COMMON LAW ASPECTS OF SHALE OIL AND GAS DEVELOPMENT

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I. INTRODUCTION	367
II. SURFACE OWNERSHIP VS. MINERAL OWNERSHIP	369
A. Separation and Dominance of the Mineral Estate	369
B. Surface Owner Administrative Challenges	372
C. Surface Owner Common Law Litigation	373
III. NEIGHBORING MINERAL OWNERS	377
A. Subsurface Trespass—Generally	378
B. Subsurface Trespass by Fluid Injection or Gas Storage	379
C. Coastal Oil v. Garza	384
1. Background	384
2. Decision	
3. Aftermath	387
D. Analysis of Trespass and Conservation	388
1. Microseismicity and Fracing Petroleum Engineering	388
2. Fracing and Trespass	390
E. Conservation Authority and Trespass	391
IV. SEPARATE MINERAL OWNERS	396
A. Owners of Oil and Natural Gas vs. Owners of "Other Minerals"	396
B. Owners of Different Formations	397
V. CONCLUSION	398

I. INTRODUCTION

Two spatial relationships drive current hydraulic fracturing jurisprudence and litigation: (1) in the instance of severed minerals, the vertical relationship between the surface owner and the mineral owner; and (2) the horizontal (and sometimes vertical) relationship between neighboring mineral owners. Tension between surface and mineral owners has dramatically increased in the last fifteen to twenty years as domestic onshore oil and gas development, once limited to the fringes of

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^{1.} See, e.g., Michael J. Mazzone, Changing Times Bring Conflict With Surface Owners, THE AMERICAN OIL & GAS REPORTER (2011), available atwww.aogr.com/index.php/web-features/exclusive-story/changing-times-bring-conflict-with-surface-owners; see also, Ry Rivard, Property, Mineral Rights in Conflict, CHARLESTON DAILY MAIL, July 5, 2011, available at www.dailymail.com/News/201107040823.

lesser-populated areas, has erupted in about half of the states and provinces, many of them very populous.² In some instances, such as with the Utica Shale (near the cities of northeastern Ohio) and the Barnett Shale (near Dallas), these new shale hydrocarbon operations are proximal to major cities.³ A third source of conflict is the relationship between the owners of oil and gas and the owners of other minerals, like coal or coalbed methane.⁴

As any practitioner of oil and gas law knows, conflict between neighboring mineral estate owners has burned as long as minerals have been extracted from private estates. Such conflicts are less in the public eye as such tussles affect fewer people and stem from less visually obvious harms than questions affecting surface owners. Many millions of dollars can be at stake, however, when questions of drainage, trespass, and implied covenants to prevent the same are involved.

This report seeks to analyze two broad spatial relationships and the common law that is used to wrestle with solving the conflicts among various actors. First, the general dominance of the mineral estate and subsequent attempts to empower surface owners is discussed. Challenges by surface owners arising from approval of operations by state authorities is considered next, followed by an examination of common law theories of litigation that surface owners have attempted.

The common law relationship between neighboring mineral owners is discussed next, starting with the major issue of subsurface trespass and drainage caused by fracing. Here, emphasis is placed upon analysis of the *Coastal Oil v. Garza* case and subsequent advances in microseismicity.⁶ This is followed with some commentary on whether fracing into unpermitted tracts is trespass under common law and whether expanded conservation authority is the answer to trespass claims rooted in fracing. Finally, mention of the common law relationship between the owners of oil and gas and the owners of "other minerals" is made along with a look at looming case law in Pennsylvania that may upset the present understanding of who has title to shale hydrocarbons.

A note on the terminology used in this paper: The issue of hydraulic fracturing has gotten so contentious in recent years that disagreement exists as to even the spelling of the informal term used to describe it. "Fracing," "frac'ing," and "fracing"—all pronounced the same—have all been used in media outlets as a substitute for "hydraulic fracturing." Because the words "hydraulic fracturing" do not contain the letter 'k', and because industry has generally used the spelling "fracing" since the inception of the technology, this report uses "fracing." Similarly, a "fraced well" is a well that has undergone hydraulic fracturing. Also, in the oil and gas con-

^{2.} Cf. Anne Kates Smith, Cash In on the Natural Gas Shale Boom, KIPLINGER.COM (2011), available at http://www.kiplinger.com/magazine/archives/natural-gas-shale-royalties-leases.html.

^{3.} What is the Barnett Shale?, STATE IMPACT, http://stateimpact.npr.org/texas/ tag/barnett-shale/ (last visited Jan. 9, 2012); Jim Mackinnon, Ohio's Utica Shale Development Speeding Up, OHIO.COM (Dec. 6, 2012, 10:13 PM), http://www.ohio.com/business/uti-ca/ohio-s-utica-shale-development-speeding-up-1.356039.

^{4.} Bruce Kramer, Conflicts Between the Exploration of Lignite and Oil and Gas: The Case for Reciprocal Accommodation, 21 Hous. L. Rev. 49 (1984), available at http://repository.law.ttu.edu/bitstream/ handle/10601/1566/21HousLRev49.pdf?sequence=1.

^{5.} *Cf.* H.J. Gruy, *History of the Ownership of Mineral Rights*, SWIFT ENERGY COMPANY (Aug. 11, 1999), http://www.swiftenergy.com/PUBLICATIONS/PAPERS-AND-ARTICLES/1999/gruy081199.htm (describing some early American mineral disputes over salt in Texas).

^{6.} Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008).

text, "operator" is used herein to describe any mineral developer, whether it be a self-developing mineral owner or a mineral owner's lessee. Finally, an "unpermitted tract" in this report is a mineral tract that is not owned by and has not been leased by an operator conducting fracing operations.

II. SURFACE OWNERSHIP VS. MINERAL OWNERSHIP

A. Separation and Dominance of the Mineral Estate

The United States is almost unique in that the surface owner may also own the mineral estate (or an exclusive license to develop same), unlike most other countries where the national government or its state-owned corporate minions own the minerals. However, the estates can be—and often are—severed and conveyed to separate parties. Over time, in many places this means that the mineral estate owner and the surface owner would be completely unknown to one another.

If the surface owner is also the mineral owner, then no question exists. The surface/mineral owner is usually happy to receive bonus and then royalty as the minerals are developed, including employment of all secondary and tertiary recovery practices such as fracing. Where the estates are severed, the consensus among all states is that the mineral estate owner, whether considered the owner of real property or the holder or an exclusive license to develop, owns natural gas in shale as well as in traditional reservoirs. A dichotomy in the law exists as to natural gas found in coalbed methane (CBM), with some authorities finding that the coal owner owns the CBM⁹ while others favor ownership by the oil and gas owner.¹⁰

The mineral estate may be separated from the surface estate via a "severance deed." Different minerals may go to different grantees, and different depth intervals of a particular mineral may similarly be conveyed to different grantees. 12 If the oil and gas has been severed from the surface, the surface owner likely has no financial incentive to see the oil and gas developed, and may view secondary recovery techniques like hydraulic fracturing as a nuisance threatening his or her enjoyment of the surface or as harmful to the value of the surface properties, or both.

Historically, the mineral estate has been dominant over the surface estate in disputes over competing surface uses and mineral development, including fracing.¹³ This dominance entailed the mineral owner having "the right to use so much of the

EUGENE KUNTZ, KUNTZ LAW OF OIL & GAS, § 2.1, 59 (2012).

^{9.} For example, Pennsylvania; see BARLOW BURKE & ROBERT BECK, THE LAW AND REGULATION OF MINING—MINERALS TO ENERGY 121-28 (Carolina Academic Press, 2010) (citing U.S. Steel Corp. v. Hoge, 468 A.2d 1380 (Pa. 1983)).

^{10.} For example, the federal government; see id. at 131 (citing Amoco Prod. Co. v. S. Ute Indian Tribe, 526 U.S. 865 (1999)).

^{11.} Minerals: Overview, **AGENTS** NATIONAL. TITLE INSURANCE http://agentstitle.com/agent/UM/NetHelp/default.htm?turl=WordDocuments%2Fmineralsoverview.htm (last visited Jan. 31, 2013).

^{12.} See id.

Split Estate, U.S. DEP'T OF THE INTERIOR: BUREAU OF LAND MGMT., 13. http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/split_estate.html (last visited Jan. 31, 2013).

surface as may be reasonably necessary to enjoy the mineral estate." ¹⁴ Thus, when the mineral estate is severed from the surface, the mineral estate becomes entitled to use the surface of the tract in any way that is reasonably necessary for exploration, drilling, production, reworking, and fracing of oil and gas, even if these actions would normally be subject to nuisance claims. ¹⁵ Specifically, the mineral estate is seen by courts in most states as having a sort of implied easement to use the surface of that tract in any way that is "reasonably necessary" for the exploration, drilling, production, and recovery of minerals. ¹⁶ Therefore, the right to develop comes freighted with the right to select drilling locations, construct roads, house employees, assemble and maintain any reasonably necessary padsite, to remove trees, crops, and foliage, and to use groundwater—unless these things are expressly reserved or otherwise not permitted in the severance instrument. ¹⁷

Later, the dominance of the mineral owner was attenuated somewhat by the accommodation doctrine in most states. The doctrine meant disruption of the surface owner's use of the land by subsequent mineral development might require the mineral owner to use another "reasonable" method to develop the mineral estate. 18 This doctrine, as first set forth in the Texas case of *Getty Oil v. Jones*, 19 requires the surface owner to prove three things to show the mineral owner's use of the surface for mineral development is "unreasonable." First, the surface owner (or its tenant) has to prove that it had a use predating the proposed mineral development. Second, the surface owner (or its tenant) has to prove that the preexisting use has been partially or completely precluded by the mineral owner's development. Finally, the surface owner (or its tenant) must prove that a reasonable alternative exists to the mineral owner's use within the established practices of the industry. Ultimately, however, if no such reasonable alternatives exist, the surface owner must acquiesce to the mineral developer.

Still later, in *Sun Oil Co. v. Whitaker*, the Texas Supreme Court ruled that the mineral owner cannot be compelled to go off the land to accommodate the surface owner/user, such as making the mineral developer go and get water for fracing from another lease. ²⁵ Thus, the surface owner/user must show that reasonable alternatives exist *on the lease premises* in order to invoke the accommodation doctrine

^{14.} Harris v. Currie, 176 S.W.2d 302, 305 (Tex. 1943).

^{15.} Id. at 304; Split Estate, supra note 13.

^{16.} JOHN LOWE, ET AL. OIL AND GAS LAW, 188–90 (6th ed., West, 2012).

^{17.} Id

^{18.} *Id.* at 191–92.

^{19.} Getty Oil Co. v. Jones, 470 S.W.2d 618 (Tex. 1971).

^{20.} *Id.* at 622.

^{21.} *Id*.

^{22.} *Id*.

^{23.} Id.

^{24.} *Id*.

^{25.} Sun Oil Co. v. Whitaker, 483 S.W.2d 808 (Tex. 1972). In *Sun Oil Co.*, the landowner attempted to prevent the producer from using an isolated and finite aquifer for water with which to conduct secondary recovery processes because the landowner used the water for irrigation. *Id.* at 809. The producer would then have to truck water in from off the lease. *Id.*

successfully. 26 Most other oil and gas producing states followed suit with their own local variations on the Texas theme. 27

For the average surface owner, proving these three things in the face of expert witness testimony by an oil company is challenging, particularly the third point. The accommodation doctrine also kept intact the overall dominance of the mineral estate—if no other reasonable method existed for mineral development, then the mineral owner could go ahead with the disruptive development without the surface owner's consent and without being liable for damages for the disruption unless the operator acted negligently.²⁸

Not surprisingly, given the greater number of surface owners versus the number of operators, and the potential difficulty of surface owners to succeed in litigation with the accommodation doctrine, state politicians began to face pressure from the electorate to codify statutory protections for surface owners.²⁹ Surface Damages Acts ("SDAs") are designed to compensate surface owners for damage caused by the mineral owner.³⁰ Across the spectrum of SDAs, the basic goals of SDAs vary surprisingly little.³¹ At least ten states have enacted SDAs.³²

Almost all SDAs require some kind of access notification or initial negotiation before entry in order to facilitate contact between operators and surface owners and, sometimes, their tenants.³³ Common SDA entry negotiation protocol requires determination of the timing and place of entry, the length of drilling and fracing, and what the payment will be for surface damages associated with such activities before actual rigging up begins—including damages that may be caused by fracing.³⁴ Many also require bonding and a means to determine the costs of payments due the surface owner.³⁵

In summation, while the mineral estate owner is no longer completely dominant over the surface owner, he can enter and develop provided his development is reasonable, non-negligent, non-excessive and for the benefit of that particular mineral tract, in accord with the terms of the original mineral severance deed and the current mineral lease. In addition, the mineral owner must remain in compliance with both the accommodation doctrine (in most states) and with statutory and regulatory laws that govern development, such as SDAs and environmental regulations.

Ownership of the pore space in rock can potentially affect fracing. Either the surface or the mineral estate can own the pore space in the strata comprising a cap-

^{26.} Id. at 812.

^{27.} See Christopher M. Alspach, Surface Use by the Mineral Owner: How Much Accommodation is Required under Current Oil and Gas Law, 55 OKLA. L. REV. 89 (2002) (describing the accommodation doctrine, in various permutations, within producing states).

^{28.} Thomas Kurth, et al., *American Law and Jurisprudence on Fracking*, 47 ROCKY MTN. MIN. L. FOUND. 2, 293 (2010).

^{29.} See id.

^{30.} *Id*.

^{31.} *Id*.

^{32.} *Id*.

^{33.} *Id*.

^{34.} *Id*.

^{35.} *Id*.

tion tract through case law or statute.³⁶If the surface owner owns the pore space, as is generally the rule in Texas,³⁷ the operator should consider whether its insertion of its fracing operations will disrupt the surface owner's use of the pore space for operations such as natural gas storage or CO₂ sequestration, as well as exploration and development of materials belonging to the surface owner. No case law was found wherein surface owners attempted to stop fracing based on pore space ownership.

B. Surface Owner Administrative Challenges

May a surface owner challenge state administrative action permitting fracing operations? The Supreme Court of Appeals of West Virginia considered this question on September 25, 2012, when oral argument was given in the case of *James Martin, Director of the Department of Environmental Protection and EQT Production Co. v. Matthew Hamblett.* In *Martin*, the surface owner had filed an "appeal" of a drilling permit issued to one of the plaintiffs by the West Virginia Department of Environmental Protection ("WVDEP") allowing a horizontal well in the Marcellus Shale. The WVDEP and EQT Production Co. ("EQT"), the operator, sought dismissal of the "appeal" because the right to such an appeal is not provided for in the WVDEP regulations or in West Virginia law. The circuit court disagreed, citing a 2002 West Virginia case where such a court challenge was allowed in a case involving the revocation of a well permit that had already been issued, the West Virginia Supreme Court of Appeals to consider whether or not a surface owner can get judicial review of WVDEP permits allowing horizontal drilling.

The WVDEP argued that surface owners cannot "appeal" drilling permits, noting that surface owners already have the right to file comments regarding drilling permit applications and that these applications are reviewed by both the operator applicant and the WVDEP. EQT noted further that surface owners have additional rights, including injunctive relief and compensation for surface damages as allowed for in West Virginia's code. Both plaintiffs suggested that public policy should not favor such "delay tactics" by surface owners, and both argued that the 2002 decision allowing such a court challenge by a surface owner should be either

^{36.} Most states that have considered the question of pore ownership give it to the surface owner. See Louisiana: United States v. 43.42 Acres of Land, 520 F.Supp. 1042 (W.D. La. 1981); Miss. River Transp. Corp. v. Tabor, 757 F.2d 662 (5th Cir. 1985); Michigan: Dep't of Transp. v. Goike, 560 N.W.2d 354 (Mich. App. 1996); New York: Home Gas Co. v. Miles, 40 A.D.2d 896 (N.Y. App. Div. 3d Dep't. 1972); Int'l Salt Co. v. Geostow, 697 F.Supp. 1258 (W.D.N.Y. 1998), aff'd878 F.2d 570 (2d. Cir. 1989); Oklahoma: Sunray Oil Co. v. Cortez Oil Co., 112 P.2d 792 (Okla. 1941); Ellis v. Ark. La. Gas Co., 609 F.2d 436 (10th Cir. 1979); New Mexico: S.B. 208, 51st Leg. Sess. (N.M. 2009); Wyoming: H.B. 89, 59th Leg. Sess. (Wyo. 2008). Pennsylvania favors pore ownership by the mineral owner. (U.S. Steel Corp. v. Hoge, 468 A.2d 1380 (Penn. 1983)).

^{37.} Getty Oil Co. v. Jones 470 S.W.2d 618 (Tex. 1971); Mapco, Inc. v. Carter, 817 S.W.2d 686, 687 (Tex. 1991) (pore ownership in the case of sandstone or other non-mineral belongs to surface owner, but pore ownership in the case of salt or other mineral belongs to the mineral owner).

^{38.} Martin v. Hamblet, No. 11-1157, 2012 W. Va. LEXIS 904 (W. Va. Nov. 21, 2012).

^{39.} Id. at *6.

^{40.} *Id*.

^{41.} State ex. rel. Lovejoy v. Callaghan, 576 S.E.2d 246 (2002).

^{42.} Martin, 2012 W. Va. LEXIS 904, at *11.

^{43.} Id. at *6.

^{44.} Id.

disregarded entirely or differentiated as being inapplicable to horizontal drilling permits since the rule involved only vertical wells. The surface owner argued that the laws should make no distinction as to the type of well permit involved.

The West Virginia Surface Owners' Rights Organization ("SORO") intervened. SORO argued that (1) since the WVDEP permit directly concerns the surface owner's estate, he should be allowed a hearing and an appeal of the permit by constitutional due process rights, and (2) the WVDEP did not follow their own regulations. It also contended that an appeal should be granted because the state agency failed to follow the state agency's own rules. 46

On November 21, 2012, the West Virginia Supreme Court issued their unanimous opinion, overruling *Lovejoy* and holding that surface owners cannot challenge drilling permits issued by the WVDEP.⁴⁷ In handing down the expected result, the court rejected the plaintiff's argument that depriving surface owners the ability to challenge issued drilling permits violates their constitutional due process and equal protection rights, noting that the drilling of permitted wells is a lawful exercise of the right of the mineral owner to develop its estate and is not a governmental action.⁴⁸ Further, with regard to due process protections, the court noted that surface owners in West Virginia already have possible recourse in the West Virginia surface damage act and through various common law actions.⁴⁹ In addition, the court said that surface owners already had the right to file comments with the WVDEP regarding drilling permit applications under consideration by that body. Interestingly, despite these extensive protections, the court urged the state legislature to consider whether well permitting should be appealable by surface owners.⁵⁰

C. Surface Owner Common Law Litigation

The primary vector of actions by surface owners against those engaged in fracing are related to claims that water supplies have been contaminated or otherwise adversely impacted.⁵¹ Surface owners and owners of neighboring tracts have also complained about a panoply of side effects related to the process of fracing such as the ozone, smells, dirt and dust of fracing.⁵² Citizens have asserted that they have inhaled fumes from the diesel-powered compressors and generators that are

47. Martin v. Hamblet, 737 S.E.2d 80 (W. Va. 2012).

^{45.} *Id.* at *14. (As to the due process complaint, SORO's cites Snyder v. Callaghan, 284 S.E.2d 241 (W. Va. 1981) In that case, the West Virginia Supreme Court granted surface owners who lived downstream of the proposed Stonewall Jackson Dam the right to a hearing before the state issued a permit.

^{46.} *Id*

^{48.} *See* Press Release, Christopher "Kip" Power, West Virginia Surface Owners May Not Appeal Gas Well Permits, (Nov. 29, 2012), *available at* http://www.martindale.com/environmental-law/article__1634118.htm (last visited April 1, 2013).

^{49.} Martin, 737 S.E.2d at 89.

^{50.} Id. at 89-90.

^{51.} Dave Neslin, "Hydraulic Fracturing Litigation—Recent Developments and Current Issues in Cases Involving Alleged Water Supply Impacts," *The Water-Energy Nexus* 1 (Rocky Mt. Min. L. Fdn., Paper No. 7, 2012). (This paper provides an excellent "snapshot in time" look at common law cases from around the country that involve fracking as of mid-2012.)

^{52.} Michael Mazzone, Changing Times Bring Conflict with Surface Owners, THE AMERICAN OIL & GAS REPORTER, Sept. 23, 2012, available at http://www.aogr.com/index.php/web-features/exclusive-story/changing-times-bring-conflict-with-surface-owners (last visited Jan. 31, 2013).

necessary for production.⁵³ Surface owners have complained about bad odors, production and fracing noise, and lights from nocturnal operations.⁵⁴

Contamination of groundwater is another common complaint. The most sensational (if not accurate) alleged contamination caused by fracing is methane seeping into groundwater and causing photogenic flaming faucets.⁵⁵ The theory behind such flammable fixtures is that fracturing frees methane gas, and that gas somehow migrates upward through thousands of feet of rock to the freshwater aquifers comprising the local groundwater, and then finds its way into the landowners' wells.⁵⁶ Landowners also complain that other chemicals allegedly used in fracing, such as benzene, have entered the groundwater supply through more mundane causes like spills and inadequate disposal.⁵⁷

As of September 13, 2012, thirty-five actions have been brought against operators, but these have thus far met with little success.⁵⁸ While the cases involve a multitude of scenarios, some patterns have emerged. For example, the plaintiffs in these cases are generally surface owners dependent on private well water and living within a couple of miles from one or more productive oil and gas lease(s).⁵⁹ Most of the cases involve allegations that drilling and fracing operations have contaminated private water wells with methane, benzene, ethylene, toluene, and/or xylene.60

Once the plaintiffs relate to their attorneys the actual problems the plaintiffs allege, the attorneys then try to fit these woes into one or more recognized causes of actions. These cases typically sound in common law tort with claims for nuisance, trespass, strict liability, and—above all—negligence. 61 Some actions also seek medical monitoring.⁶² All successful actions, whatever the theory, require plaintiff to show causation, and this has proven the rock on which many claims have foundered. 63 The actual cases themselves still largely rely on traditional property-based tort theories.⁶⁴ That is, private nuisance generally involves a significant and unreasonable interference with the private use and enjoyment of the surface by the surface owner. 65 Trespass by the operator generally encompasses intentional and unlawful intrusion upon real property owned by another. 66 Some activities are considered by statute to be abnormally dangerous activities and thus subject to strict liability—the defendant pays even if it acted with utmost care. ⁶⁷ Questions then arise about whether fracing is such an ultra-hazardous activity.

^{53.} Id.

^{54.} Id.

^{55.} See GASLAND (New Video Group, 2010).

^{56.} Mazzone, supra note 52.

^{57.} Id.

Neslin, supra note 51, at 1. 58.

^{59.} Id. at 5.

^{60.} Id.

^{61.} Id.

^{62.} Id.

^{63.} Id.

^{64.}

BLACK'S LAW DICTIONARY 1172 (9th ed. 2009).

Neslin, supra note 51, at 6.

Id. at 7

The most frequent common law action brought by surface owners against operators is negligence. Negligence requires that the operator owe some kind of legal duty to the surface owner that the operator in turn breaches and that can be proven to be the proximate cause of damages to the surface owner. To avoid negligence, companies must satisfy a fundamental obligation to act as "reasonable and prudent operators." What is "reasonable and prudent" is a generous standard for operators in that courts rarely find a particular activity of a mineral owner or its lessee to be unreasonable. Generally, what is a "reasonable" activity under a particular circumstance is what a normal operator would have done in similar circumstances—usually a question of "industry standard" activity.

Negligent operations have been found to encompass all the following: property damage arising from operator use of antiquated or malfunctioning equipment; allowing a disposal pit full of saltwater or used frac fluid to overflow; nonfulfillment of notification requirements as codified by an SDA; and failure to complete a well in a way that prevents gas escaping from a well. To Gross negligence arises when the negligent behavior of an operator is particularly wanton and reckless. Violation of some law and regulations can be found to be negligence per se.

Examples of all of these can be found in the recent crop of fracing cases sounding in tort. For example, common law nuisance was claimed in *Hagy v. Equitable Production Co.*, wherein fracing fluid was alleged to have infiltrated the water well of the surface owning plaintiff. According to the plaintiffs, the cause of this infiltration arose from shoddy well completion techniques of the operator and insufficient staff oversight. Among the claims made, the plaintiffs allege the operator caused a continuing and serious nuisance by allowing fracing chemicals into their water supply.

The theory of trespass stood out in *Dillon v. Antero Resources*,⁷⁹ a recent Pennsylvania action surrounding fracing wherein the surface owner claims multifarious harms to its personal and real property interests "arising from the process of recovery, through the hydraulic fracturing of shale, of natural gas from drilling sites adjacent to their land." Specifically, the plaintiff alleges that fracing in a production well located 400 feet within the plaintiff's water supply resulted in an invasion of hydrocarbons and saltwater that contaminated the aquifer from which the plaintiffs draw water, ⁸¹ and that this contamination was exacerbated by fracing chemi-

^{68.} Mazzone, supra note 52.

^{69.} Id.

^{70.} Id.

^{71.} *Id*.

^{72.} *Id*.

^{73.} Neslin, supra note 51, at 5.

^{74.} Id

^{75.} Hagy v. Equitable Prod. Co., No. 2:10-CV-01372, 2011 WL 3031124 (S.D.W. Va. July 22,

^{2011).}

^{76.} Complaint at ¶¶ 5-17, Hagy, 2011 WL 3031124 (No. 2:10-CV-01372).

^{77.} *Id.* at ¶¶ 5–13.

^{78.} *Id.* at ¶¶ 37–38.

^{79.} Dillon v. Antero Res., No. 2:11-CV-01038, 2012 WL 2899710 (W.D. Pa. July 10, 2012).

^{80.} Id. at *1.

^{81.} Complaint at ¶¶ 8–17, *Dillon*, 2012 WL 2899710 (No. 2:11-CV-01038).

cals released into the potable groundwater. 82 This incursion of hydrocarbons, saltwater, and chemicals is claimed to be a trespass of the surface estate. 83

An example of a claim alleging all three aforementioned varieties of negligence—traditional negligence, gross negligence, and negligence per se—among other claims is *Fiorentino v. Cabot Oil and Gas Corp.*,⁸⁴ wherein the surface-owning plaintiffs alleged that defendant operators had contaminated their land and water with the negligent operation of sixty-two gas wells.⁸⁵ Casting traditional negligence in the role of oil and gas, plaintiffs assert that the operators must exercise reasonableness and avoid negligence as they pursue drilling and fracing operations, and that they failed to do so by allowing contaminating chemical releases.⁸⁶ The gross negligence allegation utilized traditional language for such claims, stating that the operator had acted in a grossly reckless and wantonly negligent fashion.⁸⁷ The negligence per se claim arose from purported violation of both state and federal environmental laws.⁸⁸

As commentator Dave Neslin astutely notes, since many states have extensive laws and regulations governing oil and gas exploration and production, violation of one or more of those laws could trigger an action by a surface owner for negligence per se. ⁸⁹ This potentially cuts both ways as an operator who avoids violation of such laws and regulations can more easily show it did not act with negligence.

Many cases are hybrid cases—with several different causes of action being asserted. For example, in late 2010, fourteen families in central Pennsylvania sued an energy company, 90 alleging the trespass of fracing fluid and other pollutants onto the surface estate of plaintiffs, negative health effects, and nuisance. 91

Some parties are discovering that purchasing a surface estate subject to an existing oil and gas lease means that their new property is subject to the terms of the lease and all the inconvenience this may cause. With no apparent exceptions, many courts believe that, as an early Texas court opined, if a party purchases "premises burdened with the terms of a mineral lease, he is in no position to complain of conditions produced [The landowner] is presumed to have known that conditions would naturally arise during the drilling of said well which would make the use the premises as a home disagreeable, inconvenient and perhaps dangerous." 92

On the fringes, all sorts of causes of actions have been attempted. One example is the case of Jim and Linda Scoma living in Crowley, Texas, who filed suit in 2010 against Chesapeake Energy Corporation, alleging the company stored production waste near their property. This storage caused a parade of woe, including turning Mrs. Scoma's hair the color of a pumpkin, causing her "emotional harm

^{82.} Id. at ¶¶ 8–16.

^{83.} *Id.* at ¶¶ 8–26.

^{84.} Fiorentino v. Cabot Oil & Gas Corp., 750 F. Supp. 2d 506 (M.D. Pa. 2010).

^{85.} Complaint at ¶ 26, Fiorentino, 750 F. Supp. 2d 506 (No. 3:09-cv-02284-TIV).

^{86.} *Id.* at ¶ 63.

^{87.} Id. at ¶ 66.

^{88.} Id. at ¶¶ 38, 55.

Neslin, supra note 51, at 5.

^{90.} Complaint, Berish v. Southwestern Energy Prod. Co., 2010 WL 3627011 (M.D. Pa. Sep. 14, 2010) (No. 2010-1882CP).

^{91.} *Id.* at ¶ 56.

^{92.} Grimes v. Goodman Drilling Co., 216 S.W. 202, 204 (Tex. Civ. App. 1919).

^{93.} Mazzone, *supra* note 52.

and mental anguish from deprivation of enjoyment, loss of peace of mind, annoyance, inconvenience and anxiety about the contaminated well water."94

In another case, plaintiffs have alleged assault.⁹⁵ In 2011, the Parr family of Wise County, Texas, filed a claim against several operators and their contractors.⁹⁶ In a case seemingly torn from the pages of an H.P. Lovecraft horror story, the claimants allege that nearby fracing subjected them to the spectacle of witnessing the decline of each other's health, the grisly demise of their animals, and the devastation of their property.⁹⁷

In summary, courts seem slow to find a nuisance caused by noise, smells or light, perhaps reflecting an attitude that the surface owner ought to know what can happen when the surface is purchased over a severed mineral right. Without proof of causation, a clear breach of lease terms, or a breach of a law or a regulation, surface owners thus far have had a challenging time succeeding with nuisance or negligence claims.

III. NEIGHBORING MINERAL OWNERS

Mineral owners have significant power over the surface owners above them, but they do not have the same mastery over neighboring estates. For example, a surface asset necessary for the development of the mineral estate, like a gas compressor station that is placed on the surface estate over the mineral estate, may be considered a nuisance to neighbors even as its necessity may obviate the surface owner's recourse of nuisance. 98

Since the late Middle Ages, British, and then American common law, both looked to the *ad coelum* doctrine to describe how an owner of real property can own minerals from the center of the earth to the surface and the air from the surface into outer space. ⁹⁹ This rule was found to not be practically applicable to oil and gas deposits that moved through the strata from tract to tract. ¹⁰⁰

The *ad coelom* doctrine was abrogated by the rule of capture.¹⁰¹ The rule of capture stems from the common law of Great Britain and is a starting point for determining ownership of produced natural assets including groundwater, oil, natural gas, and—as originally applied—game animals.¹⁰² The rule of capture as applied to petroleum production has generally provided for well over a hundred years that absolute title to a resource goes to the first person to "capture" a migratory natural

^{94.} *Id*.

^{95.} Id.

^{96.} *Id.* ("Due to defendants' natural gas activities, actions and/or inactions, defendants made physical contact with plaintiffs' person through defendants' releases, spills, emissions and discharges of hazardous gases, chemicals and industrial wastes created by defendants, and are liable to plaintiffs for assault").

^{97.} Id

^{98.} See, e.g., Natural Gas Pipeline Co. of Am. v. Justiss, No. 06-09-00047-CV, 2010 WL 1730148 (Tex. App. Apr. 30, 2010) rev'd, No. 10-0451, 2012 WL 6214635 (Tex. Dec. 14, 2012).

^{99.} See generally Osborne Reynolds, Jr., Distinguishing Trespass and Nuisance: A Journey Through a Shifting Borderland, 44 OKLA. L. REV. 227, 235–38 (1991).

^{100.} JOHN LOWE, et al., OIL AND GAS LAW 54-55 (6th ed. 2012).

^{101.} See David K. Johns et al., Colo. Est. Planning Handbook § 47.3.1 (2012), available at Westlaw Colo. Est. Planning Handbook 47.3.1.

^{102.} Pierson v. Post, 3 Cai. R. 175, 176 (N.Y. Sup. Ct. 1805).

resource that is free to roam, seep, or flow from tract to tract and therefore was never reduced to personal property. While the rule of capture may seem antiquated because of state and federal conservation rules that curtail free-for-all drilling as in the hoary days of yore, one product of fracing has been new legal issues arising from differences between competing subsurface owners over correlative rights.

A. Subsurface Trespass—Generally

"Trespass" has two definitions, being either a form of common law action to recover damages for an injury to one's property or having had an unauthorized intrusion or invasion of private premises of another. 104 Classic trespass started as a strict liability action—any unauthorized entry onto another's real property was a trespass whether or not actual damage occurred or the intention of the trespasser. 105 Property jurisprudence moved away from this view with regard to contamination issues over time, leavening the harshness of strict liability with the requirement of the property owner to show actual and substantial damages to the property. 106 Like attenuation of trespass liability with regard to planes flying very high over real property, trespass far underground lost its strict liability foundations when the United States Supreme Court noted that such parochial readings of trespass would disrupt modern onshore production of oil and gas. 107 Similarly, seismic operations have been found to not constitute trespass on the mineral estate of an unpermitted owner—even though the resultant P-waves may penetrate the unpermitted tract—so long as the surface operations themselves are not trespassory. 108 By allowing draining of another's property from a well drilled entirely within a permitted tract, courts embraced the rule of capture and thus allowed oil and gas development to flourish, sometimes uncontrollably.

Still, an actual physical entry onto an unpermitted tract typically constitutes trespass, even underground. A well that reaches its terminus within the subsurface land of another results in a trespass even if the surface location of the well is on permitted land, and the intent of the operator has no bearing on the action. In earlier days, directional drilling was often a haphazard process, the undern directional drilling now allows for very precise well geometry and termination of wells at exact locations. Porehole surveying is often conducted post-drilling for the purpose of well-bore mapping of established wells, but can be done during ac-

^{103.} Kelly v. Ohio, 49 N.E. 399, 399 (Ohio 1897).

^{104.} WILLIAMS & MEYERS, OIL AND GAS LAW, §§ 223-232 (1959).

^{105.} Robert H. Cutting, "One Man's Ceilin' is Another Man's Floor": Property Rights as the Double-Edged Sword, 31 ENVTL. L. 819, 866 (2001).

^{106.} *Id.* at 876.

^{107.} See United States v. Causby, 328 U.S. 256, 261 (1945).

^{108.} Villarreal v. Grant Geophysical, Inc., 136 S.W.3d 265, 270 (Tex. App. 2004).

^{109.} See WILLIAMS & MEYERS, supra note 104, § 227 (If the driller intentionally bottoms the well on an unpermitted tract, the trespass is considered "bad faith" and the trespasser is liable for the value of the oil at the surface without being allowed to deduct drilling and operating costs. "Good faith" trespasses can deduct such costs before accounting to the rightful owner.).

¹¹⁰ *Id*

^{111.} \emph{Id} . (In some old oilfields, it is likely that many of the wells terminate within land not owned or permitted by the operator of the well.)

^{112.} *Id*.

tual drilling in real time. ¹¹³ With such evidence of a borehole's trajectory, modern directional drilling has therefore raised whole new worries for operators who do not want to have a well cross the underground property boundary between the permitted tract and a neighboring unpermitted tract. Directional techniques, old and new, now allow for "bottoming" wells in a specific direction within a permitted tract by slant drilling and "whipstocking wells." ¹¹⁴ Commentators believe that with such advanced technology available to operators, trespassers who plead "good faith" in drilling or completing a directional well into an unpermitted tract will rarely be successful before a court. ¹¹⁵ Now that directional well surveys are the norm, most such trespasses are likely to be seen as intentional or at least grossly negligent. ¹¹⁶

The most difficult question currently is not so much the potential liability of subsurface trespassers as proving *how* the alleged trespass has occurred. ¹¹⁷ Federal courts have held that discovery methods allow for disclosure of the geometry and directional information and logs of deviated and horizontal wells. ¹¹⁸ A Texas court has ruled similarly, holding that Texas trial courts were allowed to ". . . entertain suits in the nature of bills of discovery, and grant relief therein in accordance with the usages of courts of equity." ¹¹⁹

General theories of liability for surface trespass included conversion, negligence, private nuisance, and subsurface trespass. ¹²⁰ All these have been tried in the context of slant-drilling and other directional drilling instances and injection wells used for secondary recovery and storage. ¹²¹

B. Subsurface Trespass by Fluid Injection or Gas Storage

Fracing fluids, proppants, and fractures that cross a property boundary have raised trespass issues. Since the nation often follows the lead of Texas on oil and gas jurisprudence, Texas courts may be the foundry for the legal framework for resolution of property disputes arising from fracing trespass. The Texas Supreme Court has indirectly addressed the subsurface trespass question, emphasizing in its

117. Id

^{113.} Aboelmagd Noureldin, et al., A New Borehole Surveying Technique for Horizontal Drilling Processes Using One Fiber Optic Gyroscope and Three Accelerometers 1, Society of Petroleum Engineers, (A paper presented at the IADC/SPE Drilling Conference, 23-25 February 2000, New Orleans, Louisiana), available at onepetrol.org.

^{114.} WILLIAMS & MEYERS, *supra* note 104, § 227. Developed by John Eastman, "whipstocking" a well involves dropping a spoon-shaped metal plate into the borehole, which then directs the well away from vertical (hopefully) in the chosen direction. *See* JOHN SCHMIDT, GROWING UP IN THE OIL PATCH 161–63 (1989).

^{115.} WILLIAMS & MEYERS, supra note 104, § 227.

^{116.} Id.

^{118.} *Id.* (Rule 34 of the Federal Rules of Civil Procedure has been interpreted as allowing discovery rules to apply to directional surveys describing the geometry and direction of deviated and horizontal wells after a showing of good cause is made by the applicant.).

^{119.} Hastings Oil Co. v. Texas Co., 234 S.W.2d 389, 393 (Tex. 1950).

^{120.} Terry Ragsdale, *Hydraulic Fracturing: The Stealthy Subsurface Trespass*, 28 TULSA L.J. 311, 316 (1993).

^{121.} Id.

holdings the importance of the role of the Texas Railroad Commission (the "RRC") in regulation, and considering whether fracing could be an actionable trespass. ¹²²

Texas, the state with arguably the most oil and gas jurisprudence on fracing, first looked at the fluid trespass issue in 1961. 123 In two attendant cases that involved two leasehold owners of standard-sized drilling tracts, Holmes and Gregg, seeking to drill two wells, the neighboring mineral tract owner sought to squelch their Rule 37 exception permits that, among other activities, would have allowed fracing within one hundred feet of its property boundary. 124 Delhi-Taylor was concerned that the fractures would have crossed over the boundary plane into its tract, facilitating what it believed to be drainage not allowed by the rule of capture. 125 As it turned out, the main question contemplated in the case was whether the RRC or the district courts had jurisdiction to rule on the action seeking to stop the fracing operation. 126 The court of appeals not only ruled that the RRC did not have jurisdiction to consider trespass claims but also strongly implied that, in instances of underground trespass, courts can enjoin such trespass and that the RRC cannot authorize same. 127 Specifically, the court said:

We think the allegations are sufficient to raise an issue as to whether there is a trespass. The invasion alleged is direct and the action taken is intentional. Gregg's well would be, for practical purposes, extended to and partially completed in Delhi-Taylor's land. The pleadings allege a physical entrance into Delhi-Taylor's leasehold. While the drilling bit of Gregg's well is not alleged to have extended into Delhi-Taylor's land, the same result is reached if in fact the cracks or veins extend into its land and gas is produced therefrom by Gregg. 128

In the end, the court ruled that, in the absence of (1) an explicit legislative grant of exclusive jurisdiction to the RRC and (2) specific RRC rules or orders governing secondary recovery operations, the courts have jurisdiction to decide the questions of liability and remedies for subsurface trespass, including whether injunctive relief is available to prevent a landowner from fracturing a common formation beyond his property lines for the purpose of increasing the productivity of the landowner's well. ¹²⁹

In *Geo Viking, Inc. v. Tex-Lee Operating Co.*, Tex-Lee hired Geo Viking to conduct fracing operations on a well drilled into the Austin Chalk formation. ¹³⁰ The Austin Chalk is a tight fossiliferous marl and chalk formation found in the Gulf Coast region of Texas and along the Gulf Coast. ¹³¹

^{122.} WILLIAMS & MEYERS, supra note 104, § 228.

^{123.} Id

^{124.} *See* Delhi-Taylor Oil Corp. v. Holmes, 344 S.W.2d 420 (Tex. 1961); Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 411 (Tex. 1961); Holmes v. Delhi-Taylor Oil Corp. 337 S.W.2d 479 (Tex. Civ. App. 1960); Delhi-Taylor Oil Corp. v. Gregg, 337 S.W.2d 216 (Tex. Civ. App. 1960).

^{125.} Gregg, 344 S.W.2d at 411.

^{126.} *Id*.

^{127.} *Id.* at 415.

^{128.} Id. at 416 (emphasis added).

^{129.} *Id.* at 415.

^{130.} Geo Viking, Inc. v. Tex-Lee Operating Co., 817 S.W.2d 357, 359 (Tex. App. 1991).

^{131.} U.S. Geological Survey, *Austin Chalk*, MINERAL RESOURCES ON-LINE SPATIAL DATA, http://tin.er.usgs.gov/geology/state/sgmc-unit.php?unit=TXKau%3B0 (last visited Jan. 31, 2013).

The Austin Chalk...[is] marked by zones of natural fractures that trend in a common direction. While the Austin Chalk is often saturated with hydrocarbons, it typically remains uneconomic unless a horizontal borehole intersects a number of the fractures. Therefore, seismic and surficial mapping techniques were developed to find these natural fracture zones and orientations.¹³²

Tex-Lee claimed that due to negligence by Geo Viking in conducting the fracing job, Tex-Lee failed to produce any oil and gas. ¹³³ The trespass issue related to fracing came into the case through defendant's defenses and jury charges arising from the calculation of possible damages. ¹³⁴ In addition to general denials of negligence, Geo Viking argued that Tex-Lee could not even claim damages for the value of oil and gas from acreage outside of the eighty-acre spacing in which the fraced well was located. ¹³⁵

This case then went through several strange procedural maneuvers. First, the court of appeals rejected the proposed jury charge of Geo Viking that stipulated some of the production could have only occurred because of a trespass of the fractures on the neighboring tracts. ¹³⁶ Instead, a united court held that the rule of capture allowed for Tex-Lee to potentially own *all* of the oil and gas produced from the well, however, such production might be assisted by fracing fluid intruding on unpermitted tracts. ¹³⁷

Upon rehearing, one of the three justices peeled out of formation, and in a dissent, cited dicta in *Gregg*, noting that while oil and gas are subject to traditional drainage without trespass liability according to the venerable rule of capture, the owner is accorded the usual remedies against trespassers and that "fracing under the surface of another's land constitutes a [subsurface] trespass." This would mean that not only would the rule of capture *not allow* Tex-Lee to recoup drainage of hydrocarbons that might have been produced as the result of fracing beyond the boundaries of its tract, ¹³⁹ but also, by implication, suggests that frac fluid—and the fractures that provide the necessary flow conduit—that crosses into an unpermitted tract and permits recovery of hydrocarbons not otherwise recoverable is not cov-

^{132.} Thomas E. Kurth et al., *American Law and Jurisprudence on Fracking*, ROCKY MTN. MIN. L. INST. (2012) (citing Kevin P. Corbett, David R. Van Alstine & Janell D. Edman, *Stratigraphic Controls on Fracture Distribution in the Austin Chalk: An Example from the First Shot Field, Gonzalez Co., Texas*, 1997 AAPG Hedberg Research Conference; Ilyas Juzer Najmuddin, Austin Chalk Fracture Mapping Using Frequency Data Derived from Seismic Data (2003) (unpublished Ph.D. dissertation, Texas A&M University) (on file with Texas A&M University Library), *available at* http://repository.tamu.edu/bitstream/han dle/1969.1/34/etd-12112002-153843-1.pdf?sequence=1).

^{133.} *Geo Viking*, 817 S.W.2d at 359.

^{134.} Id. at 364.

^{135.} *Id.* at 363–64.

^{136.} *Id.* at 364.

^{137.} Id. at 365.

^{138.} Id. at 365 (Grant, J., dissenting).

^{139.} See id.

ered by the rule of capture. Still, the other justices did not change course, and the court of appeals did not change its overall ruling. 140

The Texas Supreme Court then took up the petitioner's application for a writ of error. At first, the court reversed the court of appeals, ruling in a (later withdrawn) per curiam opinion that "[f]racing under the surface of another's land constitutes a subsurface trespass" and that the lower court's reliance on the rule of capture was "misplaced." Then, the supreme court curiously withdrew its first opinion, leaving intact (without comment or concurrence) the opinions of the trial court. It is substitute opinion, the court had a change of heart, remarking that, "... we should not be understood as approving or disapproving the opinions of the court of appeals analyzing the rule of capture or trespass as they apply to hydraulic fracturing."

During the period between the withdrawal of the first opinion and the release of the second opinion by the court, the Federal Court of the Northern District of Texas released its opinion in *Gifford Operating v. Indrex, Inc.*¹⁴⁵ In *Gifford*, the court, relying on the first opinion of *Geo Viking* as being the definitive state case law it was to apply, opined "sand fracing across lease lines amounts to subsurface trespass." ¹⁴⁶

The oil and gas law commentators, Williams and Meyers, suggest that *Geo-Viking, Inc., Gregg*, and *Gifford* reaffirm the judicial branch's prerogative to hand down injunctions preventing fracing if sufficient evidence exists to show that the fracing fluid may transgress property lines. ¹⁴⁷ In *Railroad Comm'n of Tex. v. Manziel*, ¹⁴⁸ however, the Texas Supreme Court determined that a mineral owner was not entitled to an injunction suspending an RRC order authorizing a spacing exception allowing a reservoir pressure maintenance project (i.e. a "water flood" operation) in the East Texas Oil Field. ¹⁴⁹ The mineral owners complained that the injected water would almost certainly cross through the boundary of their tract and that this would manifest a trespass. ¹⁵⁰ They sought to have an RRC order vacated despite the RRC's claim that the operation would heighten ultimate recovery from the well. ¹⁵¹

The court noted that in those conditions "[t]he subsurface invasion of adjoining mineral estates [sharing a common reservoir] by injected salt water . . . is to be expected, and in the [injunction] case at bar we are not confronted with the tort

141. Geo Viking, Inc. v. Tex-Lee Operating Co., No.05-0446, 1992 WL 80263 (Tex. 1992), withdrawn, Geo Viking, Inc. v. Tex-Lee Operating Co., 839 S.W.2d 797, 798 (Tex. 1992).

^{140.} Id. at 364.

^{142.} Id. at *2.

^{143.} Geo Viking, Inc. v. Tex-Lee Operating Co., 839 S.W.2d 797, 798 (Tex. 1992).

^{144.} Id.

^{145.} Gifford Operating v. Indrex Inc., 1992 U.S. Dist. LEXIS 22505, at *1 (N.D. Tex. 1992).

^{146.} Id.

^{147.} WILLIAMS & MEYERS, *supra* note 104, § 228 (citing Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 419 (Tex. 1961), *aff'g*, 337 S.W.2d 222 (Tex. Civ. App. 1960); Delhi-Taylor Oil Corp. v. Holmes, 344 S.W.2d 420 (Tex. 1961), *rev'd*, 337 S.W.2d 479 (Tex. Civ. App. 1960)).

^{148.} R.R. Comm'n of Tex. v. Manziel, 361 S.W.2d 560 (Tex. 1962).

^{149.} *Id.* at 574. Secondary recovery operations (like reservoir pressure maintenance) involve the injection of saltwater into a producing rock formation. This case involved a tract under the minimum size allowed by the RRC absent an exception order, whose owner had sought permission from the RRC to conduct reservoir pressure maintenance on such a tract.

^{150.} Id. at 566-67.

^{151.} *Id*.

aspects of such practices."¹⁵² The court also recognized one commentator's forecast that a "negative rule of capture" may be emerging through challenges to the RRC's approval of secondary recovery operations in exception locations based on the law of trespass. ¹⁵³ The court found persuasive evidence that all other mineral and royalty owners had agreed to the original well spacing and that, absent secondary operations, the petitioner's leases "[had], and [would] continue to, produce far in excess of [their] fair share of the oil in place originally recoverable through the use of such methods."¹⁵⁴ Ultimately, the court deferred to the RRC's decisions, satisfied with the work and calculations that lay behind the RRC ruling. ¹⁵⁵

Texas is not the only state that has encountered the hydraulic fracing/trespass issue when other issues are being litigated. In *Columbia Gas Transmission Corp. v. Smail*, ¹⁵⁶ Columbia Gas Transmission pleaded for an injunction to halt drilling of a well on a leasehold contiguous to the boundary of a formation used for gas storage. Evidence was introduced at the trial describing the possible influence of fracing on the portion of the strata being used for storage, suggesting that the fractures could deplete or otherwise harm Columbia Gas Transmission's storage efforts. ¹⁵⁷ Splitting the baby, the trial court allowed drilling but required that a notice be sent to Columbia Gas Transmission before any subsequent fracing so that it could seek administrative relief. ¹⁵⁸

Kansas courts have also touched upon the problem in *Zinke & Trumbo, Ltd. v. State Corporation Commission*. ¹⁵⁹ Again, the issue of trespass was subsumed into a larger argument regarding the Corporation Commission establishing the production allowable of a fraced well. ¹⁶⁰ In *Zinke*, an operator fraced a well only 330 feet from a property boundary. ¹⁶¹ This frac operation initially increased the production from the well by 500%. ¹⁶² Petroleum engineering evidence suggested that the drainage area radius, and hence the length of the induced fractures, was at least 400 feet, meaning that the fractures potentially went seventy feet over the property line. ¹⁶³ The leasehold owner facing the alleged fracture intrusion challenged the allowable order promulgated by the Corporation Commission, believing that is was too high as the order was established in part based upon the adjusted open-flow rate of the well. ¹⁶⁴ Although the court did not mention the trespass issue in its opinion, it did recite the oft-mentioned mantra that the Corporation Commission had the duty to protect correlative rights among mineral owners and their lessees and therefore had to consider the evidence that the fracing could result in production from underneath

^{152.} Id. at 566.

^{153.} Id. at 568.

^{154.} Id. at 573.

^{155.} Id. at 574

^{156.} Columbia Gas Transmission Corp. v. Smail, 1986 U.S. Dist. LEXIS 22580, at *1–2 (N.D. Ohio 1986).

^{157.} *Id.* at *1–3.

^{158.} Id. at *25-26.

^{159.} Zinke & Trumbo, Ltd. v. State Corp. Com., 749 P.2d 21 (Kan. 1988).

^{160.} Id. at 27.

^{161.} *Id.* at 23.

^{162.} *Id.* at 27.

^{163.} *Id*.

^{164.} *Id.* at 24.

the tract neighboring the well when issuing an allowable order.¹⁶⁵ The court recognized that the Corporation Commission's liberal allowable would reward the adjacent operator's trespass since the fracture clearly crossed into Zinke's leasehold estate.¹⁶⁶

Finally, fracing trespass was litigated in Wyoming in *ANR Production Co. v. Kerr-McGee Corp.*, wherein the Wyoming Supreme Court considered a fracing operation that caused oil and gas migration to the fraced well in one formation from another unitized formation forty to fifty feet above the first formation. ¹⁶⁷ ANR Production Co. fraced the well in the lower formation causing the unit operator to bring an administrative action before the Wyoming Oil and Gas Conservation Commission, claiming that the resultant fractures caused communication between the two formations and requesting a shut-in order. ¹⁶⁸ After a trial court affirmed the Commission's shut-in order, ¹⁶⁹ a second action reached the Wyoming Supreme Court seeking to recover damages for trespass. ¹⁷⁰ While not actually discussed by the Wyoming Supreme Court, the trial court's order confirming trespass was apparently presumed valid as the parties were disputing the *amount* of damages, not whether damages were due for trespass in the first place. ¹⁷¹

C. Coastal Oil v. Garza

1. Background

Gregg seems to put on solid ground the idea that fracing operations where the fractures and fracing fluid cross property lines constitute actionable trespass. Thirty years later the Texas Supreme Court first confirmed that view only to withdraw its opinion and issue a per curiam order stating that it neither approves or disapproves of the opinion of the court of appeals that *Gregg* would find that fracing operations may constitute a trespass. ¹⁷² Then, apparently in an effort to be consistent with its historical role as a proponent of a public policy promoting development of oil and gas resources, the Texas Supreme Court reversed the tide and turned away from trespass arguments.

Recently, litigation in Texas sprang from fracing of a gas well on a lease adjacent to the plaintiffs' tract that allegedly made it possible for gas to flow from the plaintiffs' lease to the adjacent lease. 173 When the Texas Supreme Court granted the petition for review of the Corpus Christi Court of Appeal's decision in *Mission Res.*, *Inc. v. Garza Energy Trust* 174—a case involving a long-running dispute between a producer and the royalty owners of a natural gas lease in South Texas—the trespass issue seemed destined for final resolution. But in *Coastal Oil & Gas Corp.*

166. Id. at 27-28.

172. Geo Viking, Inc. v. Tex-Lee Operating Co., 817 S.W.2d 357, 364 (Tex. App. 1991).

^{165.} Id.

^{167.} ANR Prod. Co. v. Kerr-McGee Corp., 893 P.2d 698 (Wyo. 1995).

^{168.} Id. at 700-01

^{169.} ANR Prod.Co. v. Wyoming Oil & Gas Conservation Comm'n, 800 P.2d 492 (Wyo. 1990).

^{170.} Kerr-McGee, 893 P.2d at 700.

^{171.} *Id*.

^{173.} See Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008).

^{174.} Mission Res., Inc. v. Garza Energy Trust, 166 S.W.3d 301, 310–11 (Tex. App. 2005), rev'd, 268 S.W.3d 1 (Tex. 2008).

v. Garza Energy Trust, ¹⁷⁵ as the case was named in the review, the court issued an opinion that almost, but not quite, answered the question of whether fracing can result in an action for trespass.

Factually, the case involved two contiguous tracts called "Share 12" and "Share 13" located in southern Texas and that contain the Vicksburg T formation that requires fracing. ¹⁷⁶ The original plaintiffs and respondents ("*Salinas*") ¹⁷⁷ owned mineral rights in the Share 13 tract, and Coastal Oil & Gas Corp. ("*Coastal Oil*") took an oil and gas lease from Salinas over Share 13. ¹⁷⁸ Coastal Oil also had a fee mineral interest in Share 12. ¹⁷⁹

Coastal Oil placed a well on Share 12 exactly 467 feet from the property boundary with Share 13—the minimum distance allowed according to the state spacing rules. This vertical well was fraced with the intention that the resultant fractures would extend between 1000 feet and 1500 feet from the annulus, meaning that the fracing survey was designed and conducted in such a way as to extend the fractures over the property boundary. Is 181

Salinas brought suit, alleging, among several causes of action, trespass and arguing that between a quarter and a third of the resultant production from the Coastal Oil well on Share 12 was, in fact, from Share 13. ¹⁸² The jury found that trespass had occurred and that the resultant drainage amounted to over a million dollars in lost royalties to Salinas. ¹⁸³ The court of appeals lowered the awards but did not rescind the trespass claim. ¹⁸⁴

2. Decision

Thus, when the Texas Supreme Court took the case, Salinas possessed a substantial judgment for damages against Coastal Oil for subsurface trespass and wrongful drainage caused by fracing, breach of the implied covenant to develop, and bad faith pooling. First, the court recognized Salinas's standing to assert an action for trespass, holding that the mineral lessor's reversion interest in the minerals leased to Coastal Oil gave standing to sue for "trespass on the case," a form of trespass that requires proof of actual injury but no actual physical entry. Trespass quare clausum fregit was ruled out because Salinas, an oil and gas lessor, did not have the necessary possessory interest in the trespassed estate, namely Share 13. Trespass on the case, however, requires actual damages be shown, unlike trespass

^{175.} Coastal Oil & Gas Corp., 268 S.W.3d at 1.

^{176.} Id. at 5.

^{177.} Id.

^{178.} Id.

^{179.} Id

^{180.} *Id.* at 6; see also, 16 Tex. ADMIN. CODE § 3.37 (2011).

^{181.} Coastal Oil & Gas Corp., 268 S.W.3d at 7.

^{182.} Id. at 8.

^{183.} *Id*.

^{184.} *Id.* at 9.

^{185.} Id. at 9-11.

^{186.} Id. at 9.

quare clausum fregit a strict liability common law tort that only requires entrance. 187

Citing *Gregg* and *Manziel*, the majority of the court ruled that Salinas's single alleged injury for trespass on the case—the drainage allegedly caused by Coastal Oil's fracing operation—was foreclosed by the rule of capture. ¹⁸⁸ The court further held that "damages for drainage by hydraulic fracturing are precluded by the rule of capture." Differentiating between hydrocarbons produced from a directional well that itself enters an unpermitted tract and gas that crosses from an unpermitted tract to a well that stays within the leased tract, the court noted that the rule of capture only applies to the latter because only in that scenario have the hydrocarbons actual migrated over a property boundary. ¹⁹⁰

The majority then went on to give three reasons why the rule of capture should govern when no physical entry occurs. First, the rule of capture's classic recourse—go and do likewise—remains in the arsenal of the party experiencing drainage caused by fracing. ¹⁹¹ As for lessors anxious about drainage caused by an inactive lessee, they could assert a claim for the violation of the implied covenant to prevent drainage. ¹⁹² Second, the RRC—as compared to the courts—was the most knowledgeable authority regarding optimum field development, correlative rights, and waste prevention and should therefore be the authority charged with applying regulations to curtail the rule of capture through field production rules and determining any damages due from breaking field or default spacing and density rules. ¹⁹³ Third, as a matter of sound public energy policy, and in the interest of preventing widespread industry disruption, it was better to allow the rule of capture to absolve the liability claimed by Salinas. ¹⁹⁴ Ultimately, the court felt it unnecessary to consider the "broader issue" of whether fracing may give rise to an action for trespass. ¹⁹⁵

The concurrence in *Coastal* pressed the court to adopt a bright line rule that "a claim for 'trespass-by-frac[k]' is nonexistent in either drainage or nondrainage cases." Relying on the court's prior holding in *Manziel*, Justice Don Willett likened the fracing in the present case with the water flooding allowed by the RRC (and, in turn, the court) in *Manziel*. Justice Willett stressed the public policy concern of continuing to allow shale hydrocarbon development to go forward without the potentially crippling effect of trespass cases from owners of unpermitted tracts convincing shale developers to go elsewhere to explore. In *Manziel*, the RRC allowed a secondary recovery spacing exception even though the neighboring unpermitted tract owner complained that the injected water would trespass onto his

^{187.} Coastal Oil & Gas Corp., 268 S.W.3d at 10.

^{188.} Id. at 12-13.

^{189.} Id. at 17.

^{190.} Id. at 14.

^{191.} See id. at 17.

^{192.} *Id.* at 14.

^{193.} *Id.* at 15.

^{194.} See id. at 17.

^{195.} *Id.* at 11–12.

^{196.} Id. at 30 (Willett, J., concurring).

^{197.} Id. at 35-37 (citing Railroad Comm. of Tex. v. Manziel, 361 S.W.2d 560 (Tex. 1962)).

^{198.} Id. at 31–32.

tract because the RRC believed this would enhance ultimate recovery. ¹⁹⁹ Justice Willett believed this judicial recognition of RRC expertise in *Manziel* should carry over to *Coastal* and other similar cases of administratively-approved secondary recovery operations. ²⁰⁰

Three justices dissented in part.²⁰¹ The dissent criticized the majority's failure to "address Coastal's primary issue: does hydraulic fracturing across lease lines constitute subsurface trespass."²⁰² The dissenters felt that intrusion of fracing fluid could be found to be a trespass and, if so, such transgression negated application of the rule of capture.²⁰³ The partial-dissenters cited their own public policy concerns, noting that allowing potential trespass by fracing could allow developers of leased tracts to drain unleased tracts without compensating the owners of the minerals in the unleased tracts.²⁰⁴

Salinas's two other claims against Coastal Oil for the breach of implied covenants and bad-faith pooling met similar dismissive ends. ²⁰⁵ The court found no evidence that Coastal Oil had acted as an imprudent operator and thus denied Salinas's claim of breach of the covenant to protect their tract from drainage. ²⁰⁶

3. Aftermath

Coastal seems to signal a change in the Texas Supreme Court's view of the role of the RRC with regard to enhanced recovery operations like fracing. First, in Gregg, the court accepted the absence of RRC regulatory activity with regard to secondary recovery operations as allowing for judicial action. Then, in Manziel, the decision cited exercise of regulatory authority by the RRC over non-fracing related, secondary recovery projects as a reason to eschew judicial action by denying relief for trespass. With the recent spate of activity specifically addressing fracing by the legislature, the RRC, and the TCEQ starting in 2011, Manziel paired with Coastal may have signaled a dawning willingness by Texas courts to leave fracing trespass largely up to regulatory agencies.

The majority of the court in *Coastal* did not close the door on future claims arising from fracing. Other tort claims are also left untouched. The majority opinion reserved final judgment on whether trespass, either trespass *quare clausum fregit* or trespass on the case, could ever qualify as the basis for a claim arising from fracing. ²¹⁰ Still, however, without proof of entry and drainage, claimants could be

^{199.} See Manziel, 361 S.W.2d at 568.

^{200.} Coastal Oil & Gas Corp., 268 S.W.3d at 30 (Willett, J., concurring).

^{201.} Id. at 44 (Johnson, J., Jefferson, C.J., and Medina, J., concurring in part and dissenting in part)

^{202.} Id.

^{203.} Id. at 43-44.

^{204.} Id. at 44.

^{205.} See id. at 18-19.

^{206.} Id. at 19.

^{207.} Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 411 (Tex. 1961).

^{208.} Manziel, 361 S.W.2d at 568-69.

^{209.} See Christopher S. Kulander, Environmental Effects of Petroleum Production: 2010-2011 Texas Legislative Developments, 44 Tex. Tech L. Rev. 863 (2012).

^{210.} See Coastal Oil & Gas Corp., 268 S.W. 3d at 17.

hard-pressed to meet the required proof thresholds for liability and actual damages. Unless evidence of an intentional tort, such as trespass, is presented, exemplary damages are probably unavailable. Injunctive relief may be possible if it can be shown that a trespass threatens imminent harm other than drainage.

Left unanswered in *Coastal* is the effect of fracing on the promotion of orderly development, the protection of correlative rights of owners of adjoining tracts, and the prevention of waste-three primary missions of any state conservation agency. 211 If fracing is beneficial to achieving the highest ultimate production and total recovery of a unit or field, then it would seem both defensible under the law of capture (if the rule applies) and the three aforementioned conservation missions. But at least one commentator has posited that fracing operations that lowered the ultimate recovery of an entire reservoir—lowering the amount realizable by the neighboring tracts while enhancing only the recovery of the well being fraced would violate the correlative rights of the neighboring tracts, where "each owner possesses certain undivided rights within the reservoir." Further, conservation commissions should consider the ultimate recovery of the reservoir or field when considering field spacing and density rules and any associated well allowables.²¹³ Under such a conservation regime, it is argued, all the parties sharing ownership of the reservoir are field-wide co-tenants, and therefore a recovery operation like fracing that increases one field co-tenant's ultimate recovery to the detriment of the other field co-tenants should at least trigger further consideration by state conservation authorities to defend the correlative rights of all field co-tenants.²¹⁴

D. Analysis of Trespass and Conservation

1. Microseismicity and Fracing Petroleum Engineering

A landowner may have a well-founded suspicion that a neighboring fracturing job is straying into his land, but how can it be proven? Significant progress has been made in recent decades in subsurface remote sensing, particularly in the area of microseismicity, a type of geophysical exploration. In the absence of an actual surface trespass, Texas courts have conclusively found that no geophysical trespass occurs when seismic waves actually enter and cross over an unpermitted tract.²¹⁵

In a couple of instances in *Coastal*, the court noted that it believes the extent of the fractures could not be ascertained, opining, "we are talking about fissures of immeasurable length and uncontrollable direction," and "testimony in this case reveals that although the fracture length of an operation can be estimated . . . the effective length—the length of the fracture through which gas will flow—cannot." This uncertainty apparently caused the court to opine that "determining

^{211.} See Kemp Wilson, Conservation Acts and Correlative Rights: Has the Pendulum Swung Too Far? 35 ROCKY MTN. MIN. L. INST. 18 (1989); see also ROBERT E. SULLIVAN, CONSERVATION OF OIL & GAS, A LEGAL HISTORY (1958).

^{212.} David E. Pierce, Minimizing the Environmental Impact of Oil and Gas Development by Maximizing Production Conservation, 85 N.D. L. REV. 759, 771–72 (2009).

^{213.} *Id.* at 776.

^{214.} *Id.* at 776–77

E.g., Villarreal v. Grant Geophysical, Inc., 136 S.W.3d 265, 268 (Tex. App. 2004), rev. denied.

^{216.} Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 32, 47 (Tex. 2008).

the value of oil and gas drained by hydraulic fracturing is the kind of issue the litigation process is least equipped to handle." Specifically, the court found the length, direction, and number of the induced fractures to be essentially unknown and unknowable. ²¹⁸

This is no longer true, however, as advances in seismic technology currently allow for mapping of micro-seismic events arising from fracing event to be recorded in "real time" by picking up the seismic vibrations from fracing with an array of omnidirectional geophones located in a monitoring well offset proximal to the treatment well. ²¹⁹ Detailed velocity models of the intervening strata can be constructed from sonic logs taken in existing wells, and the locations and geometry of the individual rock-fracturing events—"micro seismicity"—are then computed at the point in space that "matches" the seismic waves emanating from the fracing. ²²⁰ All this provides for data showing the orientation, height, and length of the fractures resulting from the fracing process. ²²¹

Therefore, since *Coastal*, recording and interpretation techniques for directional downhole seismic data have become more sophisticated, allowing petroleum seismologists to determine the direction and extent of fracturing. The location of the seismic events associated with the propagating fractures can be then be mapped on a 3D spatial volume alongside property lines to highlight where and to what extent fractures cross into a unpermitted volume of rock, and thus allow a landowner to present fairly compelling evidence of both trespass and the existence of drainage. Further calculations by a petroleum engineer could possibly determine the amount of drainage. Future plaintiffs claiming trespass *quare clausum fregit*, which allows for damages where there is unlawful and wrongful trespass into an unpermitted tract, could have different results once it is widely recognized and accepted that actual intrusion and drainage can be proven.

Such future cases may also turn on how fracing operations may be controlled industry-wide compared to how they are, on a case-by-case basis, actually controlled. If, as an industry, operators can demonstrably and repeatedly control the extent and direction of fractures in a fracing job, and one operator still chooses to design his frac job so that it either purposefully or recklessly crosses property boundaries into an unpermitted tract, evidence of same may convince a fact finder that such a willful entrance and drainage (if also proved) is actionable. Operators do

^{217.} Id. at 16.

^{218.} Id.

^{219.} N. R. Warpinski & L. W. Teufel, *Influence of Geologic Discontinuities on Hydraulic Fracture Propagation*, Vol. 39, No. 2 JOURNAL OF PETROLEUM TECHNOLOGY, 209 (1987).

^{220.} R.E. Peterson, HORIZONTAL GAS WELL COMPLETION TECHNOLOGY, Gas Research Institute (1996).

^{221.} Id.

^{222.} See e.g., Microseismic Mapping - Decision Space Desktop Pinnacle Example, HALLIBURTON UNCONVENTIONAL RESERVOIRS MULTIMEDIA, Jul. 2010, available at http://www.halliburton.com/ps/Default.aspx?navid=2514&pageid=4249&folderid=MSE%3a%3a10452297 47050391 (showing example of seismic events from frack salvos in a horizontal well being recorded and placed in a 3D spatial volume in "real time").

^{223.} *Id.* The extent of the fractures are then calculated and displayed.

have a measure of control over the extent and direction of fractures, with improvements coming all the time. ²²⁴

2. Fracing and Trespass

The question of whether or not fracing across a property boundary is trespass is perhaps best examined in its starkest example. Consider two undeveloped, contiguous tracts located over a prospective shale formation called Blackacre and Whiteacre. The tracts are located in an area where no limit is placed on the location of production casing intervals relative to boundary lines. The operator on Blackacre drills a horizontal lateral very close and parallel to the boundary with Whiteacre. He hydraulically fractures the well, purposefully directing the fractures towards the boundary with Whiteacre, perhaps assisted with the orientation of naturally-occurring fractures and stress fields in the rock. The fractures then extend hundreds of feet into Whiteacre. In addition, hundreds of thousands of gallons of fracing fluid and proppants flow into Whiteacre. When that fracing fluid is withdrawn, half remains, along with most of the proppant. Subsequent production predominantly comes from Whiteacre.

Is this actionable trespass, and can damages arise and be measured? Like the concurrence in *Coastal*, some industry groups, agencies, and judges think absolutely not, that the rule of capture holds sway. I respectfully submit that in such a case, without an order from the appropriate state oil and gas conservation authority, it is trespass. First, production from fracing is not a "natural" draining process akin to traditional recovery caused by reservoir pressure—such fractures are themselves akin to extensions of a directional well. Second, fracing that results in fractures crossing property boundaries into unpermitted tracts is not an enhanced recovery process that merely attracts hydrocarbons to the permitted tract by making the permitted tract a better conduit to the borehole, but rather is a process by which unpermitted tract(s) are themselves modified to serve as a conduit for flow to the fraced well.

The propagation of artificial fractures across property boundaries deep into an unpermitted tract permits the recovery of hydrocarbons that would not otherwise be recoverable through the traditional recovery methods around which the rule of capture arose. ²²⁷ Leaving these hydrocarbons behind in an effort to avoid a trespass

^{224.} See generally, Tim Beard, Fracture Design in Horizontal Shale Wells – Data Gathering to Implementation, EPA Hydraulic Fracturing Workshop (Mar. 10-11, 2011).

^{225.} See generally, Amicus Brief, Costal Oil & Gas Corp v. Garza Energy Trust, 268 S.W.3d 1 (NO. 05-0466) 2008 TX S. Ct. Briefs LEXIS 1449; Amicus Brief, Costal Oil & Gas Corp v. Garza Energy Trust, 268 S.W.3d (No. 05-0466) 2005 TX S. Ct. Briefs LEXIS 424; Amicus Brief, Costal Oil & Gas Corp v. Garza Energy Trust, 268 S.W.3d 1 (05-0466), 2006 TX S. Ct. Briefs LEXIS 1387; Amicus Brief, Costal Oil & Gas Corp v. Garza Energy Trust, 268 S.W.3d 1 (05-0466), 2005 TX S. Ct. Briefs LEXIS 422; Amicus Brief, Costal Oil & Gas Corp v. Garza Energy Trust, 268 S.W.3d 1 (05-0466), 2005 TX S. Ct. Briefs LEXIS 425; Amicus Brief, Costal Oil & Gas Corp v. Garza Energy Trust, 268 S.W.3d 1 (05-0466), 2005 TX S. Ct. Briefs LEXIS 423; Amicus Brief, Costal Oil & Gas Corp v. Garza Energy Trust, 268 S.W.3d 1 (05-0466), 2005 TX S. Ct. Briefs LEXIS 1025.

^{226.} With this thought, I agree with Terry Ragsdale, *supra* note 120, at 339, who noted that "[f]rom both a functional and physical perspective, a hydraulic fracture is largely analogous to a directionally drilled well."

^{227.} Bruce M. Cramer & Owen L. Anderson, *The Rule of Capture—An Oil and Gas Perspective*, 35 Envtl. L. 899, 902–03 (2005).

claim potentially constitutes waste and thus prevents the applicable state oil and gas conservation commission from implementing enhanced recovery plans that allow the commission to fulfill its mission of avoiding such waste.²²⁸

While such recognition of actionable trespass may seem to put much fracing activity—and hence widespread shale hydrocarbon development—under pressure, the Texas Supreme Court in *Manziel* seemed to recognize a regulatory exception that would seem to alleviate liability. In *Manziel*, the essential question was as follows: if a state oil and gas conservation authority authorizes a secondary (or tertiary) recovery operation that results in some kind of injected fluid crossing a property boundary onto an unpermitted tract, does an actionable trespass occur?²²⁹ To this question, the court responded, "[T]he technical rules of trespass have no place in the consideration of the validity of the orders of the Commission," and therefore actions such as frac fluid invasion are not trespass when sheltered under approval by the state oil and gas conservation commission.²³⁰ The court was reluctant to effectively revoke an RRC administrative power (in this case, allowing secondary recovery designed to enhance the ultimate recovery from a field) by allowing a trespass action to arise from the RRC attempting to fulfill its mission of preventing waste while protecting correlative rights.²³¹

Justice Willett of the Texas Supreme Court perhaps recognizes the need to allow state oil and gas conservation commissions the ability to organize and/or approve of enhanced recovery projects most eloquently in his concurring opinion to *Coastal*, opining that the Texas Legislature has already bestowed upon the RRC "sweeping jurisdiction over all Texas oil and gas wells" with the discretion to "weigh the competing interests and strike the proper regulatory balance" over hydraulic fracturing. Sagely presuming the importance of secondary recovery projects, Justice Willett believes its control should not be left to haphazard judicial resolution but rather "to the regulators as the [Texas] Legislature intended."

E. Conservation Authority and Trespass

If fracing across property boundaries into unpermitted tracts is potentially a trespass, and if microseismicity data is seen as credible and admissible evidence of same, what lies in store for an industry dependent on fracing for continued success? At first blush, this could seem like a major impediment for development that depends upon fracing, as the courtroom doors would be open wide for trespass claims. As Justice Willett of the Texas Supreme Court opined in *Coastal*,

Permitting trespass liability would be a grave blunder, auguring industry-wide tumult, the resulting tremors of which would be substantial and far-reaching. Both worldwide and in our energy-

^{228.} Id.

^{229.} R.R. Comm'n of Tex. v. Manziel, 361 S.W.2d 560, 567 (Tex. 1962).

^{230.} Id. at 568-69.

^{231.} *Id.* at 566.

^{232.} Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 38 (Tex. 2008).

^{233.} *Id.* at 40.

intensive State, energy is at once increasingly desired and increasingly scarce, and thus increasingly expensive. Courts shape the common law, but we cannot repeal the law of supply and demand any more than we can repeal the law of gravity. We occupy a petroleum-addicted world, and decades may pass before scalable fossil-fuel alternatives (wind, nuclear, solar, etc.) comprise a significantly larger piece of our diversified energy portfolio. Until then, letting neighbors file tres-frac[k] suits against each other will only yield these stubborn realities: fewer wells will be drilled; fewer older (but still productive) wells will undergo remedial fracing to enhance recovery and will instead be plugged prematurely; huge swaths of Texas land will remain undeveloped, their resources utterly wasted. The Texas economy would not grind to a halt, but it would feel the dampening effects of such a decision, and those effects would be real and acute.²³⁴

But would the tumult and tremors of allowing trespass for fracing really be fraught with such tumultuous temblors? First, practically speaking, since application of microseismicity by geophysicists to determine the extent to which fracs emanate from a well records events only *during* the actual process of fracing and not later once the fracs are already created, microseismicity is likely to not be useful in determining the extent of past frac activity. Second, the lateral extent of fractures from production casing during a frac job can be measured and controlled with increasing exactitude. Should this knowledge of the extent of fractures be translated into the ability to accurately and consistently design frac operations that result in fractures only within permitted/pooled tracts, such self-limiting designs would protect producers from trespass claims from both horizontal (lateral) neighbors and vertical neighbors. Indeed, operators are currently designing frac surveys with an eye toward fitting the fractures within well and perforation spacing, covering the height of the pay interval, and minimizing interference between wells.

Third, and perhaps most importantly, if fracing across property boundaries without fear of trespass claims is indeed such an important part of the public good of shale development as Justice Willett believes, why not allow it by statute if the allowed trespass is seen as promoting good conservation practice though the prevention of waste while protecting correlative rights, the goal of any conservation commission? Indeed, conservation practice may be best served if, instead of allowing common law trespass claims to stymie some fracing operations on one tract so that an additional well is necessary on a neighboring tract that otherwise could have been drained with the first well and fracing unfettered with the worry of liability for trespass, why not include the unpermitted tract in such state-mandated pooling sys-

^{234.} Id. at 41.

^{235.} See Warpinski & Teufel, supra note 219.

^{236.} See Kevin Fisher & Norm Warpinski, Hydraulic Fracture-Height Growth, Real Data, Society of Petroleum Engineers, Paper #145949 (2011); see also Richard Davies, et al., Hydraulic Fractures: How Far Can They Go?, MARINE AND PETROLEUM GEOLOGY (2012), available at http://www.dur.ac.uk/resources/dei/JMPG_1575.pdf.

^{237.} E.g., owners of mineral rights in other formations or depth intervals within the same tract.

^{238.} Beard, supra note 224.

tem or other conservation scheme? Using the rule of capture to shield Coastal Oil from Salinas's drainage claims was considered necessary to preserve "unimpeded" the RRC's "power to regulate production to assure a fair recovery by each owner . . [which] role should not be supplanted by the law of trespass." ²³⁹

This is a noble goal, as allowing trespass for fracing operations that result in fractures that "break the plane" onto an unpermitted tracts would indeed result in more litigation—perhaps a lot more. Also, if one frac job from a well can propagate fractures a great distance, is it not better for conservation practice purposes to suspend recondite common law theories of trespass in favor of promoting the idea that it is better to have fewer wells than more wells that can produce the same volume of hydrocarbons? If common law trespass theories impede conservation results and protection of correlative rights in the face of fracing can instead be achieved with finesse through regulation by an oil and gas conservation agency instead of with the battle-axe of litigation, courts and legislatures should encourage a policy of disallowing trespass actions for fracing where the fracing is conducted under approved conservation rules.

Conservation rules still live under the shadow of that other common law rule, the antinode of trespass known as the rule of capture. One commentator, Professor David Pierce in Kansas, has eloquently put forth the idea that, although curtailed somewhat by spacing and density rules, the rule of capture remains the centerpiece of modern oil and gas development and thus still compels landowners to either drill or become associated with a well. Such an idea, he argues convincingly, leads to waste manifested by the drilling of more wells than necessary to drain a reservoir. He goes on to say, "The capture regime will also haunt technological advances that require cooperation instead of competition in the subsurface porous and permeable rock structures where oil and gas reside."

Another brace of commentators, Professor Peter Gerhart and Robert Cheren, echoed this sentiment within the broader framework of surficial private property common law jurisprudence being applied, saying, "We are thinking about subsurface common pool resources through the wrong paradigm—the private property paradigm that assumes that we ought to reduce common pool resources to private property and try to coordinate rights and responsibilities through the same private property paradigm we apply to surface ownership."²⁴⁴ This plea for more and earlier conservation control over field-wide development for maximum ultimate recovery instead of focusing simply on applying a common property law framework de-

^{239.} Coastal Oil & Gas Corp., 268 S.W.3d at 15–16. (The court went on to observe that "[t]hough hydraulic fracturing has been commonplace in the oil and gas industry for over sixty years, neither the Legislature nor the [RRC] has ever seen fit to [specifically] regulate it"—an observation that is no longer true since the promulgation by the RCC of fracking fluid ingredient disclosure rules in December, 2011.).

^{240.} David E. Pierce, Minimizing the Environmental Impact of Oil and Gas Development by Maximizing Production Conservation, 85 N.D. L. REV. 759 (2009).

^{241.} *Id.* at 765.

^{242.} Id. at 761.

^{243.} Id. (emphasis added).

^{244.} Peter M. Gerhart & Robert D. Cheren, *Regulating the Shared Ownership of Common Pooled Resources*, 63 CASE W. RES. L. REV. 4 (2012).

signed for solving conflicts between two neighboring property holders reflects a more far-sided view towards preventing waste.

While this author generally agrees with Professor Pierce's premise that "shifting the focus of rights in oil and gas reservoirs away from capture rights and toward correlative rights" applies well to conventional reservoirs, the different nature of shale and other "tight" reservoirs may require a slightly different approach.

The overall production protocol developed to exploit "traditional" reservoirs—those comprised of sandstones, carbonates, and other rock types that have porosity enough to permit flow throughout the contiguous reservoir rock—does indeed require oversight and adjustment by producers and the applicable conservation commission upon completion of the first field-defining wildcats through to tertiary field-wide recovery operations in order to best develop the field with a minimum of waste. Rushed production in one portion of a traditional reservoir—such as on the updip portion of a tilted reservoir rock—could lead to negative results such as "watering out" in another portion of the field—such as on the downdip portions of the same tilted reservoir formation—leaving oil and gas behind and causing waste. ²⁴⁶

In contrast, shale and other "tight" reservoirs do not typically experience reservoir-wide flow due to the persuasive low porosity and (especially) permeability. Therefore, the resource desired stays in the strata comprising each separate mineral estate through which the shale or other "tight" formation is found until fracing operations are conducted to allow flow of the hydrocarbons by artificially raising the hydraulic conductivity. In this way, the shale hydrocarbons, being far more stationary before fracing, are more akin to a solid resource like coal that will wait patiently until their rightful owner—or a neighboring trespasser—fracs and develops them.

Because of this difference, the concept of excusing trespass by fracing simply by invoking the rule of capture is strained. As the hydrocarbons do not flow in shale and other "tight" formations because of the low permeability, a neighboring party does not simply drill and then sit back and allow the hydrocarbons to flow across the property line to his well as happens in traditional reservoirs, but rather must actively "reach out" across the property boundaries with fracing to release the hydrocarbons to flow back across the property lines to his well.

This difference is crucial when considering whether the rule of capture allows fracing across property lines as described in *Coastal* or whether enhanced powers given and exercised by local conservation commissions can or should excuse trespass claims for fracing across property boundaries. With regard to future cases similar to the situation found in *Coastal*, properly conducted microseismicity surveys will be able to prove the extent of fracturing and whether the fractures cross into an unpermitted tract. Also in the future, the length and direction of induced fractures will be subject to better control by hydraulic fracturing design engineers, ²⁴⁹ lessen-

^{245.} Id. at 759.

^{246.} See Amoco Prod. Co. v. Alexander, 622 S.W.2d 563 (Tex. 1981).

^{247.} R. ALLAN FREEZE & JOHN A. CHERRY, GROUNDWATER 158 (Prentice Hall, 1st ed. 1979).

^{248.} *Id*.

^{249.} See generally Environmental Protection Agency, Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane

ing the opportunity for a fracing trespasser to claim its fracing was an accident or that it could not be controlled.

Gerhart and Cheren promote a system of private governance to address fracing and conservation. ²⁵⁰ Such a system would prohibit fracing until the operators with leases or self-developing mineral owners themselves had formed a joint venture. While this author does not believe that operators who choose to utilize fracing should be prohibited from doing so by the regulating authorities until they include every party that *could* be part of a field into a joint venture, ²⁵¹ broader powers of state authorities to unitize a field earlier in its life span are favored. ²⁵²

If the fracing is conducted in accordance with the rules of the appropriate oil and gas conservation commission, however, such a trespass has previously been allowed at law akin to other approved intrusions such as flying an airplane high over private property. On the other hand, if the extent of fractures can be controlled and the fracing operator still chooses to knowingly frac over a property boundary into an unpermitted or unpooled tract, at present such an activity looks like willful and provable trespass to this author absent a state conservation policy that allows such practice while protecting the correlative rights of the owners of the minerals in such targeted unpermitted tracts. Such a conservation policy should be crafted to take full advantage of the ability of horizontal drilling and fracing to, in concert, potentially dramatically increase the lateral extent of drainage allowed by one pad site with multiple wells.

While purposefully fracing into an unpermitted tract and using those fractures to place proppant and draw hydrocarbons from that tract after the advent of microseismicity, combined with the ability to control the lateral extent of fracing, strikes this author as provable trespass when considered as an independent concept, the public policy of promoting production of onshore domestic oil and gas spoken of by Justice Willett in his concurring opinion in *Coastal* strikes this author as reason enough to remove fracing from trespass consideration provided conservation rules are observed—though, perhaps not by evocation of the rule of capture. It is those conservation laws that will need revision, then, to reflect the place that fracing can take to promote maximum efficient field development with a minimum amount of waste.

In the end, practitioners seek practical solutions. The best time for lessors to protect their land from drainage caused by fracing sourced in another tract may be during leasing. For example, lessors could demand special lease provisions to protect against a common lessee favoring its current or future mineral interests in

RESERVOIRS—APPENDIX A: HYDRAULIC FRACTURING WHITE PAPER, EPA WHITE PAPER 816-R-04-003, (June 2004), available at http://www.epa.gov/ogwdw/uic/pdfs/cbm study_attach_uic_append_a_doe_whitepaper.pdf.

^{250.} Gerhart & Cheren, *supra* note 244.

^{251.} Such a scheme is perforated with issues, starting with knowing how to define a field before drilling even begins (wildcat wells are generally necessary when looking for production) and then being required to (1) find all the necessary parties in title and (2) get those parties—some potentially unsophisticated—to agree on a development scheme (3) all within a reasonable time.

^{252.} See Owen L. Anderson & Ernest E. Smith, The Use of Law to Promote Domestic Exploration and Production, in 50 INST. ON OIL & GAS L. & TAX'N §§ 2-1, 2-64 to 76 (1999).

^{253.} See Owen L. Anderson & John D. Pigott, Seismic Technology and Law: Partners or Adversaries. 24 ENERGY & MIN. L. INST. 285 (2004).

neighboring lands. Such clauses might include a specific drilling and development schedule or a requirement to drill an offset well—or take other protective or compensatory measures—to either protect against, or make restitution for, drainage where the lessee has a working interest in a well on a neighboring tract.

For now, lessees seem relatively safe from fracing trespass claims. This lacuna of safety from liability may only be temporary, however, with advancements in microseismicity and corresponding proof of entrance of fractures, proppant, and fracing fluid followed by the departure of hydrocarbons from unpermitted tracts.

IV. SEPARATE MINERAL OWNERS

A. Owners of Oil and Natural Gas vs. Owners of "Other Minerals"

What happens when the mineral estate itself is separated, with the hydrocarbons owned by one party and the other minerals by a second party? Questions have arisen over which party owns the hydrocarbons *inside* the shale if the shale itself is considered a mineral. Shale located thousands of feet below the surface is itself worthless. ²⁵⁴ Traditional deposits of oil and natural gas located in reservoirs comprised of sandstone, carbonates, or other rock are property of the oil and natural gas owner, ²⁵⁵ and not the owner of other, the surrounding rock, or (generally) the pore space in the rock. The owners of the minerals other than the oil and natural gas, like coal, however, can cite in support of their ownership claim the 1983 Pennsylvania case of *U.S. Steel Corp. v. Hoge*, ²⁵⁶ wherein the Pennsylvania Supreme Court ruled that the methane gas found inside coal seams belongs to the coal owner, not the natural gas owner. Therefore, ownership of the "mineral" shale should necessarily entail ownership of the natural gas found therein. ²⁵⁷

The question of ownership of natural gas between the owner of the hydrocarbons and the owner of the other minerals is now being considered by Pennsylvania courts in the case of *Butler v. Charles Powers Estate*. ²⁵⁸ In that case, the trial court found that a reservation in a mineral deed that reserved "one half the minerals and Petroleum Oils" did not include Marcellus Shale gas based on the application of the "Dunham Rule." This rule arose from the case of *Dunham & Shortt v. Kirkpatrick*, ²⁶⁰ where a conveyance reserving or conveying "minerals" without references to oil or gas creates a rebuttable presumption that the grantor did not intend for "minerals" to include oil or natural gas. ²⁶¹

Pennsylvania's Superior Court (the appellate-level court in Pennsylvania) disagreed and held that it is not clear whether the Dunham Rule applies to Marcellus Shale gas.²⁶² The decision raises a factual question as to whether shale gas should

^{254.} This is not entirely true. Shale can act as a seal to hold hydrocarbons in traditional reservoirs below the shale. In addition, it partially comprises the strata that support the surface.

^{255.} Or, as in Oklahoma, the owner of the mineral rights has an exclusive license to develop the oil and gas but does not actually own the oil and gas molecules themselves.

^{256.} U.S. Steel Corp. v. Hoge, 468 A.2d 1380 (Pa. 1983).

^{257.} Id. at 1383.

^{258.} Butler v. Charles Powers Estate, 29 A.3d 35 (Pa. 2011).

^{259.} *Id.* at 40.

^{260.} Dunham & Shortt v. Kirkpatrick, 101 Pa. 36 (1882).

^{261.} Id.

^{262.} Butler, 29 A.2d at 43.

be treated like coal bed methane, when under Pennsylvania jurisprudence is owned by the coal owner. 263 Instead of deciding whether or not the Dunham Rule applies and feeling that expert testimony would be helpful, the Superior Court instead remanded the case back to the trial court for a factual determination of (1) whether the shale is legally a "mineral"; (2) whether shale gas constitutes the type of conventional natural gas contemplated by the Dunham Rule; and (3) whether shale like the Marcellus Shale is similar to the coal in *Hoge* in that whoever owns the shale owns the shale gas contained therein. 264

The ultimate result of *Butler v. Powers* warrants national attention, as hitherto the national consensus of oil and gas law practitioners seems to have been that the owner of the oil and natural gas owned the shale gas over the owner of the other minerals (where the mineral estate is bifurcated between an owner of oil and gas and other minerals), except—sometimes—in the situation of coalbed methane. Interestingly, *Hoge* describes the method of removing coal bed methane as including horizontal wells and hydrofracing. Although the opinion has not been released, one Pennsylvania oil and gas attorney has said that most commentators in the state believe the Pennsylvania Supreme Court will determine that "gas is gas" and the natural gas owner, not the mineral owner, owns the Marcellus shale gas.

B. Owners of Different Formations

In the past, the most commonly discussed spatial relationship between conflicted mineral owners dealt with the horizontal relationship—mineral estates with a vertical plane between them. Mineral estates on top of one another—those with a horizontal plane between them—are also common, however, and fractures started from a horizontal production interval of an annulus within one estate could very easily travel vertically up or down through the horizontal estate boundary. Meaning the state boundary.

Nearer the surface, because the weight of the overburden is relatively light, the induced fractures have a tendency to propagate in a plane perpendicular to the direction of the least stress.²⁶⁹ In other words, the fractures generally occur in a horizontal plane. As depths increase, the direction of least stress is no longer vertical as the weight of the overlying strata increases.²⁷⁰ The direction of least stress becomes horizontal, aligned according to regional tectonics stress.²⁷¹ At these greater depths, the fractures propagate vertically—raising the prospect of fractures crossing into another depth interval owned by another party (as well as allowing for

^{263.} U.S. Steel Corp., 468 A.2d at 1380. (Physical mining of oil shale, although not practiced in Pennsylvania or in the Marcellus region in general, would certainly make the *Hoge* analogy more applicable.).

^{264.} Butler, 29 A.2d at 43.

^{265.} Id. at 1393.

^{266.} Personal communication, John W. Carroll, Attorney, Pepper Hamilton LLP, Harrisburg, Pennsylvania, Nov. 27, 2012 (on file with author).

^{267.} Beard, *supra* note 224, at 36.

^{268.} Id.

^{269.} Memorandum from the Office of the Gen. Counsel of the RRC 5 (July 17, 2012), available at http://www.rrc.state.tx.us/rules/prop-amend-3-13-Aug21-2012.PDF (citing Fisher & Warpinski, supra note 236; also citing Davies et al., supra note 236).

^{270.} Id.

^{271.} *Id*.

upward migration of fracing fluid into potable aquifers).²⁷²

V. CONCLUSION

The proper categorization of property—and real property in particular—is a necessary but sometimes complicated task when comparing the sometimes competing rights of various intertwined owners. This is especially true when considering mineral property—as all manner of surface and mineral property owners, mineral owners proximal to one another, owners of different minerals within the same space, contemporaneous owners of portions of the same mineral estate (e.g. a lessor and a lessee or a life estate owner and a remainderman), owners of minerals separated by various types of horizontal boundaries (e.g. a certain total depth, the top or bottom of one or more geological formations, or even the first or last appearance of a certain 'marker' fossil type). Only once the competing estates are properly categorized can their respective rights be evaluated.

272. *Id*.