Hydraulic Fracturing Goes to Court: How Texas Jurisprudence on Subsurface Trespass Will Influence West Virginia Oil and Gas Law

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HYDRAULIC FRACTURING GOES TO COURT: 
HOW TEXAS JURISPRUDENCE ON SUBSURFACE 
TRESPASS WILL INFLUENCE WEST VIRGINIA 
OIL AND GAS LAW

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I. INTRODUCTION

Hydraulic fracturing is a commonly used technology in the modern oil and gas industry that increases production from wells by fracturing, or cracking, rock formations containing oil and gas.¹ A legal issue arises when the fissures in the rock strata created during the hydraulic fracture treatment extend beyond the property boundaries and intrude beneath neighboring land.² Such an invasion is technically a trespass, but courts have struggled in deciding whether to allow the trespass to be actionable.³ The trespass issue is an important one due to hydraulic fracturing’s universal use and its ability to greatly increase the rate of hydrocarbon extraction, particularly in oil and gas fields that were previously deemed exhausted.⁴

Few state courts have dealt with hydraulic fracturing as a trespass, and Texas has been the only jurisdiction to thoroughly and forthrightly consider all the issues involved.⁵ The Texas court recently determined that a trespass resulting from hydraulic fracturing was not an actionable trespass in which damages could be recovered.⁶ West Virginia has yet to hear a controversy involving hydraulic fracturing but the West Virginia court would most likely follow the lead of the Texas court.⁷ The oil and gas jurisprudence of Texas and West Virginia have much in common,⁸ and both states possess similar hydrocarbon reserves which have exceptional economic potential but require hydraulic fracturing to

¹ See discussion infra Part I.B–C.
² See discussion infra Part II.C.
³ See discussion infra Parts II.C & IV.A–B.
⁴ See discussion infra Part II.B.
⁶ See generally Coastal, 268 S.W.3d 1.
⁷ Hydraulic fracturing was only briefly mentioned in Trent with the court refusing to consider whether a cause of action existed in West Virginia for a hydraulic fracturing trespass. Trent, 902 F.2d at 1147. See discussion infra Parts V & VI.
⁸ See discussion infra Parts V.B–C.
be successfully exploited. Thus, the same legal arguments and policy concerns relied upon by the Texas court to justify exempting hydraulic fracturing from an actionable trespass will most likely appeal to the West Virginia court as well.

This Note provides a concise overview of hydraulic fracturing as a trespass and the resultant debate. The author compares Texas law pertaining to hydrocarbon extraction with that of West Virginia, as well as the policy concerns associated with the oil and gas industry in both states, in order to make a modest prediction on how the West Virginia court might decide the hydraulic fracturing trespass issue. Part II provides an overview of hydraulic fracturing in the oil and gas industry. In particular, the geology of oil and gas bearing rocks, the history and technology of hydraulic fracturing, and the legal problems created by hydraulic fracturing are examined. Part III explains in detail the legal concept of subsurface trespass, the different types of subsurface trespasses, and the dispute over whether hydraulic fracturing should be considered an actionable trespass. Part IV explores the case history of hydraulic fracturing in the few states that have had occasion to address the issue; most importantly, the decisions of the Texas court are analyzed in detail. Finally, in Part V, the author predicts that the West Virginia court will decide a hydraulic fracturing trespass case in a similar manner as did the Texas court. This prediction is based on the similarities of Texas and West Virginia oil and gas jurisprudence as well as the recent success both states have experienced in exploiting unconventional oil and gas reserves through the use of hydraulic fracturing and the public policy issues surrounding the continued use of this technology.

II. HYDRAULIC FRACTURING

Hydraulic fracturing is a commonly used technology in modern oil and gas drilling operations, particularly with deep shale formations where its use is essential. Hydraulic fracturing involves injecting fluid at high pressure into an oil or gas well. The force of the fluid fractures, or cracks, the rock thereby producing fissures throughout the rock strata. Into these fissures is further injected small proppants, usually sand, which remain behind to ensure that the fissures remain open. As a result of this procedure, oil and gas are more easily liberated from the rock allowing it to flow towards the well head, thus increas-

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9 See discussion infra Part V.D.
10 See discussion infra Part VI.
12 HYNE, supra note 11, at 424.
13 Id.
14 Id.
ing the rate of extraction. But with the benefits of hydraulic fracturing also comes the potential for trespass.

A. The Dispute

A legal dispute may arise when a landowner suspects that a fracture-treated well located on his neighbor’s property has caused fractures, and the proppants contained within them, to have crossed over his boundary line. The presence of these fissures and tiny proppants thousands of feet below his property have the potential of increasing the rate that oil and gas underlying his own property will flow into his neighbor’s well. A difficulty arises because hydraulic fracturing technicians are unable to accurately predict the length of the artificially-made fissures produced by the fracture treatment. Moreover, it is expensive and sometimes impossible to determine whether the fractures, and the proppants injected into the fractures, have crossed over boundary lines. Added to this difficulty is the great economic benefit conferred by hydraulic fracturing and a fear that trespass lawsuits will stifle its continued use.

B. Geology of Oil and Gas Bearing Rock

A brief overview of the geology of hydrocarbon-bearing rock is helpful in understanding the necessity of hydraulic fracturing. Oil and gas deposits formed eons ago when plant and animal life settled on the ocean bottom and were covered with silt. Pressure, heat, and bacteria slowly converted this organic material into hydrocarbons. The oil and gas created millions of years ago are contained in reservoirs consisting of sedimentary rocks, such as sandstone or shale. These beds of sedimentary reservoir rock have the physical attributes of porosity and permeability, which means they can both contain and transmit oil and gas. Porosity is the measure of space within the sedimentary rock in which oil and gas reside. Permeability relates to how easily oil and gas

16 Id.
17 See infra notes 39–41 and accompanying text.
18 Id.
19 See discussion infra Part IV.D.
21 Id.
23 Id.
24 Id. at 3–4. A common misconception is that oil and gas are contained within large underground caverns, but most often hydrocarbons reside in a much more modest habitation, the pores of rock measuring only a millimeter in size. Id. at 4.
flow through the rock. For instance, fine-grained sedimentary rocks have a low permeability which reduces the ability of oil and gas contained within the rock to travel from one pore to another.

C. History and Technology of Hydraulic Fracturing

Well stimulation is nothing new in the oil and gas industry. In the 1860s, during the infancy of the industry, rock formations were fractured by exploding a canister of nitroglycerin within the well. Although common during the late 19th and early 20th centuries, explosive fracturing is infrequently used today.

Hydraulic fracturing made its appearance in the natural gas fields of western Kansas during 1947. The majority of natural gas wells drilled since the 1950s have utilized hydraulic fracturing, and the practice is now almost universal with ninety percent of new wells using the technology. Throughout the United States, most of the easy-to-extract oil and gas fields have been exhausted and hydraulic fracturing technology is necessary to exploit reservoirs with low porosity and permeability that had previously been underdeveloped; therefore, hydraulic fracturing is no longer just an option, but instead is a necessity.

To fracture-treat a well, large amounts of fluid are forced into the well under extreme pressure, causing fissures to form in the underlying rock strata. A variety of fluids can be used, such as water, diesel oil, nitrogen foam, or water containing acid. Usually, hydraulic fracturing fluid is a high-viscosity gel which breaks down into liquid form within a few hours, allowing for easier extraction. In order to keep the artificially created fissures from closing due to

25 Id.
26 Id. at 5.
27 Id. at 7; see also HYNE, supra note 11, at 424 (providing a good description of well-stimulation methods used in the oil and gas industry).
28 Burney, supra note 15, at ch. 19, 10.
30 PETER VALKO & MICHAEL J. ECONOMIDES, HYDRAULIC FRACTURE MECHANICS 2 (John Wiley & Sons 1997).
31 Broomes, supra note 11, at 2; see also Ben Casselman & Russell Gold, Drilling Tactic Unleashes a Trove of Natural Gas – And a Backlash, WALL ST. J., Jan. 21, 2010, at A1 [hereinafter Drilling Tactic].
32 Id. at 4.
33 HYNE, supra note 11, at 424.
34 Id.
35 Broomes, supra note 11, at 3. The original fracturing treatments of wells in the 1940s utilized gasoline and napalm left over from the Second World War as hydraulic fracturing fluid. Guntis Moritis, Unlocking Gas From Tight Sands, 104 OIL & GAS J. 8, 17 (Feb. 27, 2006), available at 2006 WLNR 5257329.
the immense weight of the overlying rock, additional fluid containing large amounts of propping agents are further injected. \(^{36}\) These proppants consist of small spheres, usually quartz sand grains. \(^{37}\) Once the pressure is released, the hydraulic fracturing fluid flows back towards the well where it is pumped out, leaving behind the many millions of tiny proppants which maintain the fissures within the rock strata. \(^{38}\)

The fissures created by hydraulic fracturing can be measured in three different ways: the hydraulic length is the distance that the hydraulic fracturing fluid travels, which can be as much as 3000 feet; the propped length measures the distance the proppants travel, usually slightly less than the hydraulic length; and the effective length is even shorter and represents the distance over which the fracturing treatment will enhance the flow of oil and gas. \(^{39}\) The length of a fracture can only be estimated, because the geological nature of the rock strata will influence how far it will travel. \(^{40}\) An operator cannot be certain that the fractures he is creating, and the proppants injected within them, have not crossed underneath an adjacent landowner’s property. Moreover, determining the fracture height and length after they have been created is both expensive and uncommon. \(^{41}\) Therefore, an adjacent landowner would have little indication that tiny artificially created fissures, many thousands of feet underground, have crossed over the boundary of his property.

III. SUBSURFACE TRESPASS

Is it possible for a hydraulic fracture treatment to constitute a trespass? *The Restatement (Second) of Torts* states that one is liable for trespass if he intentionally causes something to enter the land of another, such as an object which the actor has caused to be there, regardless of whether any harm results. \(^{42}\) Thus, a trespass occurs when the actor invades the property of another by propelling or placing something beneath the surface of the land. \(^{43}\) Under the *Restatement* definition, the propelling of the proppants contained in the hydraulic fluid beyond the boundaries of one’s land, without the permission of the adjoining landowner, constitutes a trespass. In this respect, hydraulic fracturing is

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36 HYNE, supra note 11, at 424.
37 Id. at 424–25.
38 Id. at 426.
39 Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 7 (Tex. 2008) (referring to the geology of the Barnett Shale Formation in northern Texas).
40 Id.
41 Burney, supra note 15, at 10–11.
43 Id. at cmt. i.
similar to directional drilling and waterflooding used in secondary recovery operations as a possible source of a subsurface trespass.\(^{44}\)

\(\text{A. Directional Drilling and Secondary Recovery Operations} \)

One form of subsurface entry that has been determined to constitute an actionable trespass is a directional or slant well.\(^{45}\) As the name suggests, a slant well, or directional well, is drilled upon one plot of land yet deviates from the vertical to the extent that the bore hole crosses under the boundary of an adjacent lot.\(^{46}\) Slant wells are clearly a trespass and are not protected under the rule of capture.\(^{47}\)

Secondary recovery projects, or waterflooding, became common during the 1950s and 1960s as a method of retrieving oil that was un-extracted during conventional operations.\(^{48}\) To enhance the amount of oil recoverable from a field that has been “played out,” salt water is injected at various locations which sweeps the remaining hydrocarbons towards wells where they are extracted.\(^{49}\) The injected water has the potential of crossing boundary lines and thus can constitute a trespass.\(^{50}\) But due to the economic benefit of secondary recovery operations, courts have been reluctant to allow liability for such a trespass.\(^{51}\)

\(^{44}\) Burney, supra note 15, at 23; see also Ragsdale, supra note 29, at 317–18. Secondary recovery refers to a technique of extracting oil from a reservoir which was previously depleted using standard well-drilling technology. In order for oil to rise through a well, sufficient pressure must exist within a reservoir to force the oil out of the ground. Once this pressure has been relieved, no additional oil can be extracted through the well; however, large amounts of oil can still remain within a reservoir. To extract the remaining oil, secondary recovery techniques are utilized in which salt water is injected into one end of a reservoir causing the remaining oil to be “swept” towards the other wells with enough pressure to allow for extraction. See generally R.R. Comm’n v. Manziel, 361 S.W.2d 560 (Tex. 1962).

\(^{45}\) Ragsdale, supra note 29, at 317.

\(^{46}\) The Supreme Court of Texas, in Hasting Oil Co. v. Texas Co., 234 S.W.2d 389 (Tex. 1950), was probably the first court to contend with directional drilling when it determined that a directional well trespass is an actionable tort and damages can be recovered. Ragsdale, supra note 29, at 320.

\(^{47}\) Burney, supra note 15, at 23. The rule of capture is a common-law legal doctrine that permits a landowner to extract as much oil and gas as possible from a well located on his own property regardless of whether the oil and gas extracted were originally located under his land or under neighboring tracts. The rule is justified because hydrocarbons can easily migrate once the pressure in a reservoir is disturbed thereby making it difficult to determine how much oil and gas are actually under a particular plot of land. Although the rule of capture allows for drainage of hydrocarbons from beneath a neighboring tract, it does not allow drainage by means of trespass, for example, through the use of a directional, or slant, well which is drilled at a diagonal across a property boundary. See discussion infra Part V.B.

\(^{48}\) Broomes, supra note 11, at 3.

\(^{49}\) Id.

\(^{50}\) Ragsdale, supra note 29, at 338.

\(^{51}\) Id. at 335; see, e.g., R.R. Comm’n v. Manziel, 361 S.W.2d 560 (Tex. 1962).
Even though hydraulic fracturing also allows for the extraction of oil and gas otherwise un-recoverable by conventional methods, two important distinctions exist between hydraulic fracturing and secondary recovery projects. The endorsement of secondary recovery by some state legislatures has strengthened its standing as good public policy. Moreover, secondary recovery operations occur pursuant to compulsory unitization orders overseen by state conservation commissions, thus providing some protection to a potentially aggrieved landowner. As of yet, hydraulic fracturing, although universally used in the oil and gas industry, is not encouraged under state statutes as is secondary recovery, thus weakening the claim that hydraulic fracturing is a protected activity based on public policy concerns.

B. Hydraulic Fracturing as a Trespass

Under the standard definition of trespass, hydraulic fracturing across property boundaries constitutes a technical trespass. In fact, hydraulic fracturing across a boundary line can be easily analogized to directional drilling into another’s property. Each method results in a physical violation of the adjacent property: directional drilling by the presence of a drill bit and bore hole, and hydraulic fracturing by way of artificially produced fissures filled with prop- pants. Moreover, both methods cause a loss of hydrocarbons in a manner not envisioned under the rule of capture.

Despite the obvious trespass potential of hydraulic fracturing, some significant problems are presented by allowing a cause of action. As discussed supra, it is difficult to determine whether the fissures created by a fracturing treatment actually crossed a property line. Also, due to the unpredictability of

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52 Burney, supra note 15, at 23.
53 Ragsdale, supra note 29, at 335–38. Unitization is the combining of leases and wells above a common reservoir into a single administrative unit. This permits a state conservation commission to regulate drilling in a manner which ensures that the pressure within a reservoir remains sufficient for the extraction of the maximum amount of hydrocarbons possible. JOHN S. LOWE, OIL AND GAS LAW IN A NUTSHELL 240–41 (4th ed., Thompson West 2003).
54 See supra note 30 and accompanying text.
55 Burney, supra note 15, at 18. The Supreme Court of Texas, in Railroad Commission of Texas v. Manziel, 361 S.W.2d 560 (Tex. 1962), justified shielding the operator of a secondary recovery operation from trespass liability on public policy grounds as expressed by the Railroad Commission’s approval of the project. Burney, supra note 15, at 17. However, one commentator believes that the Texas court’s refusal to allow trespass liability for an approved secondary recovery program would not be strictly enforced in other jurisdictions. Id. at 18.
56 See supra notes 42–43 and accompanying text.
57 Ragsdale, supra note 29, at 338.
58 id.
59 id.
60 Burney, supra note 15, at 24; see discussion supra Part I.C.
the hydraulic fracturing process, courts may have difficulty deciding whether a hydraulic fracture trespass is innocent or willful.\textsuperscript{61} Associated with willfulness is the specter of large punitive damages.\textsuperscript{62} Determining a trespasser's willfulness can greatly influence the damage award, as is discussed infra.\textsuperscript{63}

1. Public Policy Concerns

Due to the difficulty of proving a trespass and the overwhelming use and necessity of hydraulic fracturing in today's oil and gas industry, should courts allow hydraulic fracturing trespasses to be actionable?

Probably the strongest reason for overlooking the technical trespass aspect of hydraulic fracturing deals with the public policy concerns regarding the economic value of the technology. Close to ninety percent of all the wells drilled within the United States use fracturing treatments to stimulate the flow of oil and gas.\textsuperscript{64} For example, virtually every one of the approximately 350,000 oil and gas wells located within Pennsylvania use hydraulic fracturing technology, and the hydrocarbon industry has been rapidly growing throughout the state of Pennsylvania within the last few years.\textsuperscript{65} The most striking example of hydraulic fracturing's ability to increase production occurs within unconventional gas reserves, such as tight sands, shales, and coalbed methane.\textsuperscript{66} These types of oil and gas fields were previously under-exploited using traditional drilling methods. Improvements in hydraulic fracturing technology have been responsible for the successful production of unconventional reserves.\textsuperscript{67} From the late 1970s to 2008, the share of natural gas produced from unconventional reserves has risen from less than seven percent to over forty percent, and is expected to increase in the future.\textsuperscript{68}

Another aspect of the hydraulic fracturing as a trespass controversy is the lack of court actions.\textsuperscript{69} This raises the question of how much damage this type of trespass actually causes. The argument has been made that damage caused by a hydraulic fracturing subsurface trespass would be incremental, thus offering the aggrieved landowner time to rectify the situation; for example, by offset drilling or fracture-treating his own well.\textsuperscript{70} In fact, secondary recovery

\textsuperscript{61} Burney, supra note 15, at 24.
\textsuperscript{62} Broomes, supra note 11, at 14.
\textsuperscript{63} See discussion infra Part IV.C.
\textsuperscript{64} VALKÓ & ECONOMIDES, supra note 30, at 2; see also Drilling Tactic, supra note 31.
\textsuperscript{66} Frac Advances Key to Unconventional Gas Supply Growth, 106 OIL & GAS J. 36 (2008), available at 2008 WLNR 20097631.
\textsuperscript{67} Id.
\textsuperscript{68} Id.
\textsuperscript{69} See discussion supra Part III.A.
\textsuperscript{70} Broomes, supra note 11, at 25.
operations, which cause far more widespread damage when a trespass occurs, have been deemed non-actionable, just so long as they are pursuant to government regulation.\footnote{\textit{Id.}} However, in this regard, the major difference between secondary recovery operations and hydraulic fracturing is that the former is regulated and encouraged by state statutes and the latter is not.\footnote{\textit{Burney, supra note 15, at 18.}} Thus, a landowner suffering a trespass caused by his neighbor’s fracture treatment has less recourse through a state conservation commission.

2. Negative Rule of Capture

In addition to public policy concerns, not allowing an action for a hydraulic fracturing trespass has logical support under a theory referred to as the negative rule of capture.\footnote{\textit{Id.}}\footnote{\textit{Williams & Myers, Oil & Gas § 204.5, at 61–62 (1997).}} Just as a landowner may drain the oil and gas from a neighbor’s tract if the well is on his property, he may also inject substances into his own well which may flow beneath the property of an adjacent tract for the purpose of draining oil and gas.\footnote{\textit{Id.}} Such an approach would certainly ensure that a beneficial technology is not hampered.\footnote{\textit{Broomes, supra note 11, at 14.}} However, operators could then purposefully hydraulic fracture into adjacent property and violate the correlative rights of others with impunity.\footnote{\textit{Id.}} The traditional self-help solution under the rule of capture would be for an aggrieved land owner to fracture-treat his own well.

3. Other Causes of Action for Subsurface Trespass

Even if a tort action under trespass is unavailable to a landowner whose property is violated by a neighboring hydraulic fracturing operation, several other methods may provide him with a remedy.

a. Doctrine of Implied Covenants

If a landowner believes that a trespass has occurred under his property caused by a neighboring fracture treatment on an adjacent lot, instead of bringing an action under trespass, he could claim that his lessee failed to fracture-treat his well in violation of the implied covenant to manage and administer the lease (which entails using modern methods of production) and the implied covenant to prevent drainage.\footnote{\textit{Burney, supra note 15, at 25–26.} In oil and gas law, an implied covenant is an unwritten promise imposing a duty on the lessee to protect the interests of the lessor. The lessee’s conduct is measured by the “reasonable prudent operator” standard, which requires that the lessee manage...} For instance, a lessor could claim that a lessee...
failed to prevent drainage by not using hydraulic fracturing technology when the operator of an adjacent well used this technique.\textsuperscript{78} However, as with drilling an offset well, hydraulic fracturing would have to be profitable before a lessee would be required to do so under an implied covenant.\textsuperscript{79} Moreover, even though hydraulic fracturing has become a common practice, courts may be reluctant to impose a duty upon a lessee until state legislatures explicitly accept hydraulic fracturing as a public policy goal, as is the case with secondary recovery.\textsuperscript{80} Of course, if hydraulic fracturing was considered an actionable trespass, then there would be no implied duty to fracture-treat a well because such an activity would expose the operator to tort liability.\textsuperscript{81}

b. Conservation Commission

Another possibility is to have state conservation commissions regulate hydraulic fracturing as they do secondary recovery operations.\textsuperscript{82} Instead of costly court actions, a state agency would be responsible for the approval of fracturing treatments and thus be in a position to protect against waste and ensure correlative rights.\textsuperscript{83} However, hydraulic fracturing is not yet a highly regulated activity, possibly due to the burdens it would impose upon both the regulating agencies and well operators.\textsuperscript{84} In order for a state conservation commission to gain the needed authority to thoroughly regulate hydraulic fracturing, state legislatures would have to be convinced that the expenses involved, in both funding the regulatory agency and in loss of hydrocarbon production that would result from having to go through a regulatory process, are worth the cost. Considering the paucity of trespass claims, it is unlikely that legislators would see a need for expanded regulation.

There are other problems in relying on state agencies to protect a landowner from a subsurface trespass. Unlike the courts, an agency’s power is usually only prospective in that it can enjoin an activity, but an agency would not be able to provide damages for a prior trespass that has resulted in the drainage of hydrocarbons.\textsuperscript{85} And, truth be told, the major motivation for state gov-

\begin{footnotesize}
\begin{itemize}
\item the leasehold in good faith, competently, and with due regard for the lessor’s interests. LOWE, supra note 53, at 305, 309–10.
\item Burney, supra note 15, at 27.
\item Id.
\item Id. at 26.
\item Id. at 27.
\item Broomes, supra note 11, at 13.
\item Id.
\item Id. at 12–13. West Virginia’s regulation of hydraulic fracturing does not extend much beyond the requirement that operators obtain a permit. W. VA. CODE § 22-6-12 (1994). See discussion infra Part IV.A.2.
\item Broomes, supra note 11, at 14.
\end{itemize}
\end{footnotesize}
ernment involvement in secondary recovery operations is to prevent waste more
so than the protection of correlative rights.86 The problems surrounding hydrau-
lic fracturing do not relate to waste; on the contrary, such a practice allows for
greater exploitation of oil and gas resources. Instead, the issue is one of property
rights which is better addressed by the courts.87 Therefore, it is uncertain
whether state conservation commissions are the proper authorities to settle dis-
putes.88 However, this does not mean that an aggrieved landowner has no re-
course to an agency when the state lacks a regulatory scheme for hydraulic fract-
turing.89 Even under current law, a conservation commission may have the
power to protect a landowner and could at least provide prospective relief.90

c. Nuisance

If a landowner is barred from a trespass action, he may still be able to
gain relief under private nuisance.91 The Supreme Court of Appeals of West
Virginia recently reiterated, in In Re Flood Litigation, that a private nuisance is
a substantial and unreasonable interference with the private use and enjoyment
of another’s land, and that the unreasonableness of the interference is deter-
mined when the gravity of the harm outweighs the social value of the activity.92
As is evident, the standard for proving a nuisance is greater than that needed for
a trespass.93 Also, it is uncertain whether hydraulic fracturing interferes with a
landowner’s use and enjoyment of his property to the same extent as water-
flooding, which is a situation where nuisance actions have been successful.94
Moreover, secondary recovery operations have the potential of making one’s
land unsuitable for drilling oil and gas, whereas a hydraulic fracturing trespass
would only result in partial reductions in the value of the mineral estate.95

86 Id.
87 See, e.g., Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 411, 418 (Tex. 1961).
88 Broomes, supra note 11, at 14.
89 Id.
90 Id.
91 Ragsdale, supra note 29, at 345–46.
92 In re Flood Litigation, 607 S.E.2d 863, 872 (W. Va. 2008).
93 See discussion supra Part III.
94 Ragsdale, supra note 29, at 345–46.
95 Broomes, supra note 11, at 11 (referring to waterflooding as the “atomic bomb of subsur-
face trespass” because it results in the complete destruction of the land’s ability to produce oil and
gas).
IV. CASE HISTORY

Court cases addressing hydraulic fracturing trespass claims are few and far between. However, Texas has been the most active jurisdiction for this type of litigation. A few other states have briefly dealt with hydraulic fracturing in the context of wider disputes and their cases do not focus on it exclusively or at great length. However, these non-Texas cases do illustrate the different ways in which courts have analyzed the issue of subsurface trespass, and the logic used to decide these cases is applicable to hydraulic trespass disputes. And although the Texas cases represent the most extensive body of jurisprudence on hydraulic fracturing as a subsurface trespass, there is no reason that the West Virginia court would only look to Texas and not to other states in determining a hydraulic fracturing case. Therefore, before analyzing the Texas cases, a brief overview of cases from other jurisdictions is helpful in understanding the debate.

A. Other State Cases

Although the Supreme Court of Ohio did not address hydraulic fracturing in Chance v. B.P. Chemicals Inc., it did help define the limits of a subsurface trespass. The plaintiffs were landowners who claimed that the chemical company defendant had trespassed when it injected miles under the earth allegedly migrated below their properties. The court refused to grant the plaintiffs absolute ownership of all the subsurface property; instead, it stated that a landowner must accept some limitations to his subsurface rights just so long as there is no “interference with the reasonable and foreseeable use of the property.” Moreover, in “an indirect invasion . . . such as this,” the

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97 See generally Coastal, 268 S.W.3d 1; Geo Viking, 817 S.W.2d 357; Gregg, 344 S.W.2d 411.

98 See generally Chance, 670 N.E.2d 985; ANR Production, 893 P.2d 698; Snyder, 798 P.2d 587; Zinke, 749 P.2d 21.

99 Id.

100 See generally Coastal, 268 S.W.3d 1; Geo Viking, 817 S.W.2d. 357; Gregg, 344 S.W.2d 411.

101 Chance, 670 N.E.2d at 985.

102 Id. at 989.

103 Id. at 993.
court required that physical damages be established in order for damages to be awarded.\textsuperscript{104} Also, the court was frustrated by the difficulty of establishing whether the injected waste migrated across borderlines, stating that the evidence was too speculative to prove trespass.\textsuperscript{105}

The *Chance* court’s reasoning could be applicable to hydraulic fracturing trespass claims because if subsurface property rights are weakened, it would be more difficult for an aggrieved landowner to prove an actionable trespass. For instance, instead of merely relying on the occurrence of a technical trespass to receive relief, a plaintiff-landowner might have to prove that his neighbor’s fracture treatment caused physical damage and interfered with the foreseeable use of his property. However, perhaps the drainage of oil and gas would constitute an interference with a reasonable and foreseeable use of property. The *Chance* case is not dispositive on this issue because it dealt with the injection of waste material and not the oil and gas business.\textsuperscript{106} Nevertheless, a dispute involving injected chemicals or the fissures created by a fracture treatment present a difficulty in determining if they actually crossed underneath a boundary line; and this was one of the concerns that led the *Chance* court to reject speculative evidence in determining a subsurface trespass.\textsuperscript{107} Therefore, if the West Virginia court relied on the analysis used by the *Chance* court it might also diminish absolute ownership rights in regard to underground property due to the difficulties of proving that a trespass occurred and damages resulted from a fracture treatment.

In contrast to the Ohio court in *Chance*, courts in New Mexico,\textsuperscript{108} Kansas,\textsuperscript{109} and Wyoming\textsuperscript{110} took a much stricter view of subsurface property rights. The Supreme Court of New Mexico addressed the issue of saltwater injection as a subsurface trespass in *Snyder Ranches, Inc. v. Oil Conservation Commission of the State of New Mexico*.\textsuperscript{111} In *Snyder*, the plaintiff landowner objected to a state conservation permit that allowed his neighbor to inject saltwater into an underground rock formation.\textsuperscript{112} The plaintiff alleged that some of the saltwater migrated underneath his property and constituted a trespass.\textsuperscript{113} The court found the plaintiff’s evidence to be insufficient and therefore affirmed the lower court’s decision in favor of the defendants.\textsuperscript{114} However, the court clarified the

\textsuperscript{104} Id.
\textsuperscript{105} Id.
\textsuperscript{106} Id. at 991.
\textsuperscript{107} *Chance*, 670 N.E.2d at 993.
\textsuperscript{108} Snyder Ranches, Inc. v. Oil Conservation Comm’n, 798 P.2d 587 (N.M. 1990).
\textsuperscript{111} See generally *Snyder*, 798 P.2d 587.
\textsuperscript{112} Id. at 588.
\textsuperscript{113} Id. at 589.
\textsuperscript{114} Id. at 589–90.
law in New Mexico when it stated that if the saltwater did migrate across the boundary lines, the state’s issuance of a license to inject would not shield the defendants from a trespass claim.\textsuperscript{115}

The Supreme Court of Kansas had occasion, in \textit{Zinke \& Trumbo, Ltd. v. State Corporation Commission of the State of Kansas},\textsuperscript{116} to consider hydraulic fracturing in the context of a proration order by the state conservation commission. An operator, Sho-Bar, drilled a well above the same reservoir over which Zinke also had a well.\textsuperscript{117} The Sho-Bar well was placed close to the boundary line and its fracturing treatment resulted in a subsurface trespass within Zinke’s leasehold, causing an enhanced flow of over five times to Sho-Bar’s well.\textsuperscript{118} Zinke drilled an offset well, but due to the geology of the reservoir was unable to counter the drainage occurring from its own lease.\textsuperscript{119} Sho-Bar applied to the state conservation commission for a determination of well spacing and prorationing of the reservoir.\textsuperscript{120} Zinke objected to the conservation commission’s proration order, contending that it did not take into proper consideration the enhanced flow resulting from the subsurface trespass.\textsuperscript{121}

The court determined that the fractures created by Sho-Bar extended over the property boundary into Zinke’s leasehold.\textsuperscript{122} The court concluded that the conservation commission did not adequately protect correlative rights within the common field because it unreasonably ignored the enhanced flow created by Sho-Bar’s fracture-treated well, and the inability, due to the reservoir’s geology, of Zinke’s offset well to compensate for the drainage.\textsuperscript{123} The court chastised the conservation commission for not considering that the Sho-Bar well was fracture-treated when making the proration order; that is, the conservation commission should consider the enhanced drainage which results from hydraulic fractured wells when determining how to allocate the hydrocarbons among the owners above a common well.\textsuperscript{124} Although this case deals with hydraulic fracturing, the dispute surrounded the conservation commission’s prorationing of a common reservoir and not subsurface trespass per se.\textsuperscript{125} However, the case does illustrate how seriously a court can take the protection of correlative rights and

\textsuperscript{115} \textit{Id.} at 590.
\textsuperscript{116} \textit{Zinke}, 749 P.2d at 21.
\textsuperscript{117} \textit{Id.} at 23.
\textsuperscript{118} \textit{Id.}
\textsuperscript{119} \textit{Id.}
\textsuperscript{120} \textit{Id.}
\textsuperscript{121} \textit{Id.} at 24.
\textsuperscript{122} \textit{Zinke}, 749 P.2d at 27.
\textsuperscript{123} \textit{Id.} at 28.
\textsuperscript{124} \textit{Id.}
\textsuperscript{125} \textit{Id.} at 23–24.
the high degree of concern for a leasehold owner who has been drained as the result of someone else’s fracture-treated well.\textsuperscript{126}

The Supreme Court of Wyoming also took up the issue of a hydraulic fracturing trespass within a conservation commission unit in \textit{ANR Production Co. v. Kerr-McGee Corp.}\textsuperscript{127} ANR and Kerr-McGee’s predecessor-in-interest entered into a unitization agreement arranged by the state conservation commission.\textsuperscript{128} The unit consisted of only one level, or zone, of a productive rock formation.\textsuperscript{129} ANR received permission to drill into a lower zone within the formation which required hydraulic fracturing to enhance the flow of hydrocarbons.\textsuperscript{130} However, the fracture treatment caused fissures to extend upward into the unitized level fifty feet above.\textsuperscript{131} Kerr-McGee’s predecessor-in-interest, as the operator of the unit, successfully petitioned the conservation commission to shut in ANR’s well because it was draining hydrocarbons from the unitized zone.\textsuperscript{132} The court determined that ANR’s fracture treatment resulted in “substantial communication” between the two zones, thus allowing ANR to drain hydrocarbons that the conservation commission had not allocated to it.\textsuperscript{133} The court concluded that ANR’s action constituted a trespass and required it to pay damages for the hydrocarbons it converted.\textsuperscript{134}

If the Supreme Court of Appeals of West Virginia were to follow the precedents set by the New Mexico, Kansas, and Wyoming courts in regard to subsurface trespass, it would be inclined to strictly adhere to sub-surface property rights and have a concern over whether correlative rights of landowners above a common pool were being respected. Thus, the West Virginia court might similarly determine that hydraulic fracturing trespasses are actionable. However, it must be stressed that the courts which decided the above cases did not engage in the depth or extent of analysis as did the Texas court in regard to the hydraulic fracturing trespass issue. Therefore, the West Virginia court would most likely give the greatest attention to Texas decisions due to their thoroughness.

\begin{itemize}
\item \textsuperscript{126} \textit{Id.} at 28.
\item \textsuperscript{127} ANR Production Co v. Kerr-McGee Corp., 893 P.2d 698 (Wyo. 1995).
\item \textsuperscript{128} \textit{Id.} at 699–700.
\item \textsuperscript{129} \textit{Id.} at 700.
\item \textsuperscript{130} \textit{Id.}
\item \textsuperscript{131} \textit{Id.}
\item \textsuperscript{132} \textit{Id.}
\item \textsuperscript{133} \textit{ANR Prod.}, 893 P.2d at 700.
\item \textsuperscript{134} \textit{Id.} at 701, 706.
\end{itemize}
B. Texas Cases

Texas is the only state to possess complete and germane case law on hydraulic fracturing as a trespass.\(^{135}\) The Texas courts have contended with the issue periodically since the early 1960s but their opinions have been inconsistent.\(^{136}\)

1. Hydraulic Fracturing’s Day in Court

The first case in which the Texas court contended with hydraulic fracturing was Gregg v. Delhi-Taylor Oil Corporation,\(^{137}\) decided in 1961. A. W. Gregg was the owner of an oil and gas leasehold measuring around seventy-five feet wide and occupying less than half an acre.\(^{138}\) Surrounding the Gregg property was a mineral estate owned by the Delhi-Taylor Oil Corporation.\(^{139}\) At its closest, Gregg’s well was a mere 37.5 feet from Delhi-Taylor’s leasehold.\(^{140}\) When Gregg planned to fracture-treat his well to increase production, Delhi-Taylor filed suit alleging that such activity would result in a subsurface trespass.\(^{141}\)

Gregg contended that the Railroad Commission had the primary jurisdiction over the conflict because the legislature delegated to the commission the responsibility for regulating the oil and gas industry which included the making and enforcing of rules to prevent waste, protect correlative rights, and supervise the drilling and completion of wells.\(^{142}\) Gregg further alleged that the commission could even hear and determine complaints, and the courts would only have the power to review the commission’s actions.\(^{143}\) According to Gregg, allowing the Railroad Commission primary jurisdiction in a case such as this would permit trained experts to evaluate the complicated issues involved in the dispute and would provide for more uniform regulations.\(^{144}\)

In response, Delhi-Taylor pointed out that the legislature had not delegated to the Railroad Commission the authority to regulate hydraulic fracturing or to authorize a subsurface trespass; therefore, the commission did not have

\(^{135}\) Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008); Geo Viking, Inc. v. Tex-Lee Operating Co., 817 S.W.2d 357 (Tex. App. 1991); Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 411 (Tex. 1961).

\(^{136}\) Compare Coastal, 268 S.W.3d 1, with Gregg, 344 S.W.2d. 411.

\(^{137}\) Gregg, 344 S.W.2d. 411.

\(^{138}\) Id. at 412.

\(^{139}\) Id.

\(^{140}\) Id.

\(^{141}\) Id.

\(^{142}\) Id. at 412–13.

\(^{143}\) Gregg, 344 S.W.2d at 413.

\(^{144}\) Id.
primary jurisdiction to settle the dispute, and such a matter must be determined by the court.\textsuperscript{145} The court agreed and claimed jurisdiction over the case, stating that the legislature had not granted exclusive jurisdiction to the Railroad Commission to determine subsurface trespass disputes caused by hydraulic fracturing, and that the commission had made no rule in that regard.\textsuperscript{146}

The court then addressed the trespass issue by stating that a person need not enter, in person, the land of another to cause a trespass, but that a trespass may occur if a person causes or permits something to cross the property boundary.\textsuperscript{147} In this case, the court found the allegations sufficient to raise the possibility of a trespass because the alleged invasion was direct and intentional.\textsuperscript{148} The court noted that, for all practical purposes, Gregg’s fracture treatment would result in a physical invasion of Delhi-Taylor’s mineral estate: the fissures that would extend into Delhi-Taylor’s property would be the equivalent of purposefully directing a drill bit under the property. Both methods would result in the production of gas from Delhi-Taylor’s property.\textsuperscript{149} Therefore, the court enjoined Gregg from fracture-treating his well.\textsuperscript{150}

2. Confused Court

It took thirty years until another dispute over hydraulic fracturing reached the Texas courts.\textsuperscript{151} The Court of Appeals of Texas, in \emph{Geo Viking, Inc. v. Tex-Lee Operating Co.}, had occasion to hear a dispute that involved hydraulic fracturing as a trespass.\textsuperscript{152} Tex-Lee hired Geo Viking to fracture-treat an oil well that was drilled into a tight formation.\textsuperscript{153} Geo Viking incorrectly performed the fracture treatment rendering the well un-usable.\textsuperscript{154} Thereupon, Tex-Lee filed a suit to recover damages.\textsuperscript{155} The court determined that Geo Viking’s improperly performed fracture treatment ruined any possibility of future production of oil from the area around the well.\textsuperscript{156}

Regarding the damage calculations, Geo Viking claimed the trial court erred in allowing the jury to consider the value of hydrocarbons contained outside of Tex-Lee’s unit, arguing that Tex-Lee had no right to obtain the oil and

\begin{flushleft}
\textsuperscript{145} \textit{Id.} at 415.
\textsuperscript{146} \textit{Id.} at 416.
\textsuperscript{147} \textit{Id.}
\textsuperscript{148} \textit{Id.}
\textsuperscript{149} \textit{Gregg}, 344 S.W.2d at 416.
\textsuperscript{150} \textit{Id.} at 419.
\textsuperscript{151} \textit{See Geo Viking, Inc. v. Tex-Lee Operating Co.}, 817 S.W.2d 357 (Tex. App. 1991).
\textsuperscript{152} \textit{Id.}
\textsuperscript{153} \textit{Id.} at 359.
\textsuperscript{154} \textit{Id.} at 360.
\textsuperscript{155} \textit{Id.} at 359.
\textsuperscript{156} \textit{Id.} at 361.
\end{flushleft}
gas from the adjacent tracts even though the fracture treatment would have allowed drainage from beyond the unit’s boundaries.\textsuperscript{157} The court of appeals rejected Geo Viking’s claim and refused to consider at length the issue of hydraulic fracturing and trespass.\textsuperscript{158} Instead, the court referenced the long-standing formula of the rule of capture: a landowner may drill as many wells on his property as are allowed by the Railroad Commission and he will not be liable for the hydrocarbons drained from his neighbor’s land.\textsuperscript{159} Each landowner must look out for his own interests.\textsuperscript{160} A concurring opinion suggested that Geo Viking may not be excused from liability by claiming that some of Tex-Lee’s production would have been due to trespass; such a dispute is between Tex-Lee and the adjacent landowners.\textsuperscript{161} However, the dissenting judge pointed out that the rule of capture does not allow drainage resulting from trespass.\textsuperscript{162} The dissent further noted that the evidence indicated the fracture treatment would have extended well beyond the boundary lines and, therefore, Tex-Lee could not recover damages that would have resulted from such a trespass.\textsuperscript{163}

The following year, the Supreme Court of Texas reversed the decision of the court of appeals.\textsuperscript{164} In a per curiam opinion, the court declared that the rule of capture does not sanction trespass and that “[hydraulic fracturing] under the surface of another’s land constitutes a subsurface trespass,” thus Tex-Lee could not claim as damages the oil and gas that might have been recovered by hydraulic fracturing into adjacent property.\textsuperscript{165} However, later in the year, the Supreme Court of Texas issued another per curiam opinion withdrawing its earlier opinion by simply stating that it neither approved nor disapproved of the “opinions of the court of appeals analyzing the rule of capture or trespass as they apply to hydraulic fracturing.”\textsuperscript{166}

3. Taking a Stand

In the 2008 case of \textit{Coastal Oil & Gas Corp. v. Garza Energy Trust},\textsuperscript{167} the Supreme Court of Texas settled the issue of whether a hydraulic fracture treatment that extends across a boundary line is an actionable trespass in which

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\textsuperscript{157} Geo Viking, 817 S.W.2d at 363–64.
\textsuperscript{158} \textit{Id.} at 364.
\textsuperscript{159} \textit{Id.}
\textsuperscript{160} \textit{Id.}
\textsuperscript{161} \textit{Id.} at 364 (Cornelius, C.J., concurring).
\textsuperscript{162} \textit{Id.} at 365 (Grant, J., dissenting).
\textsuperscript{163} Geo Viking, 817 S.W.2d at 366 (Grant, J., dissenting).
\textsuperscript{165} \textit{Id.} at 5.
\textsuperscript{166} Geo Viking, Inc. v. Tex-Lee Operating Co., 839 S.W.2d 797, 798 (Tex. 1992) (per curiam).
\textsuperscript{167} Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008).
\end{flushleft}
damages can be recovered for the value of the drained hydrocarbons. The court decided that the rule of capture bars any recovery for damages.\textsuperscript{168} But unlike the appellate court in \textit{Geo Viking},\textsuperscript{169} which came to the same conclusion, the \textit{Coastal} court extensively explained its logic and policy concerns.\textsuperscript{170}

The court preferred to use the name Salinas, the surname of many of the joint owners of a tract of land involved in the dispute, to refer to the Garza Energy Trust.\textsuperscript{171} A tract of land referred to as Share 13 had been occupied by Salinas and their ancestors for over a century.\textsuperscript{172} Coastal owned the adjacent lot, Share 12, in fee.\textsuperscript{173} Both units were above a common reservoir, a "tight" sandstone formation requiring hydraulic fracture stimulation to be productive.\textsuperscript{174} As lessee of Salinas’ Share 13, Coastal drilled numerous wells, one of which was an exceptional producer.\textsuperscript{175} With the permission of the Railroad Commission, Coastal located a well on its own lot, Share 12.\textsuperscript{176} Because of the close proximity of the new well to Share 13, Salinas feared that it was being drained by its own lessee.\textsuperscript{177} To allay Salinas’ fear, Coastal frantically drilled on Salinas’ Share 13 and halted drilling on its own land for three years.\textsuperscript{178}

The resulting legal dispute centered around the well located on Coastal’s plot, Share 12, and whether its fracturing treatment caused a subsurface trespass of Salinas’ plot, Share 13, resulting in substantial drainage of gas.\textsuperscript{179} Both parties agreed that the hydraulic and proppant lengths crossed the boundary line, but disagreed on whether the effective length (i.e., the distance necessary to enhance flow) also crossed over into Salinas’ property.\textsuperscript{180}

a. Majority Opinion

The court first addressed the issue of whether Salinas, as only a royalty interest owner of its hydrocarbons, had standing to bring the trespass case.\textsuperscript{181}

\textsuperscript{168} \textit{Id.} at 2.


\textsuperscript{170} \textit{See generally} \textit{Coastal}, 268 S.W.3d 1; \textit{Geo Viking}, 817 S.W.2d 357.

\textsuperscript{171} \textit{See Coastal}, 268 S.W.3d at 5.

\textsuperscript{172} \textit{Id.}

\textsuperscript{173} \textit{Id.}

\textsuperscript{174} \textit{Id.} at 5–6.

\textsuperscript{175} \textit{Id.} at 7.

\textsuperscript{176} \textit{Id.}

\textsuperscript{177} \textit{Coastal}, 268 S.W.3d at 6.

\textsuperscript{178} \textit{Id.}

\textsuperscript{179} \textit{Id.} at 9.

\textsuperscript{180} \textit{Id.} at 7. \textit{See the discussion} \textit{supra} Part II.C for more information on the various methods of measuring the length of a hydraulic fracture.

\textsuperscript{181} \textit{Coastal}, 268 S.W.3d at 9–11.
The court concluded that a non-possessory, reversionary-interest owner could bring an action under trespass just so long as an injury was sustained. 182

However, the court stressed that an “actionable trespass requires injury” and Salinas’ claim of injury, that Coastal’s fracture treatment caused gas to drain from Salinas’ land, was “precluded by the rule of capture.” 183 The court was adamant in stating that the gas Salinas alleged was illegally taken “simply [did] not belong to him” due to the rule of capture. 184 Moreover, the court observed that Salinas claimed no physical damage to his own well or the common reservoir as a result of the fracture treatment. 185 Therefore, Salinas could show no injury for which to recover trespass damages. 186

Salinas claimed that the rule of capture did not apply because hydraulic fracturing is unnatural. 187 The court replied that any exploitation of oil and gas requires “unnatural” human intervention, and that hydraulic fracturing is a commonplace and necessary aspect of the oil and gas industry. 188 Moreover, Salinas was admonished to protect his rights by going and doing the same, i.e., fracture-treating the wells on his own property, which is what was done by his lessee, Coastal. 189

Salinas also compared a fracture treatment that extends beyond a property’s boundaries to that of a slant well bottomed under a neighbor’s tract because both produce the oil and gas from the adjacent property. 190 In response, the court, somewhat confusingly, claimed that a slant well does not capture hydrocarbons that flow from an adjacent property because the well head is already located within the other property. 191 An owner can always protect the drainage of his gas by drilling wells on his own property, but similar protection is not possible with a slant well. 192 Therefore, the rule of capture does not allow one to use a directional well, but does allow for the drainage of a neighbor’s hydrocarbons from a well situated on another’s land. 193

The court explained at greater length why the rule of capture permits drainage resulting from hydraulic fracturing across lease lines. 194 First, as with

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182 *Id.* at 9–10.
183 *Id.* at 12–13.
184 *Id.* at 13.
185 *Id.*
186 *Id.* The court remarked that if the trespass was against a possessory interest, an injury would not have to be proven, but only nominal damages could be awarded. *Id.* at n.36.
187 *Coastal*, 268 S.W.3d at 13.
188 *Id.*
189 *Id.*
190 *Id.* at 13–14.
191 *Id.* at 14.
192 *Id.*
193 *Coastal*, 268 S.W.3d at 14.
194 *Id.*
any other case of drainage, the law offers remedies.\textsuperscript{195} The landowner whose property is being drained can drill an offset well, and if his lessee refuses to do so, the owner can sue for a violation of the implied covenant to protect against drainage.\textsuperscript{196} Moreover, a landowner who fears he is being drained can offer to pool and if such an offer is rebuffed, he could apply to the Railroad Commission for forced pooling.\textsuperscript{197} Also, the Railroad Commission could use its authority to “regulate production to prevent drainage.”\textsuperscript{198}

Second, the court was concerned that if drainage resulting from hydraulic fracturing was allowed to constitute a trespass, then the rule of capture would be weakened, thus impeding the Railroad Commission’s authority to regulate oil and gas production.\textsuperscript{199} Without the rule of capture, the Railroad Commission would be hampered in fulfilling its legislative mandate to prevent waste and protect correlative rights.\textsuperscript{200} The Railroad Commission has been given the authority to control the spacing, density, and allowables of wells.\textsuperscript{201} These powers are contingent on the fact that the rule of capture allows for the legal drainage of hydrocarbons from another’s property.\textsuperscript{202} If every landowner had an absolute right to the minerals beneath his property, the Railroad Commission’s regulations could amount to a “taking of a mineral owner’s property.”\textsuperscript{203}

Third, the court explained that the oil and gas industry has always depended on the rule of capture, in a large part due to the uncertainty of the actual quantities of oil and gas underneath the earth.\textsuperscript{204} An alteration of the rule of capture would “create new and uncertain possibilities for liability” based upon speculative evidence.\textsuperscript{205} Moreover, hydraulic fracturing has become a necessary technology in ensuring maximum extraction of hydrocarbons, and drainage is unavoidable.\textsuperscript{206} The Railroad Commission has traditionally been the govern-

\begin{flushleft}
\textsuperscript{195} Id.

\textsuperscript{196} Id.

\textsuperscript{197} Id. Pooling is the process of combining smaller leaseholds so that only a single well needs to be drilled in order to efficiently drain the oil and gas underneath the leaseholds. \textit{Lowe, supra} note 53, at 240.

\textsuperscript{198} \textit{Coastal}, 268 S.W.3d at 14.

\textsuperscript{199} Id. at 14–15.

\textsuperscript{200} Id. at 15.

\textsuperscript{201} Id. An allowable is the amount of oil or gas that a certain well is permitted to extract. A state conservation commission (which in Texas is the Railroad Commission) will apportion or allocate a certain amount of hydrocarbons within a common reservoir to the various leaseholds overlying the reservoir. The purpose of this allocation is to ensure that oil and gas is extracted at an optimal rate and to entitle each leasehold owner to the hydrocarbons underlying his leasehold. \textit{See, e.g., Tex. Nat. Res. Code Ann.} § 85.053(a)(1–2) (Vernon 2007).

\textsuperscript{202} \textit{Coastal}, 268 S.W.3d at 15.

\textsuperscript{203} Id.

\textsuperscript{204} Id. at 16.

\textsuperscript{205} Id.

\textsuperscript{206} Id.
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mentally, that balances the various interests involved, and it is in a better position than the courts to fulfill such a task.\footnote{Id.}

Fourth, the court observed that no one in the oil and gas industry wanted the rule of capture to be applied differently to hydraulic fracturing.\footnote{Coastal, 268 S.W.3d at 16.} The many amicus curiae briefs submitted for the case, from “regulators, landowners, royalty owners, operators, and hydraulic fracturing service providers” all warned of the “adverse consequences” of allowing trespass actions due to fracture treatments.\footnote{Id. at 16–17.} The court noted that for over sixty years, hydraulic fracturing has been a common aspect of oil and gas production, yet the Railroad Commission has never shown a desire to regulate it even though most other aspects of the industry are regulated.\footnote{Id. at 17.} The court quoted at length some of the amicus briefs which warned of the massive economic costs if hydraulic fracturing were discouraged.\footnote{Id. at 17 n.56.} The court appeared to believe that potential tort liability resulting from fracture-treating would be chaotic to the industry, weakening the economy throughout the entire state.\footnote{Id. at 17.}

\subsection*{b. Concurring Opinion}

The concurring opinion was even more adamant in its public policy concerns regarding the economic health of the state and nation.\footnote{Id. at 27–29 (Willett, J., concurring).} Texas possesses the largest reserves of oil and gas and is also the nation’s leader in production.\footnote{Coastal, 268 S.W.3d at 27.} Such production results in great economic benefits, such as royalty payments to mineral owners and state revenue resulting from taxes.\footnote{Id.} However, the concurrence worried about the decline in oil and gas production in Texas over the past three decades.\footnote{Id. at 28} Because of the increasing difficulty of discovering hydrocarbon resources, hydraulic fracturing technology is essential to maximize recovery, and “enshrining trespass liability for [hydraulic fracturing]” would stifle the necessary production of energy supplies.\footnote{Id. at 29.} The concurrence feared that due to the difficulty of controlling the length of a fracture, an operator would be reluctant to assume tort liability on account of a possible subsur-

\begin{footnotes}
\footnotetext[207]{Id.}
\footnotetext[208]{Coastal, 268 S.W.3d at 16.}
\footnotetext[209]{Id. at 16–17.}
\footnotetext[210]{Id. at 17.}
\footnotetext[211]{Id. at 17 n.56.}
\footnotetext[212]{Id. at 17.}
\footnotetext[213]{Id. at 27–29 (Willett, J., concurring).}
\footnotetext[214]{Coastal, 268 S.W.3d at 27.}
\footnotetext[215]{Id.}
\footnotetext[216]{Id. at 28}
\footnotetext[217]{Id. at 29.} The concurrence noted evidence presented during the case which stated that successful production of the Barnett Shale was due, in large part, to hydraulic fracturing technology.\footnote{Id. at 31–32.}
face trespass and would instead refrain from using a technology necessary for efficient production of oil and gas.\footnote{\textit{Id.} at 30–33.}

Although agreeing with the majority view that the rule of capture makes an injury resulting from drainage impossible to maintain, the concurring judge believed the best approach was to foreclose any action under trespass due to hydraulic fracturing by applying the “balancing of interests” approach used in \textit{Railroad Commission of Texas v. Manziel}.\footnote{\textit{Id.} at 29–30 (referencing R.R. Comm’n v. Manziel, 361 S.W.2d 560 (Tex. 1962)).} Unlike the actionable/unactionable trespass analysis used by the majority that focused on injury, the balancing-of-interest test does not consider whether an injury resulted from a subsurface encroachment but rather on the wrongfulness of the act itself.\footnote{\textit{Coastal}, 268 S.W.3d at 29–30.} For example, the court in \textit{Manziel} determined that although waterflooding during a secondary recovery operation encroached upon another’s land, such an activity was beneficial and therefore did not constitute a trespass.\footnote{\textit{Id.} at 30, 36 (referencing \textit{Manziel}, 361 S.W.2d. at 568–69).} The concurring judge further observed that hydraulic fracturing is much less invasive than waterflooding and less likely to cross boundary lines.\footnote{\textit{Id.} at 37.} But like waterflooding, hydraulic fracturing “generates societal and economic benefits that outweigh any harm to individual operators.”\footnote{\textit{Id.} at 30–33.} The concurrence therefore believed that due to the importance of hydraulic fracturing to the industry and economy, the activity should not even be considered a trespass but instead should be evaluated under the \textit{Manziel} balancing-of-interest test, which is similar to the analysis in a nuisance case.\footnote{\textit{Id.} at 37.} Moreover, the Railroad Commission, not the courts, is in the best position to “balance the competing interests and fine-tune the production of Texas hydrocarbons.”\footnote{\textit{Id.} at 40–41.}

The concurrence further expanded upon the majority’s observation that an aggrieved landowner has other remedies outside of trespass damages.\footnote{\textit{Coastal}, 268 S.W.3d at 40–41.} As for a non-drainage case, such as the damaging of another’s well or harming a common formation reservoir, the concurrence saw no need to allow the possibility of a trespass claim, as did the majority.\footnote{\textit{Id.} at 37.} Instead, the concurring judge preferred to rely on the theory of negligence.\footnote{\textit{Id.} at 40.} Regarding drainage, if a landowner fears that he is being deprived of the hydrocarbons under his land, he can resort to self-help remedies such as drilling an offset well or engaging in pooling.\footnote{\textit{Id.} at 40–41.}
the property is under lease and the lessee refuses to take remedial actions, the lessor could always file a breach of contract action for the lessee’s failure to abide by the implied covenant to protect against drainage.230 Although these self-help remedies may be expensive or inconvenient, they are nevertheless adequate to provide protection and, therefore, should not be supplanted by a new common-law tort.231 The concurrence further stated that the Railroad Commission has both the expertise and legal ability to protect correlative rights.232 Although the Railroad Commission does not require that operators obtain a permit to fracture-treat a well, it can nevertheless use its authority, such as in regard to well spacing and pooling, to protect a nearby landowner from a potentially damaging fracture treatment.233

c. Dissenting Opinion

The dissenting judge believed that the majority misapplied the rule of capture because hydraulic fracturing across a boundary line constitutes a trespass and the rule of capture only sanctions the legal drainage of hydrocarbons.234 For this reason, methods employing deviated wells and vacuum pumps have been outside the parameters of the rule of capture.235 Like a deviated well, hydraulic fracturing across a boundary line involves the intentional insertion of foreign materials into an adjacent landowner’s property without his permission, resulting in the drainage of hydrocarbons.236 The dissent observed that both methods represent a trespass and trespassing is an illegal activity outside the bounds of the rule of capture.237

The dissent also doubted that the self-help remedies recommended by the court could be used by all mineral owners.238 The dissenting judge claimed that operators can more easily disadvantage small landowners because they can now legally fracture-treat into adjacent property and drain the minerals.239 Thus, an operator has less incentive to negotiate new lease lines or enter into pooling agreements with a small adjacent landowner.240 The dissent believed the best method of balancing the various interests of those in the oil and gas

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230 Id. at 40.
231 Id. at 41.
232 Coastal, 268 S.W.3d at 38–39.
233 Id. at 39.
234 Id. at 42–43 (Johnson, J., dissenting).
235 Id. at 43.
236 Id. at 43.
237 Id. at 44.
238 Coastal, 268 S.W.3d at 45 (Johnson, J., dissenting).
239 Id.
240 Id.
business would be to allow a hydraulic fracturing trespass to be actionable but preclude the recovery of exemplary damages.\textsuperscript{241}

Despite the dissenting judge’s misgivings, the Coastal court clarified the law in Texas regarding hydraulic fracturing as a subsurface trespass by holding that “damages for drainage by hydraulic fracturing are precluded by the rule of capture.”\textsuperscript{242} Nevertheless, the rule “cannot be used to shield misconduct that is illegal, malicious, reckless, or intended to harm another without commercial justification . . . .”\textsuperscript{243} In the present dispute, the court found no such behavior and therefore would not allow an actionable trespass.\textsuperscript{244}

V. \textbf{WHAT WILL THE SUPREME COURT OF APPEALS OF WEST VIRGINIA DO?}

Any prediction on how a court will decide a legal issue is speculative at best; therefore, the author makes only a modest claim when he asserts that the West Virginia court will most likely follow the lead of the Texas court in determining that a hydraulic fracturing trespass is not actionable. Texas has been a leader in oil and gas development since the industry’s inception and as a result other states refer to her decisions on contentious issues in oil and gas law.\textsuperscript{245}

The most logical forecasting method involves comparing the oil and gas jurisprudence of both states. Texas and West Virginia have developed similar common law concepts in areas such as the rule of capture and trespass damages.\textsuperscript{246} Moreover, Texas and West Virginia have both experienced increased growth within the oil and gas industry by fracture-treating unconventional reservoirs.\textsuperscript{247} The similarities among the two states suggest that the West Virginia court could rely on the same legal arguments and have the same public policy concerns as did the Texas court, and as a result, the West Virginia court might arrive at the same conclusion.

\textit{A. West Virginia Case Law and Statutes Relating to Hydraulic Fracturing}

West Virginia jurisprudence contains little mention of hydraulic fracturing. The West Virginia Code contains references to hydraulic fracturing, but mostly in the context of coalbed methane.\textsuperscript{248} There is only one case that tangentially mentions hydraulic fracturing in which the court expressed uncertainty

\textsuperscript{241} \textit{Id.} at 47.
\textsuperscript{242} \textit{Id.} at 17 (majority opinion).
\textsuperscript{243} \textit{Id.}
\textsuperscript{244} Coastal, 268 S.W.3d at 17, 26.
\textsuperscript{245} \textit{Id.} at 42 (Willett, J., concurring).
\textsuperscript{246} \textit{See} discussion infra Parts V.B–C.
\textsuperscript{247} \textit{See} discussion infra Part V.D.
\textsuperscript{248} \textit{See} W. VA. CODE § 22-6-12; -6-13; -6-15; -6-26; -6-40; -21-6; -21-7 (1994).
over whether the state common law allowed a trespass action resulting from a fracture treatment.\footnote{See Trent v. Energy Development Corp., 902 F.2d 1143 (4th Cir. 1990).}

1. State Code

The West Virginia Code requires that an operator gain permission from the Department of Environmental Protection (“DEP”) to fracture-treat a well.\footnote{W. VA. CODE § 22-6-12 (1994). Interestingly, Texas lacks a requirement that a well operator obtain a permit to perform a fracture treatment. Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 39 (Tex. 2008).} Moreover, the operator applying for a permit must provide the DEP with the names of the owners of the tracts adjacent to the well.\footnote{Id. § 22-6-13.} However, the applicant operator is only required to notify the DEP and coal operators who are conducting mining operations underneath the well site before fracture-treating a well, not the surrounding landowners.\footnote{Id. § 22-21-7.} But if the well operator wishes to fracture into a coal seam to extract coalbed methane, he must notify those owning or operating the underlying coal.\footnote{Trent v. Energy Development Corp., 902 F.2d 1143 (4th Cir. 1990).}

2. Case Law

The Fourth Circuit case of Trent v. Energy Development Corp.\footnote{Id. at 1144.} is the only case to have dealt with the issue of hydraulic fracture trespass in West Virginia. The defendant in Trent was a lessee, Energy Development, which drilled a productive well on its lessee’s leasehold of only 5.61 acres.\footnote{Id.} The neighbors adjacent to the tract complained bitterly about the well due to its close proximity to their property and out of fear that the gas under their own tract would be quickly drained.\footnote{Id. § 22-13.} To appease the adjacent landowners, Energy Development entered into an agreement in which it would grant the aggrieved landowners a 1/16 overriding interest of its 7/8 interest in the well’s production.\footnote{Id. at 1144.} In return, the adjacent landowners agreed not to drill an offset well and allowed surface right-of-ways.\footnote{Id. at 1144-45.} The dispute arose when Energy Development reneged on the agreement and did not pay the landowners the agreed-to royalty.\footnote{Id. at 1145.}
In an attempt to evade liability, Energy Development filed a third-party complaint against its lessor, the Cassadys.\textsuperscript{260} Prior to the agreement between Energy Development and the adjacent landowners, Mr. Cassady was persuaded by the threats of his neighbors to sign a temporary agreement granting them a share of his wife’s and his own royalties.\textsuperscript{261} This agreement was meant to be only temporary and became ineffective upon the adjacent landowner’s formal agreement with Energy Development.\textsuperscript{262} However, Energy Development alleged that the Cassadys should still be held responsible for part of the money that the court might award the neighboring landowners.\textsuperscript{263} Specifically, Energy Development alleged that the Cassadys were only entitled to the oil and gas located directly under their own land and thus not allowed royalty payment on gas that was drained from the adjacent lot.\textsuperscript{264} And because only the Cassadys, and not their neighbors, were paid a royalty on all the gas extracted from the well, the Cassadys were liable to their neighbors for gas drained from the adjacent tracts.\textsuperscript{265} The court refused to entertain Energy Development’s argument that the lease only applied to the gas located directly beneath the Cassadys’ lot by stating that the rule of capture allows for the legal drainage of an adjacent lot.\textsuperscript{266}

Energy Development further argued that because the well was artificially stimulated by hydraulic fracturing, the resulting drainage of gas from the adjacent tracts was therefore unnaturally enhanced and, thus, outside the rule of capture.\textsuperscript{267} The court replied that, outside of a trespass, the rule of capture allows for the drainage of gas from adjacent lands even if a well is artificially stimulated by a fracture treatment.\textsuperscript{268} The court further stated that “[a]lthough not alleged here, any trespass cause of action based upon [hydraulic fracturing], if in fact such a cause of action exists in the common law of West Virginia, would belong to the landowners, not [Energy Development Corporation].”\textsuperscript{269}

As is evident from the above analysis of West Virginia law, there is very little jurisprudence involving hydraulic fracturing and none on whether such an activity constitutes an actionable subsurface trespass. However, due to the similarities of West Virginia oil and gas law with that of Texas, the author surmises that the West Virginia court, if ever confronted with a hydraulic fracturing trespass case, will decide in a like manner to the Texas court.

\textsuperscript{260} Trent, 902 F.2d 1143.
\textsuperscript{261} Id.
\textsuperscript{262} Id.
\textsuperscript{263} Id.
\textsuperscript{264} Id.
\textsuperscript{265} Id.
\textsuperscript{266} Trent, 902 F.2d at 1146–47.
\textsuperscript{267} Id. at 1147.
\textsuperscript{268} Id. (referencing KUNTZ, THE LAW OF OIL & GAS § 4.1 (1978)).
\textsuperscript{269} Id.
B. Rule of Capture

The doctrine of the rule of capture entered American jurisprudence in the late 19th century as a way to establish ownership of oil and gas, and has become a cornerstone of oil and gas jurisprudence.\footnote{270} Basically, the rule of capture states that a landowner does not have absolute ownership of the oil and gas underlying his land until he extracts the hydrocarbons.\footnote{271} As long as the oil and gas are within the ground, other landowners above a common source may “capture” or drain the minerals, thus gaining legal ownership of them even though the oil and gas originated under another’s property.\footnote{272} The evolution of the rule of capture has progressed along parallel paths in both Texas and West Virginia.\footnote{273}

1. Rule of Capture in Texas

In Texas, a landowner has “ownership of the oil or gas in place” and a lessee possess a “determinable fee therein.”\footnote{274} However, this ownership is subject to the rule of capture.\footnote{275} A landowner has the right to produce as much oil and gas that may flow out of a well located on his land, “limited only by the physical possibility of the adjoining landowner diminishing the oil and gas un-

\footnote{270} Bruce M. Kramer & Owen L. Anderson, The Rule of Capture — An Oil and Gas Perspective, 35 ENVTL. L. 899, 904, 953–54 (2005) [hereinafter Kramer & Anderson]. The rule of capture has a distinguished pedigree. Ancient Roman jurists regarded groundwater as an element of property which a landowner could use in a non-defective manner without liability to his neighbor for a loss of stream flow or loss of a well. Dylan O. Drummond, Lynn Ray Sherman & Edmond R. McCarthy, Jr., The Rule of Capture in Texas — Still So Misunderstood After All These Years, 37 TEX. TECH. L. REV. 1, 29 (2004). Such an activity did not give rise to a cause of action for damages, especially when the damage was anticipated yet the neighboring landowner did nothing to protect himself. \textit{Id.} English common law incorporated the Roman view around the 13th century and the rule of capture was definitively established regarding percolating waters in the English case of \textit{Acton v. Bludell} in 1840, which accepted the Roman notion that one may dig a well on his own land even though it drain his neighbor’s, just so long as he does not do so maliciously. \textit{Id.} at 34–35 (citing \textit{Acton v. Bludell}, 152 Eng. Rep. 1223 (1843)). During the 19th century, \textit{Acton} was widely cited by American courts to settle groundwater disputes. Kramer & Anderson, supra note 270, at 904. During the later part of the century, when American courts were struggling with ownership disputes over oil and gas, jurists analogized the fugacious nature of hydrocarbons to that of groundwater in holding that a surface owner does not have absolute title to the oil and gas below his property. \textit{Id.} American courts also justified the rule of capture by analogizing oil and gas to wild animals because of their ability to escape the bounds of one’s property. Laura H. Burney, \textit{A Pragmatic Approach to Decision Making in the Next Era of Oil and Gas Jurisprudence}, 16 J. ENERGY NAT. RESOURCES & ENVTL. L. 1, 8 (1996) (referring to Westmoreland v. DeWitt, 18 A. 724, 725 (Pa. 1889)).

\footnote{271} KUNTZ, supra note 5, at § 4.1.

\footnote{272} \textit{Id.}

\footnote{273} See discussion supra Part IV.B.

\footnote{274} Brown v. Humble Oil & Refining Co., 83 S.W.2d 935, 940 (Tex. 1935).

\footnote{275} \textit{Id.}
der [the common reservoir] land by the exercise of the same right of capture.”

“[D]ue to their fugitive nature, the hydrocarbons when captured belong to the owner of the well to which they flowed, irrespective of where they may have been in place originally, without liability to his neighbor for drainage.”

“The rule of capture is justified because a landowner can protect himself from drainage by drilling his own well, thereby avoiding the uncertainties of determining how gas is migrating through a reservoir.”

However, the rule of capture is subject to state regulations that ensure the protection of the correlative rights of owners above a common reservoir. Regulations are meant to “afford each owner a reasonable opportunity to produce his proportionate part of the oil and gas from the entire pool and to prevent operating practices injurious to the common reservoir.” Moreover, the rule of capture does not apply to negligent or wasteful drainage, and a landowner harmed by such negligence can recover damages.

2. Rule of Capture in West Virginia

In Trent, the Fourth Circuit reaffirmed that West Virginia follows the rule of capture:

[Oil and gas] belong to the owner of the land, and are part of it, so long as they are on it or in it subject to his control; but when they escape and go into other land, or come under another’s control, the title of the former is gone.

While in place, oil and gas is considered real estate and subject to absolute ownership. As such, a landowner has title to the oil and gas underlying his property. But due to the fugacious qualities of oil and gas and the difficulty of determining with certainty whether hydrocarbons reside under a particular parcel of land, a landowner does not actually possess them until extracted by

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276 Id.
277 Halbouty v. R.R. Comm’n, 357 S.W.2d 364, 375 (Tex. 1962).
278 Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 14 (Tex. 2008).
279 Halbouty, 357 S.W.2d at 374–75.
280 Elliff v. Texon Drilling Co., 210 S.W.2d 558, 582 (Tex. 1948).
281 Id. at 582–84.
284 Id. at 269.
him. The rule of capture is subject to state statutes, such as pooling and spacing requirements.

As can be seen from the above analysis, the rule of capture is formulated essentially the same in both Texas and West Virginia jurisprudence. Both states recognize ownership of the hydrocarbons while in place but allow legitimate drainage of neighboring tracts subject to state regulation.

C. Trespass Damages

As with the rule of capture, both Texas and West Virginia courts determine mineral trespass damages in a similar manner.

1. Trespass Damages in Texas

The measure of damages a court will impose upon a trespasser who extracts the oil and gas from under the land of another varies depending on whether the trespass was the result of an innocent mistake or of a willful intent. If the trespasser acted honestly in the mistaken belief that he had title to the property, then the damages are limited to the value of the minerals minus the costs of extraction. The extraction costs that may be deducted for an innocent trespass are limited to the “drilling and operating costs.” A trespasser who enters the land of another in a good faith mistaken belief but continues to extract oil and gas from the property after learning of his error becomes a willful trespasser.

If the trespass was committed intentionally, i.e., the trespasser knew the land was not his own, the damages imposed would be the value of the minerals removed without any compensation for extraction costs or any value that was added to the minerals. The purpose of bad faith trespass damages is “to both compensate the owner and punish the trespasser.”

2. Trespass Damages in West Virginia

West Virginia law requires an innocent trespasser to pay the owner the value of the oil and gas removed minus the extraction costs. The costs that an

285 *Id.* at 269–70.
289 *Natural Gas*, 30 S.W.3d at 630; *Bender*, 127 S.W. at 171.
290 Stroud v. Guffey, 3 S.W.2d 592, 595 (Tex. App. 1927).
291 Mayfield, 693 S.W.2d at 506; *Bender*, 127 S.W. at 170.
innocent trespasser may subtract from the value of the minerals removed “must be [the] objectively reasonable operating costs” and any “reasonable doubt as to the proper nature and measure of such costs is to be resolved in favor of the mineral owner, as opposed to the trespasser.”294 An innocent trespasser is one who acted “through inadvertence or mistake, or in good faith, under the honest belief that [he] was acting within his legal rights . . . .”295 Conversely, if a trespasser acts willfully, then the owner receives the “full value of the gas [or oil] taken . . . without any deduction for costs of production.”296

D. Public Policy Concerns

In addition to having comparable oil and gas jurisprudence, Texas and West Virginia are both experiencing economic growth as a result of the exploitation of unconventional oil and gas reserves.297 The similar geological features of each state’s oil and gas fields and the recent explosive growth of the oil and gas industry in both states298 will most likely have the greatest influence on how the Supreme Court of Appeals of West Virginia will decide a hydraulic fracturing trespass case.299

Both Texas and West Virginia are underlain by extensive shale formations that contain large amounts of oil and gas which, until recently, were unexploitable due to their unique geology.300 Advances in hydraulic fracturing technology have enabled operators to profitably extract hydrocarbons from these formations.301 As a result, each state has experienced economic benefits from increased oil and gas production.302

295 Id. at 268 (quoting Pan Coal Co. v. Garland Pocahontas Coal Co., 125 S.E. 226 (W. Va. 1924)).
296 Bryan, 577 S.E.2d at 269.
297 See discussion infra Part V.D.
298 Clifford Krauss, There’s Gas in Those Hills, N.Y. TIMES, Apr. 8, 2008, at Cl.
299 Despite the importance of public policy concerns, the commonality of Texas and West Virginia oil and gas law will allow the West Virginia court, if it so chooses, to use the same logical justifications that the Texas court successfully employed in limiting hydraulic fracture trespass actions.
300 See discussion infra Parts V.D.1–2.
301 Id.
302 Id.
1. Production of the Barnett Shale in Texas

The Barnett Shale formation was created over 300 million years ago and covers around 5000 square miles in northern Texas. Similar to other shale formations located throughout the United States, the Barnett contains large amounts of organic material but has always been economically un-exploitable using conventional drilling methods. Production from the Barnett formation was minimal just five years ago, but has now become one of the best producing natural gas fields in the nation. This exceptional increase is the result of improved drilling technology, such as horizontal drilling and hydraulic fracturing. The Barnett field was the first of the tight-shale formations to be successfully exploited using these new technologies, and production has increased tenfold since 2001, accounting for seven percent of the nation’s gas supply in 2008. One commentator compared the recent production of the Barnett to the oil booms of the early 20th century. Geologists continue to be optimistic about the Barnett formation and predict that production could double by 2015.

As might be expected, economic growth in northern Texas has paralleled the increase in production from the Barnett field. The natural gas extracted from the Barnett formation is responsible for the exceptional recent economic vitality of the Dallas-Fort Worth, Texas area. From 2007 to 2008, economic activity in the local economy increased fifty percent, resulting in 83,823 additional jobs and $8.2 billion in revenue. Consequently, northern Texas was shielded from the economic slump experienced by the rest of the

306 See Krauss, supra note 304.
307 See supra note 304.
308 See Krauss, supra note 298; see also Casselman, supra note 304.
309 See supra note 305.
311 See Krauss, supra note 298; see also Casselman, supra note 304.
312 See supra note 304.
313 Id.
314 Id.
nation in the period 2007–2008.\textsuperscript{315} In light of the economic and social value of the exceptional production of the Barnett formation and the potential for production from similar shale formations, it is not surprising that the Supreme Court of Texas has not allowed trespass actions to stifle development.

2. Production of the Marcellus Shale in West Virginia

West Virginia is also home to a hydrocarbon rich shale deposit similar to the Barnett formation in Texas.\textsuperscript{316} The Marcellus shale formation is even larger than its Texas counterpart and underlies much of Appalachia.\textsuperscript{317} It covers an area of 54,000 square miles and is found under New York, Pennsylvania, eastern Ohio, and almost all of West Virginia.\textsuperscript{318} Like the Barnett deposit, the Marcellus contains large amounts of largely untapped natural gas\textsuperscript{319} but has low permeability making it difficult to extract the gas through conventional methods.\textsuperscript{320} Although geologists have long known of the potential of the Marcellus shale formation, only recently has it been possible to profitably extract its natural gas reserves.\textsuperscript{321} The Marcellus formation lies 6000 feet underground\textsuperscript{322} and requires advanced deep wells which employ horizontal drilling and hydraulic fracturing technology.\textsuperscript{323}

Spurred by high energy prices, operators are using new technology to exploit the Marcellus reservoir within West Virginia.\textsuperscript{324} The close proximity of the Marcellus formation to major metropolitan areas makes it worth the high drilling expenses needed to successfully extract its natural gas reserves.\textsuperscript{325} Although the levels of production experienced with the Barnett formation are still a few years into the future for the Marcellus,\textsuperscript{326} West Virginia enjoyed an economic boom over the summer of 2008, in large part due to the exploitation of

\textsuperscript{315} Id.

\textsuperscript{316} See Krauss, supra note 298.

\textsuperscript{317} See supra notes 298 & 305.

\textsuperscript{318} Huge Natural Gas Field Mile Below Appalachia Tantalizes Drillers, \textit{Charleston Daily Mail} (West Virginia), Feb. 4, 2008 [hereinafter Huge Natural Gas Field].


\textsuperscript{320} \textit{Where Water Trumps Energy}, supra note 319.

\textsuperscript{321} See Huge Natural Gas Field, supra note 318; see also Nina M. Rach, Operators Increase Stakes in Marcellus, 106 Oil \& Gas J. 37, Oct. 6, 2008, available at 2008 WLNR 21041970.

\textsuperscript{322} See Huge Natural Gas Field, supra note 318.

\textsuperscript{323} \textit{Where Water Trumps Energy}, supra note 319.


\textsuperscript{325} See Krauss, supra note 305. A conventional shallow well cost approximately $800,000 to construct; but in order to extract natural gas in economic quantities from the Marcellus formation, technologically-advanced deep wells are required, which costs $3 million to build. See Huge Natural Gas Field, supra note 318.

\textsuperscript{326} See supra note 305.
the Marcellus formation.\textsuperscript{327} Oil and gas operations in West Virginia will most likely continue to expand in the near future.\textsuperscript{328} In 2008, the oil and gas industry invested over one billion dollars into the state, prompting Governor Joe Manchin to declare natural gas to be “a fundamental building block of [the] state’s economy.”\textsuperscript{329}

Both Texas and West Virginia have benefited economically from the recent exploitation of geologically similar shale formations that require the use of hydraulic fracturing technology to be profitable.\textsuperscript{330} Although the recent economic slump, combined with overproduction, have substantially reduced the price of natural gas,\textsuperscript{331} the production potential of shale fields, such as the Barnett and Marcellus reservoirs, remains phenomenal.\textsuperscript{332} As a result of these newfound domestic reserves, experts predict that natural gas will claim a greater share of the transportation and electricity generation markets, two areas traditionally dominated by foreign oil and domestic coal, respectively.\textsuperscript{333} Although the future profitability of the expensive deep wells needed for such development depends upon factors such as the energy market and environmental issues,\textsuperscript{334} West Virginia’s Marcellus formation possesses exceptional economic potential.\textsuperscript{335} Consequently, the Supreme Court of Appeals of West Virginia, if presented with a hydraulic fracturing trespass case, will have to contend with the same policy concerns as did the Texas court in \textit{Coastal} and will most likely arrive at the same conclusions.\textsuperscript{336}


\textsuperscript{328} Editorial, \textit{Scott Rotruck: Natural Gas Will Grow in West Virginia}, CHARLESTON DAILY MAIL (West Virginia), Feb. 5, 2008, at 4A.

\textsuperscript{329} \textit{Id.} Joe Manchin III was re-elected in 2008 to his second term as governor of West Virginia. He was raised in the small coal mining town of Farmington, WV and attended West Virginia University on a football scholarship. Manchin served as the immediate past chairman of the Democratic Governors Association and the Southern Governors’ Association. West Virginia Office of the Governor, \textit{About Governor Manchin} (2009), http://www.wvgov.org/sec.aspx?ID=1.

\textsuperscript{330} See discussion supra Part V.D.


\textsuperscript{332} See supra note 305.

\textsuperscript{333} Casselman, supra note 304; Gold, supra note 304; Mark Peters, \textit{Natural Gas Puts Pressure on Coal Prices}, WALL ST. J., July 25–26, 2009, at B2.

\textsuperscript{334} See, e.g., Justin D. Anderson, \textit{Fossil Fuels Give States a Boost}, CHARLESTON DAILY MAIL (West Virginia), Dec. 4, 2008; see also \textit{Where Water Trumps Energy}, supra note 319; see also Drilling Tactic, supra note 31.

\textsuperscript{335} See Huge Natural Gas Field, supra note 318.

\textsuperscript{336} See generally Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008).
VI. CONCLUSION

Hydraulic fracturing is an essential technology in the modern oil and gas industry, allowing operators to successfully develop previously unexploitable reservoirs. As a result, both Texas and West Virginia have enjoyed a recent economic boost due to the development of deep shale formations: the Barnett in Texas and the Marcellus in West Virginia. These shale formations were under-exploited using traditional drilling methods and require hydraulic fracturing to be productive. Moreover, geologists calculate that both the Barnett and Marcellus formations contain extensive amounts of hydrocarbons: oil and gas reserves that are necessary to America’s energy-dependent economy.

Despite the benefits of hydraulic fracturing, the difficult legal issue of subsurface trespass arises when a fracture treatment results in fissures and propants being extended into adjacent properties. The length an artificially produced fissure will travel is difficult to predict, as is determining how far it actually traveled. In addition to the problems of proving a subsurface trespass, and whether such a trespass was innocent or willful, there are also important public policy concerns: operators may fear that trespass actions will result in large damage awards based on limited evidence, thus stifling a necessary and beneficial technology.

Texas is the only state to have thoroughly and forthrightly addressed the issue of hydraulic fracturing as a trespass. In 1961, the Supreme Court of Texas decided the case of Gregg v. Delhi-Taylor and determined that a fracture treatment that extended across boundary lines constituted an actionable subsurface trespass. Nonetheless, since that time, Texas jurisprudence struggled with the issue until the court recently reversed its precedent in Coastal Oil & Gas Corp. v. Garza Energy Trust by concluding that the rule of capture precludes an actionable trespass resulting from hydraulic fracturing treat-

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337 See supra notes 11 & 32.
338 See discussion supra Part V.D.
339 See supra notes 228 & 320 and accompanying text.
340 See supra note 305.
341 See discussion supra Parts II & III.
342 See supra notes 39–41 and accompanying text.
343 See Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 16 (Tex. 2008); see also Parts V.C & V.D.
344 See generally Coastal, 268 S.W.3d 1; Geo Viking, Inc. v. Tex-Lee Operating Co., 817 S.W.2d 357 (Tex. App. 1991); Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 411 (Tex. 1961).
345 Gregg, 344 S.W.2d 411.
346 Id. at 416.
347 Coastal, 268 S.W.3d 1.
ments.\textsuperscript{348} The Coastal court expressed two major fears about allowing tort liability for hydraulic fracturing trespasses.\textsuperscript{349} The court was concerned that hydraulic fracturing trespass actions would weaken the rule of capture, which oil and gas jurisprudence is dependent upon, by opening the possibility of “takings” actions due to drainage, therefore making it more difficult for the Railroad Commission to fulfill its legislative mandate to prevent waste and protect correlative rights.\textsuperscript{350} Moreover, the court feared that the potential of trespass actions would stifle the use of hydraulic fracturing, leading to a reduction in hydrocarbon extraction and the consequential negative economic results.\textsuperscript{351}

The issue of hydraulic fracturing as a trespass has yet to arise in West Virginia jurisprudence.\textsuperscript{352} The West Virginia Code briefly mentions the technology, mostly in connection with coalbed methane, and the common law is silent on the subject.\textsuperscript{353} If a hydraulic fracturing trespass case arises within the state, there is a good chance that the Supreme Court of Appeals of West Virginia will decide the dispute in a similar fashion to the Texas court, because both states share similar oil and gas jurisprudence in regard to the rule of capture and trespass damages.\textsuperscript{354} Moreover, and more importantly, both states possess large shale formations containing exceptional quantities of hydrocarbons, which have recently been economically exploited using hydraulic fracturing.\textsuperscript{355} The West Virginia court will be faced with the same policy concerns about hampering the use of hydraulic fracturing and the resultant economic consequences, and will probably decide the issue in favor of economic vitality and development. Furthermore, due to the similarities of Texas and West Virginia oil and gas jurisprudence, the West Virginia court will be able to use the same logical justification as did the Texas court in pre-empting any action for subsurface trespass resulting from hydraulic fracturing.

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\textsuperscript{348} Id. at 14.
\textsuperscript{349} Id. at 14–17.
\textsuperscript{350} Id. at 14–16.
\textsuperscript{351} Id. at 16–17.
\textsuperscript{352} See discussion supra Part V.A.
\textsuperscript{353} See discussion supra Part V.A.1.
\textsuperscript{354} See discussion supra Parts V.B–C.
\textsuperscript{355} See discussion supra Part V.D.

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