The Takings Clause protects not only physical property, but also private economic interests or advantages. If a governmental body has taken property, physically or otherwise, but has not compensated the property owner for the taking, the owner may bring an action for inverse condemnation in an effort to compel the government to provide compensation.

Inverse condemnation also extends to government actions that do not rise to the level of a physical seizure. If government action is so onerous that it

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103 See id.
105 See U.S. CONST. amend. V. The Takings Clause of the Fifth Amendment dictates that “private property [shall not] be taken for public use, without just compensation.” Id.
106 See U.S. CONST. amend. V; Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1022 (1992) (holding that power of the state to regulate is limited by the Fifth Amendment when that regulation amounts to severance of a private property right). Police power refers to “a state’s Tenth Amendment right, subject to due-process and other limitations, to establish and enforce laws protecting the public’s health, safety, and general welfare, or to delegate this right to local governments.” Police Power, BLACK’S LAW DICTIONARY (10th ed. 2014).
108 Eminent Domain, BLACK’S LAW DICTIONARY (10th ed. 2014). Eminent domain is defined as “the inherent power of a governmental entity to take privately owned property, esp. land, and convert it to public use, subject to reasonable compensation for the taking.” Id.
111 See First English Evangelical Lutheran Church of Glendale v. Cty. of Los Angeles, 482 U.S. 309, 322 (holding that a government’s request to have a church retreat center relocate out of a flood zone to be a compensable taking); Robert Keith Johnston, Comment, Federal Regulatory Takings Jurisprudence and Missouri Inverse Condemnation Proceedings, 58 UMKC L. REV. 421, 430 (1990) (“[T]he Supreme Court has, in effect, established an overriding federal inverse condemnation remedy
amounts to a physical taking of one’s property, then the affected individual is still due just compensation.\textsuperscript{112} The government action in this type of inverse condemnation case is often characterized as a “regulatory taking.”\textsuperscript{113} The concept was first established in the early twentieth century in the landmark United States Supreme Court case Pennsylvania Coal Co. v. Mahon.\textsuperscript{114} In Pennsylvania Coal, the Court struck down a Pennsylvania law that prohibited subsurface coal mining that triggered subsidence of surface land.\textsuperscript{115} The Court held that the regulation effectively made it illegal to mine coal in the manner that the plaintiff coal company envisioned because the mine in question was only suitable for extraction that triggered land subsidence.\textsuperscript{116} The Court in Pennsylvania Coal did not create an explicit test, but rather framed the issue as a broader question of degree, asking if the regulation goes “too far.”\textsuperscript{117}

Since the Court in Pennsylvania Coal first recognized inverse condemnations as a cause of action in 1922, courts and scholars have struggled to establish a clear rule for when a government action rises to the level of compensable taking.\textsuperscript{118} Despite the lack of an explicit standard, the Supreme Court has adopted a series of tests and considerations to determine when a regulation goes too far so as to become a taking.\textsuperscript{119}

Government actions are per se takings under the Fifth Amendment, and thus automatically warrant compensation, where the action in question requires the property owner to suffer a permanent physical invasion of the property.\textsuperscript{120} The Court established this rule in Loretto v. Teleprompter Manhattan CATV Corp., reasoning that permanent invasions of property rights resemble physical seizures of property, regardless of the economic impact on the individual.\textsuperscript{121}

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  \item See Lingle v. Chevron U.S.A. Inc., 544 U.S. 528, 539–40 (2005) (articulating that the government owes compensation to an individual whose property rights are harmed by a regulation when that regulation is so onerous that it amounts to a taking).
  \item See id. at 539.
  \item 260 U.S. 393, 415 (1922).
  \item Id. at 412, 416.
  \item See id. at 416.
  \item Id. at 415–16.
  \item See id.; Johnston, supra note 111, at 423 (“Defining exactly what constitutes a regulatory taking and when one has occurred has been one of the most difficult and problematic issues for the courts to resolve.”).
  \item See Loretto, 458 U.S. at 426 (1982) (establishing a rule that a permanent physical invasion of property amounts to a compensable taking); Penn Cent. Transp. Co. v. City of New York, 438 U.S. 104, 124 (1978) (establishing a four-part test to assess when a regulation goes so far as to encumber an individual’s property rights and trigger compensation).
  \item See Loretto, 458 U.S. at 426.
  \item See id.
\end{itemize}
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In 1978, in *Penn Central Transportation Co. v. City of New York*, the Supreme Court addressed this question of economic denial directly. The Court held that a reviewing court should consider: (1) the economic impact of the government action on the landowner; (2) the extent to which the action interferes with investment-backed expectations; (3) the character of the action; and (4) the extent to which the interference can be characterized as a physical invasion by the government. Under *Penn Central*, government action may also amount to a per se taking where it completely deprives an owner of all economic beneficial use of the property. Actions that impact a landowner but leave some economic use are not per se takings, but may still rise to the level of compensability if they meet certain criteria. As a result, the Court has established that a land use regulation warrants compensation when it denies a landowner economically viable use of the property.

No single *Penn Central* factor is controlling. Instead, courts consider the four factors in totality, and then weigh the individual’s interest against that of the government. Though the *Penn Central* test is mathematically imprecise, its factors allow courts to tackle the broad question of when a government action goes too far.

For a court reviewing a government action under the first *Penn Central* factor, the mechanics of the economic impact inquiry are self-explanatory. Generally, a court will assess the extent to which the plaintiff was monetarily harmed. Put simply, the greater the economic impact of a governmental action, the greater likelihood of success of a takings claim. A government action that eliminates all beneficial use of a property is a per se taking, and automatically warrants compensation. Something short of a total taking would be subject to an economic calculation to determine the magnitude of the loss, comparing the value that has been taken with the value remaining in the land.

For the second factor in a *Penn Central* analysis, the question of investment-backed expectations overlaps significantly with an inquiry into the eco-

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122 See id.
123 See id.
125 See Penn Cent., 438 U.S. at 124, 143–44.
126 See id.
128 See id.
129 See id. at 617, 634.
131 Id.
132 See Lucas, 505 U.S. at 1019 n.8; Echeverria, *supra* note 130, at 10,474.
133 See Lucas, 505 U.S. at 1017; Echevarria, *supra* note 130, at 10,474.
134 See Echeverria, *supra* note 130, at 10,474.
nomic impact on the property owner. The question of expectations bolsters the economic question. In other words, the economic impact will be more significant if the plaintiff’s expectations of maintaining property rights were reasonable.

The third *Penn Central* factor, the nature of the action, or character of the action, explores the government’s interest. This factor essentially weighs the policy behind the government action against the damage it has done to the individual. If the government has a weighty interest compelling its action, the court is less likely to find a compensable taking. What constitutes a weighty interest is up for debate and often political.

In 1987, the United States Supreme Court in *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, found in favor of compensation when a county ordinance required a church to move its campground out of a floodplain. While the state conservation interest in *Bragg* was fairly typical, the government’s interest in *First English Evangelical* illustrates the outer bounds of the *Penn Central* test. In *First English Evangelical*, the Court held that the government’s interest in protecting disabled children from drowning still did not outweigh the economic impact to the church that had to relocate its camp. The holding reflects a strong reluctance by the judiciary to interrupt a private property interest without compensation, even when the motivation for the government’s action is significant.

Similarly, in *Edwards Aquifer Authority v. Bragg*, the Texas Court of Appeals found that the state interest in preserving water during a drought was not significant enough to overcome the economic impact to an individual farmer. *Bragg* presents an archetypical fact pattern of a modern regulatory takings ac-

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136 See id.

137 See Palazzolo, 533 U.S. at 633; Echevarria, *supra* note 130, at 10,486.

138 See Palazzolo, 533 U.S. at 634; Echeverria, *supra* note 130, at 10,478.


140 See Echeverria, *supra* note 130, at 10,478.

141 See Mark Fenster, *The Stubborn Incoherence of Regulatory Takings*, 28 STAN. ENVTL. L.J. 525, 528 (2009). Courts have no strict benchmark for determining the significance of an economic impact, and this has led to inconsistent application of the *Penn Central* test. See 438 U.S. at 124. Compare Hadacheck v. Sebastian, 239 U.S. 394, 405, 414 (1915) (reasoning that compensation was not warranted even though the property in question decreased in value by approximately eighty-five percent), with Halco Tex., Inc. v. McMullen Cty., 221 S.W.3d 50, 55 (Tex. 2007) (reasoning that twenty-five percent diminution in value is sufficiently impactful).

142 See *First English Evangelical*, 482 U.S. at 322.

143 See id.

144 See id.

145 See id.

In *Bragg*, the Edwards Aquifer Authority, a Texas state agency, implemented a water-permitting scheme to combat drought conditions. They issued water-use permits to well owners, capping the volume one could pump from the eponymous aquifer. The plaintiffs, husband and wife pecan farmers in Central Texas, contested their water use permit. The Braggs argued that the cap amount, based on one’s previous maximum water use, was inappropriate because pecan trees require more and more water as they mature. When the Edwards Aquifer Authority denied their request for an increased cap, the Braggs filed suit alleging an invalid regulatory taking of their pecan orchards. In 2013, the court found for the Braggs, holding that the partial denial of the requested water permit amounted to a compensable taking of property and ordered the Edwards Aquifer Authority to compensate the Braggs for the loss of their orchard. Applying *Penn Central*, the court in *Bragg* found that the economic impact of a water use regulation warranted compensation partly because the plaintiff’s expectations of unencumbered access to groundwater were reasonable. The court found that these expectations were reasonable because the plaintiff farmer had a graduate degree in agriculture.

**D. Standing**

As a threshold matter, for an action to succeed, the plaintiff must have standing to sue. Generally speaking, standing is a question of whether the litigant is entitled to have the dispute heard and decided by a court. The standing requirement arises out of broad constitutional principles. Though the U.S. Constitution makes no explicit mention of standing, the Supreme Court has used the language of Article III to limit the jurisdiction of federal courts to cases and controversies. This requirement prevents the judiciary from offering un-

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147 Id. at 146, 153.
148 Id. at 124–25.
149 Id. at 125.
150 Id. at 140.
151 Id.
152 Id. at 126.
153 Id. at 146, 153. *Bragg* is also illustrative of how difficult it can be for courts to navigate the mire of takings jurisprudence. See id. See generally Joseph Belza, Comment, *A Texas Takings Trap: How the Court in Edwards Aquifer Authority v. Bragg Fell into a Dangerous Pitfall of Takings Jurisprudence*, 43 B.C. ENVTL. AFF. L. REV. 211 (2016) (criticizing the Texas Court of Appeals for fatally misapplying the crucial *Penn Central* test).
154 See *Bragg*, 421 S.W.3d at 144.
155 Id. at 143–44
157 Id.
159 Id.
prompted advisory opinions that might encroach on the enumerated powers of the other branches of government.\textsuperscript{160}

In \textit{Lujan v. Defenders of Wildlife}, the Supreme Court articulated the specific requirements for standing.\textsuperscript{161} Writing for the majority, Justice Scalia outlined three elements of standing that a plaintiff must show in order to have the right to make a legal claim and seek judicial enforcement.\textsuperscript{162} First, the plaintiff must have suffered an injury in fact.\textsuperscript{163} This injury in fact must be a “concrete and particularized” invasion of a legally protected interest.\textsuperscript{164} Moreover, the injury must be actual or imminent, and not merely hypothetical.\textsuperscript{165} Second, there must be a link of proximate causation between the plaintiff’s injury and the allegedly wrongful conduct by the defendant.\textsuperscript{166} In other words, there can be no standing to sue for the actions of a third party not before the court.\textsuperscript{167} Third, it must be likely that a favorable holding by the court will redress the injury alleged.\textsuperscript{168}

In the complaint, standing needs only to be supported by generally alleged facts.\textsuperscript{169} By the summary judgment phase, the presumption of validity shifts, and plaintiff must show specific evidence to support assertions of standing.\textsuperscript{170} When challenging a government action, a plaintiff may have standing even if the plaintiff is not the object of that action.\textsuperscript{171} Though, as a rule, standing is still available in such a case, it is not easy to meet the standing requirement in that situation.\textsuperscript{172}

1. Injury in Fact

In \textit{Lujan}, the Court held that the plaintiffs could not show a sufficient concrete injury in fact and thus dismissed the case for lack of standing.\textsuperscript{173} The plain-
tiffs sought to challenge a decision by the Secretary of the Interior ("the Secretary") not to extend the purview of Endangered Species Act to foreign nations. The plaintiffs asserted that the Secretary’s actions would increase the rate of extinction of endangered species around the globe. Plaintiffs further argued that this injured them because they had studied and observed certain endangered species abroad in the past and would potentially study other endangered species abroad in the future. The Court held that this alleged injury to their hypothetical intentions was insufficient because it was too speculative and unspecific. Likewise, the Court dismissed their assertions of an “ecosystem nexus”—that connected and granted standing to all parts of a contiguous ecosystem—because it was overbroad. The Court further clarified that for an injury to be sufficient for standing it must be concrete and either actual or imminent.

Concrete, as used in this context, does not necessarily mean physical or tangible, and many things can constitute an injury in fact. The stigma of reputational harm, for example, is inherently abstract and intangible, yet courts consistently hold that it is concrete enough to satisfy the this standing requirement. In contrast with Lujan, such an intangible harm satisfies the injury in fact requirement because its effects are presently real. Conversely, the environmental nexus harm proposed in Lujan was hypothetical and speculative and because it had not yet occurred the Court found that there was no injury.

In an environmental case where an actual injury has already occurred, the court is far more likely to find an injury in fact sufficient to create standing. For example, in Friends of the Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc., the Court found that an environmental group had standing to sue a

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174 Id. at 558–59.
175 Id. at 562.
176 See id. at 563.
177 See id. at 564.
178 See id. at 565.
179 See id. at 560.
180 See Meese v. Keene, 481 U.S. 465, 473 (1987) (holding that the accusation of disseminating political propaganda was sufficiently injurious to movie theater proprietor to create standing); Parsons v. U.S. Dep’t of Justice, 801 F.3d 701, 712 (6th Cir. 2015) (holding that the Department of Justice’s labeling of a music group as a gang was sufficiently injurious to establish standing); Nat’l Collegiate Athletic Ass’n v. Governor of N.J. 730 F.3d 215, 220 (3d Cir. 2013) (holding that reputational harm that the National Collegiate Athletic Association would suffer as a result of legal sports gambling was sufficient to create standing).
181 See Parsons, 801 F.3d at 705, 710–12; Nat’l Collegiate Athletic Ass’n, 730 F.3d at 220–22.
182 Compare Lujan, 504 U.S. at 560–61 (finding interference with hypothetical environmental enjoyment too speculative to create standing), with Parsons, 801 F.3d at 712 (finding that the Department of Justice’s labeling of a music group as a gang was sufficiently injurious to establish standing), and Nat’l Collegiate Athletic Ass’n, 730 F.3d at 220–22 (finding that reputational harm to the NCAA as a result of legal sports gambling was sufficient to create standing).
183 See Lujan, 504 U.S. at 560–62.
wastewater facility because its members suffered a concrete injury. In *Friends of the Earth*, the defendant wastewater facility had been discharging mercury into the nearby North Tyger River, and the plaintiffs alleged that this discharge impacted their ability to use and enjoy the waterway. The defendant asserted that the plaintiffs had suffered no medical harm, and had no physical injuries; in fact, the only harm the plaintiffs alleged was an interference with their ability to fish, swim, picnic, and watch birds by the river. Nonetheless, the Court found that these injuries were concrete enough to create standing because, although they were intangible, they were not overly speculative because they had already occurred.

2. Causation Fairly Traceable to Defendant

In *Lujan*, the Court established a second standing requirement: that the causation of a plaintiff’s alleged injury be fairly traceable to the defendant’s actions. The fairly traceable standard allows standing even when the defendant did not directly trigger the injury in question. Inverse condemnation suits that arise out of airplane flight paths near residential property are illustrative of this idea. For example, in *Thornburg v. Port of Portland*, the plaintiffs owned a home approximately one mile from the end of a runway at Portland International Airport. Though the plaintiffs did not live directly under the flight paths of arriving and departing aircraft, their proximity to the airport caused them to hear significant noise and in their suit they claimed that the noise from the planes amounted to a taking of their property. Thus, they filed suit seeking compensation for the taking. The Oregon Supreme Court held in favor of the plaintiffs, finding that the city government direction of the airport amounted to a compensable taking under the Fifth Amendment.

In *Thornburg* the court made three main points. First, the court held that regular and continuous airplane noise can constitute a nuisance, even absent

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185 Id. at 189.
186 Id. at 182.
187 Id.
188 Id. at 189.
189 See *Lujan*, 504 U.S. at 560.
192 *Thornburg*, 376 P.2d at 101.
193 Id.
194 Id.
195 Id. at 102–03.
196 Id.
physical trespass over the plaintiff’s property. Second, the court reasoned that unchallenged nuisance activity can ripen into an easement granting the offending party the right to continue that activity indefinitely. Finally, the court held that the creation of an easement is, on its face, a taking of property. Thus, the court reasoned that the noise from arriving and departing planes rose to the level of a physical taking by the government.

The court in *Thornburg* relied on a United States Supreme Court decision issued earlier that year, *Griggs v. Allegheny County*. In *Griggs*, the Court held that the invasion of property rights—specifically, a plane flying over an individual’s home—could ripen into an easement to continue that activity and that the government actor, and not the airline, was the appropriate defendant in a takings suit. In *Thornburg*, a private third-party actor—a private airline—caused the direct interference—the noise nuisance—with the plaintiffs’ use of their land. The government actor, the city through its the public airport, merely facilitated and oversaw the placement of the contested activity, the flight patterns. Yet, the court in *Thornburg* imputed liability to the city government and found that the disturbances to plaintiff’s property amounted to a compensable taking. The court held that a nuisance persistently committed by a private party, could ripen into a prescription, and when a government actor maintains that nuisance, it amounts to the taking of an easement.

Likewise, in *Litz v. Maryland Department of the Environment*, the Court of Appeals of Maryland, the highest state court in Maryland, found a sufficient causal link between state and county governments and water contamination to grant county residents standing in an inverse condemnation suit. In *Litz*, the plaintiff, Gail Litz, owned a parcel of lakefront land that she used to operate a commercial campground. The nearby town lacked a dedicated sewer system, so residents relied on individual septic systems. Over time, seventy to eighty

197 Id. at 102.
198 See Id. A nuisance occurs when activity disrupts the plaintiff’s ability to use and enjoy property in a way that is unreasonable and because of this disruption the plaintiff suffers harm. Raymond v. S. Pac. Co., 488 P.2d 460, 462–63 (1971). Property use can ripen into an easement when the use is (1) continuous and uninterrupted for the prescriptive period, (2) adverse to the rights of the owner, and (3) open and notorious. Wels v. Hippe, 347 P.3d 788, 805 (Or. App. 2015).
199 *Thornburg*, 376 P.2d at 103.
200 Id. at 102, 110.
201 Id. at 103 (citing *Griggs*, 369 U.S. 84 (1962)).
202 *Griggs*, 369 U.S. at 89.
203 *Thornburg*, 376 P.2d at 101.
204 Id.
205 Id. at 103, 110.
206 Id. at 102.
207 See *Litz v. Md. Dep’t of the Env’t*, 131 A.3d 923, 925, (Md. 2016); *Thornburg*, 376 P.2d at 110.
208 *Litz*, 131 A.3d at 925.
209 Id. at 926.
percent of these septic systems failed, and human waste drained into the lake abutting the plaintiff’s land. This contamination diminished the plaintiff’s ability to derive income from her campground, she subsequently fell on difficult financial times, and her property was foreclosed.

Litz, brought an inverse condemnation action against the state environmental regulatory agency and the county health department, asserting that their failure to regulate the septic system cut off her ability to use and enjoy her property. The trial court dismissed the case, and the appellate court affirmed the dismissal, in part because the government took no affirmative action that could be linked to contamination. On appeal, the Court of Appeals of Maryland reversed and remanded, holding that mere government inaction may be enough to create a taking. As this case law demonstrates indirect involvement, like the flight path orchestration in Thornburg, or even inaction, as in Litz, may be sufficient.

3. Redressability

The third Lujan standing requirement, redressability, mandates that a court can only grant standing if it is likely that a plaintiff’s injury will be remedied by a favorable decision of the court. This is a practical inquiry that considers the remedies available in a given action. Simply put, the redressability requirement asks if the remedies available to the plaintiff would actually ameliorate the alleged harms. The plaintiffs in Lujan failed on this requirement; the Court reasoned that the injunction requested would not solve the plaintiff’s alleged problems and therefore the plaintiffs’ injuries were not likely to be redressed.

In contrast with the holding in Lujan, a court is more likely to find the redressability requirement satisfied when a plaintiff employs a cause of action more clearly related to his or her injury. For example, in National Collegiate Athletic Ass’n v. Governor of New Jersey, the United States Court of Appeals for the Third Circuit found that the National Collegiate Athletic Association (“NCAA”) had standing to bring an action to block a proposed New Jersey statute that would expand legalized sports gambling. As applied in NCAA, the

210 Id.
211 Id. at 927.
212 Id.
213 Id.
214 See id. at 931, 939.
215 See id. at 932; Thornburg, 376 P.2d at 110.
216 Lujan, 504 U.S. at 561.
217 See id.
218 See id.
219 See id. at 571.
220 See Nat’l Collegiate Athletic Ass’n, 730 F.3d at 219–20.
221 Id. at 214–15.
redressability inquiry is a common sense question: does the proposed remedy actually solve the plaintiff’s alleged problem? The court held that the redressability requirement was satisfied because the proposed remedy—an injunction against the wagering statute—logically solved the reputational injury alleged.

III. INVERSE CONDEMNATION IN A FRACKING GROUNDWATER CONTAMINATION CASE

In Dimock, Pennsylvania, a hydraulic fracturing (“hydrofracking” or fracking”) rig operated by Cabot Oil and Gas (“Cabot”) caused a dangerous leak of methane gas. This combustible gas bubbled into the substrate and permeated the surrounding aquifer where local residents of Dimock draw their drinking water. By 2009, Dimock’s well water was so contaminated with methane that it could be ignited with a match. After a water well explosion and an investigation by the Pennsylvania Department of Environmental Protection, approximately forty residents filed suit against Cabot, asserting a bevy of common law tort and contract claims. Over the next seven years of litigation nearly all of the plaintiffs settled out of court. Their struggle begs the question: could they, and other similarly situated plaintiffs, have increased their odds of success by adding another cause of action to their arsenal and another defendant to their complaint? Would it have been useful for the Dimock plaintiffs—and useful for future hydrofracking groundwater contamination plaintiffs—to sue the gov-

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222 See id.
223 See id. at 219–20.
224 See Dekok, supra note 12; Wilber, supra note 17.
225 See Wilber, supra note 17.
226 See Dekok, supra note 12; Wilber, supra note 17; Judge Denies Lone Pine Order in Dimock Fracking Case, supra note 16.
228 See Dekok, supra note 12.
229 See U.S. CONST. amend. V. See generally Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC), Inc., 528 U.S. 167 (2000) (finding that the disruption of plaintiffs’ ability to swim, fish, and picnic by river was a sufficient injury in fact to create standing); Lujan v. Defs. of Wildlife, 504 U.S. 555 (1992) (outlining the three-part test for Article III standing); Griggs v. Allegheny Cty., 369 U.S. 84 (1962) (finding that the invasion of one’s property rights could ripen into an easement to continue that activity and that the government actor, and not the airline, was the appropriate defendant in a takings suit); Nat’l Collegiate Athletic Ass’n v. Governor of N.J., 730 F.3d 208 (3d Cir. 2013) (finding that reputational harm is sufficiently concrete to create standing); Litz v. Md. Dep’t of the Env’t, 131 A.3d 923 (Md. 2016) (finding that government inaction is enough to establish inverse condemnation liability); Thornburg v. Port of Portland, 376 P.2d 100 (Or. 1962) (finding a public airport liable for property disruption caused by third party airline under an inverse condemnation theory).
ernment body that granted the fracking permit under an inverse condemnation theory?230

A. Standing

In potential litigation resulting from groundwater contamination, like the litigation that followed the Dimock fracking disaster, a plaintiff is likely to satisfy the requirements for standing.231 First, the plaintiffs must show injury in fact.232 If the intangible harm of a losing one’s picnicking grounds was concrete enough to satisfy the first standing requirement in Friends of the Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc., then the significant physical injury of exploding wellheads or poisoned drinking water is likely to pass, as well.233 Moreover, the injury in a well water contamination case impacts property values.234 This financial harm is likely to constitute an injury in fact because it is quantifiable, and not hypothetical235 Similarly, the requirement of redressability is easily satisfied because the injury is largely based on financial impact to property values, it is redressable via remuneration.236

At first glance, the requirement that the injury be fairly traceable to the defendant seems more problematic for an inverse condemnation suit filed after a hydrofracking rig contaminates groundwater.237 The governmental defendant—for instance, the state government and the body that issues hydrofracking permits—would likely argue that because these entities did not directly trigger the harm, the link between its actions and the injury are too tenuous.238 In other words, the government may assert that it should not be held responsible because

230 See U.S. CONST. amend. V; Friends of the Earth, Inc. 528 U.S. at 182, 189; Lujan, 504 U.S. at 560–61; Griggs, 369 U.S. at 89; Nat’l Collegiate Athletic Ass’n, 730 F.3d at 219–20; Litz, 131 A.3d at 925; Thornburg, 376 P.2d at 110.
231 See U.S. CONST. amend. V; Friends of the Earth, Inc. 528 U.S. at 182, 189; Lujan, 504 U.S. at 560–61; Griggs, 369 U.S. at 89; Nat’l Collegiate Athletic Ass’n, 730 F.3d at 219–20; Litz, 131 A.3d at 925; Thornburg, 376 P.2d at 110.
232 See Friends of the Earth, Inc., 528 U.S. at 182; Lujan, 504 U.S. at 560.
233 See Friends of the Earth, Inc., 528 U.S. at 182 (reasoning that the harm of damaged recreational value of land constituted sufficient injury in fact); Lujan, 504 U.S. at 560 (reasoning that hypothetical decrease in wildlife population and the resulting damage to the ability to observe animal species was too intangible to constitute injury in fact); Trades Council of Buffalo v. Downtown Devel., Inc., 448 F.3d 138, 146 (2d. Cir. 2006) (reasoning that allegations that plaintiffs were exposed to pollutants by drinking water from public water supplies drawn from contaminated lake were “sufficiently concrete” to allege injury in fact).
234 See Friends of the Earth, Inc., 528 U.S. at 182 (indicating that diminution of property value is considered in the analysis of injury in fact); Lujan, 504 U.S. at 560 (suggesting that harm without any quantifiable financial impact is less likely to constitute injury in fact).
235 See Friends of the Earth, Inc., 528 U.S. at 182; Lujan, 504 U.S. at 560.
236 See Lujan, 504 U.S. at 561.
237 See id. at 560.
a private third-party actor caused the direct interference with plaintiff’s enjoyment of the property.\textsuperscript{239} The government actor merely facilitated and oversaw the placement of that private actor’s activity.\textsuperscript{240}

This argument is implicitly dispatched in the common law.\textsuperscript{241} An analogous fact pattern exists in a string of inverse condemnation cases arising out of public airport activity.\textsuperscript{242} If a court overlays the facts of a groundwater contamination case, like the one in Dimock, to the reasoning in \textit{Thornburg v. Port of Portland}, it should reach a parallel conclusion.\textsuperscript{243} In \textit{Thornburg}, a private third-party actor, a private airline, caused the direct interference, the noise nuisance, with the plaintiffs’ use of their land.\textsuperscript{244} The government actor, the city through the public airport, merely facilitated and oversaw the placement of that activity, the flight patterns, that created the noise.\textsuperscript{245} Nonetheless, the Supreme Court of Oregon in \textit{Thornburg} imputed liability to the city government and found that the disturbances to plaintiff’s property amounted to a compensable taking.\textsuperscript{246} In Dimock, the fracking operation caused the direct interference with plaintiff’s property use, but the government through the permitting board, facilitated and oversaw the placement of that activity.\textsuperscript{247} Thus, the \textit{Thornburg} court’s reasoning could logically extend from airport noise inverse condemnation to hydrofracking inverse condemnation.\textsuperscript{248}

Alternatively, the government may argue that it cannot be held responsible, because granting a permit is not an affirmative enough action to warrant liability.\textsuperscript{249} Additionally, the government may assert that it was not in a position to foresee the contamination because it was a passive actor.\textsuperscript{250} These defenses, however, hold little water.\textsuperscript{251} In \textit{Litz v. Maryland Department of the Environment}, the Court of Appeals of Maryland held that even government inaction

\begin{itemize}
\item \textsuperscript{239} See Lujan, 504 U.S. at 560; Griggs, 369 U.S. at 89.
\item \textsuperscript{240} See Lujan, 504 U.S. at 560; Griggs, 369 U.S. at 89.
\item \textsuperscript{241} See Lujan, 504 U.S. at 560; Griggs, 369 U.S. at 89.
\item \textsuperscript{243} See \textit{Thornburg}, 376 P.2d at 110.
\item \textsuperscript{244} See \textit{id.} at 101.
\item \textsuperscript{245} See \textit{id.}
\item \textsuperscript{246} See \textit{id.} at 110.
\item \textsuperscript{247} See Ely, 38 F. Supp. 3d at 532; \textit{Thornburg}, 376 P.2d at 110.
\item \textsuperscript{248} See \textit{Thornburg}, 376 P.2d at 110.
\item \textsuperscript{249} See Griggs, 369 U.S. at 89 (holding that the invasion of one’s property rights could ripen into an easement to continue that activity and that the government actor, and not the airline, was the appropriate defendant in a takings suit); \textit{Litz}, 131 A.3d at 925 (holding that in some circumstances government inaction is enough to establish inverse condemnation liability).
\item \textsuperscript{250} See Griggs, 369 U.S. at 89.
\item \textsuperscript{251} See \textit{Litz}, 131 A.3d at 925 (reasoning that in some circumstances government inaction is enough to establish inverse condemnation liability).
\end{itemize}
could carry inverse condemnation liability. Moreover, the court in *Litz* found the question of foreseeability off-point and did not entertain it. This, paired with the clear injury in fact, redressability, and the causal link supported by the analogy of airport inverse condemnation law establishes standing for the plaintiff, even in a stricter federal venue. Though *Litz* and *Thornburg* are state court cases, the constellation of law they create would be persuasive in other jurisdiction because they are a proper readings of Supreme Court case law and consistent with public policy.

**B. Government Liability Under an Inverse Condemnation Theory**

In determining if the government action was greater than is constitutionally permissible, a court will apply the *Penn Central* test. The precise application of this test is fact-specific and thus is often difficult to predict in a hypothetical scenario. Using the Dimock facts—where a hydrofracking rig contaminated groundwater with methane and other chemicals, causing a wellhead to explode—an action for inverse condemnation could have the potential for success.

It is possible that fallout from a hydrofracking catastrophe would not deny a resident all use of his or her property, and thus it would not qualify as a total taking. Instead, the economic impact of these injuries would be subject to a financial calculation to determine the magnitude of the loss by comparing the value that has been “taken” with the value remaining in the land. If groundwater contamination prevents an individual from using the land as a commercial farm, the economic loss is likely significant. Whether it is significant enough to warrant compensation is difficult to predict because application of the test has been inconsistent. For example, the Court’s decision in *Hadacheck v. Sebastian*, held compensation was not warranted even though the property in question

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252 See id.
253 See id.
254 See *Lujan*, 504 U.S. at 560–61. It is worth noting that *Thornburg* and *Litz* are both state court decisions, and as such, they hold persuasive, but not binding, authority in a federal jurisdiction. See *Litz*, 131 A.3d at 932–33; *Thornburg*, 376 P.2d at 110.
255 See *Litz*, 131 A.3d at 932–33.
257 See *Palazzolo*, 533 U.S. at 618.
258 See id.; *Dekok*, supra note 12; *Wilber*, supra note 17.
262 See *Belza*, *supra* note 153, at 215; *Wade*, *supra* note 135, at 10936.
decreased in value by approximately eighty-seven percent, but in a similar case the Supreme Court of Texas decided that twenty-five percent diminution in value is sufficiently impactful to require compensation. The success of a plaintiff in a groundwater contamination suit will be very dependent on the specific facts of the case.

The analysis of a plaintiff’s investment-backed expectations is also very fact-sensitive. Considering again a commercial farm, if the plaintiff could assert that he or she reasonably expected to be able to continue using groundwater to irrigate the property’s commercial crops, the plaintiff might also be able to support the reasonableness of that expectation with evidence of an agricultural degree, years of farming experience, or a written business plan for her operation.

The third Penn Central factor, the nature of the government action, is likely the most problematic for a plaintiff in a groundwater contamination case. This factor essentially weighs the individual’s private property rights against the government’s interest in acting as it did. This might pose an obstacle in a hydrofracking groundwater contamination case, considering the iron triangle of politics and industry money surrounding hydrofracking in many states. In most states, the government defendant would assert that it had a vital economic interest in supporting the hydrofracking industry. That being said, the importance of the government’s interest has been increasingly eroded over the years of Penn Central jurisprudence. Thus it is plausible—if not likely—that a court would not place great weight on the government interest behind the character of the regulation in a hydrofracking water contamination case. This, paired with the clear, severe economic impact on the plaintiff and the interference with investment-backed expectations, make it equally plausible that a plaintiff would suc-

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263 Compare Hadacheck v. Sebastian, 239 U.S. 394, 405, 414 (1915) (finding that compensation was not warranted even though the property in question decreased in value by approximately eighty-five percent), with Halco Tex., Inc. v. McMullen Cty., 221 S.W.3d 50, 55 (Tex. 2007) (finding that compensation was warranted when the property in question decreased in value by approximately twenty-five percent).

264 See Hadacheck, 239 U.S. at 405, 414; Halco Tex., Inc., 221 S.W.3d at 55.

265 See id.


267 See Echeverria, supra note 130, at 10478; Meltz, supra note 266, at 341–42.

268 See PLATER ET AL., supra note 87, at 239.

269 See Plosser, supra note 3, at 673; Willie, supra note 3, at 1747, 1749.

270 See Meltz, supra note 266, at 342 (“Lingle suggests that the character factor . . . is to be given less weight than the previous two Penn Central factors . . . [implying] that the nature of the underlying government purpose, part of the character factor, has been downgraded in the regulatory takings calculus.”).

271 See id.
ceed in characterizing the damage to the property as a taking, securing compensation for the harm.273

IV. IMPLICATIONS

There is a general danger that a successful inverse condemnation case in the context of hydraulic fracturing ("hydrofracking" or "fracking") could expand the availability of inverse condemnation actions.274 Through this cause of action, government actors could theoretically be held liable for the effects that permitting activities have on communities, not just the applicant.275 As takings actions become more prevalent, the government’s ability to govern and regulate effectively is undermined by the repeated need to defend its actions in court.276 This general theoretical risk does not outweigh the potential impact inverse condemnation liability would have on the hydrofracking industry.277

The fact that state actors may potentially face liability for permit granting activity has enormous implications, both long term and immediate.278 First, the chance (or the fear) of paying for a fracking operation gone wrong will immediately influence the permit granting procedure.279 With the threat of liability, a state regulatory agency that issues permits will likely be more discerning in making permit determinations.280 The specter of liability may compel these agencies to conduct more thorough investigations into company practices and performance history.281 In order to avoid liability, proactive agencies might adopt more robust monitoring activities to curb risky behavior and prevent contamination.282

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276 See Echeverria, supra note 274, at 573, 606.


278 See Kirk, supra note 277, at 910–11.

279 See id.

280 See id.


282 See Kirk, supra note 277, at 910–11; Yeager, supra note 281, at 658.
This external regulation, in turn, incentivizes petroleum companies to proactively police themselves, which in turn could raise the standard of fracking safety in the United States. \(^\text{283}\) Alternatively, if a state chooses not to respond affirmatively with regulation and oversight, it may simply grant fewer—if any—permits. \(^\text{284}\)

The cost of compliance, paired with the overall chilling effect of states not granting permits, would cut into the industry’s bottom line. \(^\text{285}\) This would worsen the already tenuous position of hydrofracking gas in a market flooded with cheaper Middle Eastern crude oil. \(^\text{286}\)

**CONCLUSION**

Communities impacted by the environmental and public health consequences of hydraulic fracturing find themselves with a limited legal toolkit. They cannot utilize landmark environmental statutes, like the Safe Drinking Water Act or the Clean Water Act, because a powerful web of industrial and political interests has undercut the citizen enforcement provisions of these laws. Common-law tort actions against hydrofracking operations likewise find little success. Potential plaintiffs could increase their likelihood of victory, however, if they also leveled an attack on the government. State regulatory agencies could face liability for granting a fracking permit to a rig that ends up contaminating the surrounding groundwater under an inverse condemnation theory. In short, the government’s act of granting a permit, and thus orchestrating the placement of the fracking rig, interfered with residents’ use and enjoyment of their property. Though there is a causal gap between the government’s actions and the direct interruption of property rights, specifically water contamination, courts have found agencies liable under comparable circumstances. Thus, the government could be Constitutionally compelled to compensate the individuals for the damage done to their property interests.

Regulatory agencies that fear liability for granting a permit would increase monitoring and regulation, and they would likely grant fewer permits overall. This oversight could very likely decrease the chance of an environmental hydrofracking disaster, and also have the side effect of chilling the growth of an industry that is already on economically thin ice.


\(^{284}\) See Kirk, supra note 277, at 910–11; Yeager, supra note 281, at 658.


\(^{286}\) See Salmon, supra note 285, at 483; Andy Rowell, *Half of U.S. Fracking Industry Could Go Bankrupt as Oil Prices Continue to Fall*, ECOWATCH (Jan. 18 2016, 2:29 PM), http://ecowatch.com/2016/01/18/fracking-industry-bankrupt/ [https://perma.cc/ZA3E-QTUE].