

COMMENT

FAULTY PIPELINE AND THE HOLEY SHALE: THE FUNDAMENTAL TRESPASS OF FRACKING

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Anglo-American courts, perhaps more than any others, hold property rights in extremely high regard. Of those rights, the right to exclude others is the most central. Beginning in the late 1800's, American courts strove to apply centuries-old case law to the new and rapidly growing field of oil and gas production. In a system of law which held nearly any physical invasion to be trespassory, the courts struggled to resolve issues of ownership of fluid, subterranean minerals. Faced with mounting pressure from industry and private landowners, the courts developed the rule of capture.

The rule was simple: so long as no equipment crosses property lines, any extracted minerals belong to the operators. Regardless of where the minerals lay, whoever drew them up—thereby capturing them—claimed ownership. The rule protected oil and gas wellhead operators from claims of trespass and conversion even when the gas flowed to their wellhead from underneath an adjacent property. So long as the drilling, pumping, and extraction remained on owned or leased property, the operators were free to produce as much as they could.

For over a century, the rule guided and shaped the oil and gas industry and how it interacted with private landowners. However, fracking, an extraction process which injects water, chemicals, and other materials underground

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irrespective of property lines, is causing a new generation of claims. Despite the near-certain physical invasion of injectants below ground, Texas and Pennsylvania courts recently decided that the rule applies regardless.

The application of the rule assumes that the geological realities of 19th century drilling apply to modern fracking. While the products are the same, the processes are wildly different, and the consequences of ignoring these differences are harming private land owners across America. Once the wells run dry, these predominantly underprivileged communities are left with the lingering social, economic, and health costs of fracking, much of which is justified largely by fracking's questionable connection to the rule of capture. This Comment examines these decisions, the precedent on which they stand, and the fundamental flaws of applying the rule of capture to modern fracking.

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Cujus est solum, ejus est usque ad coelum et ad inferos

INTRODUCTION

Throughout the development of Anglo-American common law, the right of a landowner to exclude others from their property was “one of the most essential sticks in the bundle of rights that are commonly characterized as property.”¹ The correlative rights of landowners, those other “sticks” forming the bundle of property rights, all stem from the exclusive right of possession.² Traditionally, violations of this right, usually claimed under the tort of trespass, occurred within sight or sense of the landowner.³ In such cases, the evidence of not only the trespass, but of the resulting damage, however slight, was readily available to the landowner and thus to the courts.⁴

What happens then when trespass occurs miles below the surface of the land where only sophisticated agents with expensive equipment are capable of detecting the intrusion? Should the landowners, who are in many cases underprivileged, be expected to wield the same sophistication as multi-national energy companies to protect their property rights?⁵ To demand exact evidence of intrusion from landowners that even the energy companies themselves cannot accurately develop is a gross imbalance—one that only survives from its shaky legal lineage stretching back to the oil booms of the late 19th and early 20th centuries.

This Comment argues that the rule of capture, developed to defeat claims of trespass in an era when scientific inadequacy demanded legal certainty, is fundamentally inapplicable to fracking. This Comment

1. *Kaiser Aetna v. United States*, 444 U.S. 164, 176 (1979).

2. *See United States v. Craft*, 535 U.S. 274, 278–80 (2002) (describing the “bundle of sticks” as a “collection of individual rights which, in certain combinations, constitute property”).

3. *See Dougherty v. Stepp*, 18 N.C. 371, 372 (1835) (awarding nominal damages to a landowner after a surveyor walked over the landowner’s property uninvited). The lack of any substantial damage, beyond “treading down the grass,” was irrelevant, as “[f]rom every such entry against the will of the possessor, the law infers some damage.” *Id.*

4. *See infra* Section I.A.

5. *See* Raven Rakia, *Fracking Waste More Likely to Be Located in Poor Communities and Neighborhoods of Color*, GRIST (Feb. 3, 2016), <https://grist.org/climate-energy/fracking-waste-more-likely-to-be-located-in-poor-communities-and-neighborhoods-of-color> [<https://perma.cc/64TQ-DLSS>] (finding that people in areas with more than eighty percent minority populations were over two times as likely to live near fracking wastewater wells than areas with less than twenty percent minority populations).

begins by examining the traditional notions of property ownership inherited by the American courts from English common law, then lays out how the rapid expansion of oil drilling over a century ago stressed these traditional mores.⁶ The result of this expansion was the rule of capture, which quieted claims of trespass so long as no physical intrusion occurred on, over, or under an unleased property.⁷ This Comment then explains why the physical processes of fracking, which involve the subterranean propulsion of physical materials across vast, uncertain distances, are fundamentally misaligned with the core tenets of trespass and the rule of capture.⁸ In doing so, it will demonstrate a worrying trend in courts' approach to fracking, the evidentiary imbalance that emerges, and the consequences on communities.⁹ Finally, this Comment argues for a presumption of trespass whenever fracking operations occur within the standard well-operation range of an unleased property, thereby shifting the evidentiary burden onto those responsible for the harms caused by invasive fracking.¹⁰

I. BACKGROUND

When scrutinizing the modern application of the rule of capture, it is essential to understand where the rule comes from and why it was developed. Part I begins by briefly exploring the traditional American treatment of the tort of trespass—the most common claim which the rule sought to quiet. Next, it discusses how this precedent was applied to the burgeoning field of oil and gas development. Finally, this Part explains the key differences between the methods of extraction for which the rule was designed and the modern process of hydraulic fracturing. These key differences are the primary reasons why the centuries-old rule is inapplicable to modern mineral extraction.

A. *Development of Trespass Law in U.S. Courts*

Trespass, like so many other aspects of American common law, has its roots in English common law.¹¹ In his *Commentaries on the Laws of*

6. See *infra* Section I.A.

7. See *infra* Section I.B.

8. See *infra* Section I.C.

9. See *infra* Part II.

10. See *infra* Part III.

11. See generally George F. Deiser, *The Development of Principle in Trespass*, 27 YALE L.J. 220, 220–22 (1917) (cataloguing the historical developments which fueled the legal concept of tortious trespass). The notion that damages were a fundamental part of the legal claim of trespass varied, though early courts generally assigned liability

England, William Blackstone wrote that the English common property law venerated the ancient ownership theory “[c]ujus est solum, ejus est usque ad coelum [et ad inferos.]”¹² Translated to English, this edict holds that “whoever owns the soil, it is theirs all the way to Heaven and [all the way] to Hell.”¹³ This theory, known as the *ad coelum* doctrine, came to the United States as part of the nation’s legal inheritance from England.¹⁴ Under it, any intrusion on, about, over, or under one’s property was seen as a tortious invasion of this pillar of property.¹⁵

Although some states, such as Texas and Pennsylvania, created slightly different rules, over time, the courts generally consolidated and distilled the concept of trespass.¹⁶ Early American courts discarded

where trespass could be proven without considering actual harm. *Id.* at 21. Any signs of actual injury were then used in evaluating the degree of liability. *See id.*; George E. Woodbine, *The Origins of the Action of Trespass*, 34 YALE L.J. 343, 343–45, 348–58 (1925) (explaining the origin of monetary damages as a remedy for trespass, particularly where the damage was done to property that could not easily be replaced).

12. William Blackstone, 1 COMMENTARIES ON THE LAWS OF ENGLAND 733 (William Carey Jones ed., 1916). “Land hath also, in its legal signification, an indefinite extent, upwards as well as downwards . . . [T]herefore, no man may erect any building, or the like, to overhang another’s land: and, downwards, whatever is in a direct line between the surface of any land and the center of the earth, belongs to the owner of the surface.” *Id.* at 733–34.

13. Samantha J. Hepburn, *Ownership Models for Geological Sequestration: A Comparison of the Emergent Regulatory Models in Australia & the United States*, 44 ENV’T L. REP. NEWS & ANALYSIS 10310, 10313 (2014).

14. JAMES KENT, COMMENTARIES ON AMERICAN LAW 188 (Wm. Hardcastle Browne ed., 1894) (“[T]he [English] common law . . . has been recognized and adopted as one entire system . . . It has been assumed by the courts of justice or declared by statute, with the like modifications, as the law of the land, in every state.”).

15. *See, e.g.*, *Murphy v. Bolger*, 15 A. 365, 368 (Vt. 1888) (holding that the corner of a neighbor’s roof, narrowly projecting over the property line, to be a nuisance); *Wilmarth v. Woodcock*, 25 N.W. 475, 477 (Mich. 1885) (explaining that a cornice overhanging a mere sixteen inches above a neighbor’s property is a private nuisance).

16. In Texas, “[t]respass to real property occurs when a person enters another’s land without consent.” *E.g.*, *Wilens v. Falkenstein*, 191 S.W.3d 791, 797 (Tex. App. 2006) (holding that a landscaping company trespassed, despite another person’s permission, because it did not have the owner’s consent to enter his property).

To recover damages for trespass to real property, a plaintiff must prove that (1) the plaintiff owns or has a lawful right to possess real property; (2) the defendant entered the plaintiff’s land and the entry was physical, intentional, and voluntary; and (3) the defendant’s trespass caused injury to the plaintiff. *Id.* at 798. This injury requirement has proven to be a significant hurdle to landowners who lease their mineral rights, only to have their gas drawn up on a royalty-free plot next door. *See infra* Part II. In Pennsylvania, a trespass occurs when an uninvited person intrudes upon land of another, regardless of intent. *See, e.g.*, *Kopka v. Bell Tel. Co. of*

the requirement that the invader must personally enter another's land to substantiate a claim for trespass.¹⁷ According to the Restatement,

[o]ne is subject to liability to another for trespass, irrespective of whether he thereby causes harm to any legally protected interest of the other, if he intentionally (a) enters land in the possession of the other, causes a thing or a third person to do so, or (b) remains on the land, or (c) fails to remove from the land a thing which he is under a duty to remove.¹⁸

Trespass itself is not limited to invasions on the surface of owned property. Common law also regards uninvited intrusions above or below the surface as trespassory.¹⁹ Courts have further held that even minor, temporary intrusions over a neighbor's property constitute a trespass.²⁰ However, as industry innovations demanded the use of space

Pa., 91 A.2d 232, 235 (Pa. 1952) (holding the mistaken placement of a dig site for a small hole irrelevant to the claim of trespass).

17. See *Prewitt v. Clayton*, 21 Ky. 4, 5 (1827) ("The dwelling house is one's close . . . his sanctuary . . . How can a trespass . . . be more plainly . . . complained of and averred? It cannot be pretended that one who stands in a street . . . and by[,] throwing stones[,] . . . is not guilty of a trespass."); *Wheeler v. Norton*, 92 A.D. 368, 369–70 (N.Y. App. Div. 1904) (holding sub-contractors liable for trespass because, while excavating a subway tunnel, their excavators broke a water main, causing injury to an adjoining property). These two cases, *Prewitt v. Clayton* and *Wheeler v. Norton*, became the inspiration for illustrations of trespass in the *Restatement (Second) of Torts*. RESTATEMENT (SECOND) OF TORTS § 158, cmt. i, illus. 5 (AM. L. INST. 1965). The 1907 Minnesota Supreme Court case, *Whittaker v. Stangvick*, in which the court held the defendant liable for trespass for firing a shotgun over the land of another, inspired another illustration. 111 N.W. 295, 295, 297 (Minn. 1907); RESTATEMENT (SECOND) OF TORTS § 158 cmt. i, illus. 6. In *Whittaker*, the actual damages were never considered, as "[t]o constitute trespass to land, neither the extent of the damage nor the form of the instrumentality by which the close is broken is material." *Whittaker*, 111 N.W. at 295.

18. RESTATEMENT (SECOND) OF TORTS § 158 (AM. L. INST. 1965).

19. See, e.g., *Hannabalsen v. Sessions*, 90 N.W. 93, 95 (Iowa 1902) ("The mere fact that plaintiff did not step across the boundary line does not make her any less a trespasser if she reached her arm across the line It is one of the oldest rules of property known to the law that the title of the owner of the soil extends, not only downward to the center of the earth, but upward"); *Hastings Oil Co. v. Tex. Co.*, 234 S.W.2d 389, 396 (Tex. 1950) (holding that proposed, horizontal, subsurface drilling as sufficiently impending and invasive to constitute an imminent trespass). This differentiation between vertical wells, which remain entirely on owned or leased property and draw up oil gas in a reservoir that spans other properties, and deviated wells, which cross under adjacent property to reach remote reservoirs, is central to this Comment's theory of fracking as trespass. See *infra* Section I.C.

20. See, e.g., *Butler v. Frontier Tel. Co.*, 79 N.E. 716, 716 (N.Y. 1906) (telephone wires); *Hannabalsen*, 90 N.W. at 96 (an arm); *Murphy*, 15 A. at 368 (the corner of a neighbor's roof); *Wilmarth*, 25 N.W. at 477 (overhanging cornice).

above and below owned property, the courts pared down the application of the *ad coelum* doctrine.²¹ For example, in considering allegations of trespass and government takings for aircrafts flying hundreds of feet above a non-consenting landowner's property, the Supreme Court stated, "[i]t is ancient doctrine that at common law ownership of the land extended to the periphery of the universe—*cujus est solum ejus est usque ad coelum*. But that doctrine has no place in the modern world."²² The Court further explained that "[t]he landowner owns at least as much of the space above the ground as they can occupy or use in connection with the land. The fact that he does not occupy it in a physical sense—by the erection of buildings and the like—is not material."²³ This additional condition—that the trespass affects not just an infinite pillar of property but some part of the land the owner can use and enjoy—immediately curbed the *ad coelum* approach to trespass.²⁴ However, the *ad coelum* survives as a generally accepted concept in the United States.²⁵

21. See *United States v. Causby*, 328 U.S. 256, 260–61 (1946) (discussing that the previous understanding of ownership extending above and below land is not compatible with the modern environment).

22. *Id.* at 258, 260–61 ("The air is a public highway Were that not true, every transcontinental flight would subject the operator to countless trespass suits. Common sense revolts at the idea."). *Causby* created to a new branch of trespass law, one in which the plaintiff must have some reasonable expectation of use or enjoyment of the affected property. See *id.* at 262 (distinguishing between trespass cases where the enjoyment and use of the land is completely destroyed versus those where it is not). The enjoyment requirement is stressed, then, when applied to the infliction of harm from an un-enjoyed, subsurface tract. See *infra* Section III.B.

23. *Causby*, 328 U.S. at 264 (citation omitted) (citing *Hinman v. Pac. Air Transp. Corp.*, 84 F.2d 755, 758 (9th Cir. 1936)).

24. See Jill Morgan, *Digging Deep: Property Rights in Subterranean Space and the Challenge of Carbon Capture and Storage*, 62 INT'L & COMPAR. L. Q. 813, 818–19 (tracing the origin, growth, curbing, and survival of the *ad coelum* doctrine from thirteenth century England to modern satellite programs).

25. *Id.* English common law is rife with minor invasions supporting a claim of trespass, including twenty-inch concrete slabs, rock anchors, and tree roots, as well as more major invasions, such as tunneling and coal mining. *Id.* at 821–22, 24. The degree of the invasion is rarely a consideration in determining whether a trespass occurred, only in the subsequent assessment of damages. See *supra* note 13 and associated text.

B. The American Ad Coelum Doctrine and the Rule of Capture

Colonel E.L. Drake drilled the first commercially successful oil well in 1859 in Titusville, Pennsylvania.²⁶ Almost overnight, the theory of unlimited ownership from heaven to hell came into dire conflict with the massive economic and social pressures born of the world's first oil boom.²⁷ Suddenly, tracts of land over oil-bearing stratum saw their prices soar over 100 times their original value.²⁸ With more oil discoveries, unfettered speculation caused an explosion in land prices in the region.²⁹ In 1901, one man who had tried for three years to sell his property for \$150 sold his land for \$20,000.³⁰ Fifteen minutes later, the buyer flipped the property to a second investor for \$50,000.³¹ One of the earliest wells drilled in Beaumont, which had an initial investment of under \$10,000, sold for \$1,250,000.³² That year, an estimated \$235 million was invested in Texas oil, amounting to nearly \$6.5 billion today.³³

Such rapid expansion and tumultuous investment led to a torrent of litigation.³⁴ As the courts struggled to assign fixed ownership to a fluid mineral, the judiciary turned to the rule of capture.³⁵ The rule of

26. J.E. BRANTLY, HISTORY OF OIL WELL DRILLING 153 (1971) (“The first well drilled purposefully for oil in the United States . . . was the Drake well.”).

27. See PAUL GIDDENS, THE BIRTH OF THE OIL INDUSTRY 57–61 (1938) (detailing the operation and consequences of the Drake well).

28. Robert Wooster & Christine Moor Sanders, *Spindletop Oilfield*, TEX. STATE HIST. ASS'N (Apr. 2, 2019), <https://www.tshaonline.org/handbook/entries/spindletop-oilfield> [<https://perma.cc/65CV-U4RG>]. Nearly forty years later, in 1901, Patillo Higgins and Captain Anthony Lucas discovered massive oil reserves in Beaumont, Texas. *Id.*

29. See Wooster, *supra* note 28.

30. *Id.*

31. *Id.*

32. *Id.*

33. *Id.*

34. See *infra* Part II.

35. For an early application of this principle of ownership, see *Pierson v. Post*, 3 Cai. 175, 175 (N.Y. Sup. Ct. 1805).

Pursuit alone gives no right of property in animals *feræ naturæ*, therefore an action will not lie against a man for killing and taking one pursued by, and in the view of, the person who originally found, started, chased it, and was on the point of seizing it. Occupancy in wild animals can be acquired only by possession . . . as to so circumvent the creature that he cannot escape.

Id. The wandering animal approach taken by the Supreme Court of New York became a common touchpoint for mineral cases across the United States as courts struggled to determine fixed ownership of fluids for the next two centuries. See *infra* Part II.

capture provides that the first person to control a resource is entitled to its ownership.³⁶ In essence, the rule precludes damages for conversion so long as the minerals flowed freely under property lines without physical invasion thereunder.³⁷ The rule was traditionally applied to wild animals and later to subterranean water rights in England throughout the 19th century.³⁸ As American courts struggled with contests of oil and gas ownership, they applied the rule to these minerals.

As the birthplace of the earliest oil booms, Pennsylvania quickly became the focus of the ensuing legal battles.³⁹ The 1889 Pennsylvania Supreme Court case *Westmoreland & Cambria Natural Gas Co. v. DeWitt*⁴⁰ was the leading application of the rule of capture to mineral rights.⁴¹ The court held that free-flowing minerals belong to those who draw them from the ground, thereby capturing them, regardless of who owns the land over the minerals:⁴²

[G]as is a mineral, and while *in situ* is part of the land, and therefore possession of the land is possession of the gas. But this deduction must be made with some qualifications. Gas . . . is a mineral with peculiar attributes [O]il, and still more strongly gas, may be classed by themselves . . . as minerals *ferae naturae*. In common with animals, and unlike other minerals, they have the power and the tendency to escape without the volition of the owner. Their 'fugitive and wandering existence within the limits of a particular tract was

36. Michael C. Blumm & Lucus Ritchie, *The Pioneer Spirit and the Public Trust: The American Rule of Capture and State Ownership of Wildlife*, 35 ENVIRON. L. 673, 690 (2005).

37. *Fracking and the Rule of Capture*, ECKERT SEAMANS (Apr. 19, 2018), <https://www.eckertseamans.com/legal-updates/fracking-and-the-rule-of-capture> [<https://perma.cc/5AWU-Q2MD>].

38. See *Acton v. Blundell*, 152 Eng. Rep. 1223, 1223, 1232, 1235 (Ex. Ch. 1843) (“The owner of land through which water flows in a subterranean course, has no right or interest in it which will enable him to maintain an action against a landowner, who, in carrying on mining operations in his own land in the usual manner, drains away the water from the land of the first-mentioned owner, and lays his well dry.”).

39. See, e.g., Michael Rubinkam, *Pennsylvania Lawmakers Sue over Delaware River Drilling Ban*, AP NEWS (Jan. 12, 2021), <https://apnews.com/article/legislature-drinking-water-quality-hydraulic-fracturing-pennsylvania-lawsuits-8f85f19cc5028d1e181cb1292b9850e3>; *Westmoreland & Cambria Nat. Gas Co. v. DeWitt*, 18 A. 724 (Pa. 1889).

40. *Westmoreland*, 18 A. at 724.

41. *Id.* at 725 (delineating that while landowners possess rights over oil and gas below the surface of their land, these ownership rights cease when an adjacent landowner is able to direct the resources into his own well).

42. *Id.*

uncertain.' They belong to the owner of the land, and are part of it, so long as they are on or in it, and are subject to his control; but when they escape, and go into other land, or come under another's control, the title of the former owner is gone. Possession of the land, therefore, is not necessarily possession of the gas. If an adjoining, or even a distant, owner, drills his own land, and taps your gas, so that it comes into his well and under his control, it is no longer yours, but his . . . [T]he one who controls the gas—has it in his grasp, so to speak—is the one who has possession in the legal as well as in the ordinary sense of the word.⁴³

Six years later, the U.S. Supreme Court harkened back to and affirmed the *Westmoreland* principle in deciding *Brown v. Spilman*.⁴⁴ In *Brown*, the Court specifically reaffirmed the notion that gas, when drawn up in a well contained entirely on an operator's land, becomes the property of the operator.⁴⁵

Throughout the twentieth century, *Westmoreland* and *Brown* guided the nation's courts as disputes over these meandering minerals percolated wherever oil did the same.⁴⁶ So long as operators drilled their "own" land, they owed any gas produced from their well.⁴⁷ Robert E. Hardwicke, a mineral rights attorney, summarized the developments in the rule of capture: "The owner of a tract of land acquires title to the oil and gas which he produces from wells drilled thereon, though it may be proved that part of such oil or gas migrated

43. *Id.* at 725.

44. 155 U.S. 665 (1895) ("If an adjoining owner drills his own land, and taps a deposit [sic] of oil or gas, extending under his neighbor's field, so that it comes into his well, it becomes his property").

45. *Id.*

46. *See, e.g.,* *Occidental Permian Ltd. v. Helen Jones Found.*, 333 S.W.3d 392, 409 (Tex. App. 2011) ("[T]he rule of capture provides that a landowner owns all of the oil and gas produced by a *legally* drilled well located on his land, even though the well may be draining minerals from nearby properties." (emphasis added) (quoting *SWEPI, L.P. v. Camden Res., Inc.*, 139 S.W.3d 332, 341 (Tex. App. 2004))); *Cowling v. Bd. of Oil, Gas & Mining*, 830 P.2d 220, 224 (Utah 1991) (finding a landowner not liable to adjacent landowner "even if the producing well [is] drilled next to the adjoining landowner's boundary"); *Rist v. Toole Cty.*, 159 P.2d 340, 343 (Mont. 1945) ("The general rule is that: 'Both petroleum and gas, as long as they remain in the ground, are a part of the realty. They belong to the owner of the land, and are a part of it as long as they are on it or in it, or subject to his control.'" (quoting *Gas Prods. Co. v. Rankin*, 207 P. 993, 998 (Mont. 1922))); *Jones v. Forest Oil Co.*, 44 A. 1074, 1075 (Pa. 1900) ("[T]he property of the owner of lands in oil and gas is not absolute until it is actually within his grasp, and brought to the surface.").

47. *Westmoreland*, 18 A. at 725.

from adjoining lands.”⁴⁸ Traditionally, adjoining landowners whose lands were drained had no recourse but to drill themselves.⁴⁹ However, the rule does not give complete license to wellhead operators to invade unleased property.⁵⁰ As the courts grappled with the issue of ownership over subterranean, migratory minerals, extraction methods advanced and demanded further inquiry.

Early challenges to drainage usually took the form of allegations of trespass or conversion of oil or gas.⁵¹ The rule of capture was sufficient to defeat many claims of trespass, though with a limitation.⁵² When an operator physically invades another’s subsurface property, such as by a drill or pipeline, then rule fails, and the operators can be held liable for trespass.⁵³ Originally, the invasion took the form of a horizontal or deviated well.⁵⁴ This procedure allows operators to access reservoirs that exist solely underneath a neighbor’s property. When the operation extends a physical object across lease lines or bottoms beneath a neighbor’s property, courts universally hold the operators

48. Robert E. Hardwicke, *The Rule of Capture and Its Implications as Applied to Oil and Gas*, 13 TEX. L. REV. 391, 393 (1935).

49. See *Barnard v. Monongahela Nat. Gas Co.*, 65 A. 801, 803 (Pa. 1907) (per curiam) (“What then can the neighbor do? Nothing; only go and do likewise.”).

50. *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334, 337 (Pa. 2020) (holding that wellhead operators cannot invade a neighboring property by drilling horizontally).

51. See, e.g., *Ross v. Damm*, 270 N.W. 722, 723 (Mich. 1936) (conversion suit for drilling offset wells near another’s property line); *Gliptis v. Fifteen Oil Co.*, 16 So. 2d 471, 473 (La. 1944) (trespass suit for involving well drilled 33 feet from neighboring property).

52. See *Briggs*, 224 A.3d at 337 (disallowing the subterranean drilling of another’s property through slant drilling).

53. *Diamond McCattle Co. v. Range La. Operating LLC*, 2018 WL 6728587, at *5 (W.D. La. Dec. 21, 2018), *aff’d*, 316 So. 3d 603 (2021) (“Defendants acted without probable cause and in ‘bad faith’ in drilling the [well] horizontally under and through Plaintiffs’ land . . . and Plaintiffs are entitled to a declaratory judgment recognizing Plaintiffs as the owners of the ‘bore-hole’ of the [well], to the extent that the ‘bore-hole’ is located on Plaintiffs’ land.”).

54. Jason A. Proctor, Note, *The Legality of Drilling Sideways: Horizontal Drilling and Its Future in West Virginia*, 115 W. VA. L. REV. 491, 496 (2012) These wells bore vertically until the shaft was situated just above the targeted formation. *Id.* at 497; see also *id.* at 516–17, 529–30 (urging West Virginia courts to strengthen the protection against wells that cross under lease lines to protect individual landowners). This argument stands on decades of coal and other mining cases that suggest the same approach. *Id.* at 529–30. Then, a rotating mechanism curves the trajectory of the bore from the “kick-off point” until the shaft runs horizontally along the bed of rock-encased oil and gas. Lynn Helms, *Horizontal Drilling*, 35 DMR NEWSL., no. 1, at 1–2.

liable because the horizontal drilling constitutes trespass.⁵⁵ However, the modern approach to drilling, which uses heavy equipment and chemicals to access distant, isolated minerals, receives a very different treatment.

C. Conventional and Unconventional Extraction of Oil and Gas

Oil and gas extraction are classified as either “conventional” or “non-conventional.”⁵⁶ Conventional extraction is fairly straightforward. Well operators use drills attached to a length of pipe, or “drill string,” to bore hundreds of feet down through earth and rock.⁵⁷ As the drill descends and grinds through the earth, it punctures a reservoir of oil or gas.⁵⁸ After well operators drill the borehole, they reinforce it with steel casings to allow the oil and gas to flow to the surface, driven by the natural pressure from the well and pumping operations.⁵⁹ Non-conventional operations, on the other hand, usually drill at an angle

55. See, e.g., *Young v. Ethyl Corp.*, 521 F.2d 771, 772, 775 (8th Cir. 1975) (holding that the rule of capture does not apply where the developer injected water beneath the plaintiff’s land to force subsurface brine out of its location so that it could be harvested through wells situated on the developer’s property); *Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1, 13 (Tex. 2008) (“[A] deviated or slant well—a well that departs from the vertical significantly—bottomed on another’s property . . . is unlawful.”); *Hastings Oil Co. v. Tex. Co.*, 234 S.W.2d 389, 390–91 (Tex. 1950) (holding wells entering others’ property to be illegal); *Gliptis*, 16 So. 2d at 474 (noting that wells located on the surface and near the property line of an owner’s land frequently deviate vertically under the ground, therefore constituting a subsurface trespass on a neighbor’s property, which is unlawful if done intentionally); *Edwards v. Lachman*, 534 P.2d 670, 672 (Okla. 1974) (“[Defendant’s slanted well] wrongfully and unlawfully trespassed upon, in and under plaintiffs’ land . . . and unlawfully converted the hydrocarbons therefrom . . .”). The *Edwards* court continued to analyze how the defendant operator’s intent was not a factor of trespass, but for the assessment of damages. *Id.* at 673.

56. *Conventional vs. Unconventional Oil & Gas Wells in the U.S.*, GRYPHON OILFIELD SOLS. [hereinafter GRYPHON], <https://www.gryphonoilfield.com/conventional-vs-unconventional-oil-gas-wells-in-u-s> [https://web.archive.org/web/20211122125221/https://www.gryphonoilfield.com/conventional-vs-unconventional-oil-gas-wells-in-u-s/]. For an in-depth explanation of non-conventional recovery, see JOHN A. HARPER, PA. GEOLOGICAL SURV., ENHANCED OIL RECOVERY IN THE UPPER DEVONIAN BRADFORD OIL FIELD 59–68 (2010); RONALD A. RILEY ET AL., EVALUATION OF CO₂-ENHANCED OIL RECOVERY AND SEQUESTRATION OPPORTUNITIES IN OIL AND GAS FIELDS IN THE MRCSP REGION 7 (2010).

57. GRYPHON, *supra* note 56.

58. *Id.*

59. *Id.*

and inject fluids to extract minerals otherwise unreachable by conventional means.

1. *Conventional Extraction*

Two important aspects of conventional extraction shape how the courts decide who owns the minerals so captured: the geological makeup of the material around the minerals and how the minerals flow therein. The first important aspect of conventional extraction is the geological makeup of the exploited strata. In conventional extraction, the oil and gas are stored in large, porous pockets, called reservoirs.⁶⁰ This formation acts as a catch, or a trap, for oil and gas that have “migrated” towards the surface from a deeper source rock structure.⁶¹ The ideal conventional reservoir is large, and some reservoirs can span hundreds of acres as one, largely connected mass.⁶² The natural pathways through which the oil and gas migrate are connected such that conventional wells can tap the entirety of an interconnected, property-spanning reservoir without ever crossing property lines.⁶³ Because of the physical nature of these conventional reservoirs, determining the owner of oil and gas as they flowed deep underground towards a well, irrespective of lease lines, was virtually impossible.⁶⁴

The second key aspect is a reliance on “the natural pressure of the reservoir or gravity [to] drive oil into the wellbore, combined with artificial lift techniques (such as pumps) which bring the oil to the surface.”⁶⁵ Thus, in conventional extraction, the oil and gas are primarily “pushed” to the surface by natural, preexisting pressure differentials.⁶⁶ Under conventional methods, the minerals will, of their own volition, move or flow from a neighboring, unleased plot to a

60. *Id.*

61. Off. of Fossil Energy & Carbon Mgmt., *Shale Research and Development*, U.S. DEP’T OF ENERGY [hereinafter *Shale Research and Development*], <https://www.energy.gov/fe/science-innovation/oil-gas-research/shale-gas-rd> [https://perma.cc/TY3A-LFYE].

62. *Id.*

63. *Wettengel v. Gormley*, 28 A. 934, 935 (Pa. 1894).

64. *See Westmoreland & Cambria Nat. Gas Co. v. De Witt*, 18 A. 724, 725 (Pa. 1889) (analogizing oil property rights to wild animal property rights because oil’s vagrant properties cause uncertainty in determining its specific underground location).

65. Off. of Fossil Energy & Carbon Mgmt., *Enhanced Oil Recovery*, U.S. DEP’T OF ENERGY, <https://www.energy.gov/fe/science-innovation/oil-gas-research/enhanced-oil-recovery> [https://perma.cc/RTR8-MYMN].

66. *Id.*

distant wellhead without the need to physically intrude upon the neighbor's property.⁶⁷ In subsequent extraction operations, when pumps are used to artificially induce further drainage, the pumps and their supporting infrastructure are collocated with the well.⁶⁸ Because the oil-bearing strata extends in one connected mass, there is no need to physically intrude on or under a neighbor's land to reach their minerals. Therefore, absent a wellbore that deviates to such a degree that it crosses under lease lines, there is no substantiation for an action of trespass.⁶⁹ These two aspects of conventional extraction, the natural tendency of the oil to travel and the natural pathways through which it can travel, served as the baseline for the application of the rule of capture to oil and gas extraction as it was known in the late 19th and early 20th centuries.⁷⁰

The natural tendency to migrate became one of the fundamental, logical foundations of the application of the rule of capture in early caselaw.⁷¹ The Pennsylvania Supreme Court explained the concept in 1894:

An oil or gas well may thus draw its product from an indefinite distance, and in time exhaust a large space. Exact knowledge on this subject is not at present attainable, but the vagrant character of the mineral, and the porous sand rock in which it is found and through which it moves, fully justify the general conclusion we have stated above, and have led to its general adoption by practical operators.⁷²

67. *Id.*

68. GRYPHON, *supra* note 56.

69. Coastal Oil & Gas Corp. v. Garza Energy Tr., 268 S.W.3d 1, 13 (Tex. 2008).

70. See Ryan Consol. Petrol. Corp. v. Pickens, 285 S.W.2d 201, 208 (Tex. 1955) (“[In Texas] oil and gas in place are by the established rules of property a part of the realty or corpus of the land . . . When oil or gas is removed from the soil it becomes personalty.”); see also Brown v. Humble Oil & Ref. Co., 83 S.W.2d 935, 940 (Tex. 1935) (“Owing to the peculiar characteristics of oil and gas, the foregoing rule of ownership of oil and gas in place should be considered in connection with the law of capture. This rule gives the right to produce all of the oil and gas that will flow out of the well *on one's land*; and this is a property right.” (emphasis added)).

71. See, e.g., Westmoreland & Cambria Nat. Gas Co. v. De Witt, 18 A. 724, 725 (Pa. 1889) (“[Oil and gas] have the power and the tendency to escape without the volition of the owner.”). This same reasoning was later cited by the U.S. Supreme Court in *Brown v. Spilman*, 155 U.S. 665, 669–70 (1895).

72. Wettengel v. Gormley, 28 A. 934, 935 (Pa. 1894). For a comparison of the natural characteristics of the subterranean minerals examined in this case with the same of the tightly-trapped, immobile minerals targeted by fracking operations, see *infra* Part II.

Although the initial yield from conventional drilling and reservoirs is better than that of other methods, much of the oil and gas is left in the reservoir or bore hole when the pressure differential equalizes and mechanical pumps can no longer draw up the minerals.⁷³ Relying solely on pressure differentials and mechanical pumps to draw oil and gas from thousands of feet below the surface leaves most of the reservoir untapped.⁷⁴ The demand for this remaining oil and gas led to the development of newer or “non-conventional” techniques.⁷⁵

2. *Non-Conventional Extraction: Fracking*

Oil and gas extraction has developed significantly since Colonel Drake’s first well in Pennsylvania. Because conventional drilling operations depleted 10% of oil and gas across oilfields,⁷⁶ producers shifted to “non-conventional” methods of extraction.⁷⁷ These methods include thermal recovery, a process that heats the subterranean reserves to improve the flowrate, and injection, where gas or chemical solutions are pumped into the reservoir in an attempt to flush out remaining minerals.⁷⁸ One of the most well-known types of injection recovery is hydraulic fracturing.

Hydraulic fracturing, or “fracking,” is a recovery method used to extract oil and gas from deep below the Earth’s surface in the stratum that conventional extraction cannot efficiently exploit.⁷⁹ The first major difference between conventional recovery and fracking is the targeted strata itself.⁸⁰ Most oil and gas produced by fracking are known as “tight oil” or “tight gas” because these pockets of minerals are tightly trapped in hard shale rock formations, unlike the larger, connected reservoirs targeted by conventional methods.⁸¹ According to the Department of Energy, “[i]n contrast to conventional

73. *Off. of Fossil Energy & Carbon Mgmt.*, *supra* note 65 (“[O]nly about 10 percent of a reservoir’s original oil in place is typically produced during primary recovery.”).

74. *Id.*

75. HARPER, *supra* note 56, at 11.

76. *Off. of Fossil Energy & Carbon Mgmt.*, *supra* note 65.

77. RILEY ET AL., *supra* note 56, at 5.

78. *Off. of Fossil Energy & Carbon Mgmt.*, *supra* note 65.

79. *The Process of Unconventional Natural Gas Production: Hydraulic Fracturing*, EPA [hereinafter EPA], <https://www.epa.gov/uog/process-unconventional-natural-gas-production> [<https://perma.cc/AG7L-84EL>].

80. *What Is Hydraulic Fracturing?*, U.S. GEOLOGICAL SURV., <https://www.usgs.gov/faqs/what-hydraulic-fracturing> [<https://perma.cc/8UZB-5YVV>] (discussing that fracking targets low-permeability source rocks).

81. *Id.*

reservoir[s], the unconventional reservoir contains oil and gas that were formed within the rock and never migrated.”⁸² This is because the geological makeup of the oil-bearing strata does not allow for the same free-flowing or migratory processes on which conventional extraction relies.⁸³ Instead, such reservoirs “need to be hydraulically fractured to create oil and gas flow-pathways.”⁸⁴

The process begins similarly to conventional extraction. Operators first need to drill hundreds or thousands of feet below the surface.⁸⁵ However, once operators dig the wellbore, the similarities cease.⁸⁶ Whereas conventional extraction allows the natural pressure differential in the reservoir to drive minerals to the surface through preexisting channels, fracking creates artificial channels in the sealed rock formation.⁸⁷ It does so by injecting large amounts of fluid—usually water, sand, and a proprietary blend of chemicals designed to induce a higher flowrate—into the oil-bearing strata.⁸⁸ The extreme pressure fractures the rock so that oil and gas can flow through otherwise impermeable stone. As these artificial channels begin to collapse, they are held open by proppants, which are most often sand, plastic, or ceramic beads.⁸⁹ This slurry of water, chemicals, and proppants allows the otherwise trapped natural gas or oil to flow and increases the types of the geological stratum that can be exploited and mineral volumes that can be recovered.⁹⁰ Most importantly, non-conventional recovery methods are not limited to the vertical reach of the well and include horizontal or directional sections extending thousands of feet.⁹¹

Once the injection and fracturing process is finished, the channels created by the process begin to normalize.⁹² This, coupled with the pressure of the injected slurry, creates an immense amount of back-pressure throughout the rock formation and causes fluid to rush to the

82. *Shale Research and Development*, *supra* note 62.

83. *Id.*

84. *Id.*

85. *Id.*

86. *See id.*

87. *Id.*

88. HARPER, *supra* note 56, at 62.

89. EPA, *supra* note 79.

90. *Id.*

91. *Id.*

92. GRYPHON, *supra* note 56.

surface through the wellbore.⁹³ The surfacing mixture is known as both “flowback” or “produced water” and contains not only the injected chemicals but may also yield naturally occurring materials such as “brines, metals, radionuclides, and hydrocarbons.”⁹⁴ The fluid is usually stored on site, most often in retaining tanks or pits, then treated before ultimate disposal or recycling.⁹⁵ Often, the mixture is simply re-injected into the same rock structure, leaving additional materials underground.⁹⁶ The same fluid may also be treated and recycled for further operations or processed by a wastewater treatment facility before being discharged into surface water.⁹⁷

Complex engineering and geography can obscure the basic physical process of fracking. As a simple illustration, picture a swimming pool where A and B each own half. The halves are roughly split across the middle of the pool, and A and B each own the water that lies on their respective sides out of the total, unknown quantity of water. Now, imagine A starts to drain the pool with a pump set on their side of the pool, a process analogous to conventional extraction. Even if it is virtually certain that some of the water A drains will come from B’s side of the pool, it is impossible to state exactly how much of the extracted water belongs to A and how much belongs to B. As A pumps, the natural tendency of water (and of oil and natural gas) to flow towards a lower pressure state causes water across the pool to flow towards A’s pump without A ever having to cross onto B’s side of the pool. In this illustration, and per the American courts, B’s only recourse is to start draining the pool themselves in order to claim their resource.⁹⁸ This is the basic premise of the rule of capture as applied to early mineral extraction.

Now imagine the same pool. This time, however, the pool is filled with neatly stacked, individual water bottles. The pool is still split between A and B and is still full of water, but now the water is trapped in isolated, static bottles, just as natural gas is trapped in hard rock

93. EPA, *supra* note 79.

94. *Id.*

95. *Id.*

96. *Id.*

97. *Id.*

98. B could simply drill on his own to offset drainage from his property. *See* Coastal Oil & Gas Corp. v. Garza Energy Tr., 268 S.W.3d 1, 14 (Tex. 2008); Barnard v. Monongahela Nat. Gas Co., 65 A. 801, 802 (Pa. 1907) (stating that the drained landowner, or B in the hypothetical, had little recourse against a well operation on his neighbor’s property beyond drilling a well himself).

formations and pockets.⁹⁹ If A punctures and drains the bottles on their side, as the injectants do in fracking, there is no effect on B's water. This is because the bottles, or pockets, are situated in such a way that does not allow a free and open flow from B's side of the pool to A's. The only way for A to access B's water is to employ a tool or process which crosses onto B's half of the pool. However, in doing so, A commits a trespass and discards the protection afforded by the rule of capture.¹⁰⁰

The differences in not only the extraction methods but also the geological formations exploited are hard to overstate. Perhaps Daniel Plainview, the nigh-sociopathic prospector from the 2007 film *There Will be Blood*, put it best. When recounting how he drained a neighbor's land of oil, Daniel explains, "[i]f you have a milkshake, and I have a milkshake, and I have a straw . . . [that] reaches across the room . . . and starts to drink your milkshake . . . I drink your milkshake!"¹⁰¹ Traditional operations function like a straw in a shared milkshake. Determining who owns each portion of the shake was simply beyond the ability of the courts that in turn resorted to the rule of capture.¹⁰² Fracking, however, is more like blasting a hole in the side of the same milkshake with a pressure washer and slurping up the spillage, leaving everyone at the table to deal with the mess.

D. *The Modern State of Fracking as Trespass*

U.S. dry natural gas production in 2020 was about 33.5 trillion cubic feet.¹⁰³ This constitutes an average of about 91.5 billion cubic feet per day, the second highest annual amount ever recorded.¹⁰⁴ This tremendous increase is almost entirely the result of horizontal drilling and hydraulic fracturing techniques, which primarily target shale and

99. *How Do We Get Oil and Gas out of the Ground*, WORLD PETROLEUM COUNCIL, <https://www.world-petroleum.org/edu/222-how-do-we-get-oil-and-gas-out-of-the-ground> [<https://perma.cc/YQV4-SNE7>].

100. See *Ryan Consol. Petrol. Corp. v. Pickens*, 285 S.W.2d 201, 208 (Tex. 1955) (noting that in Texas the rule of capture affords landowners with vested property right to the produce the oil beneath their land).

101. *THERE WILL BE BLOOD* (Paramount Vantage 2007).

102. *Ryan Consol. Petrol. Corp.*, 285 S.W.2d at 210 (Wilson, J., dissenting) (lamenting the rule of capture as a matter of legal expedience).

103. *Natural Gas Explained: Where Our Natural Gas Comes from*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/energyexplained/natural-gas/where-our-natural-gas-comes-from.php> [<https://perma.cc/YL85-PEHL>].

104. *Id.*

other tight geologic formations that preclude conventional recovery.¹⁰⁵ Currently, the Barnett Shale in Texas and the Marcellus Shale, which spans Ohio, Pennsylvania, and West Virginia, are the largest sources of natural gas from shale.¹⁰⁶ Texas and Pennsylvania collectively represented nearly half of U.S. natural gas production in 2020.¹⁰⁷ Naturally, these areas also give rise to the greatest number of trespass-by-fracture cases.¹⁰⁸

As these cases reach the courts, a troubling trend has emerged. A typical suit begins with the landowner, usually a private individual, bringing a trespass claim against a defendant energy company.¹⁰⁹ Defendants then typically defeat these claims by asserting the rule of capture.¹¹⁰ The leading case demonstrating this school of thought is *Coastal Oil & Gas Corp. v. Garza Energy Trust*.¹¹¹ In *Garza*, the Supreme Court of Texas held that the rule of capture precludes liability even when injectants physically invade another's property during fracking operations.¹¹² In *Briggs v. Southwestern Energy Production Co.*, the Pennsylvania Supreme Court limited the principles of *Garza*.¹¹³ There, the Pennsylvania Supreme Court determined that a physical intrusion of injectants could constitute trespass; however, the plaintiff's inability to conclusively prove that materials had crossed under their property barred recovery.¹¹⁴

105. *Id.*

106. *Id.*

107. *Id.*

108. *See, e.g.*, *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1 (Tex. 2008); *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334 (Pa. 2020). These two cases represent the most major modern developments of fracking as non-trespassory.

109. *See, e.g.*, *Briggs*, 224 A.3d at 339.

110. *See infra* Part II.

111. 268 S.W.3d 1 (Tex. 2008).

112. *Id.* at 14. *But see* Tiffany Dowel, *Did You Know?*, TEX. WATER RES. INST., <https://twri.tamu.edu/publications/txh2o/2014/summer-2014/did-you-know> [<https://perma.cc/W6B2-XGPW>] (describing Texas rule of capture as “the law of the biggest pump” and explaining that, at least in the case of sub-surface water extraction, “a landowner may not trespass onto another’s land . . . If a landowner’s pumping falls within one of these exceptions, he is not protected by the rule of capture and may be required to cease pumping or be liable for damages”).

113. 224 A.3d 334 (Pa. 2020).

114. *Id.* at 349 (“[A] plaintiff asserting a cause of action ‘must be able to prove all the elements of his case by proper evidentiary standards.’” (citing *Papieves v. Lawrence*, 263 A.2d 118, 121 (Pa. 1970))); *accord* *Chance v. BP Chems., Inc.*, 670 N.E.2d 985, 991 (Ohio 1996) (holding that plaintiffs alleging a subsurface trespass upon their property bear the burden of proving all elements of their claim).

1. *The Garza Model*

In *Garza*, the Supreme Court of Texas decided whether “subsurface hydraulic fracturing of a natural gas well that extends into another’s property is a trespass for which the value of gas drained as a result may be recovered as damages.”¹¹⁵ The plaintiffs-respondents, collectively referred to as Salinas, own a nearly 750-acre tract of land in Hidalgo County.¹¹⁶ The Salinas family had lived on the land, referred to as Share 13, for over 100 years.¹¹⁷ Share 13 is immediately adjacent to Shares 12 and 15, other tracts of land believed to contain natural gas.¹¹⁸ Coastal Oil & Gas holds mineral leases on Shares 12, 13, and 15.¹¹⁹ Each share is situated over a natural gas reservoir, known as the Vicksburg T formation, which runs about 12,000 feet below the surface of the land.¹²⁰ Coastal runs drilling operations across these shares and has done so for over forty years, and each share has been the subject of multiple title disputes and sporadic drilling.¹²¹ Some wells are so productive that they became known as an “exceptional producer[s].”¹²² Others far less so.¹²³

One exceptional producer was known as M. Salinas No. 3, or simply No. 3, which outpaced most wells drilled across the Vicksburg T formation.¹²⁴ No. 3 was about 1,700 feet from the neighboring share, Share 12, where Coastal held the full mineral rights and could drill and drain without paying royalties.¹²⁵ Because No. 3, which produced royalty-bound gas from Salinas’s land, was so productive, Coastal attempted to place a drill as close to No. 3 as it could while remaining on their own, royalty-free land on Share 12.¹²⁶ However, the Texas Railroad Commission refused to allow Coastal to drill because the proposed well was too close to an existing well, and both the proposed well and the existing well “would drain from Share 13.”¹²⁷ To clear the

115. *Garza*, 268 S.W.3d at 4.

116. *Id.* at 5.

117. *Id.*

118. *Id.*

119. *Id.*

120. *Id.*

121. *Id.* at 5–6.

122. *Id.* at 6.

123. *Id.*

124. *Id.*

125. *Id.* at 5–6.

126. *Id.* at 6.

127. *Id.*

spacing requirement, Coastal shut down the conflicting, operational, and productive well and ultimately drilled two new wells,¹²⁸ with one as close as 467 feet from Salinas's Share 13.¹²⁹

The court explained that

for the [more distant well], the frac[k]ing hydraulic length was designed to reach over 1,000 feet from the well. Salinas's expert . . . testified he would have designed the operation to extend at least 1,100 to 1,500 feet from the well. The farthest distance from the well to the Share 13 lease line was 660 feet. The parties agree that the hydraulic and propped lengths exceeded this distance, but they disagree whether the effective length did. The lengths cannot be measured directly, and each side bases its assertion on the opinions of an eminent engineer long experienced in hydraulic fracturing . . .¹³⁰

Both of the immediate wells were fracked.¹³¹ Salinas's expert witness testified that the fracking from the two new wells was "massive" and much larger than any other fracking operation across Share 13.¹³² At trial, Salinas claimed that Coastal had deliberately stymied drilling on Share 13 to favor the crowded well placement on Share 12, where Coastal paid no royalties on extracted gas.¹³³ Regarding the drainage of gas from Share 13 to Share 12, Salinas's expert testified that nearly one-third of the gas produced at the more distant well on Share 12 came from Share 13.¹³⁴ This amounted to over half a million dollars of gas drawn up by Coastal and over \$80,000 in lost royalties for Salinas.¹³⁵ The jury found that Coastal deliberately and maliciously slowed operations across Share 13, breached its duty to pool in good faith, maliciously appropriated Salinas's property, and, most importantly, trespassed on Share 13 by fracking.¹³⁶ The appellate court affirmed each of these findings.¹³⁷ However, the Supreme Court of Texas disagreed.¹³⁸

128. *Id.*

129. *Id.* at 6–7, 7 n.11.

130. *Id.* at 7.

131. *Id.*

132. *Id.*

133. *Id.* at 8.

134. *Id.*

135. *Id.*

136. *Id.*

137. *Id.* at 8–9.

138. *Id.* at 14.

The Texas Supreme Court offered four reasons for finding that Coastal Oil's action did not constitute a trespass.¹³⁹ The first is that the law already provided Salinas with adequate recourse for drainage.¹⁴⁰ If Salinas, the drained land owner, had no producing well, they could simply drill on their own to offset drainage from their property.¹⁴¹ If Salinas leased the mineral rights under Share 13 and Coastal failed to drill on Share 13, but only on 12, Salinas could sue for violation of the implied covenant to drill.¹⁴² Salinas could also appeal to the Texas Railroad Commission for forced pooling or additional regulation.¹⁴³ Second, the verdict below "usurp[ed]" the power of the Texas Railroad Commission to regulate gas and oil production and "assume[d] that the gas belongs to the owner of the minerals in the drained property, contrary to the rule of capture."¹⁴⁴ The court warned that the rule of capture was all that allowed the Railroad Commission to avoid a takings claim because under the rule "[t]he minerals owner is entitled, not to the molecules actually residing below the surface, but to 'a fair chance to recover the oil and gas in or under his land . . .'"¹⁴⁵ Third, the court noted that the courts were improperly equipped to handle Salinas's claims because "the material facts are hidden below miles of rock, making it difficult to ascertain what might have happened."¹⁴⁶ Fourth, the court noted that "the law of capture should not be changed to apply differently to hydraulic fracturing because no one in the industry appears to want or need the change."¹⁴⁷ Referring to a wealth of amicus curiae briefs, the preponderance of which were penned by friends of the industry, the court saw no reason to thrust itself where it was not

139. *Id.*

140. *Id.*

141. *Id.*

142. *Id.*

143. *Id.*

144. *Id.* at 14–15.

145. *Id.* at 15 (quoting *Gulf Land Co. v. Atl. Ref. Co.*, 131 S.W.2d 73, 80 (Tex. 1939)).

146. *Id.* at 16 (stating further that "[s]uch difficulty in proof is one of the justifications for the rule of capture").

147. *Id.*

wanted.¹⁴⁸ Twelve years later, the Pennsylvania Supreme Court considered a very similar set of circumstances.¹⁴⁹

2. *The Briggs Model*

In *Briggs*, the Supreme Court of Pennsylvania considered whether the rule of capture bars liability of operators when they recover oil or gas from beneath another person's land through fracking operations.¹⁵⁰ The plaintiffs, Adam, Paula, Joshua, and Sarah Briggs, owned an eleven-acre tract of land in Harford Township, Susquehanna County, Pennsylvania.¹⁵¹ No part of this tract was leased for natural gas production, and the Briggs maintained their mineral estate.¹⁵² The Briggs' property was adjacent to a separate tract of land that Southwestern Energy Production Company leased for natural gas extraction, referred to as the production parcel.¹⁵³ Southwestern drilled and operated wells across the production parcel and used hydraulic fracturing to increase natural gas extraction from the Marcellus Shale formation that runs beneath both tracts of land.¹⁵⁴

Initially, the superior court held that the rule of capture did not preclude liability for trespass due to hydraulic fracturing, but, an issue of material fact existed as to whether a physical trespass occurred.¹⁵⁵ The superior court determined that the process of fracking was

148. *Id.* at 16–17 (chronicling the submissions' sources, noting that “[t]hese briefs from every corner of the industry—regulators, landowners, royalty owners, operators, and hydraulic fracturing service providers—all oppose liability for hydraulic fracturing, almost always warning of adverse consequences in the direst language”). Texas state agencies authored two of the briefs. *Id.* at 16. The remainder came from outspoken industry advocates with a financial interest in unfettered fracking, entities employing such dire language as “[l]egitimate hydraulic fracturing should never be considered a tortious activity.” *Id.* at 16–17, 17 n.56. This, like the *Manziel* precedent on which the court is relying, is deeply rooted in economic principle, not legal precedent. *Id.* at 13, 13 n.39. For a closer examination of this motivation, see R.R. Comm'n of Tex. v. *Manziel*, 361 S.W.2d 560, 566–70 (Tex. 1962), which highlights the socioeconomic importance of curbing private property rights), and Mark E. Vandermeulen, Note, *The Texas Supreme Court Holds Hydraulic Fracturing Trespass Claim Is Precluded by the Rule of Capture*, 62 SMU L. REV. 835, 835–40 (2009), which scrutinizes the same.

149. *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334 (Pa. 2020).

150. *Id.* at 336.

151. *Id.* at 339.

152. *Id.*

153. *Id.*

154. *Id.*

155. *Id.* at 343.

fundamentally dissimilar to conventional drilling because natural gas locked in a tight shale formation is not migratory, and thus, the issue of trespass was central to the discussion.¹⁵⁶ Further, it considered the issue before it in terms of whether Southwestern had committed a trespass by conducting a fracking operation that “extend[ed] into an adjoining landowner’s property and result[ed] in the withdrawal of natural gas from beneath that property.”¹⁵⁷ Because Southwestern was not immunized by the rule of capture, the superior court determined that summary judgment for Southwestern was premature.¹⁵⁸

However, citing to Pennsylvania precedent, the Pennsylvania Supreme Court disagreed.¹⁵⁹ The parties acknowledged that the rule of capture controlled.¹⁶⁰ However, they arrived at very different conclusions from its application.¹⁶¹ Both parties “argue[d] that the traditional rule of capture should apply, subject to the common-law standard for trespass of real property based on physical intrusion onto another’s land . . . [and] depict[ed] the other as erroneously suggesting that an exception to this framework should pertain where hydraulic fracturing is used”¹⁶² The Briggs’ contended that Southwestern sought to change the rule of capture to allow for

156. *Id.* at 342–43.

157. *Briggs v. Sw. Energy Prod. Co.*, 184 A.3d 153, 158 (Pa. Super. Ct. 2018), *vacated*, 224 A.3d 334 (Pa. 2020).

158. *Id.* at 163–34.

159. *Briggs*, 224 A.3d at 336.

160. *Id.* at 338.

161. *Id.* at 344–46.

162. *Id.* at 338–39.

The actor, without himself entering the land, may invade another’s interest in its exclusive possession by throwing, propelling, or placing a thing either on or beneath the surface of the land or in the air space above it It is enough that an act is done with knowledge that it will to a substantial certainty result in the entry of the foreign matter. Thus one who so piles sand close to his boundary that by force of gravity alone it slides down onto his neighbor’s land, or who so builds an embankment that during ordinary rainfalls the dirt from it is washed upon adjacent lands, becomes a trespasser on the other’s land.

RESTATEMENT (SECOND) OF TORTS § 158, cmt. i (AM. L. INST. 1965). The Restatement also provides several illustrations:

A intentionally throws a pail of water against a wall of B’s house. A is a trespasser A erects a dam across a stream, thereby intentionally causing the water to back up and flood the land of B, an upper riparian proprietor. A is a trespasser. A, on a public lake, intentionally discharges his shotgun over a point of land in B’s possession, near the surface. The shot falls into the water on the other side. A is a trespasser.

Id.

trespassory activity when operators used fracking.¹⁶³ At the same time, Southwestern argued that no trespass occurred because its wellhead was situated entirely on its lease and the bore itself never crossed the property line.¹⁶⁴

The Pennsylvania Supreme Court simplified the superior court's reasoning into one of two logical approaches.¹⁶⁵ Either "the act of artificially stimulating the cross-boundary flow through [fracking] solely on the developer's property . . . renders the rule of capture inapplicable" or "any time natural gas migrates across property lines resulting . . . from [fracking], a physical intrusion into the plaintiff's property must necessarily have taken place."¹⁶⁶ Regarding the artificial stimulation aspect of the superior court's holding, the Pennsylvania Supreme Court stated that "all drilling for subsurface fugacious minerals involves the artificial stimulation of the flow of that substance."¹⁶⁷ However, it noted physical trespass as a significant exception to the rule of capture. The court looked to *Jones v. Forest Co.*¹⁶⁸ where the court had previously permitted the use of a pump to draw oil from a shared reservoir, though only in the absence of a physical intrusion.¹⁶⁹ As such, the court rejected as a matter of law the idea that the rule of capture cannot be applied to drainage from extraction operations that occur entirely within the extractor's property on the grounds that such drainage is less natural than the procedures used in conventional drilling.¹⁷⁰ The court punted regarding the second determination—that "drainage from under a plaintiff's parcel can only occur if the driller first physically invades that property" and the extent to which Southwestern could evade liability for trespass should it ultimately be found to have physically intruded into Briggs' subsurface property.¹⁷¹

Leaning heavily on the absence of a claim of physical trespass from the Briggs' original pleadings, and despite the superior court's

163. *Briggs*, 224 A.3d at 339.

164. *Id.* at 440.

165. *Id.* at 347.

166. *Id.*

167. *Id.* at 347–48.

168. 44 A. 1074 (Pa. 1900).

169. *Id.* at 1074, 1076 ("In view of the testimony and authorities above cited, we conclude that the use of a gas pump by defendant, under the circumstances of this case, is not an unlawful act that should be restrained by injunction . . .").

170. *Briggs*, 224 A.3d at 348–49.

171. *Id.* at 349–50.

determination that such a claim was inherently an aspect of the case, the Pennsylvania Supreme Court decided not to address the issue succinctly.¹⁷² Instead, the court simultaneously relied on case precedent, under which claims for trespass fail without physical intrusion, while insisting that there was no pressing need to determine the existence of a physical intrusion.¹⁷³ Moreover, where the court did examine a trespass, it placed the burden of proof squarely on the shoulders of the private landowners, stating “there is no basis in the record for such an assumption [of trespass].”¹⁷⁴ The Pennsylvania Supreme Court indicated that “[i]n all events, a plaintiff asserting a cause of action ‘must be able to prove all the elements of his case by proper evidentiary standards,’” despite the evidence lying thousands of feet below the Briggs’ land.¹⁷⁵ On remand, the Superior Court reinstated the summary judgment in favor of Southwestern because of the Briggs’ failure to specifically allege facts indicative of physical trespass.¹⁷⁶

172. *Id.* at 349.

On the state of the present record, this alone does not establish that a physical intrusion into a neighboring property is necessary for such action to result in drainage from that property. We cannot rule out, for example, that a fissure created through the injection of hydraulic fluid entirely within the developer’s property may create a sufficient pressure gradient to induce the drainage of hydrocarbons from the relevant stratum of rock underneath an adjacent parcel even absent physical intrusion. Nor can we discount the possibility that a fissure created within the developer’s property may communicate with other, pre-existing fissures that reach across property lines Whether these, or any other non-invasive means of drainage occasioned by hydraulic fracturing, are physically possible in a given case is a factual question to be established through expert evidence.

Id.

173. *Id.* at 350.

174. *Id.* at 349.

175. *Id.* (quoting *Papieves v. Lawrence*, 263 A.2d 118, 121 (Pa. 1970)); *see also* *Chance v. BP Chems., Inc.*, 670 N.E.2d 985, 990–91, 994 (Ohio 1996) (holding that plaintiffs alleging a subsurface trespass upon their property bear the burden of proving all elements of their claim). Here, the “question of the actual location of the injectate [was] at best a complicated inquiry not easily susceptible of a definitive answer” *Id.* The court ultimately found for the operator due to the “lack of specific and readily demonstrable concrete damage.” *Id.*

176. *Briggs v. Sw. Energy Prod. Co.*, 245 A.3d 1050 (Pa. Super. Ct. 2020).

II. THE CASE FOR A REBUTTABLE PRESUMPTION OF TRESPASS

The incredible oil booms of the late 19th and early 20th centuries came with intense ownership contests for a wandering mineral thousands of feet below the surface. The courts were simply incapable of assigning fixed ownership to a fluid mineral that could not easily be assigned to a particular plot of land. As extraction technology advanced, and pumps, injection wells, and horizontal drilling become more common, the courts have stressed the rule of capture beyond its original application to less conventional oil and natural gas production methods.¹⁷⁷ Throughout this period, the central assumption that private landowners had not only the ability, but the inclination, to drill their own wells to protect against drainage was essential to the rule of capture and the century of precedent that followed such a novel approach to mineral ownership.¹⁷⁸ As stated in *Ryan Consolidated Petroleum Corp. v. Pickens*,¹⁷⁹

the owner of the adjoining tract from which the oil is migrating can protect himself by drilling offset wells. This equal right to drill has always supported the constitutionality of the rule of capture. Take it away and the reason for the rule fails, leaving a result not only unjust but one inconsistent with the fundamental concept of ownership [B]ecause of early difficulty in determining the source of oil produced from a well we stopped judicial inquiry at the mouth of the well, [and] called it the rule of capture [T]his was a matter of expediency, and in the then state of the oil business and the then knowledge of reservoir dynamics, it reached a practical result.¹⁸⁰

However, the rule was given an Achilles heel. In cases where the drained landowner could prove that a physical intrusion under the lease line took place, such as by a drill or pipeline, the protection afforded by the rule fell away, and the operators were held liable for trespass.¹⁸¹ In the mid-20th century, this invasion usually took the form

177. See J.E. BRANTLY, HISTORY OF OIL WELL DRILLING 153 (1971) (discussing the difficulty of applying traditional mineral legal theory to modern extraction).

178. Giddens, *supra* note 27, at 57–61.

179. 285 S.W.2d 201 (Tex. 1955).

180. *Id.* at 210 (Wilson, J., dissenting).

181. See, e.g., *Baatz v. Columbia Gas Transmission, LLC*, 929 F.3d 767, 773 (6th Cir. 2019) (holding migration of stored gas beneath property lines an actionable trespass but for property owner's testimony that they neither used nor intended to use the land affected by the migration). Under Ohio law, a trespass claim regarding subsurface property requires a showing of interference with a reasonable use of the land by the natural gas migration. *Id.* The plaintiff's testimony was the primary reason the court

of a horizontal or deviated well, which allowed operators to access reservoirs solely underneath a neighbor's property by drilling at a horizontal slant.¹⁸² Thus, American courts quickly declared the action a trespass and held the operators liable when any material part of a horizontal well or drilling operation physically crossed lease lines or bottomed beneath a neighbor's property.¹⁸³ Both the *Garza* and *Briggs* courts acknowledge this limitation of trespass, though both also stopped short of applying it to hydraulic fracturing.¹⁸⁴

Both *Garza* and *Briggs* overextend the rule of capture. Both *Garza* and *Briggs* either misstate the basic geological realities of hydraulic fracking, misapply the rule of capture, or both.¹⁸⁵ The court in *Garza* states that proppants could constitute a trespass, the liability for which is precluded by the rule of capture.¹⁸⁶ This approach is backwards. The rule does not defeat trespass; trespass defeats the rule.¹⁸⁷ The *Briggs* court, which looked heavily to *Garza*, acknowledged that a trespass was possible, but simply too difficult to prove.¹⁸⁸ This uncertainty was the

held that the mineral's migration from underground storage area into subsurface of landowners' property to be non-trespassory. *Id.*; see also *Briggs*, 224 A.3d at 337 (“[A] developer may [not] invade the subsurface area of a neighboring property by drilling at an angle rather than vertically (referred to as slant drilling or slant wells), or by drilling horizontally beneath the surface.”); *Diamond McCattle Co. v. Range La. Operating LLC*, No. 18-CV-00229, 2018 WL 6728587, at *5 (W.D. La. Dec. 21, 2018) (explaining that subsurface trespasses, which involve the bottoming of a well under the land of another without their consent or invading the subsurface of another's land uninvited, are usually tied to the removal of minerals and that the attendant damages consist of the value of the minerals so extracted); *Nunez v. Wainoco Oil & Gas Co.*, 488 So. 2d 955, 958 (La. 1986) (declaring a two-inch diameter pipe nearly two miles below the surface of an unleased property a trespass); *Gliptis v. Fifteen Oil Co.*, 16 So. 2d 471, 474 (La. 1943) (concluding that the invasion by any person into the subsurface of a neighboring property and the resulting extraction of minerals constitute a trespass); H. WILLIAMS & C. MEYERS, OIL AND GAS TERMS 737 (5th ed. 1981) (defining sub-surface trespass).

182. Proctor, *supra* note 54, at 494–95.

183. See *supra* note 55.

184. *Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1, 13 (Tex. 2008); *Briggs*, 224 A.3d at 336.

185. *Garza*, 268 S.W.3d at 12, 16 (explaining that “[i]n this case, actionable trespass requires injury” but also noting that the court is ill-equipped to determine the impact of “material facts . . . hidden below miles of rock,” though “[s]uch difficulty in proof is one of the justifications for the rule of capture”).

186. *Id.* at 11–13.

187. *Hastings Oil Co. v. Tex. Co.*, 234 S.W.2d 389 (Tex. 1950).

188. *Briggs*, 224 A.3d at 348–51.

driving need for the rule from its earliest application.¹⁸⁹ *Garza* and *Briggs* represent the two most important modern cases on fracking as trespass.¹⁹⁰ While some states have departed from these cases as models, Texas and Pennsylvania are home to more than half of the country's fracking wells.¹⁹¹ The cases from these major markets will likely inform battles over subterranean property rights across the nation, just as *Westmoreland* did over a century ago.¹⁹²

A. *Why the Garza and Briggs Approaches Fail*

Prior to *Garza*, Texas courts approached the rule of capture with the understanding that it only precluded liability for extracting minerals drained from a neighboring property in the absence of a physical invasion to the unleased property.¹⁹³ The exception was in cases of trespass, such as where an operator drills a horizontal or deviated well.¹⁹⁴ Fracking, by the admission of the Texas Supreme Court and by

189. See *Westmoreland & Cambria Nat. Gas Co. v. De Witt*, 18 A. 724, 725 (Pa. 1889) (discussing the difficulty of discerning mineral ownership so far underground and the need for a clearer mechanism).

190. *Garza*, 268 S.W.3d 1; *Briggs*, 224 A.3d 334.

191. See *Stone v. Chesapeake Appalachia, LLC*, 2013 WL 2097397 (N.D. W. Va. Apr. 10, 2013), *vacated due to settlement*, No. 2013 WL 7863861 (N.D. W. Va. July 30, 2013). In *Stone*, the court denied the defendant operator's motion for summary judgment on facts fundamentally similar to both *Garza* and *Briggs*. *Stone*, 2013 WL 2097397, at *8; *Garza*, 268 S.W.3d at 4–6; *Briggs*, 224 A.3d 336–39. The West Virginia court excoriated the *Garza* opinion as giving “oil and gas operators a blank check to steal” from small landowners. *Stone*, 2013 WL 2097397, at *6. The court lamented that such a lopsided rule gave operators no reason to cooperate with landowners, as they could simply frack under their property and take the oil and gas without compensation. *Id.* Such an arrangement would not even require communication with the drained property owner, only their neighbors. *Id.* The case was cut short, though, as the parties settled out of court. The court looked closely to *Young v. Ethyl Corp.*, in which the Eighth Circuit held a similarly-operated and situated brine-extraction well operator liable for trespass. 521 F.2d 771, 771 (8th Cir. 1975).

192. *Westmoreland & Cambria Nat. Gas Co. v. DeWitt*, 18 A. 724 (Pa. 1889); see *FPL Farming Ltd. v. Env't Processing Sys., L.C.*, 351 S.W.3d 306, 314 (Tex. 2011) (discussing the application of *Garza* to subsequent mineral and subsurface reclamation tort claims). The jury ultimately declined to assign liability for the subterranean migration of wastewater under property lines due, in part, to this guidance. *Env't Processing Sys., L.C. v. FPL Farming Ltd.*, 457 S.W.3d 414, 425 (Tex. 2015).

193. *Peterson v. Grayce Oil Co.*, 37 S.W.2d 367, 370–71 (Tex. Civ. App. 1931), *aff'd*, 98 S.W.2d 781 (Tex. 1936).

194. *Garza*, 268 S.W.3d at 14 (“One cannot protect against drainage from a deviated well by drilling his own well; the deviated well will continue to produce his gas. Nor is there any uncertainty that a deviated well is producing another owner's gas. The

the federal government's own definition, can only extract the minerals it physically frees from tight formations.¹⁹⁵ This demands the injection of material within a small distance, sometimes mere inches, of the pockets of oil and gas.¹⁹⁶ The Texas Supreme Court held that the rule of capture barred damages for drainage by fracturing.¹⁹⁷ The court gave four reasons why the claims for trespass failed: the plaintiff's had sufficient alternative remedies; the rights and obligations of mineral producers were left to the determination of the railroad commission; the value of any drainage so alleged would be too difficult to determine, especially considering the social costs that would come with a change to the rule of capture; and, finally, the industry did not want to see said change.¹⁹⁸

The court in *Garza* ignores both the near-certainty of trespass and the destructive effect such a trespass has on the protection of the rule. Instead, it simultaneously insists that real injury must be proven while maintaining that such injury is too far underground to concern the court.¹⁹⁹ This flies in the face of the general consensus of the states on not only the rule of capture, but on trespass generally.²⁰⁰ Some courts have held that surface blasting activity on one's own land that results in cracks in the surface of neighboring land can constitute a trespass.²⁰¹

justifications for the rule of capture do not support applying the rule to a deviated well.”).

195. See *id.* at 11–13 (“Had Coastal caused something like proppants to be deposited on the surface of Share 13, it would be liable for trespass In this case, actionable trespass requires injury, and Salinas’s only claim of injury . . . is precluded by the rule of capture In sum, Salinas does not claim damages that are recoverable.”). But see HOSS BELYADI ET AL., *HYDRAULIC FRACTURING IN UNCONVENTIONAL RESERVOIRS* (2d ed. 2019) (“Proppant is used to keep the fractures open after the frac job is complete After the frac job is completed, proppant prevents the fractures from closing due to overburden pressure. However, unpropped areas will reclose under the overburden pressure”).

196. Off. of Fossil Energy & Carbon Mgmt., *Shale Gas 101*, U.S. DEP’T OF ENERGY, <https://www.energy.gov/fe/shale-gas-101> [https://web.archive.org/web/20211001103920/https://www.energy.gov/fecm/shale-gas-101].

197. 268 S.W.3d at 14.

198. *Id.* at 14–17.

199. *Id.* at 12, 16.

200. RESTATEMENT (SECOND) OF TORTS § 158 (AM. L. INST. 1965).

201. *Martin v. Reynolds Metals Co.*, 342 P.2d 790, 793–94 (Or. 1959); see also Laura H. Burney & Norman J. Hyne, *Hydraulic Fracturing: Stimulating Your Well or Trespassing?*, 44 ROCKY MTN. MIN. L. INST. 19–1, 19–45 (1998) (“Under both common law and modern definitions, a trespass occurs if a ‘thing’ physically crosses property

Others have established the bright line rule that trespass overcomes the protection afforded by the rule of capture.²⁰² Directing water beneath a property line constitutes a trespass.²⁰³ Firing pellets over a property line constitutes a trespass.²⁰⁴ Allowing chemicals to seep beneath property can be the same.²⁰⁵ The mind reels attempting to see how fracking, which propels water, pellets, and chemicals across property lines, is any different.²⁰⁶

In *Garza*, the court listed the various alternative remedies available to Salinas, such as drilling their own land or leasing the same, bringing suit against their lessee for failing to drill, offering to pool their resources, or appealing to the Texas Railroad Commission.²⁰⁷ These alternatives are “the justification for the rule of capture, and . . . [apply] regardless of whether the drainage is due to [fracking].”²⁰⁸ According to the Texas Supreme Court, “[t]he rule of capture is justified because a landowner can protect himself from drainage by drilling his own well, thereby avoiding the uncertainties of

boundaries [T]his definition is satisfied when [fracking] extends beyond lease or unit lines.” (emphasis omitted)).

202. See *Gliptis v. Fifteen Oil Co.*, 16 So. 2d 471, 474 (La. 1943) (“[D]uring drilling operations some oil and gas wells drilled normally . . . [may] deviate[] or swing[] so far away from the vertical that [they] pass[] through, and [are] bottomed in, [a] neighbor’s property. When this happens, there is a ‘subsurface trespass’, whether the deviation is normal or whether it is brought about by intentional controlled directional drilling.”).

203. *Wheeler v. Norton*, 86 N.Y.S. 1095, 1096 (N.Y. App. Div. 1904) (discussing the excavators breaking of a water main and their liability for damage caused by the water).

The defendants had the right to dig the canal; the plaintiff, the right to the undisturbed possession of his property. If these rights conflict, the former must yield to the latter, as the more important of the two, since, upon grounds of public policy, it is better that one man should surrender a particular use of his land, than that another should be deprived of the beneficial use of his property altogether, which might be the consequence if the privilege of the former should be wholly unrestricted.

Id.

204. *Whittaker v. Stangvick*, 111 N.W. 295, 295–96 (Minn. 1907).

205. See *Hill v. Sw. Energy Co.*, 858 F.3d 481, 487–88 (8th Cir. 2017) (holding that an issue of material fact existed as to whether the defendant operator’s fracking waste migrated from its disposal well to the subsurface of neighboring property, thereby precluding summary judgment in favor of the operator in a trespass lawsuit).

206. BELYADI ET AL., *supra* note 195 (describing fracking injectants as a slurry of water, chemicals, and spheroid particles).

207. *Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1, 14–18 (Tex. 2008).

208. *Id.* at 14.

determining how gas is migrating through a reservoir.”²⁰⁹ Perhaps this was an option to private landowners at the time, but modern extraction demands a multi-million dollar buy-in—far beyond the means of many of the most affected landowners.²¹⁰

Justice Johnson’s *Garza* dissent provides an approach that maintains decades of precedent, accounts for the geological realities of fracking, and protects the property interests of small, private landowners in the face of industry.²¹¹ Here, Justice Johnson harkened back to Texas precedent, which limits the application of the rule only to instances of legal, property-bound recovery.²¹² Both parties in *Garza* agree that some material travelled beyond Coastal’s lease line.²¹³ Justice Johnson urged the court to treat this intrusion for what it is—an illegal trespass that destroys the legality of any materials thereby recovered.²¹⁴ Thus, the gas Coastal extracted was never legally acquired and so could not be protected by the traditional protection of the rule of capture.²¹⁵

Briggs follows a pattern similar to the majority holding in *Garza*.²¹⁶ In rejecting the notion that the rule of capture is inapplicable to hydraulic fracturing, the Pennsylvania Supreme Court improperly minimized the differences between conventional and unconventional oil acquisition.²¹⁷ The rule of capture was developed with certain geological assumptions in mind, most importantly that oil and gas will wander under their own volition.²¹⁸ This process occurs naturally in the porous, permeable sandstone formations targeted by conventional drilling operations, the litigation over which led to the rule.²¹⁹

209. *Id.*

210. *Trends in U.S. Oil and Natural Gas Upstream Costs*, EIA, <https://www.eia.gov/analysis/studies/drilling/pdf/upstream.pdf> [<https://perma.cc/LTZ9-G7L4>].

211. *Garza*, 268 S.W.3d at 42 (Johnson, J., dissenting).

212. *Halbouty v. R.R. Comm’n*, 357 S.W.2d 364, 375 (Tex. 1962) (explaining that “since the gas in a continuous reservoir will flow to a point of low pressure the landowner is not restricted to the particular gas that may underlie his property originally but is the owner of all that which he may *legally recover*”) (emphasis added).

213. 268 S.W.3d at 42.

214. *Id.* at 43.

215. *Id.*

216. *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334, 352 (Pa. 2020); *Garza*, 268 S.W.3d at 4.

217. See generally Victoria N. Georgevich, *Tapping into Trespass: Fracking, The Rule of Capture, and Landowner Protection*, 69 DEPAUL L. REV. 793, 800–05 (2020) (discussing the irregularities between the historic caselaw developed regarding conventional extraction as applied to unconventional methods).

218. *Brown v. Spilman*, 155 U.S. 665, 669–70 (1895).

219. Giddens, *supra* note 27, at 57–61.

However, this natural migration is simply impossible in the compact, impermeable shale rock formations targeted by fracking, where the minerals simply cannot migrate without being physically forced to do so.²²⁰ Simply stated, “[t]o get the oil and gas out you . . . have to artificially fracture the shale” whereas in conventional natural gas deposits, the natural gas generally flows easily up through wells to the surface.²²¹

This fundamental logic and exploration of the geographical realities of fracking demands that the rule of capture should be limited to the same conventional drilling operations it was designed to guide.²²² The appellate court in *Briggs* explained the major differences between the wandering nature of oil and gas used by conventional methods and the explosive extraction of minerals tightly trapped in rock formations by hydraulic fracturing.²²³ In doing so, the court decided that, due to the non-migratory nature of shale-locked minerals, and the need to reach out and fracture the pockets where they are stored, the rule of capture could not bar liability for trespass in claims surrounding fracking.²²⁴

[H]ydraulic fracturing may constitute an actionable trespass where subsurface fractures, fracturing fluid and proppant cross boundary lines and extend into the subsurface estate of an adjoining property for which the operator does not have a mineral lease, resulting in

220. See HARPER, *supra* note 56, at 3 (explaining the geological structure of the stratum targeted by nonconventional methods of extraction).

221. MICHAEL STEPHENSON, SHALE GAS AND FRACKING: THE SCIENCE BEHIND THE CONTROVERSY 32, 54 (2015).

222. Off. of Fossil Energy & Carbon Mgmt., *How Is Shale Gas Produced?*, U.S. DEP'T OF ENERGY, (Apr. 2013), https://www.energy.gov/sites/default/files/2013/04/f0/compleat_brochure.pdf [<https://perma.cc/79DY-3K3N>] (“The bottom line is that in a conventional reservoir, the gas is in interconnected pore spaces, much like a kitchen sponge, that allow easier flow to a well; but in an unconventional reservoir, like shale, the reservoir must be mechanically ‘stimulated’ to create additional permeability and free the gas for collection.”).

223. *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334, 338 (Pa. 2020) (“After injection, fluid is withdrawn from the well while leaving the proppants in place to hold the fissures open.”).

224. *Id.*; see also *Marcum v. Columbia Gas Transmission, L.L.C.*, 423 F. Supp. 3d 115, 126 (E.D. Pa. 2019) (holding that a civil trespass occurs where a party intrudes upon the lands of another or causes a thing to do so). In *Marcum*, plaintiffs alleged that the defendant improperly constructed natural gas pipelines, thereby directing surface and subsurface waters onto plaintiffs’ property. 423 F. Supp. 3d at 115.

the extraction of natural gas from beneath the adjoining landowner's property.²²⁵

The court called for additional evidence and expert testimony to determine the true distance the subsurface injectants traveled and resulting fractures under the plaintiff's land, but it still held that the plaintiff's allegations were sufficient on their own to support an inquiry in to whether a trespass had occurred.²²⁶ The Pennsylvania Supreme Court disagreed.²²⁷

Subsurface fractures, and the injected physical materials which cause them, are the reason fracking is profitable.²²⁸ There is no reason to treat the injectants any differently from a deviated well, which state courts have universally held to constitute a trespass, or from the individual components of the injectants, the individual components of which can sustain a claim of trespass on their own.²²⁹ Both processes physically invade an unleased property to reach minerals that could not otherwise migrate back to the wellhead.²³⁰ In its reasoning, the court stated that

all drilling for subsurface fugacious minerals involves the artificial stimulation of the flow of that substance. The mere act of drilling interferes with nature and stimulates the flow of the minerals toward artificially-created low pressure areas, most notably, the wellbore. This Court has held that the rule of capture applies although the driller uses further artificial means, such as a pump, to enhance production from a source common to it and the plaintiff – so long as no physical invasion of the plaintiff's land occurs.²³¹

225. *Briggs v. Sw. Energy Prod. Co.*, 184 A.3d 153, 163–64 (Pa. Super. Ct. 2018), *vacated and remanded*, 224 A.3d 334 (Pa. 2020).

226. *Id.*

227. *Briggs*, 224 A.3d at 334.

228. See BELYADI ET AL., *supra* note 195 (“Without proppant in the formation, the formation will reclose under the overburden pressure [T]he production will decrease dramatically and the well will not be economical in the long run due to the absence of proppant to keep the fractures open.”).

229. See *Hastings Oil Co. v. Tex. Co.*, 234 S.W.2d 389, 397–98 (Tex. 1950) (holding that a trespass occurs when a well begun on property where the operator has a right to drill is, without permission, deviated so the well crosses into another's lease); see also *Gliptis v. Fifteen Oil Co.*, 16 So. 2d 471, 474 (La. 1943); *Edwards v. Lachman*, 534 P.2d 670, 671 (Okla. 1974).

230. See BELYADI ET AL., *supra* note 195; see also *How Hydraulic Fracturing Works*, NAT'L GEO., <https://www.nationalgeographic.org/media/how-hydraulic-fracturing-works> [<https://perma.cc/K4LQ-QUXB>].

231. *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334, 347–48 (Pa. 2020) (citation omitted).

This reasoning not only misstates the physical reality of the fracking process, it also ignores the legal implications of the very likely trespass that—but for a pleading error—would be before the court.²³² The Pennsylvania Supreme Court drew support from Professor Engelder’s brief in support of Southwestern Energy.²³³ Professor Engelder stated that “[u]ntil a reservoir is entered by mechanical means (drilling and the fracturing that comes with drilling), the fugacious minerals remain static in both sandstone and shale, a property of conventional reservoirs.”²³⁴ The court relied almost exclusively on the professor’s brief to greatly oversimplify the differences between conventional and non-conventional wells.²³⁵ While it is true that oil and gas will act similarly on a molecular level, the pockets in which those molecules are found are entirely dissimilar.²³⁶ Instead of leaving private landowners to fend for themselves, the courts should adopt the approach taken by the Pennsylvania appellate court and Justice Johnson in his *Garza* dissent.²³⁷

B. *The Self-Inflicted Harm of Doing Likewise*

Where the original legal rationale for the rule fails, the courts should not further extend its application. To protect disadvantaged people and their fundamental property rights, the courts should establish a rebuttable presumption of trespass for wells within a standard operating range of an unleased property. In doing so, they would shift the burden to prove no harm to the financially-backed and scientifically complex operators—the source of the harm itself.

Since the application of the rule of capture to shared reservoirs, the aggrieved party’s sole recourse was often simply to drill on their own land in a race to draw up as much of “their” oil as possible.²³⁸ Over sixty

232. *Id.*

233. *Briggs*, 224 A.3d at 349.

234. Brief of *Amicus Curiae* Prof. Terry Engelder at 11–12, *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 224 (Pa. 2020).

235. *Briggs*, 224 A.3d at 344–45, 349.

236. *Id.*; *see supra* Section I.C (discussing, *inter alia*, the difference between the flow of oil and gas in conventional and non-conventional wells).

237. *Briggs v. Sw. Energy Prod. Co.*, 184 A.3d 153, 162–63 (Pa. Super. Ct. 2018); *Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1, 42 (Tex. 2008) (Johnson, J., concurring in part and dissenting in part).

238. *See* *Barnard v. Monongahela Nat. Gas Co.*, 65 A. 801, 802 (Pa. 1907) (“What then can the neighbor do? Nothing; only go and do likewise.”); *Garza*, 268 S.W.3d at 13 (“[T]he law affords [the plaintiff] ample relief. He may use hydraulic fracturing to stimulate production from his own wells and drain the gas to his own property.”).

years ago, the Texas Supreme Court stated that the drained landowner's "equal right to drill has always supported the constitutionality of the rule of capture. Take it away and the reason for the rule fails, leaving a result not only unjust but one inconsistent with the fundamental concept of ownership."²³⁹ Unfortunately, in the case of fracking, the ability to "go and do likewise" is simply not available to small, private landowners.²⁴⁰ In many cases it is immediately harmful.²⁴¹

In 2016, a report from the U.S. Energy Information Administration estimated the cost of a new hydraulic-fracturing well was between \$4.9 million and \$8.3 million.²⁴² The study lists the most costly categories as "land acquisition; capitalized drilling, completion, and facilities costs; lease operating expenses; and gathering processing and transport costs."²⁴³ The predictions were accurate: in total, the capital costs per well have ranged from \$4.9 million to \$8.3 million, which includes the average completion costs that generally fall in the range of \$ 2.9 million to \$ 5.6 million per well.²⁴⁴ Of course, an average price-tag of \$6.6 million means that personally building an operating well far beyond the scope of most private landowners, the majority of whom are economically disadvantaged, minority, and elderly populations.²⁴⁵

The *Garza* court suggests that landowners unable to afford the multi-million-dollar bill of drilling their own wells could simply work with the energy companies to extract the minerals beneath their property.²⁴⁶ What, then, if the landowner does not want to drill? There are ample studies on the dire health and environmental consequences of

239. *Ryan Consol. Petrol. Corp. v. Pickens*, 285 S.W.2d 201, 210 (Tex. 1955) (Wilson, J., dissenting).

240. *Barnard*, 65 A. at 802.

241. Brown, V.J., *Radionuclides in Fracking Wastewater: Managing a Toxic Blend*, ENV'T HEALTH PERSPECTIVES (2014); E. C. Chapman et al., *Geochemical and Strontium Isotope Characterization of Produced Waters from Marcellus Shale Natural Gas Extraction*, ENV'T SCI. & TECH., at 3545–55, 3551 (2012); G.H. Lyman et al., *Association of Leukemia with Radium Groundwater Contamination*, 254 J. AM. MED. ASS'N 621 (1985).

242. *Trends in U.S. Oil and Natural Gas Upstream Costs*, *supra* note 210, at 2.

243. *Id.*

244. *Id.*

245. Yelena Ogneva-Himmelberger & Liyao Huang, *Spatial Distribution of Unconventional Gas Wells and Human Populations in the Marcellus Shale in the United States: Vulnerability Analysis*, 60 APPLIED GEOGRAPHY 165–74 (2015).

246. See *Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1, 6, 13–14 (Tex. 2008) (implying that the owner may lease the affected area and sue for failure to drill a well).

fracking.²⁴⁷ For example, a two-year study conducted by Environmental Health News and the University of Missouri has returned striking yet disturbingly common side effects of living near fracking wells:

A urine sample taken from Gunnar[, who lives within five miles of at least twenty active fracking wells,] contained [eleven] harmful industrial chemicals . . . linked to a range of health effects including respiratory and gastrointestinal problems, skin and eye irritation, organ damage, reproductive harm, and increased cancer risk. These chemicals are found in things like gasoline, pesticides, [and] industrial solvents They're also commonly detected in air emissions from fracking wells.²⁴⁸

Further studies found chemicals like benzene and butylcyclohexane in drinking water and air samples and breakdown products for chemicals like ethylbenzene, styrene, and toluene in the bodies of children living near fracking wells at levels up to 91 times as high as the average American and substantially higher than levels seen in the average adult cigarette smoker.²⁴⁹ The chemicals detected in the environment and inside people's bodies are connected to a wide array of negative health impacts, ranging from dermal and respiratory irritation to severe organ damage and an increased risk of cancer.²⁵⁰ Studies have found that "women living closer to fracking have increased odds of having a baby with lower-than-average birth weight" and have a significantly increased risk of a high-risk pregnancy and

247. *Id.*; see also Cueto-Felgueroso, L. & Juanes, R., *Forecasting Long Term Gas Production from Shale*, 110 PROC. NAT'L ACAD. SCI. 19660, 19660–61 (2013); EPA, HYDRAULIC FRACTURING FOR OIL AND GAS: IMPACTS FROM THE HYDRAULIC FRACTURING WATER CYCLE ON DRINKING WATER RESOURCES IN THE UNITED STATES 1–3, 39 (2016); *Fractured: The Body Burden of Living near Fracking*, ENV'T HEALTH NEWS, (Mar. 1, 2021), <https://www.ehn.org/fractured-series-on-fracking-pollution-2650624600.html> [<https://perma.cc/XVC6-HUNX>]; Kristina Marusic, *Babies Born Near Natural Gas Flaring Are 50 Percent More Likely to Be Premature: Study*, ENV'T HEALTH NEWS (July 16, 2020), <https://www.ehn.org/fracking-preterm-births-2646411428.html> [<https://perma.cc/ST4Z-LGH7>]; Colorado Dep't of Pub. Health and Env't, *Human Health Risk Assessment for Oil & Gas Operations in Colorado*, <https://cdphe.colorado.gov/health/oil-and-gas-and-your-health> [<https://perma.cc/DWR3-E72H>]; C. Busby & J. Mangano, *There's a World Going on Underground—Infant Mortality and Fracking in Pennsylvania*, 8 J. ENV'T PROT., 381, 381–93 (2017).

248. Kristina Marusic, *Fractured: Harmful Chemicals and Unknowns Haunt Pennsylvanians Surrounded by Fracking*, ENV'T HEALTH NEWS (Mar. 1, 2021), <https://www.ehn.org/fractured-harmful-chemicals-fracking-2650428324.html> [<https://perma.cc/7FL5-YREP>].

249. *Id.*

250. *Id.*

have babies with abnormally low infant health index.²⁵¹ In addition, a connected study found that ethnic minorities, especially Hispanics and African Americans, disproportionately live near fracking wells.²⁵²

Private landowners must resort to filing lawsuits against energy companies for some chance at recovery.²⁵³ These claims center on allegations that nearby fracking has resulted in increased water contamination, air pollution, noise, traffic, and seismic activity.²⁵⁴ Uncharted tunneling, washouts, landslides, unlicensed resource extraction, and contamination are frequent consequences to fracking operations, and effects can linger for decades after the gas is taken.²⁵⁵ When plaintiffs turn to traditional common-law causes of action, including negligence, strict liability, and trespass, they are faced with an enormous evidentiary burden.²⁵⁶ Due to the difficulty of proving causation, invasion, standing, and loss, plaintiffs have recently begun to pursue their claims as nuisance actions, enabling them to avoid some of the difficult causation issues otherwise required to prove specific damages in fracking cases.²⁵⁷ However, these actions often cannot address the core harms of mineral loss and pollution.²⁵⁸ It is simply infeasible to force non-consenting landowners to inflict upon themselves the same harm they suffer at the hands of gas companies. Moreover, the harm is more than the drainage of oil and gas. Groundwater is contaminated, radioactive materials are spread throughout the soil, water, and air, and public spaces are poisoned. Drilling an offset well would only make the problem worse and bring the consequences, quite literally, to the landowner's own backyard.²⁵⁹

251. Kristina Marusic, *After a Decade of Research, Here's What Scientists Know About the Health Impacts of Fracking*, ENV'T HEALTH NEWS (Apr. 15, 2019), <https://www.ehn.org/health-impacts-of-fracking-2634432607.html> [<https://perma.cc/2TKA-DA9R>].

252. *Id.*

253. *See supra* notes 245–47 and accompanying text (suggesting that most private landowners must resort to filing lawsuits against energy companies because the cost of personally building an operation well is far too expensive).

254. Jason B. Binimow, Annotation, *Liability for Trespass or Nuisance in Hydraulic Fracturing, Hydro-fracturing, or Hydro-fracking* 41 A.L.R.7th, Art. 1, § 2 (2019).

255. *Id.*

256. *See infra* Part II.

257. Binimow, *supra* note 254, § 2.

258. *See supra* notes 245–47 and accompanying text (noting that there are dire health and environmental consequences of fracking).

259. *Radioactive Waste Material from Oil and Gas Drilling*, EPA, <https://www.epa.gov/radtown/radioactive-waste-material-oil-and-gas-drilling> [<https://perma.cc/ELN8->

Traditional extraction, the method of oil and natural gas production on which controlling mineral case law is built, exploits pre-existing pressure gradients and natural channels which allow gas to flow freely and naturally to a distant wellhead.²⁶⁰ The mineral's migratory nature is the logical foundation of the rule of capture as applied to natural gas and oil.²⁶¹ Because the gas will, of its own volition, flow to a neighbor's well, it is considered as migratory as a wild animal.²⁶² Therefore, the only way to assert true ownership is to draw the gas to the surface and thereby "capture" it.²⁶³ Fracking, however, requires the high-power injection of materials deep underground to fracture oil-bearing strata and thereby artificially induce the flow of oil and gas.²⁶⁴ These injected materials are propelled across distances and in directions that even the wellhead operators cannot accurately predict or control.²⁶⁵ In some jurisdictions, fracking wells can be built less than 100 feet from a non-consenting neighbor's property,²⁶⁶ despite these wells having an operating range, or injection radius, of hundreds to thousands of feet.²⁶⁷ Operators wield this uncertainty to defeat trespass claims and

Y9CE] (discussing radionuclides being dispersed into the surrounding areas by drilling through certain types of geological formations).

260. See *Hague v. Wheeler*, 27 A. 714, 718 (Pa. 1893) (referring to this flow as "drainage"); *GRYPHON*, *supra* note 56 (explaining the differences between traditional drilling and fracking operations).

261. *Halbouty v. R.R. Comm'n of Tex.*, 357 S.W.2d 364, 375 (Tex. 1962); *Occidental Permian Ltd. v. Helen Jones Found.*, 333 S.W.3d 392, 409 (Tex. App. 2011) ("[T]he rule of capture provides that a landowner owns all of the oil and gas produced by a legally drilled well located on his [property], even though the well may be draining minerals from [neighboring] properties . . ."); *Cowling v. Bd. of Oil, Gas & Mining*, 830 P.2d 220, 224 (Utah 1991) (holding the operator not liable to adjacent landowner "even if the producing well [is] drilled next to the adjacent landowner's boundary" so long as there is no trespass).

262. See *Pierson v. Post*, 1805 WL 781 (N.Y. Sup. Ct. 1805) ("Pursuit alone gives no right of property in animals *ferae naturae* Occupancy in wild animals can be acquired only by possession . . .").

263. See *supra* notes 218–20 and accompanying text.

264. *GRYPHON*, *supra* note 56.

265. EPA, *supra* note 79; *Binimow*, *supra* note 254, § 2.

266. *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334, 355 (Pa. 2020) (Dougherty, J., concurring in part and dissenting in part) ("Plaintiffs also relied on an expert report indicating at least one of Southwestern's boreholes is located within 63 feet of their land, when the relevant 'fracking area' could be approximately 371 feet each way from a borehole.").

267. *Id.*; see also *Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1, 6–7 (Tex. 2008) (fracking fluid travels "sometimes as far as 3,000 feet from the well." The range in question was designed to reach "over 1,000 feet from the well.").

to shift the evidentiary burden onto socio-economically vulnerable populations, even when the injection of material across lease lines is virtually certain.²⁶⁸ This forces the costs of complex tests and surveys onto those who also bear the brunt of the health and environmental consequences of the extraction.²⁶⁹

CONCLUSION

Non-conventional extraction operations offer tremendous economic benefits to some well operators and companies, but these operations inflict the open and hidden costs of lowered land values, social upheaval, and dire health consequences for others.²⁷⁰ Those who contest the local disposal of residual waste left behind after fracking, as well as the destructive effects of the extraction operations themselves, look to tort law as a remedy.²⁷¹ If recent settlement trends are any indication, most cases built on tort claims will settle in months, and jury trials are rare.²⁷² The meaning of common-law phrases, such as trespass and nuisance, vary, and, although there is general consensus between the states, each jurisdiction operates under unique statutes and case law:²⁷³

268. See, e.g., *Briggs*, 224 A.3d at 349 (Pa. 2020) (“Plaintiffs will bear the burden of demonstrating that such an intrusion took place”); *Chance v. BP Chems., Inc.*, 670 N.E.2d 985, 991 (Ohio 1996) (holding that any plaintiff alleging a subsurface trespass upon or under their property bears the burden of proving all elements of their claim).

269. *Fractured: The Body Burden of Living Near Fracking*, *supra* note 247 (finding areas that were more than 80% minority were twice as likely to live near permitted wastewater wells than areas less than 20% minority); Owen L. Anderson, *Foreword: The Evolution of Oil & Gas Conservation Law & the Rise of Unconventional Hydrocarbon Production*, 68 ARK. L. REV. 231, 251–53 (2015) (discussing advanced technologies used to monitor underground fractures).

270. See *supra* Part II.

271. *Id.*; see also *Tucker v. Sw. Energy Co.*, Nos. 11-cv-44 & 11-cv-45, 2012 WL 528253, at *1 (E.D. Ark. Feb. 17, 2012) (describing groundwater wells fouled by fracking chemicals air polluted by methane gas and its burn-off byproducts). The court explained that “[s]ettled pleading law requires the [plaintiffs] to plead enough facts to state legal claims . . . that are not just possible, but plausible. Drawing this line is more art than science, a matter of common sense and judicial experience.” *Id.* at *2 (citation omitted) (first citing *Braden v. Wal-Mart Stores, Inc.*, 588 F.3d 585, 594 (8th Cir. 2009); and then citing *Hamilton v. Palm*, 621 F.3d 816, 818 (8th Cir. 2010)). Why, then, is the burden to prove that chemicals, otherwise absent in such large quantities, are from a source other than the wellhead operations that demonstrably employ their use?

272. *Binimow*, *supra* note 254, § 2.

273. *Id.*

No uniformly applicable federal statutory definition controls, with state definitions using vague terms like ‘injurious’ and acts interfering with the ‘comfortable enjoyment of life or property.’ The concept has been that the plaintiff’s property had been invaded not in a conventional trespass, but by the defendant’s ‘light, sound, odor, or foreign substance’ [T]his is conditioned upon either an ‘intentional and unreasonable’ invasion, or an invasion that is ‘otherwise actionable under the rules controlling liability for negligent or reckless conduct, or for abnormally dangerous conditions or activities.’ Relatively little contemporary scholarship touches upon these issues in the context of gas extraction activities.²⁷⁴

Fracking is only profitable when large expanses of natural-gas pockets are artificially induced to flow not where they might otherwise, but where they could not otherwise.²⁷⁵ This artificial flow demands the physical intrusion of proppants, water, and sludge to reach into isolated pockets of oil and gas.²⁷⁶ However, the courts have begun a troubling trend of allowing the rule of capture to defeat claims for trespass despite the centuries of precedent to the contrary and the physical and geological realities of hydraulic fracturing.²⁷⁷ This places an immense evidentiary burden on the aggrieved landowner and gives well operators an open license to pillage unleased property simply because the physical intrusion is subterranean.²⁷⁸

Instead, the courts should establish a minimal operating range of fracking wellhead operations as developed by the same experts the testimony of whom the courts already rely.²⁷⁹ Where this sphere of effect infringes on a non-consenting landowners’ property, the operator becomes liable under a rebuttable assumption of trespass. In such cases, the rule of capture is discarded, and it falls to the oil company to prove that it has not encroached onto the land of another. This would, in essence, become a setback regulation that disallows wellheads within a minimal range of a non-consenting landowner’s

274. *Id.*

275. GRYPHON, *supra* note 56.

276. *Id.*; *see also* BELYADI ET AL., *supra* note 195.

277. *See supra* Part II.

278. *See supra* Part II.

279. Both of the major cases discussed in this Comment relied heavily on expert testimony to determine where, precisely, the alleged trespass may have occurred. *Briggs v. Sw. Energy Prod. Co.*, 224 A.3d 334, 337 (Pa. 2020); *Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1, 14 (Tex. 2008).

property.²⁸⁰ Such a presumption would allow for the maximum exploitation of minerals without violating the property rights of small landowners.

280. For an evaluation of setback regulations, see Nathan Richardson et al., *THE STATE OF SHALE GAS REGULATION*, (2013) (“[A] setback rule could prohibit drilling within 500 feet of a stream . . .”); *Pennsylvania Setback Regulations for Fracking Do Not Prevent Setback Incidents*, Harvard Univ. (Apr. 28, 2021), <https://www.hsph.harvard.edu/c-change/news/ungsetbacks> [<https://perma.cc/F8Z6-BDDH>] (urging the adoption of an alternative).