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OIL, GAS & ENERGY RESOURCES LAW
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IN THIS ISSUE

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Message of the Chair of the
Oil, Gas & Energy Resources Law Section

Happy New Year 2019! It hardly seems possible that we are nearly two decades into this century. When I first entered the energy business (in the last century), policy around energy was driven from a perspective of scarcity. After all, we were running out of oil and gas. By contrast, the Energy Information Administration recently reported that the United States is the largest global crude oil producer – having surpassed both Saudi Arabia and Russia. Globally, the U. S. ranks #1 in total energy production: oil production, natural gas production, nuclear power, geothermal power, and biofuels. We are #2 in wind, solar, and coal production. And, of course, Texas ranks #1, per EIA reports, for total U. S. energy production.

You, as members of the Oil, Gas & Energy Resources Law Section, support this amazing story through your representation of producers, transporters, and consumers of energy products. The law we create here serves as a model for the rest of the country – and sometimes for other countries. Investment dollars come to Texas because people have confidence in the jurisprudence and the regulatory framework that supports the energy industry. Thank you for helping to build and uphold that reputation.

This edition of the Section Report includes articles on topics of interest to our oil and gas constituency. I know you will read them with interest. And don't forget that you can read them again with ease on our website, www.oilgas.org. The contents of this and previous Section Reports can be found there in addition to the materials from most of our CLE seminars. In fact, you should take a quick trip around the website to familiarize yourself with the many features it offers.

On behalf of the Council, let me invite your input and feedback on the topics in any of our Reports as well as the content of the website. It is our goal to provide you value for your membership and the best way to make that happen is to let us hear from you.

Best wishes to you and yours for a healthy and prosperous new year!

Kathleen E. Magruder,
Chair, Oil, Gas & Energy Resources Law Section

Editor's Message

The Fall 2018 Edition of the Section Report leads with *Recent Texas Oil and Gas Cases* by Richard Brown of Brown & Fortunato, P.C. in Amarillo. Richard, who is a former Chairman of the OGERL Section, provides an overview and analysis of four Texas Supreme Court cases, *Endeavor Energy Res., L.P. v. Discovery Operating, Inc.*; *Perryman v. Spartan Texas Six Capital Partners, Ltd.*; *TRO-X, L.P. v. Anadarko Petroleum Corp.*; and *Murphy Exploration & Production Co. v. Adams*, as well as recent cases from the San Antonio, Houston, Eastland, and Amarillo courts of appeals.

The next article is from a repeat contributor to the Section Report, Paul Yale, and co-author Brooke Sizer, both of Gray Reed & McGraw, LLP in Houston, Texas. Paul and Brooke take an in-depth look at criticism and support of hydraulic fracturing in *A Brief Look at the Law of Hydraulic Fracturing in Texas and Beyond*. This article is also forthcoming in Issue 3, Volume 60 of the *South Texas Law Review*, and we are grateful to that publication for allowing us to share publication of the article.

The next two articles share a common subject: the recent Texas Supreme Court case of *Murphy Exploration & Production Co. v. Adams*. Robert Park of Uhl, Fitzsimons, Jewett, Burton & Wolff, PLLC in San Antonio delivers a criticism of this decision in *Contract and Policy in the Wake of Murphy v. Adams*. On the other side, Amy Dashiell and Bryan Lauer of Scott Douglass & McConnico LLP write in support of the decision in *Murphy v. Adams: A Reasoned Decision*. We are grateful to Robert, Amy, and Bryan for their insight into this case.

If you are receiving this Section Report, it is because you are a member of the OGERL Section. As a member of the Section, you can always access past Section Reports and many CLE presentations via the Section's website: www.oilgas.org.

Katy Pier Moore
Editor

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RECENT TEXAS OIL AND GAS CASES

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XTO Energy, Inc. v. EOG Res., Inc.[1] held that an oil company's interest in the mineral estate was an equitable interest that was cut off by the foreclosure of a deed of trust lien. The parties aligned as successors to "Grantor" and "Grantee" under a 1928 deed ("Deed") and as the "Assignee" from Grantee under a second deed executed two days later ("Second Deed"). In the Deed, Grantor conveyed to Grantee fee simple title to 1,653 acres. The purchase price was payable by a series of promissory notes. To secure the payment of the purchase price, Grantor retained a vendor's lien and also obtained a deed of trust. Grantee ultimately failed to pay, there was a foreclosure, and Grantor reacquired title.[2] The Deed and the deed of trust both provided:

> It is further agreed and stipulated that grantee may make such disposition of seven-eights [sic] (7/8) of the mineral rights as he may deem fit, however, it further provides [sic] that the usual one-eighth (1/8) royalty will be retained against the land for the protection of the holder or holders of the notes, until the entire balance against the land shall have been fully paid, with all interest thereon.[3]

The parties referred to this clause as the "Disposition Clause."

Two days after the Deed was executed, Grantee assigned to Assignee under the Second Deed:

> An undivided seven-eights [sic] (7/8ths)
>
> All the oil and gas and oil and gas rights and other minerals and mineral rights in and under and that may be produced from the [property]. . . .[4]

It was undisputed that the Second Deed was a mineral deed.

The issue was whether the Disposition Clause permitted Grantee to convey title to the 7/8ths mineral interest (or perhaps all of the mineral interest) to Assignee free and clear of the vendor's lien and deed of trust lien.[5] On competing motions for summary judgment in trespass to try title, the trial court ruled that Grantor reacquired all of the title in the foreclosure.

Assignee argued that the Disposition Clause permitted Grantee to convey title to Assignee "free and clear" of the vendor's lien and the deed of trust lien and replaced that security interest with a lien on the 1/8th royalty. Therefore, the foreclosure extinguished the 1/8th royalty and conveyed the surface estate, but the foreclosure had no effect on Assignee's mineral estate.[6] Grantor argued that the 1/8th royalty in the

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1 554 S.W.3d 127 (Tex. App.—San Antonio 2018, pet. filed).
2 *Id.* at 130-32.
3 *Id.* at 131.
4 *Id.* at 132.
5 *Id.* at 131-32.
6 *Id.* at 133-34.

Disposition Clause was a third level of security for Grantor. Grantee was free to assign a 7/8ths equitable interest in the minerals to Assignee, subject to the vendor's lien and deed of trust lien. After the foreclosure, Grantor reacquired Assignee's 7/8ths equitable interest in the minerals, the 1/8th of the minerals not conveyed by Grantee, and the surface estate not conveyed by Grantee (*i.e.*, fee simple).[7]

The court read and construed the Deed and the deed of trust together and found that there was no attempt made to distinguish between the mineral estate and the surface estate and that it was clear that the conveyance to Grantee would not become absolute until Grantee paid in full.[8] Therefore, Grantee and Assignee of Grantee acquired only an equitable interest. The parties agreed that the Disposition Clause was not ambiguous.[9] However, Assignee contended that the court should consider the surrounding circumstances in determining the intent of the parties. Assignee contended that Grantor knew that the original Assignee (an oil company acquiring a lease) was furnishing the money to Grantee for the initial payment and that it was Grantee's intent to immediately convey the 7/8ths interest to Assignee. Mixed in with this was "estate misconception" (that lessor retained 1/8 of the minerals and leased 7/8 of the minerals). Moreover, three subsequent conveyances in the Grantor chain of title were made subject to the Second Deed.[10]

The court refused to consider extrinsic evidence and held that the unambiguous plain language of the Deed and deed of trust expressed the intent to retain a lien "against the 'Property,' *i.e.*, the entire mineral estate and surface estate."[11] The 1/8th royalty retained as additional security in the Disposition Clause was against the land, to secure the notes, and it did not exclude the mineral estate.[12] The court relied on settled case law as to vendor's liens and deeds of trust to hold that Assignee acquired only an equitable title that was cut off by the foreclosure.[13]

The dissent argued that the power of disposition expressed in the Deed gave Grantee the power to convey 7/8ths of the minerals unencumbered by Grantor's lien. The dissent reasoned that disposition clauses are unrestricted unless the restriction is clear. The Disposition Clause in this case clearly authorized Grantee "to convey 'seven-eight[h]s (7/8) of the mineral rights' free and clear from the vendor's lien. Otherwise, the language requiring [Grantee] to retain 'the usual one-eighth (1/8) royalty against the land' for security purposes would be unnecessary and superfluous."[14]

This is a deed construction case, and perhaps Assignee had little hope for success without the evidence of surrounding circumstances. The significance of the case is the court's refusal to consider the surrounding circumstances to "inform its decision" in determining the intent of the parties. It also illustrates "superior title" out of a common source of title in trespass to try title.

Endeavor Energy Res., L.P. v. Discovery Operating, Inc.[15] held that a "proration unit assigned to a well" in a retained acreage clause referred to the operator's assignment

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7 *Id.* at 134-35.
8 *Id.* at 135-36.
9 *Id.* at 135.
10 *Id.* at 136-37.
11 *Id.* at 138.
12 *Id.*
13 *Id.* at 138-40.
14 *Id.* at 143.
15 554 S.W.3d 586 (Tex. 2018).

of acreage in its regulatory filings with the Railroad Commission. Endeavor Energy Resources ("Operator") leased and completed multiple wells on its lease under Special Field Rules that provided for 80-acre spacing and optional 160's. Operator designated 80-acre proration units for its wells,[16] and its lease terminated under the retained acreage clause, which provided:

> [Lease] shall automatically terminate as to all lands and depths covered herein, save and except those lands and depths located within a governmental proration unit assigned to a well . . . with each such governmental proration unit to contain the number of acres required to comply with the applicable rules and regulations of the Railroad Commission of Texas for obtaining the maximum allowable for the particular well.[17]

Discovery Operating, Inc. ("Lessee") acquired a top lease on the acreage not included in the proration units and drilled additional wells on the lands originally leased by Operator, but not included in Operator's designated proration units. When Operator learned of Lessee's wells, it filed amended plats to include 160 acres for each of Operator's wells.[18] Lessee filed a trespass-to-try-title action against Operator. The Commission did not act on the amended plats because of the suit. The interpretation of the retained acreage clause turned on the meaning of the phrases "proration unit assigned to a well" and "maximum allowable for the particular well."[19]

One way the Commission manages mineral resources is by using production allowables and proration units.[20] "Generally, 'an operator must first designate [a well's] proration unit and the acreage assigned to it, then certify that the acreage is productive before receiving the well's production allowable."[21] The Commission requires operators to "file certified plats of their properties in the field, which plats show those things pertinent to the determination of the acreage claimed for each well. . . ."[22] The field rules for the area where Operator's leases are located established a standard 80-acre proration unit, but allowed an operator to "assign a tolerance of not more than [80] acres of additional unassigned lease acreage to a well on an [80] acre unit and shall in such event receive allowable credit for not more than [160] acres."[23]

When the Court analyzed the phrase "proration unit assigned to a well" the focus was on the word "assigned." Operator argued the Commission assigned the 160-acre maximum. However, Lessee argued the lessee or operator, Endeavor in this case, assigned the acreage, not the Commission.[24] The Commission's statewide and field rules acknowledge the operator is responsible for assigning acreage to a proration unit in its filings. This has consistently been upheld in the courts and an

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16 *Id*. at 591-92.
17 *Id*. at 600.
18 *Id*. at 593-94.
19 *Id*. at 600.
20 *Id*. at 595-96.
21 *Id*. at 596 (quoting *Browning Oil Co. v. Luecke*, 38 S.W.3d 625, 634 (Tex. App.—Austin 2000, pet. denied)).
22 *Id*. at 599 (quoting Tex. R.R. Com'n, *Special Order Adopting Rules and Regulations for the Spraberry Trend Area Field*, Oil & Gas Docket Nos. 125 & 126, 7 & 8–25,841 (Dec. 22, 1952)).
23 *Id.* at 599 (quoting Tex. R.R. Comm'n, *Final Order Amending Field Rule Nos. 2 and 3 in the Spraberry (Trend Area) Field Various Counties, Texas*, Oil and Gas Docket No. 08-0259977 (Dec. 16, 2008)).
24 *Id.* at 601.

amicus brief from the Commission concurred.[25] The Commission's brief stated, "[I]f the operator's assignment of acreage complies with the rules, the Commission will input that acreage into a well-tracking system, and it becomes 'the lawfully assigned proration acreage for purposes of the [Commission's] records.'"[26] The Court concluded that "assigned" was not ambiguous and referred to the operator's assignment of acreage in its regulatory filings.[27]

Operator argued that the Commission's records cannot determine title. However, this ignores the contractual nature of Operator's leasehold interest.[28] "Although the Commission does not unilaterally determine title by approving or accepting an operator's assigned proration unit, the parties are free to agree that the operator's leasehold interest will survive and continue only to the extent of that assignment."[29]

Operator also contended that regardless of the "assigned" language the "maximum producing allowable" language means that each unit automatically consists of 160 acres.[30] Rule 4 of the Special Field Rules provides that the maximum producing allowable for a well on an 80-acre proration unit is 515 barrels per day,[31] but, it was undisputed that Operator's wells were producing below the allowable.[32]

Thus, Operator did exactly what it was required to do under the lease: it applied for the proration unit that would give it the maximum allowable.[33] "Rule 3 [of the Special Field Rules] provides that [Operator] could have attempted to assign to each of its existing proration units an additional 80 acres of 'tolerance acreage'"[34] In dicta, in an earlier draft of the opinion, the Court suggested that attempting to assign more acreage may have subjected Operator to liability for attempting to retain more acreage than the acreage required to obtain the maximum allowable. The citation was to secondary authority and presumably refers to liability to lessor for claiming too much acreage.[35] That suggestion did not appear in the published opinion.[36]

The significance of this case is that operators, not the Commission, assign acreage to proration units for their wells. The Commission establishes the number of acres required or permitted for a proration unit, but the operators assign the acres to be included in a specific proration unit.

Eagle Oil & Gas Co. v. Shale Exploration, LLC[37] held that a compilation of ownership data within a prospect may constitute a trade secret, and misappropriation of that data may result in a judgment for lost profits. "Operator" developed a large prospect for drilling horizontal shale wells in an area where ownership was highly fractionalized. There were tens of thousands of mineral owners and the county records were not available

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25 *Id.* at 602 n. 10.
26 *Id.* at 602.
27 *Id.* at 603.
28 *Id.*
29 *Id.*
30 *Id.*
31 *Id.* at 604-05.
32 *Id.* at 604-06, n. 13 (citing Tex. R.R. Comm'n, *Final Order Amending Field Rule 4 in the Spraberry (Trend Area) Field Various Counties, Texas*, Oil and Gas Docket No. 7C-0258301 (Jan. 15, 2009)).
33 *Id.* at 605-06.
34 *Id.* at 605.
35 *See Endeavor Energy Res., L.P. v. Discovery Operating, Inc.*, 2018 WL 1770290 at *12 (Tex. Apr. 13, 2018).
36 *Endeavor Energy*, 554 S.W.3d at 605.
37 549 S.W.3d 256 (Tex. App.—Houston [1st Dist.] 2018, pet. dism'd).

online.[38] Operator had as many as 100 people working on the prospect and compiled lease and leasing information for a year with specialized software.[39] The ultimate goal was to find a business partner that would drill for oil or gas and flip the acreage to that driller.[40] Operator made a deal with Apache for Apache to take 300,000 or more acres at $800 per acre, and Apache purchased all of the acres Operator was able to deliver.[41]

However, Operator also showed the prospect to other companies, including "Competitor." There was a confidentiality and non-competition agreement.[42] Operator and Competitor had several lengthy meetings, and Operator disclosed most of Operator's information, including the "treasure map" showing the open acreage in areas to be included in the drilling units together with the lease schedule and other maps distinguishing between open and leased lands.[43] After Operator made its deal with Apache, Competitor immediately formed a subsidiary under an unrelated name to take title to leases in the county and also formed a leasing company under an unrelated name to conduct the leasing program.[44] There was no other competitor for leases in the county.[45] Competitor, without doing any title work, directed the leasing company to acquire leases in the areas targeted by Operator and gave the leasing company the treasure map.[46] Operator acquired far more than 300,000 acres for Apache,[47] but Competitor acquired more than 11,000 leases in six weeks.[48] Competitor was Operator's only competition in the county, and that competition caused the average bonus to go up, and Operator was not able to acquire and sell Competitor's 11,000 leases to Apache.[49]

Operator sued Competitor on breach of contract and misappropriation of a trade secret.[50] The jury found for Operator and awarded $14,300,000 for lost profits and $4,500,000 in exemplary damages.[51] Operator had to choose its remedy as between its contract and tort claim,[52] and judgment was entered on misappropriation of a trade secret.[53] On appeal, the principal issues were whether there was a trade secret, sufficiency of the evidence on lost profits, and sufficiency of the evidence on exemplary damages.

"[Operator] had to prove that it disclosed a trade secret to [Competitor], in confidence, and that [Competitor] breached this confidence and made unauthorized use of the secret."[54] "A compilation of business information that provides a competitive advantage over those who lack the compilation may constitute a trade secret."[55] Although much of the information may have been derived from public sources, the compilation may constitute a trade secret.[56] The court held the evidence was factually sufficient to support the jury's implicit finding of a trade secret.[57]

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38 *Id.* at 264.
39 *Id.* at 270-71.
40 *Id.* at 264.
41 *Id.* at 265, 277.
42 *Id.* at 264.
43 *Id.* at 264-65.
44 *Id.*
45 *Id.* at 273.
46 *Id.* at 273-74.
47 *Id.* at 265.
48 *Id.* at 273.
49 *Id.* at 265-66.
50 *Id.*
51 *Id.* at 263.
52 *Id.* at 268-69.
53 *Id.* at 266.
54 *Id.* at 269 (citing *RSM Prod. Corp. v. Global Petroleum Grp.*, 507 S.W.3d 383, 393 (Tex. App.—Houston [1st Dist.] 2016, pet. denied)).
55 *Id.* at 270 (citing *Computer Assocs. Int'l v. Altai, Inc.*, 918 S.W.2d 453, 455 (Tex. 1996)).
56 *Id.*
57 *Id.* at 272.

To prove damages for lost profits, Operator relied upon expert testimony to establish lost profits attributable to "(1) leases that it would have acquired but for [Competitor's] conduct; and (2) increased leasing costs resulting from [Competitor's] wrongful competition."[58] In summary, Operator's expert calculated damages under (1) by subtracting $250 per acre (the most Operator ever paid prior to Competitor's entry into the prospect) from $800 per acre (Apache's price) for all of the 35 leases within the prospect that Competitor obtained. The result was $6 million in lost profits, and the jury awarded $4 million. Operator's expert calculated damages under (2) as falling within a range of $15 million to $25 million for lost profits. Operator's expert eliminated all of the leases Operator acquired for $300 per acre or less as within the range of acquisition costs, absent the competition. As to the 926 leases acquired by Operator which cost more than $300 per acre, Operator's expert calculated the high end of the range by subtracting $150 per acre (Operator's initial standard offer) from the actual cost. For the low end of the range, Operator's expert subtracted $250 per acre (Operator's highest price paid prior to Competitor's entry into the prospect) from the actual cost. The range was $15 million to $25 million and the jury awarded $10.3 million, for a total award of $14.3 million for lost profits.[59] Competitor's expert effectively testified that Operator suffered no lost profits.[60]

The court reviewed the evidence on damages for lost profits and found the evidence to be legally sufficient.[61] It was clearly important and simplified the necessary proof that there was no other competition in the prospect and Apache was ready to buy all of the leases Operator could obtain.[62] Competitor also challenged the judgment because the jury's award was less than the lower end of the range established by Operator's expert. The court held that the jury's finding was within the range of the testimony, because Competitor's own expert established the lower end as zero, and the jury was not required to pick a number within the range of Operator's expert testimony.[63]

The court reversed the jury's award of $4 million in exemplary damages. Operator had to prove by clear and convincing evidence that the lost profits it suffered resulted from malice, and malice requires a specific intent that Competitor intended to cause Operator a substantial injury.[64] The intent to commit the tort alone cannot justify an award of exemplary damages, or every intentional tort would justify exemplary damages. "Rather, the substantial injury [Competitor] intended must be independent and qualitatively different from the compensable harms associated with [Operator's] claim for misappropriation of trade secrets . . . . [Competitor's] conduct also must have been outrageous, malicious, or otherwise reprehensible."[65]

The court held that there was no evidence of any harm other than Competitor's purchase of some of the leases and increased costs. Apache did not walk away, and drilling stopped only because the results were poor.[66] The dissent would affirm on exemplary damages because there was some evidence that Competitor never drilled, never planned to drill, but intended to position itself

58 *Id.* at 266.
59 *Id.* at 275-76.
60 *Id.* at 277-78.
61 *Id.*
62 *Id.* at 275-78.
63 *Id.* at 278.
64 *Id.* at 283-84.
65 *Id.* at 283.
66 *Id.* at 285.

to break up prospective drilling units, thus forcing additional negotiations and opportunities for Competitor. The question is not whether Competitor succeeded, but what it intended.[67] Exemplary damages are not compensation for economic loss, but a punishment, and the jury could award those damages for deterrence and retribution.[68]

The opinion follows precedent that extensive compilations of land data on a prospect may be a trade secret. It also offers guidance on presenting expert testimony on damages for lost profits from misappropriation of such a trade secret. Finally, it highlights the distinct elements of proof required to support exemplary damages.

Perryman v. Spartan Texas Six Capital Partners, Ltd.[69] construed the language in a deed to determine whether it created a reservation or an exception and whether the *Duhig* doctrine applied. There were multiple parties, eight different deeds in the chain of title, and other ancillary issues. However, the principal issue was to construe language from a 1983 deed. At the time of the conveyance, Grantor owned all of the surface and all of the minerals in the lands being conveyed, subject to an outstanding 1/4 of royalty interest.[70] Grantor conveyed the property with general warranty:

> Less, save and except an undivided one-half (1/2) of all royalties from the production of oil, gas, and/or other minerals that may be produced from the above described premises which are now owned by the Grantor. It being understood that all of the rest of my ownership in and to the mineral estate in and under the above described lands is being conveyed hereby.[71]

The deed was silent as to the outstanding royalty interest, and the issue was to determine the interest of Grantor after giving effect to the deed.

The trial court construed the deed to reserve 1/2 of the royalties "now owned" by the Grantor to the Grantor.[72] The court of appeals construed the deed to reserve 1/2 of the royalties "in the premises" to the Grantor.[73] The court of appeals held that "because the deeds made 'no mention' of the 'previously excepted' royalty interests, and yet provided general warranties covering all the title purportedly conveyed, the grantors breached their warranties and thus 'are estopped from claiming a royalty interest in the subject property under the *Duhig* doctrine.'"[74] The Supreme Court held that the deed created an exception from the grant, not a reservation for the Grantor.[75] This clause did not reserve any royalty interest for Grantor because the deed "conveyed the entire property interest 'less, save, and except' a 1/2 royalty interest, and [it] contained no language purporting to reserve that excepted interest for or unto the [Grantor]."[76] Therefore, the *Duhig* doctrine did not apply.

The deed conveyed all of Grantor's interest, except insofar as that conveyance was limited by this clause.[77] Reservations must be in favor of and for the benefit of the grantor in a deed and reservations are never

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67 *Id.* at 288.
68 *Id.*
69 546 S.W.3d 110 (Tex. 2018).
70 *Id.* at 113-14.
71 *Id.* at 114.
72 *Id.* at 113.
73 *Id.*
74 *Id.* at 118 (*See Duhig v. Peavy-Moore Lumber Co.*, 144 S.W.2d 878, 880-81 (Tex. 1940)).
75 *Id.* at 119.
76 *Id.*
77 *Id.*

implied.[78] Because the deed contains an exception, not a reservation, there is no need to consider ***Duhig***.[79]

The Court analyzed the clause grammatically utilizing the last-antecedent construction canon, the series-qualifier canon and the absence of a comma to conclude that the now-owned-by-Grantor modifier applied to the last item in the series.[80] That is, "now owned" modified "premises" not "royalties." The Court also reasoned that although a conveyance of a portion of the interest a grantor owned might imply that the grantor does not own and cannot convey the full interest, an exception of a portion of the interest grantor owns does not. "A deed that conveys all of the property interests but excepts a fraction of the interest the grantor now owns necessarily conveys all of the interests not excepted."[81] "As a result, the [deed] purported to convey 1/2 and except 1/2 of all of the . . . royalty interests, not just one half of the royalty interest [Grantor] then owned."[82]

The Court concluded that the deed conveyed all of the interests in the surface, mineral, and royalties of the acreage "less, save, and except," 1/2 of all royalties from the minerals produced from the premises owned by Grantor. The royalty interest passed 1/2 to the grantee, 1/4 was owned by a third party, and Grantor still owned 1/4.

This is a deed construction case that illustrates the distinction between a reservation and an exception, and the implications under the *Duhig* doctrine.

MCG Drilling Invs., LLC v. Double M Ranch, Ltd.[83] held that a dispute centered upon whether an option to lease was exercised should be resolved as a suit to quiet title, not for declaratory judgment, and therefore attorneys' fees were not recoverable. The parties aligned as Lessor and Lessee under a 2012 Lease Option Agreement ("LOA"). Lessee attempted to exercise the option to lease, but Lessor refused to execute a lease. The parties disputed whether, under the facts and circumstances of the attempt to lease, the LOA did or did not terminate.[84] Lessor contended the LOA had expired and pleaded declaratory judgment, trespass to try title and suit to quiet title.[85] Lessee specially excepted to Lessor's pleadings, contending that the proper cause of action was a trespass to try title action and not a suit for declaratory judgment.[86] After a bench trial, the trial court entered a declaratory judgment in favor of Lessor,[87] and the trial court overruled Lessee's special exceptions and awarded Lessor approximately $231,000 in attorneys' fees.[88]

The principal issues on appeal were whether the case could be brought as a suit for a declaratory judgment (and thus, also, for attorneys' fees) and whether the findings of fact and conclusions of law would support a judgment in trespass to try title or suit to quiet title. "Any suit that involves a dispute over the title to land is, in effect, an action in trespass to try title, whatever its form."[89] "The proper method to determine title to lands, tenaments, or other real property is a

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78 *Id.* (citing *Pitch v. Lankford*, 302 S.W.2d 645, 650 (Tex. 1957); *Sharp v. Fowler*, 252 S.W.2d 153, 154 (Tex. 1952)).

79 *Id.*

80 *Id.* at 121.

81 *Id.* at 123-24.

82 *Id.* at 124.

83 No. 11-14-00299-CV, 2018 WL 2022590 (Tex. App.—Eastland Apr. 30, 2018, no pet.) (mem. op.).

84 *Id.* at *1-2.

85 *Id.* at *11.

86 *Id.* at *2.

87 *Id.* at *1

88 *Id.* at *2.

89 *Id.* at *3 (quoting *Hawk v. E.K. Arledge, Inc.*, 107 S.W.3d 79, 84 (Tex. App.—Eastland 2013, pet. denied)).

trespass to try title action."[90] "The Declaratory Judgment Act will not supplant a suit for trespass to try title, or a suit to quiet title and allow attorney's fees under these circumstances."[91]

Lessor sought to support its judgment for attorneys' fees by pointing to authority holding that an option on real property is not a possessory right. The bonus payment was not timely paid, and therefore there was no transfer of ownership.[92] The Texas Supreme Court in *North Shore Energy, L.L.C. v. Harkins*[93] held that a lease option agreement by itself does not convey a possessory interest in minerals.[94] The court distinguished *North Shore*, in which the Supreme Court construed an allegedly ambiguous contract in a declaratory judgment proceeding, from the dispute in this case, *MCG Drilling*, which revolved "around the parties' conduct – evidentiary matters – and whether that conduct transferred title to minerals.[95] Because the "declaratory judgment act will not supplant a suit for trespass to try title or a suit to quiet title and allow attorney's fees under these circumstances,"[96] the court reversed the declaratory judgment and vacated the award of attorneys' fees.[97]

The court declined to address whether the findings of fact would support a judgment in trespass to try title and considered only the judgment to quiet title.[98] The "trial court held that [Lessee] had no right to claim oil and gas leases and no current or future rights under the 2012 LOA."[99] Lessor pleaded a suit to quiet title, but did not request findings of fact or conclusions of law on that specific claim.[100] The court found that the trial court nonetheless made findings specific to at least one of the elements of the quiet title claim, which was supported by the evidence, and all other necessary findings would be presumed.[101]

The case restates the recent string of opinions refusing to allow attorneys' fees under the Declaratory Judgment Act when the issue involves a determination of title. The opinion does make a nuanced distinction between interpreting option agreements (not determining possession) and determining whether conduct triggers or terminates an option (determining title).

Neuhoff v. Piranha Partners[102] relied heavily upon proof of surrounding circumstances to construe an assignment of overriding royalty. The parties aligned as Assignor and Assignee under a 1999 Assignment. Assignor owned an overriding royalty interest under the Puryear Lease covering an undivided interest in all of Section 28.[103] Assignor sold an interest at public auction to Assignee, and the interest sold was conveyed by Assignment on the same form as the form assignment made available before the sale.[104] Assignee contended that the Assignment was effective to convey all of Assignor's interest in the overriding royalty in all of Section 28. Assignor contended that the Assignment was effective to convey only Assignor's interest in the overriding royalty in the NW/4 of

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90 *Id.* (citing Tex. Prop. Code Ann. § 22.001 (West 2014)).
91 *Id.* at *4.
92 *Id.* at *3
93 501 S.W.3d 598, 606 (Tex. 2016).
94 *MCG Drilling*, 2018 WL 2022590 at *4.
95 *Id.*
96 *Id.* at *4.
97 *Id.* at *11.
98 *Id.* at *8.
99 *Id.* at *3.
100 *Id.* at *4.
101 *Id.* at *6-8.
102 No. 07-16-00136-CV, 2018 WL 2223132 (Tex. App.—Amarillo May 15, 2018, pet. filed) (mem. op.).
103 *Id.* at *2.
104 *Id.* at *3.

Section 28, which is produced from the Puryear 1-28 Well.[105] The Assignment conveyed all of Assignor's interest in the "Properties" described in Exhibit A, without warranty. Exhibit A described multiple tracts in the "Properties," and, as to the land in this dispute, provided:

> Lands and Associated Well(s): Puryear #1-28, Wheeler County, Texas.
>
> NW/4, Section 28, Block A-3, H&GN Ry Co. Survey
> Oil and Gas Lease(s)/Farmout Agreement(s):
> [Lease identified by Volume and page with incorrect Volume][106]

Assignor and Assignee filed competing traditional motions for summary judgment. Assignor relied in part on parole evidence of the auction and surrounding circumstances, including the fact that the "production data sheet" referenced production from only the Puryear 1-28 Well.[107] Assignee relied in part on the Puryear Lease as parole evidence of the proper description of the property assigned as all of Section 28.

The court reviewed and cited precedent for the general principle that the intent of the parties to a conveyance is to be determined from the document itself, but parole evidence as to surrounding circumstances may be considered in clarifying the purpose and meaning of the language used.[108] The court was not persuaded that the Puryear Lease was conclusively identified. While it might be reasonable to assume the reference to the volume number was a scrivener's error, Assignee never did anything to correct the record.[109]

Moreover, the court reasoned it was more important to construe and harmonize all of the Assignment in light of the surrounding circumstances. This was a large scale auction, not a direct negotiation, and it is reasonable to conclude that Assignee purchased the Puryear overriding royalty on the same basis as the other, unrelated, overriding royalty included in the same Assignment. Exhibit A, as to that overriding royalty, listed multiple leases, expressly followed by "only insofar as these leases cover the lands described hereinabove."[110] The court was also persuaded that its conclusion was supported by the similar "INSOFAR AND ONLY INSOFAR AS SET OUT IN EXHIBIT A" language in the text of the Assignment itself.[111]

"In other words, the Northwest quarter of Section 28 harmonizes the three descriptors used in the assignment: (1) The Puryear #1-28 well, (2) the Northwest quarter of Section 28 lands, and (3) Mallott to Lister [presumably Puryear] oil and gas lease."[112] The court rendered judgment that the Assignment conveyed the overriding royalty as to the NW/4 of Section 28 only.

The significance of the case is the reliance on surrounding circumstances in the context of an oil and gas auction with a form assignment. The court considered other materials from the auction process and also implied some of the words in that assignment from one property description into another, where those words were not used.

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105 *Id.* at *1.
106 *Id.* at *3.
107 *Id.* at *3-4.
108 *Id.* at *5.
109 *Id.* at *6.
110 *Id.* at *3, *6.
111 *Id.* at *6.
112 *Id.*

TRO-X, L.P. v. Anadarko Petroleum Corp.[113] held that when a lessor and lessee under an existing lease execute a new lease of the same mineral interests subject to the existing lease, the existing lease is terminated, unless the new lease objectively demonstrates both parties intended otherwise. In 2007, Lessor leased multiple tracts ("2007 Leases"), and the 2007 Leases were eventually acquired by Anadarko.[114] In 2009, Anadarko failed to drill an offset well, and that failure may or may not have terminated the 2007 Leases. In 2011, Lessor demanded a release of the 2007 Leases. Lessor and Anadarko negotiated for leases on different terms ("2011 Leases").[115] The earliest 2011 Lease was executed June 15, 2011 and all Leases were executed before June 30, 2011, but all 2011 Leases were effective on June 17, 2011. On June 30, 2011, the 2011 Leases were recorded and Anadarko executed a release of the 2007 Leases.[116] Anadarko's interest in the 2007 Leases was acquired subject to a Participation Agreement under which TRO-X owned a 5% back-in after payout, which also applied to "top leases." TRO-X contended that the 2011 Leases were top leases and therefore subject to TRO-X's 5% back-in.[117] The Participation Agreement contained an anti-washout clause to protect the back-in option that extended to "any renewal(s), extension(s), or top lease(s) taken within one (1) year of termination of the underlying interest."[118] The issue was whether the 2011 Leases were top leases that did not wash-out TRO-X's back-in, or new leases that washed out TRO-X's back-in.

TRO-X contended that the 2011 Leases were top leases because "they neither make any mention of the 2007 Leases nor contain any indication that Anadarko and the [Lessors] intended the 2011 Leases to terminate the 2007 Leases."[119] Anadarko argued that *Ridge Oil* stands "for the proposition that parties to an oil and gas lease terminate an existing mineral lease between them if they enter into a new lease with 'the intent and understanding that, by doing so, they would effect a release' of the prior lease."[120] Further, Anadarko maintained that the 2011 Leases did not exist at the same time as the 2007 Leases, because the execution of the 2011 Leases terminated the 2007 Leases. Therefore, the 2011 Leases cannot be top leases.[121]

The Court agreed with Anadarko. "In Ridge Oil, we recognized that '[e]ven if an oil and gas lease does not contain a surrender clause, the parties may mutually agree to a release, or they effectively terminate their lease by signing a new one.'"[122] "TRO–X observes that the *Ridge Oil* opinion cited *Sasser*, which TRO–X claim[ed] stands for the proposition that a subsequent lease cannot terminate a previous lease without evidence that the parties intended to do so."[123] However, the Court disagreed with TRO-X's assertion, and held that "an existing lease . . . terminates when the parties enter into a new lease covering that interest unless the new lease objectively demonstrates that both parties intended for the new lease not to terminate the prior lease between them."[124] Further, "[a] party contending that a new

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113 548 S.W.3d 458 (Tex. 2018).
114 *Id.* at 459-60.
115 *Id.* at 460.
116 *Id.*
117 *Id.* at 461.
118 *Id.* at 460.
119 *Id.* at 461.
120 *Id.* (quoting *Ridge Oil Co. v. Guinn Invs., Inc.*, 148 S.W.3d 143, 153 (Tex. 2004)).
121 *Id.* at 462.
122 *Id.* at 463 (quoting *Ridge Oil*, 148 S.W.3d at 152-53).
123 *Id.* (citing *Ridge Oil*, 148 S.W.3d at 153 n.34; *Sasser v. Dantex Oil & Gas, Inc.*, 906 S.W.2d 599, 603 (Tex. App.—San Antonio 1995, writ denied)).
124 *Id.* (citing *Ridge Oil*, 148 S.W.3d at 152-53).

lease did not terminate the previous one has the burden to prove and obtain a finding that the parties intended for the previous lease to survive execution of the new lease."[125]

The Court found that no overlap existed between the 2007 Leases and the 2011 Leases, because the 2011 Leases terminated the 2007 Leases.[126] Therefore, there was no "top" lease. Note that the Court did not consider whether the 2011 Leases were extensions or renewals under the anti-washout clause of the Participation Agreement, because TRO-X only asserted the 2011 Leases were top leases.[127]

The significance of this case is the holding that when a lessor and lessee under an existing lease execute a new lease of the same mineral interests subject to the existing lease, the existing lease is terminated unless the new lease objectively demonstrates both parties intended otherwise.

Gonzalez v. Janssen[128] held that making a warranty deed "subject to" certain prior conveyances did not limit the grant. By Deed #1, the Property was made subject to a term royalty. By Deed #2, Janssen acquired part of the reversionary interest in the royalty on the property. By Deed #3, Janssen acquired the Property. By Deed #4, Janssen conveyed the Property to Gonzales subject to Deed #1 and Deed #2. After the termination of the term royalty, Janssen claimed that Janssen's interest in the reversionary royalty interest was not conveyed in Deed #4 by Janssen to Gonzales.[129]

Janssen argued that the "subject to" language acted as an exception or reservation for the reversionary royalty interest or, alternatively, that the deed was ambiguous. Gonzalez argued that the effect of the "subject to" clause was solely to place Gonzalez on "notice of outstanding interests in the chain of title that may affect the interest transferred," but it did not explicitly reserve or except anything.[130]

Reading Deed #4 in its entirety and giving words their plain meaning, the court concluded that the deed did not include any language purporting to exclude Janssen's part of the reversionary royalty interest from the conveyance.[131]

Janssen also relied on *Bass v. Harper*[132] to support Janssen's argument that the "subject to" clause was intended to exclude Janssen's part of the reversionary royalty interest from Deed #4.[133] The deed in *Bass* was similarly structured so that the "subject to" clause was located after the description of the land and stated "'this Grant is Subject to the Mineral Reservation contained in the following Deeds. . . .'"[134] The Supreme Court in *Bass* concluded that the language in that deed showed the parties' intent to limit the grant and exclude those interests from conveyance.[135] Here, the court distinguished the *Bass* deed from the Janssen deed because the "subject to" clause in the *Bass* case was "tied specifically to the grant."[136] The Texas Supreme Court recently stated that the reasoning in *Bass* should be limited to the specific language used in that case, virtually overruling *Bass*.[137] Thus, the court

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125 *Id.* at 464.
126 *Id.* at 466.
127 *Id.* at 465.
128 553 S.W.3d 633 (Tex. App.—San Antonio 2018, pet. filed).
129 *Id.* at 635-36.
130 *Id.* at 636.
131 *Id.* at 640-42.
132 441 S.W.2d 825 (Tex. 1969).
133 *Gonzalez*, 553 S.W.3d at 641.
134 *Id.* at 641-42 (quoting *Bass*, 441 S.W.2d at 826).
135 *Id.* at 641-42.
136 *Id.* at 642.
137 *Id.* at 641-42 (citing *Wenske v. Ealy*, 521 S.W.3d 791, 795 (Tex. 2017).

determined that the Janssen deed was unambiguous, and Janssen conveyed all of his interest in the Property, including all of his share of the reversionary royalty interest, to Gonzalez.[138]

The significance of this case is the holding that "subject to" clauses, used in their ordinary sense, primarily serve the purpose of informing grantees of other outstanding interests and to protect the grantor on grantor's warranty, unless it is made explicit that the clause is intended to except or reserve an interest from the conveyance.

Murphy Exploration & Prod. Co. v. Adams[139] held that a horizontal well offsetting a horizontal well could be drilled anywhere on the leased premises under the terms of the offset well clause in the lease. Well-established concepts applicable to vertical wells may not be applicable in the context of horizontal wells. The offset operator drilled a horizontal well with a 1,800 foot lateral in the Eagle Ford Shale 350 feet from the lease boundary parallel to the lease line, which triggered the offset well clause in Lessee's lease (less than 467 feet from the lease line). Lessee elected to drill under the offset well clause, which required Lessee "to commence drilling operations on the leased acreage and thereafter continue the drilling of such off-set well or wells with due diligence to a depth adequate to test the same formation from which the well or wells are producing from [sic] on the adjacent acreage...."[140] Lessee drilled a horizontal well with a 1,800 foot lateral in the Eagle Ford Shale 1,800 feet from and parallel to the lease line with the offset operator.[141] Lessor sued Lessee for breach of contract, alleging that Lessee's location failed to comply with the offset well clause.[142] Lessee counterclaimed, seeking declaratory relief regarding its obligations under and compliance with the offset well clause.[143] Lessor argued that an offset well "must be in close proximity to the lease line adjacent to the tract where the neighboring well is located" in order to prevent drainage, and that Lessee's well was not.[144] Lessee argued that the only specific requirements in the clause were that the well be "on leased acreage" and "to a depth adequate to test the formation," both of which were met by Lessee's well.[145] It was undisputed that the lease was drafted with horizontal shale drilling in mind.[146] Therefore, the Court reasoned that "[t]he realities of this type of drilling are thus part of the 'facts and circumstances surrounding the contract's execution' that may 'inform' our construction of the lease language."[147]

The Court contrasted vertical drilling to horizontal drilling with hydraulic fracturing, in which points along the horizontal wellbore are perforated and fractured and oil and gas is drained from surrounding rock.[148] The Court recognized that "horizontal drilling does not involve shared reservoirs in the same sense" as vertical drilling because, although "the same strata of shale may underlie two separate tracts, little or no drainage will occur between the two tracts."[149]

With this context in mind, the Court concluded that while an implied proximity requirement may be a "reasonable premise in

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138 *Id.* at 642.
139 No. 16-0505, 2018 WL 2449313 (Tex. June 1, 2018).
140 *Id.* at *1.
141 *Id.*
142 *Id.* at *2.
143 *Id.*
144 *Id.* at *3.
145 *Id.*
146 *Id.* at *4.
147 *Id.* (quoting *URI, Inc. v. Kleberg Cnty.*, 543 S.W.3d 755, 765 (Tex. 2018)).
148 *Id.*
149 *Id.* (quoting Jason Newman & Louis E. Layrisson, III, *Offset Clauses in a World Without Drainage*, 9 TEX. J. OIL GAS & ENERGY L. 1, 25 (2013-2014)).

the context of vertical drilling, where placement of an offset well is an important factor in minimizing the amount of oil or gas being drained," the "same principle does not apply in the context of horizontal drilling and hydraulic fracturing."[150] The Court noted that the offset clause makes sense if the parties intended to require accelerated drilling when production from a well on an adjacent tract evidenced that the leased tract was also capable of production, and stated that "this is the only reasonable interpretation of the provision in light of the parties' recognition of the horizontal shale drilling at issue."[151] The Court completed its analysis by limiting its holding to the circumstances of this case, which involved "unconventional production in tight shale formations."[152]

The opinion strictly and literally construes the terms of the agreement which is consistent with the Court's recent opinions. The difficulty was in finding a meaning for "offset" in the context of drilling in which no drainage can occur. The Court concluded it was a trigger for accelerated drilling, unrelated to drainage, but nevertheless a trigger tied to propinquity.

[150] *Id.* at *5.
[151] *Id.* at *6.
[152] *Id.* at *7.

A Brief Look at the Law of Hydraulic Fracturing in Texas and Beyond[1]

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I. Introduction

Hydraulic fracturing is controversial—even the name evokes controversy. Opponents of hydraulic fracturing often call and spell it "fraking," perhaps relishing the similarity to another, less polite word. Proponents of the process often refer to is as hydraulic "fracturing," perhaps to avoid this same association. The word "fracking," spelled with a "ck," is also used (and appears in Webster's Dictionary).[2]

But regardless of how it is spelled, 51% of the American public opposes hydraulic fracturing, according to a March 2016 Gallup Poll.[3] This should not be surprising—the opponents of hydraulic fracturing are legion, and information about fracking in the national media almost invariably sheds a negative light on the practice.[4] Opponents of fracking say that fracking pollutes water;[5] causes low birth rates in babies;[6] causes earthquakes;[7] and abets climate change.[8] Opponents of fracking also assert that fracking regulation is absent or wholly ineffective.[9] According to its opponents, fracking should be banned in the United States,[10] as it is already in a handful of

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2 *Fracking*, Webster's New World College Dictionary (5th ed. 2018).

3 Art Swift, *Opposition to Fracking Mounts in the U.S.*, GALLUP (Mar. 30, 2016), https://news.gallup.com/poll/190355/opposition-fracking-mounts.aspx.

4 Charles Sartain, Partner, Gray Reed & McGraw LLP, Presentation at the Dallas Bar Association 33rd Annual Review of Oil and Gas Law: *Facts and Fantasy in the Fracing Debate* (Aug. 3, 2018).

5 Justin Nobel, *"The Harms of Fracking": New Report Details Increased Risks of Asthma, Birth Defects, and Cancer*, ROLLING STONE (March 13, 2018), https://www.rollingstone.com/politics/politics-news/the-harms-of-fracking-new-report-details-increased-risks-of-asthma-birth-defects-and-cancer-126996/ (Citing a report authored by Concerned Health Officials of New York & Physicians for Social Responsibility, COMPENDIUM OF SCIENTIFIC, MEDICAL, AND MEDIA FINDINGS DEMONSTRATING RISKS AND HARMS OF FRACKING (UNCONVENTIONAL GAS AND OIL EXTRACTION), (5th ed., Mar. 2018). Discussion of water pollution allegedly caused by fracking begins on p. 48.

6 Darryl Fears, *Fracking Sites May Raise the Risk of Underweight Babies, New Study Says*, WASH. POST (December 13, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/12/13/fracking-sites-raise-the-risk-of-low-birth-weight-babies-new-study-says/?utm_term=.3cc843d530fc (citing Janet Currie, Michael Greenstone, & Katherine Meckel, *Hydraulic Fracturing and Infant Health: New Evidence from Pennsylvania*, 3 SCI. ADVANCES 12 (Dec. 2017), http://advances.sciencemag.org/content/3/12/e1603021.full).

7 Alison Grass, *Fracking Causes Earthquakes. Period.*, FOOD & WATER WATCH (Nov. 22, 2016), https://www.foodandwaterwatch.org/insight/fracking-causes-earthquakes-period.

8 *Ban Fracking Everywhere*, FOOD & WATER WATCH, https://www.foodandwaterwatch.org/campaign/ban-fracking-everywhere (last visited Aug. 6, 2018).

9 Nobel, *supra* note 5.

10 *Ban Fracking Everywhere*, *supra* note 8.

U.S. states plus France,[11] Bulgaria,[12] and other foreign countries.[13]

Such accusations about fracking are all debatable,[14] particularly the last one, that fracking regulation is absent or wholly ineffective. A substantial body of law has evolved in the United States over the past ten years that seeks to regulate hydraulic fracturing. Are there gaps? Likely—the states are not uniform in their approach to regulation of fracking. As is the case with other complex industrial processes, scientific and engineering consensus on fracking regulation is not always achievable, so political compromise sometimes fills the void.

Whether hydraulic fracturing regulations are adequate, therefore, can be as much a political question as it is a scientific or engineering question. A person's political persuasions, or economic self-interest, can strongly color their objectivity when viewing hydraulic fracturing. It is not a coincidence that those states in the United States where fracking is banned are all often referred to as "blue" states, and ones in which the oil and gas industry plays a relatively small role in the state's economy, if any role at all.[15]

However, differences of opinion on hydraulic fracturing can run much deeper than "blue" state versus "red" state political orientation. Opponents and proponents of hydraulic fracturing often have starkly different attitudes towards fossil fuels in general. Many opponents of fracking believe that fossil fuel usage is the root cause of global warming, and as such is an existential threat to civilization.[16] Extreme opponents of fracking believe it is an assault on the planet and that sabotage, or worse, is justified if

[11] France banned fracking in response to public opposition in 2011. In 2013, the ban was upheld in France's highest authority of constitutional interpretation. David Jolly, *France Upholds Ban on Hydraulic Fracturing*, N.Y. TIMES (Oct. 11, 2013), https://www.nytimes.com/2013/10/12/business/international/france-upholds-fracking-ban.html.

[12] Bulgaria enacted a fracking ban in 2012. Mirel Bran, *Bulgaria becomes Second State to Impose Ban on Shale-gas Exploration*, THE GUARDIAN (Feb. 14, 2012), https://www.theguardian.com/world/2012/feb/14/bulgaria-bans-shale-gas-exploration.

[13] *See* Arthur Neslen, *The Rise and Fall of Fracking in Europe*, THE GUARDIAN (Sept. 29, 2016), https://www.theguardian.com/sustainable-business/2016/sep/29/fracking-shale-gas-europe-opposition-ban.

[14] Seth Whitehead, Opinion, *Anti-fracking Health Claims Not Supported by Facts*, THE SOUTHERN ILLINOISAN (Sept. 13, 2017), https://thesouthern.com/opinion/columnists/opinion-seth-whitehead-anti-fracking-health-claims-not-supported-by/article_17e8be29-6828-574d-b84f-c237c60ef1a7.html; see also *Compendium of Studies Demonstrating the Health and Safety Benefits of Fracking*, ENERGY IN DEPTH (Apr. 2017), http://eidhealth.org/wp-content/uploads/2017/04/Positive-Health-Compendium.pdf (last accessed Aug. 6, 2018).

[15] Fracking is currently banned in Vermont (2012), New York (2015), and Maryland (2017); nearby Massachusetts enacted a ten-year moratorium on fracking in 2016. *Vermont Becomes First State to Ban Fracking*, FOX NEWS (May 17, 2012), http://www.foxnews.com/politics/2012/05/17/vermont-becomes-first-state-to-ban-fracking.html; Daniel Wiessner & Edward McAllister, *New York Bans Fracking after Health Report*, REUTERS (Dec. 17, 2014, 12:06 PM), https://www.reuters.com/article/us-energy-fracking-newyork/new-york-bans-fracking-after-health-report-idUSKBN0JV29Z20141217?irpc=932; Jon Hurdle, *With Governor's Signature, Maryland Becomes Third State to Ban Fracking*, STATEIMPACT PA. (Apr. 4, 2017, 9:35 PM), https://stateimpact.npr.org/pennsylvania/2017/04/04/with-governors-signature-maryland-becomes-third-state-to-ban-fracking/; Ben Hellerstein, *Massachusetts Senate Approves Fracking Moratorium*, ENV'T MASS. (June 10, 2016), https://environmentmassachusetts.org/news/mae/mass-senate-approves-fracking-moratorium.

[16] *See, e.g.*, climate change activist Bill McKibben's website, 350, https://350.org/ (last visited Aug. 6, 2018); *see also* DEEP GREEN RESISTANCE, https://deepgreenresistance.org/en/ (last visited Aug. 6, 2018).

necessary to stop the practice.[17] Fracking's opponents look upon whatever success the oil and gas industry is having with fracking as a last gasp aberration in the necessary and inevitable march towards abandonment of fossil fuels.

In contrast, supporters of hydraulic fracturing and of the oil and gas industry more generally believe that fossil fuels have contributed significantly to the standard of living in the United States and the rest of the world.[18] While most in the oil and gas industry accept that climate change is a significant threat, supporters of hydraulic fracturing believe that continued use of fossil fuels, in at least the near term, is necessary to sustain living standards and to prevent billions of people from sliding into poverty. Supporters see fracking as a positive development, because it is helping postpone "peak oil" (*i.e.*, the turning point after which discovery of new oil and gas deposits cannot keep up with demand[19]), and the downward spiral of the world economy anticipated if oil and gas were depleted before technology can develop viable alternatives. In addition, fracking allows for greater use of natural gas in place of coal, which many argue reduces current levels of greenhouse emissions and can serve as a bridge fuel to the future.[20]

When opponents and proponents of fracking confront each other with such starkly different worldviews, civil discourse can degenerate. Many opponents of fracking disparage fracking supporters as climate science deniers and profiteers putting economic interests ahead of preserving the planet. Proponents often disparage opponents of fracking as hypocrites who rail against the evils of fracking while continuing to enjoy cars, airplanes, heating, plastics and the multitude of other modern conveniences made possible all or in part by fossil fuels.

Recognizing that opponents and proponents of fracking can approach the subject with such starkly different worldviews is necessary in sifting through the voluminous number of often conflicting technical papers, blog posts, internet sites, and news accounts relating to hydraulic fracturing. Fracturing is a complex technical subject. Cause and effect is rarely obvious and cost-benefit analysis is never simple. Exaggerated and simplistic pronouncements about fracking, while common, are not helpful and can lead to dissemination of misinformation, chilling of rational discourse, and polarization of opinion.

This article is a "brief" look at the law of hydraulic fracturing in Texas and beyond.

[17] Kyle Swenson, *Anti-fracking Activists and Anarchists are Blocking Rail Tracks in Olympia, Wash. They Don't Plan on Leaving*, WASH. POST: MORNING MIX (Nov. 29, 2017), https://www.washingtonpost.com/news/morning-mix/wp/2017/11/29/anti-fracking-activists-and-anarchists-are-blocking-rail-tracks-in-olympia-they-dont-plan-on-leaving/?noredirect=on&utm_term=.84 c1f513c424.

[18] *See generally*, ALEXANDER J. EPSTEIN, THE MORAL CASE FOR FOSSIL FUELS (2014).

[19] Richardson R. Lynn, *It's Not the End of the World, But You Can See It From There: Legal Education in the "Long Emergency"*, 40 U. TOL. L. REV. 377, 378 (2009).

[20] "Bridge fuel to the future" is a term attributed to Robert F. Kennedy, Jr. in an essay in the 2009 *Financial Times* where he said, "Converting rapidly from coal-generated energy to gas is President Barack Obama's most obvious first step towards saving the planet and jump starting our economy." Opinion, *How to End America's Deadly Coal Addiction*, FIN. TIMES (July 19, 2009), https://www.ft.com/content/58ec3258-748b-11de-8ad5-00144feabdc0.

But Robert F. Kennedy, Jr. later changed his mind. *See* Marie Cusick, *Robert F. Kennedy Jr. Calls Natural Gas a "Catastrophe"*, STATEIMPACT PA. (Oct. 3, 2013, 4:14 PM), https://stateimpact.npr.org/pennsylvania/2013/10/03/robert-f-kennedy-jr-calls-natural-gas-a-catastrophe/.

In preparing this article, the authors[21] have relied heavily upon a more comprehensive treatment of the subject found in *Hydraulic Fracturing Law and Practice*.[22] It was the privilege of both authors to be contributors to *Hydraulic Fracturing Law and Practice* as the insights and knowledge gained by working with such an esteemed group of co-authors, many of whom were much more eminently qualified than they to be writing about the topic, greatly increased their understanding of the subject.

II. What is "the Law of Hydraulic Fracturing?"

Hydraulic fracturing is not a new process, though the combination of hydraulic fracking and horizontal drilling is a relatively recent development.[23] Most people who refer to "fracking" are referring to the utilization of both technologies in oil and gas well drilling and completion operations, and that is how the term "fracking" is used in this paper.

Trying to define "the law of hydraulic fracturing" has been likened to defining "the law of mobile telephones."[24] In both instances, the laws are heavily intertwined with other areas of law. For example, hydraulic fracturing law can touch upon oil and gas, environmental, nuisance, trespass, employment, transportation, and procedural law, among a multitude of other areas of state and federal law and regulations.

Another problem with trying to define or compartmentalize hydraulic fracturing law is that it is so intertwined with laws and regulations governing conventional oil and gas extraction. Oil and gas rules and regulations applicable to conventional oil and gas operations are not suspended when a well is fracked. For this reason, the majority of oil-producing states have not put in place exhaustive new regulatory regimes addressing hydraulic fracturing, at least in part because they believe their existing oil and gas regulatory regimes adequately deal with most concerns regarding the fracking process. A minority of oil-producing states have taken a more aggressive and comprehensive approach. Differing state approaches to regulation of hydraulic fracking are discussed in Part VII.

Its broad range of subject matter and the diverse regulatory regimes among the states make the "law of hydraulic fracturing" difficult to define and even more difficult to compartmentalize. But here is an attempt—the "law of hydraulic fracturing" is that body of law addressing the industrial process known as hydraulic fracturing through statutes, regulations, and case law. The law of hydraulic fracturing includes seven distinct but non-exclusive areas: (a) fracking fluid chemical disclosures; (b) wellbore integrity requirements; (c) air and water pollution prevention; (d) nuisance; (e) notices; (f)

[21] In interests of full transparency, both of the authors are employed in a law firm that predominately represents oil and gas producers. As Upton Sinclair once wrote, "It is difficult to get a man to understand something, when his salary depends on his not understanding it." (quoted in GARY SERNOVITZ, THE GREEN AND THE BLACK, 9 (2016)). Nevertheless, this paper is intended as an objective look at the law of hydraulic fracturing and the public policy issues surrounding it.

[22] DAVIS GRAHAM & STUBBS LLP, GRAY REED & MCGRAW LLP & VORYS, SATER, SEYMOUR AND PEASE LLP, HYDRAULIC FRACTURING LAW AND PRACTICE (2017) [hereinafter HYDRAULIC FRACTURING L&P].

[23] *See infra* Part IV for a short history of hydraulic fracturing.

[24] Attributed to Dave Neslin, Of Counsel, Davis Graham & Stubbs LLP, Presentation at the South Texas College of Law Houston 30th Annual Energy Law Institute for Lawyers and Landmen (Aug. 2017). Neslin is one of the co-authors of *Hydraulic Fracturing Law and Practice (2017)*.

induced seismicity; and (g) local government preemption.

Hydraulic fracturing law has developed primarily at the state, not the federal, level.[25] The reasons for this are threefold. First, as Justice Brandeis observed, the states have always been the laboratories of the nation.[26] States are more nimble and more responsive to local circumstances, which is important in regulating oil and gas activities.

Second, although a Bureau of Land Management (BLM) permit is required in addition to state permits when drilling is undertaken on federal lands, onshore hydraulic fracturing has taken place more on private or state lands than on federal lands.[27] In the offshore realm, hydraulic fracturing is relatively rare—it has been estimated that less than 15% of wells drilled in the Gulf of Mexico have been fracked.[28] Geology in the Gulf of Mexico is such that fracking is less likely to aid in production enhancement.

Third, since state regulations also apply to oil and gas well drilling on BLM lands, federal fracking regulation is arguably redundant. This is part of the reason why the Trump Administration rescinded the Obama Administration's BLM fracking rule.[29]

Hydraulic fracturing law also includes case law. The body of hydraulic fracturing case law in the U.S. has been slow to develop and more sparse than anticipated, given the controversies and passions on both sides of the fracking debate. This is partly explainable because hydraulic fracturing has come of age relatively recently, and many cases involving fracking have settled prior to reaching appellate courts for review. Other reasons are that proving causation in tort cases involving fracking can be difficult and class certifications are problematic due to lack of commonality. Some of the major case law developments pertaining to hydraulic fracturing are discussed in Part IX.

III. What is Hydraulic Fracturing?[30]

The first step to a better understanding of the law of hydraulic fracturing is to understand the industrial

[25] *See* Grace Heusner, Allison Sloto & Joshua Ulan Galperin, *Defining and Closing the Hydraulic Fracturing Governance Gap*, 95 DENV. L. REV. 191 (2017).

[26] *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) ("It is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.").

[27] Although this was partly due to the greater regulatory scrutiny of fracking on Bureau of Land Management lands than private lands, especially during the years of the Obama Administration, the primary reason is that federally owned minerals administered by the BLM are found primarily in the Rocky Mountain States. *See Administrative Boundaries Map, Public Lands Managed by the Bureau of Land Management*, U.S. BUREAU OF LAND MGMT., https://www.blm.gov/maps/frequently-requested (last accessed Aug. 7, 2018). Texas, which currently accounts for one-third of U.S. crude oil production and one-fifth of U.S. energy production and has led the nation in drilling permits for at least the past decade, has virtually no federally owned minerals (except in and around national parks, forests, military bases and a few other federally acquired properties). *See State Energy Profile: Texas Analysis*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/state/analysis.php?sid=TX#1.

[28] HYDRAULIC FRACTURING L&P, *supra* note 22, § 4.02[1]. In this section of the treatise, Philip B. Jordan provides an overview of the differences between onshore and offshore hydraulic fracturing while discussing federal legislation and regulation.

[29] *See infra* Part IX.C, Case Law Developments: Rulemaking Challenges and Miscellaneous.

[30] The authors borrow heavily in this section from Chapter 2 of *Hydraulic Fracturing Law and Practice* (2017), written by Professor Azra N. Tutuncu, Harry D. Campbell Chair in Petroleum Engineering Department and Director of the Unconventional

process of hydraulic fracking. The American public, fueled by negative media coverage and anti-fracking activism, has many misperceptions about fracking.

To start with, the following is the regulatory definition of hydraulic fracturing:

> Hydraulic fracturing treatment—A completion process involving treatment of a well by the application of hydraulic fracturing fluid under pressure for the express purpose of initiating or propagating fractures in a target geologic formation to enhance production of oil and/or natural gas. The term does not include acid treatment, perforation, or other non-fracture treatment completion activities.[31]

Note that the definition excludes "acid treatments, perforation, or other non-fracture treatment completion activities." Fracking, contrary to many people's perceptions, is not new. Acid fracking first came in use in the 1930s. Other forms of fracking date to the Civil War era. Hydraulic fracking is the relative newcomer, having begun in the 1940s.[32]

A. Fracking—the Basics

A modern hydraulically fracked oil and gas well begins just as a conventional oil and gas well does. A drilling rig moves onto a surface site (or "pad"), surface casing is put in place to protect near surface water aquifers, and then drilling begins. The wellbore penetrates the surface, and then drills downward from one to two miles below the surface into a shale formation. Shale formations vary in thickness. The Eagle Ford formation in South Texas, for example, is typically 300 to 500 feet thick. After penetrating the target formation, the wellbore bends horizontally and drilling then proceeds laterally for distances that typically range from one to three miles.

Upon completion of horizontal drilling in the "plug and perf" method of fracking, which is by far the most commonly used method in the United States, a three-foot long perforation "gun" is sent to near the end of the horizontal lateral ("the toe") for the first stage of the fracking operation. A fracking "stage" is a 250-foot length of lateral wellbore isolated from the rest of the wellbore lateral by plugs. The perf gun then shoots off explosive charges to create 100 to 300-foot cracks in the adjoining shale formation. The cracks themselves are typically of hairline width, analogous to cracks in a block of ice.

Next, large volumes of water are injected under high pressure mixed with proppant (usually sand, but sometimes ceramic beads or other materials[33]) which

Natural Gas and Oil Institute at the Colorado School of Mines.

[31] 16 Tex. Admin. Code § 3.13(a)(2)(J)(2018).

[32] A short history of fracking and horizontal drilling is included *infra* Part IV.

[33] While sand is the most common proppant used in hydraulic fracturing operations due to its ready availability and low cost, other proppants, such as man-made ceramics, magnesium silicate, or fly ash can also be used. John D. Furlow & Corinne V. Snow, *In the Wake of the Shale Revolution: A Primer on Hydraulic Fracturing Fluid Chemical Disclosure*, 8 TEX. J. OIL GAS & ENERGY L. 249, 251-52 (2012-13).

serve to "prop open" the cracks in the shale formation to facilitate flow of oil and gas. Chemical additives[34] are mixed with the frack water to reduce friction and enhance flow of oil and gas. This is where the term "slickwater fracking" comes from.

The frack stage is then plugged off, and the entire operation repeated in the next 250-foot stage along the lateral, then the next, and so on. Hence, a fracking operation is actually a series of "mini-fracks" running along most of the length of the lateral. It is not unusual to have 20 to 25 stages per fracked well, and 50-stage fracking is not unheard of.

Once all the stages of the fracking operation are complete, a drill bit bores through the plugs, allowing the remaining frack fluids to flow back to the surface. Then, if all has gone well, the weight of the overburdening rock creates sufficient pressure to force oil and gas through the propped-open cracks in the formation into the wellbore and up to the surface for storing, processing, and transportation to market.

What has been described so far is a single well lateral fracking operation. What is more typical, however, is multi-well drilling from a single surface "pad." The number of wells drilled from a typical surface pad varies, but seven to eight wells per pad is not uncommon. The pad itself, typically the size of a football field (or two), can be used to complete multiple laterals both in different directions and in different formations, stacked one upon the other. A single pad containing seven to eight surface locations can be used to complete a dozen or even dozens of fracked oil and gas wells. This provides an advantage over conventional well drilling because a much smaller land area is utilized than would be the case were a comparable number of vertical wells drilled.

Besides minimizing surface impacts, multi-well pad drilling enables utilization of techniques such as "zipper fracking," where fracking occurs in a staggered pattern between two wellbores simultaneously to optimize stress on the formation and facilitate movement of oil and gas into the wellbore. Multi-well pad drilling and zipper fracking are but two examples among the many rapidly evolving technologies used by oil and gas companies, which have contributed to fracking's success and rapid expansion throughout the U.S. oil patch.

B. Fracking—Sand and Water Usage

Each stage of a fracking operation requires several hundred thousand pounds of proppant (most often sand).[35] A typical 20 to 25 stage fracking operation will use around six million to seven-and-a-half million pounds of sand, which equals the weight of about 35,000 average American men.[36] Fifty-stage fracking would use even more sand. Some of the largest fracked wells have reportedly used 50 million pounds of sand.[37] The U.S. oil and gas industry in 2014 was estimated to have used 95 billion pounds of

[34] For more on chemical additives, see *infra*, Part VI.A, Hydraulic Fracturing Risks—1. Water Quality.

[35] Task Force on Environmental and Community Impacts of Shale Development in Texas, *Environmental and Community Impacts of Shale Development in Texas*, THE ACADEMY OF MEDICINE, ENGINEERING AND SCIENCE OF TEXAS, 40 (2017), http://tamest.org/wp-content/uploads/2017/07/Final-Shale-Task-Force-Report.pdf [hereinafter TAMEST]. TAMEST, The Academy of Medicine, Engineering and Science of Texas, is a non-profit brain trust composed of the Texas-based members of the National Academies of Sciences, Engineering and Medicine, and the state's Nobel Laureates.

[36] SERNOVITZ, *supra* note 21, at 78.

[37] Jordan Blum, *Frackers to Yield Record Highs*, HOUS. CHRON., Jan. 26, 2018, at A1.

sand in fracking operations, roughly equivalent in mass to downtown Chicago.[38]

Until recently, indigenous Texas sands were not considered to have the optimal crystallinity to serve as frack proppants and most of the sand used in fracking operations in Texas was imported from Wisconsin and other Midwestern states. However, as fracking technology has evolved, the quality differences between Texas sand and sand from the U.S. Midwest have become less consequential. Mining operations for frack sands have been on the upswing in Texas as local sources are plentiful and more cost-effective to transport than sands from the Midwest.

Opponents of fracking have not shown as much concern about the diversion of sand for fracking as they have about the diversion of water. Fracking uses a lot of water. Though water volumes used in hydraulic fracturing vary by location, total water used in a frack operation is typically around 200,000 gallons per stage,[39] or 4 to 6 million gallons of water for a 20 to 25 stage frack job.[40] That would be enough water to fill six to twelve Olympic-sized swimming pools.[41] Water usage for fracking, however, has been on the upswing, with some wells reportedly using 25 million gallons of water, or more.[42]

To get all the sand and water to the wellsite requires transportation. In most frack sites in Texas, sand and water is trucked in. A typical frack job in the South Texas Eagle Ford shale area requires about 1,700 truck trips per fracked well.[43] To put this in perspective, that would be the equivalent of 17 miles of semi-trailer trucks if lined up—for a single well. With 80 to 90 rigs running in the South Texas Eagle Ford area (as of March 2018),[44] traffic injuries and fatalities have been on an upswing. Wear and tear on roads and bridges has also become a significant concern. These issues are not limited to South Texas—practically everywhere fracking is utilized, it is causing upswings in traffic injuries and fatalities and is placing strains on infrastructure.[45]

C. Fracking Water Disposal and Earthquakes

Far more formation wastewater is generated from producing wells than oil. The Texas Railroad Commission estimates that ten barrels of water are produced from conventional oil wells with every single barrel of oil, regardless of whether a well is horizontally fracked or completed as a conventional vertical well.[46] Nationwide, the average ranges from seven to ten barrels of water for each barrel of oil.[47] This is why an industry observer quipped, "oil companies are in the produced water business, not the oil business."[48]

[38] SERNOVITZ, *supra* note 21, at 78.
[39] TAMEST, *supra* note 35.
[40] *Id*.
[41] SERNOVITZ, *supra* note 21, at 78.
[42] Blum, *supra* note 37.
[43] TAMEST, *supra* note 35.
[44] Elizabeth Alford, *Eagle Ford Rig Count Increases with All Horizontal Drilling*, EAGLE FORD SHALE NEWS (Mar. 11, 2018), https://eaglefordshale.com/efs-news/eagle-ford-rig-count-increases-with-all-horizontal-drilling.
[45] For an excellent account of social and infrastructure impacts on shale development in the Bakken region of North Dakota, see MAYA RAO, GREAT AMERICAN OUTPOST: DREAMERS, MAVERICKS AND THE MAKING OF AN OIL FRONTIER (2018).
[46] Aaron Powell, Comment, *Salty Plaintiffs and Industry Defenses: A Texas Lawyer's Guide to Induced Seismicity and Salt Water Disposal Wells*, 48 TEX. TECH L. REV. 1001, 1003 (2016).
[47] Keith B. Hall, *Induced Seismicity: An Energy Lawyer's Guide to Legal Issues and the Causes of Man-Made Earthquakes*, 61 ROCKY MT. MIN. L. INST. 5-1, 5-27 (2015).
[48] Gerry Morton, Senior Counsel, Carrizo Oil & Gas Inc., Panel Presentation at the Houston Bar

The high salinity of produced waters in many parts of the U.S., and especially in Texas, limits the economic viability of treatment options.[49] Oil companies have recently started to recycle some of this produced water for fracking, which despite cost disadvantages reduces road traffic and mitigates the likelihood of spills.[50] But in Texas and elsewhere, most produced water is re-injected into the ground either for secondary recovery purposes or in saltwater disposal wells to keep it away from surface water and water aquifers.[51] There are about 100,000 injection wells drilled in the United States used for secondary recovery purposes.[52] There are another 30,000 wells used for wastewater disposal purposes.[53]

Most of the water used in fracking operations is not recycled and flows back to the surface along with produced water.[54] However, the bulk of the water injected into most oil and gas disposal wells is naturally occurring produced water, not frack fluid flowback.[55] The percentage of fracking flowback water in ratio to produced water being injected varies greatly by region, but across the board, it is a small portion.[56] "In the Permian Basin far more water is generated over the life of a well than is initially injected for hydraulic fracturing. In the Barnett Shale region, the amounts of produced and injected water are in approximate balance over the lifetime of a well ….In the Eagle Ford region, only a small fraction of frack water injected ultimately returns to the surface…."[57] In Oklahoma, frack water accounts for less than 10% of the water sent to injection wells.[58]

This raises the subject of earthquakes. Despite frequent assertions to the contrary by opponents of fracking, most geologists do not believe that hydraulic fracturing causes earthquakes except under very rare circumstances.[59] Conversely, there is a growing consensus in the scientific community that if certain geologic conditions are present in a given subsurface formation, disposal of water in injection wells for either secondary recovery or wastewater disposal purposes can cause seismic activity severe enough to be felt at the surface.[60] This appears to be especially true in Oklahoma, where doubling saltwater disposal well volumes from 1997 to 2013 came with an increase in magnitude 3.0 or greater earthquakes from about 2.2 earthquakes annually in 2008 to 890 annually in 2015.[61]

How many earthquakes can be traced back to re-injection of fracking fluid flowback water versus formation produced water? Critics of hydraulic fracking might respond that the question is irrelevant. The dramatic increases in earthquakes in Oklahoma and elsewhere over the past ten years are not likely to have happened coincidentally. But for hydraulic fracking, the large volumes of produced water being disposed of in deep water injection wells—the root cause of the upsurge in earthquakes—would not be occurring, or at least would be occurring at much lower

Association Oil, Gas and Mineral Law Section: In-House Counsel Roundtable on Developments in Oil and Gas Transactions (Feb. 22, 2018).

[49] TAMEST, *supra* note 35, at 126.

[50] Jackie Benton, *Recycling Fracking Water*, TEX. COMPTROLLER OF PUBLIC ACCOUNTS FISCAL NOTES (Oct. 2015), https://comptroller.texas.gov/economy/fiscal-notes/2015/october/fracking.php.

[51] Hall, *supra* note 47.

[52] *Id*. at 5-22.

[53] *Id*.

[54] *Id*.

[55] *Id*. at 5-27.

[56] *Id*. at 5-28.

[57] TAMEST, *supra* note 35, at 125.

[58] Hall, *supra* note 47, at 5-29.

[59] *Id*. at 5-37.

[60] Powell, *supra* note 46, at 1002.

[61] *Id*.

volumes. The additional re-injection of any fracking flowback water, in whatever percentage to produced water, simply compounds the problem.

The first rebuttal to that argument is that its underlying premise—that the large volumes of produced water being injected in the U.S. are a direct result of increased fracking activities—is debatable.[62] As referenced earlier, there are over 130,000 injection wells operating in the U.S. Most of these wells, especially the 100,000 injection wells being used to enhance secondary recovery, have little or nothing to do with fracking.[63] As discussed in Part VI.D, there is insufficient data to conclude that produced water injected from fracked wells is primarily responsible for earthquakes.

A second rebuttal might be that, even assuming for the sake of argument that injected produced water from fracked wells is responsible for the rise in earthquakes, the world will still need oil and gas. If fracking was not creating increased volumes of produced water, conventional well completions would fill the void and the end result would be the same.

The rebuttal to that argument might be that hydrocarbons should be kept in the ground, period, to avoid any risk, earthquakes, or otherwise. Suffice to say that as with so many of the other controversies surrounding hydraulic fracturing, the causal connection between earthquakes and fracking is complex. Conclusions drawn can be driven as much by political persuasion as they are by data and logical analysis.

IV. Fracking: A Brief History[64]

Contrary to the prevailing public perception, hydraulic fracturing as a well completion technique has been around a long time, or at least it has been when considered separately from horizontal drilling. The first hydraulically fractured well in the world is thought to have been in Kansas, in 1949, with the first hydraulically fracked well in Texas following shortly thereafter.[65]

However, before hydraulic fracturing, there was fracturing by other means. The first fractured wells in the world were in Pennsylvania in the 1860s, where nitroglycerin was used to break apart rock to stimulate oil production. Related fatalities dampened enthusiasm for this technique, but explosive techniques continued to be used in fracking wells for a long time following.[66] Non-explosive fracturing using acid stimulations was introduced in the 1930s.[67]

Horizontal drilling separate and apart from hydraulic fracturing is likewise not new. The first horizontal well was drilled near Texon, in West Texas, in 1929. The 1980s and 90s saw widespread utilization of

[62] Hall, *supra* note 47, at 5-28.
[63] *Id*. at 5-22.
[64] Part IV is sourced primarily from GREGORY ZUCKERMAN, THE FRACKERS: THE OUTRAGEOUS INSIDE STORY OF THE NEW BILLIONAIRE WILDCATTERS 17-111 (2013).
[65] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.01.
[66] In the 1960s the Soviets conducted experimental fracking in some of their oil fields using underground atomic explosions. Luca Gandossi, *An Overview of Hydraulic Fracturing and Other Formation Stimulation Technologies for Shale Gas Production*, EUROPEAN COMMISSION JOINT RESEARCH CENTRE INSTITUTE FOR ENERGY AND TRANSPORT TECHNICAL REPORTS 33 (2013), http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/30129/1/an%20overview%20of%20hydraulic%20fracturing%20and%20other%20stimulation%20technologies%20%282%29.pdf.
[67] *Hydraulic Fracturing in the United States*, WIKIPEDIA, https://en.wikipedia.org/wiki/Hydraulic_fracturing_in_the_United_States.

horizontal drilling techniques in the Austin Chalk in Central Texas.

Then, beginning in the early 1990s, a Houston-based independent oil company, Mitchell Energy, combined horizontal drilling and hydraulic fracking techniques to develop the Barnett Shale gas field in North Texas. The founder and CEO of Mitchell Energy was long-time Texas oilman George Mitchell (1919-2013). Mitchell, then in his 70s, relentlessly pushed Mitchell Energy's engineers to perfect the technique that became known as "slickwater fracking." In slickwater fracking, special chemical additives were added to frack fluids to reduce friction and otherwise better facilitate the flow of oil and gas through the shale formation.

Slickwater fracking, combined with multi-stage fracking, became the key to unlocking commercial quantities of Barnett Shale gas. Mitchell Energy, financially stressed through much of the 1990s, was so successful with its new fracking techniques that George Mitchell sold the company to Devon Energy in 2001 for $3.1 billion, making himself a billionaire in the process.[68]

George Mitchell was not the only individual who played a major role in developing modern fracking techniques. EOG Resources, led by Mark Papa, and Continental Energy, led by Harold Hamm, pioneered fracking techniques in North Dakota's Bakken Shale play.[69] Aubrey McClendon (1959-2016), co-founder of Chesapeake Energy, helped spread fracking across the U.S. through his company's aggressive oil and gas leasing and drilling, and his monumental personal energy, drive and charisma.[70]

But George Mitchell, who died in 2013, perhaps more than any other single individual, was responsible for the "Shale Revolution."[71] The technology Mitchell's company introduced became a template for shale plays across the state and the nation.[72] It is possible that historians will look upon George Mitchell as one of the pivotal individuals of his times, one whose impact on the world has been so game changing that he can be compared to other famous contemporaries such as Steven Jobs and Bill Gates. Mitchell's contribution can best be appreciated by considering the positive impacts of fracking on both the United States and the world.

V. Benefits of Hydraulic Fracturing

The national media and opponents of the oil and gas industry highlight the risks of hydraulic fracturing much more than its benefits. But the benefits of fracking can be summarized in six areas: (a) growth in oil and gas production and reduction of foreign imports; (b) economic growth and jobs; (c) more competitive U.S. manufacturing; (d) greenhouse gas reduction; (e) reduced prices for consumer goods; and (f) reduced surface impacts.

[68] In 2008, *Forbes* magazine estimated George Mitchell's net worth as $3.2 billion, placing him among the 500 richest people worldwide. *In Pictures: America's Energy Billionaires*, FORBES (Oct. 7, 2008, 3:30 pm), https://www.forbes.com/2008/10/07/energy-billionaires-biz-energy-cx_af_1007energybillies_slide.html.

[69] SERNOVITZ, *supra* note 21, at 46.

[70] *Id*. at 36-39; 42, 46.

[71] *The U.S. Shale Revolution*, POLICY RESEARCH PROJECT AT THE UNIV. OF TEX. AT AUSTIN LYNDON B. JOHNSON SCHOOL OF PUB. AFFAIRS (May 15, 2015), https://www.strausscenter.org/energy-and-security/the-u-s-shale-revolution.html.

[72] TAMEST, *supra* note 35, at 30.

A. Growth in Oil and Gas Production and Reduction of Foreign Imports

Growth in U.S. oil and gas production due to shale development started in earnest in 2007. At a forecasted yearly average of 81.2 billion cubic feet of natural gas production a day in 2018,[73] shale gas development has enabled the United States to continue leading the rest of the world as the largest producer of natural gas, having surpassed Russia in 2009.[74] Growth in U.S. oil production has been even more stunning. As of July 2018, the United States was producing almost 11 million barrels of oil a day, up from 5 million barrels a day a decade ago.[75] That is the highest level of oil production seen in the U.S. in over 50 years. This has caused the United States to surpass Saudi Arabia as the world's second largest producer of oil worldwide,[76] and the U.S. is predicted to overtake Russia as the world's largest oil producer in 2018 or 2019, at latest.[77] In 2017, approximately 50% of U.S. oil and gas production and 60% of U.S. natural gas production was from unconventional development—that is, obtained from shale resources through hydraulic fracturing techniques.[78]

Growth in oil and gas production in Texas has been equally dramatic. Texas production in February 2018 was over 4 million barrels of oil per day,[79] up from slightly over 1 million barrels of oil a day in 2007,[80] a 300% increase. This upsurge in production has ended an almost 30-year statewide production decline. Texas now produces more than a one-third of all the oil produced in the United States, which would make Texas on a stand-alone basis a larger oil producer than all but a half dozen or so foreign countries.[81]

At year-end 2017, the U.S. was still importing oil. Oil imports are a complicated subject because U.S. refinery capacity has historically been weighted more towards heavier crudes imported from overseas. The U.S. has historically exported crude for similar reasons—lack of capacity to refine domestic crudes, compounded by a "not in my back yard" attitude toward new refinery construction.

The significant number, therefore, is the difference between oil exports and imports. That figure at year-end 2017 was 2.6 million barrels a day, which is the lowest level since the U.S. Energy Information

[73] *Natural Gas Production in U.S. to Set Records in 2018, 2019*, KALLANISH ENERGY (June 12, 2018) https://www.kallanishenergy.com/2018/06/12/natural-gas-production-in-u-s-sets-records-in-2018-2019/.

[74] *The U.S. Surpassed Russia as World's Leading Producer of Dry Natural Gas in 2009 and 2010*, U.S. ENERGY INFO. ADMIN. (Mar. 13, 2012), https://www.eia.gov/todayinenergy/detail.php?id=5370.

[75] Julia Payne, Devika Krishna Kumar & Dmitry Zhdannikov, *U.S. Oil Boom Delivers Surprise for Traders – and It's Costly*, REUTERS (July 15, 2018), https://www.reuters.com/article/us-oil-traders-wti-brent/u-s-oil-boom-delivers-surprise-for-traders-and-its-costly-idUSKBN1K507S.

[76] *Id*.

[77] Osamu Tsukimori, *U.S. to Overtake Russia as Top Oil Producer by 2019 at Latest: IEA*, REUTERS (Feb. 26, 2018, 10:19 PM), https://www.reuters.com/article/us-energy-iea/u-s-to-overtake-russia-as-top-oil-producer-by-2019-at-latest-iea-idUSKCN1GB0C6.

[78] *Frequently Asked Questions (Oil)*, U.S. ENERGY INFO. ADMIN. (Mar. 8, 2018), https://www.eia.gov/tools/faqs/faq.php?id=847&t=6; *Frequently Asked Questions (Natural Gas)*, U.S. ENERGY INFO. ADMIN. (Mar. 8, 2018), https://www.eia.gov/tools/faqs/faq.php?id=907&t=8.

[79] Sheela Tobben, *Texas Oil Production Climbs to All-Time High*, BLOOMBERG: MARKETS (Apr. 30, 2018, 1:44 PM) https://www.bloomberg.com/news/articles/2018-04-30/texas-oil-production-climbs-to-all-time-high-amid-strong-prices.

[80] *Texas Field Production of Crude Oil*, U.S. ENERGY INFO. ADMIN. https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfptx2&f=m.

[81] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.01.

Service began tracking the number in 1973.[82] If shale development continues on its present scale, and if U.S. refining capacity is expanded to handle the growing abundance of lighter domestic crudes, United States oil independence is a real possibility by the mid-2020s. This, again, is a stunning development given the gasoline lines of the late 1970s and concerns, especially prevalent during the 1980s and 90s, that the world would be running out of oil in the very short term.[83]

B. Economic Growth and Jobs

One commentator has calculated that the additional oil and gas reserves created by the shale revolution combined with the equity growth of the oil field service industry, pipelines, gathering systems, and export terminals have created $1.8 to $2 trillion in additional wealth for the United States between the years 2000 and 2016.[84] Texas has benefited economically from the shale revolution more than any other state due to its high percentage of U.S. oil and gas production.

In 2014, it was estimated that the oil and gas industry in Texas alone accounts for an annual gross product of $473 billion and 3.8 million jobs.[85] Though the percentage of oil and gas employment and contribution to GDP varies greatly from year to year due to the rise and fall of oil and natural gas prices, in 2017 about 13% of the state's population was employed in the oil and gas industry and about 30% of the state's economy was tied to oil and gas.[86]

Not all of these 3.8 million jobs are in frack crews. Refinery, petrochemical, and pipeline workers and service industries (including lawyers) are all part of the mix. If limited strictly to upstream oil and gas exploration and production, the number of oil and gas related jobs in Texas was estimated at 194,818 in 2017,[87] making up approximately 23% of the U.S. total of 850,000 exploration and production related jobs.[88] Oil and gas production, refining, and petrochemicals, however, are closely integrated as industries. The dramatic upsurge in oil and gas production brought about by hydraulic fracking over the past ten years has stimulated all sectors of the oil and gas industry, not just upstream exploration and production.[89]

In addition, it is estimated that $27 billion in royalty payments in the Permian, Eagle Ford, and Haynesville shale play areas were paid to private landowners in Texas in the year 2014, an amount comprising about two-thirds of total royalty payments to private landowners in the U.S.[90] About 11 billion dollars in Texas state tax revenues

[82] Robert Rapier, *U.S. Net Petroleum Imports Plunging Toward Zero*, FORBES (Mar. 21, 2018, 9:00 AM), https://www.forbes.com/sites/rrapier/2018/03/21/u-s-net-petroleum-imports-plunging-toward-zero/#311d5dd927ba.

[83] Mike Moffatt, *Will the World's Supply of Oil Run Out?*, THOUGHTCO. (Apr. 1, 2018), https://www.thoughtco.com/we-will-never-run-out-of-oil-1146242.

[84] SERNOVITZ, *supra* note 21, at 46.

[85] TAMEST, *supra* note 35, at 30.

[86] The Texas population at year end 2017 was approximately 28 million people. Alexa Ura & Ryan Murphy, *Texas Population Grew to 28.3 Million in 2017*, TEX. TRIBUNE (Dec. 20, 2017), https://www.texastribune.org/2017/12/20/texas-population-grew-283-million-2017/w. Texas GDP was about $1.5 Trillion Dollars. *Real Gross Domestic Product (GDP) of the Federal State of Texas from 2000-2017*, STATISTA, https://www.statista.com/statistics/188132/gdp-of-the-us-federal-state-of-texas-since-1997/.

[87] TAMEST, *supra* note 35, at 30.

[88] SERNOVITZ, *supra* note 21, at 206.

[89] For example, the boom petrochemical expansion along the Houston Ship Channel. *See* Katherine Blunt, *Rising Oil Prices Good for More Than Oil Companies*, HOUS. CHRON, (June 8, 2018), https://www.houstonchronicle.com/business/article/Rising-oil-prices-good-for-more-than-oil-companies-12977142.php.

[90] TAMEST, *supra* note 35, at 31.

were attributed to shale resource development in 2017.[91]

C. United States Manufacturing More Competitive

According to the Boston Consulting Group, the United States enjoys a "global energy advantage" due to the shale revolution, with wholesale gas prices one-third of those in most other industrialized countries and electricity prices 30% to 50% less than those in other major exporting nations.[92] The dramatic growth in natural gas production in Texas and elsewhere has lowered natural gas prices and therefore feedstock prices for manufacturing, which lowers overall manufacturing costs. Lowered manufacturing costs has helped to offset generally higher labor costs in the United States versus foreign competitors.

D. Greenhouse Gas Reduction

A particularly inconvenient fact for opponents of fracking is that the U.S. is leading the world in reducing CO_2 emissions—due largely to shale gas.[93] This is because natural gas fired electric generating plants emit on average 50% less CO_2 than coal fired plants.[94] As a result, 17% less coal was burned in the U.S. in 2014 than it was ten years earlier.[95] As one commentator has pointed out, reductions in CO_2 emissions in the United States between 2007 and 2012 equaled an entire year of CO_2 emissions from Germany, the sixth largest CO_2 emitter in the world.[96]

This is one reason that U.S. air quality has been steadily improving over the past ten years,[97] which is a fact almost ignored in national media reports on hydraulic fracturing.[98] To quote the same commentator, "Nothing over the last decade, probably ever, has done more to limit coal emissions and keep tar sands—the Canadian tar sands, mainly—in the ground than the American shale revolution."[99]

Opponents of fracking will not readily concede that fracking is a net benefit in greenhouse gas reduction. It has been asserted that wellhead, pipeline or gas plant leakage of methane cancels out the net benefit of CO_2 reductions.[100] This, however, is a subject of much debate,[101] discussed in Part VI.C.

E. Reduced Prices for Consumers

Another inconvenient fact for opponents of fracking is that increased production of oil and gas due to fracking has been a positive development for consumers. The Brookings Institute has estimated that the shale gas boom has caused natural gas prices, alone, to decrease by 47% between 2007 and 2013 which generated total

[91] Katherine Blunt, *Texas Mineral Taxes and Royalties Increased in 2017*, HOUS. CHRON. (Mar. 29, 2018, 8:02 AM), https://www.chron.com/business/energy/article/Texas-mineral-taxes-and-royalties-increased-in-12710678.php.
[92] *See* SERNOVITZ, *supra* note 21, at 1-15.
[93] *Id*. at 78.
[94] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.04[3].
[95] SERNOVITZ, *supra* note 21, at 171.
[96] *Id*. at 7, 171-72.
[97] U.S. ENVTL. PROTECTION AGENCY, 2014 NAT'L EMISSIONS INVENTORY REPORT (VERSION 2), TRENDS (Feb. 2018), https://gispub.epa.gov/neireport/2014/.
[98] SERNOVITZ, *supra* note 21, at 171-81; *see also* EPSTEIN, *supra* note 18, at 151-54.
[99] SERNOVITZ, *supra* note 21, at 193.
[100] *Id*. at 174-77 (citing conclusion in a 2011 Cornell University study).
[101] *Id*. (citing a 2013 University of Texas study rebutting the Cornell conclusions).

consumer benefits of about $74 billion annually.[102]

It is impossible to say what today's natural gas and gasoline prices might be if fracking had never come along. Odds are, however, that they would be higher.[103] Lower oil and gas prices translate to lower prices for a wide range of consumer products derived from fossil fuels, not just fuel, electrical, and heating costs.[104]

F. Reduced Surface Impacts

As explained in Part III.A, horizontal drilling and fracking techniques allow for much smaller surface footprints for drilling and completion operations than is the case for conventionally drilled vertical oil and gas wells. As the Academy of Medicine, Engineering, and Science of Texas (TAMEST) concluded in a 2017 report on the environmental and community impacts of shale development in Texas:

> The vast number of new wells drilled in shale formations in Texas since 2007 have had substantial spatial impacts on the landscape. However, horizontal wells have a smaller impact than the equivalent number of vertical wells would have had. When operators use a single well pad for multiple wells, surface impacts are significantly reduced.[105]

Besides reduced space for wells, multi-pad drilling reduces the need for additional gathering lines, tank batteries, roads, pipelines, compressor stations, and other facilities as compared to the equivalent number of conventional vertical wells. Horizontal drilling also enables directional drilling under nature preserves, lakes, rivers, and buildings and structures.

The advent of shale drilling has also led to dramatic reductions in the U.S. rig count and increases in per well productivity compared to ten years ago.[106] The reduction in rig count offsets in part the increases in road traffic brought about by fracking, since fewer drilling rigs must be mobilized.

VI. Hydraulic Fracturing Risks

There are risks and concerns associated with hydraulic fracturing as well as benefits. These risks and concerns can be grouped as follows: (a) water quality; (b) water usage; (c) air quality/climate change; (d) earthquakes; (e) land use; (f) transportation; and (g) social issues.

A. Water Quality

Environmental activism in the United States has historically been fomented by singular incidents. The 1969 Cuyahoga River fire in Cleveland, Ohio prompted the passage of the federal Clean Water Act and helped spawn the creation of the Environmental Protection Agency. The Love Canal episode near Niagara Falls, New York in the late 1970s spawned CERCLA—the Superfund

[102] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.04[2].

[103] Sernovitz, an oil and gas investor and businessman, states that "If the U.S. shale revolution hadn't happened, oil and gas prices would probably be triple what they are today…" *supra* note 21, at 9.

[104] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.04[2].

[105] TAMEST, *supra* note 35, at 78.

[106] SERNOVITZ, *supra* note 21, at 113. Well productivity per horizontally fracked completion is anywhere from 400% to 2000% more than conventional wells depending on the U.S. region. HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.04[4].

Act. The Three Mile Island incident near Harrisburg, Pennsylvania in 1979 was a turning point in global development of nuclear power, halting what, until that time, had been historic growth both in the United States and abroad.

With hydraulic fracturing, however, instead of a specific incident, it was a 2010 HBO documentary, *Gasland*, by Josh Fox, that, as much as anything else, turned the tide of public opinion in the United States against fracking.[107] The most iconic scene in *Gasland* was the lighting of a match to a kitchen faucet, which then erupted into flames. Ironically, it was later demonstrated that the gas leakage from the faucet was not caused by fracking, but by biogenic methane that had been leaking into water supplies in the area of Colorado where the incident was filmed for decades.[108]

But the impact of *Gasland* on the public perception of natural gas drilling in the United States has been likened to the impact of Rachel Carson's 1960s book, *Silent Spring*, which led to a nationwide ban on DDT. Soon after *Gasland*, international opposition to fracking took root, leading to legislative bans on fracking in a handful of European countries and in several U.S. states. Even where fracking was not banned, citizens demanded greater regulation, especially for disclosure of chemicals being injected down wells during the fracturing process.[109]

However, much of the water quality concerns raised by Josh Fox in *Gasland* and by other opponents of fracking are not rooted in facts. According to TAMEST, "the depth separation between oil bearing zones and drinking water bearing zones in Texas makes direct fracturing into drinking waters unlikely, and it has not been observed in Texas."[110] Professor Tutuncu in *Hydraulic Fracturing Law and Practice* concurred more broadly, speaking not only of Texas but of other oil producing states, of which she wrote, "[it is] extremely unlikely that any fracture can propagate far enough through all the intervening rock formations to contaminate a drinking water aquifer."[111]

Both of these expert conclusions are supported by common sense. Shale oil and gas are produced from what has been called the "most impermeable rock in the history of the oil business" and is generally separated from the surface by 1 to 2 miles of near equally impermeable overburdening rock.[112] It is highly improbable, if not impossible, for direct contamination of water aquifers to occur due to fracking operations conducted a mile or more below the aquifer. If anything, fracking is less of a direct threat to water supplies than most conventionally drilled oil and gas wells, which are often completed and produced at shallower depths and in much more permeable formations.

But what about casing leaks or surface spills of frack fluid after it returns to the surface? Even if water was migrating into fresh water aquifers from leaks in casing or oil spills, it should be remembered that 98% to 99% of frack fluids are sand and water. The remaining 1% to 2% is mostly acid, which has been used to frack oil and gas wells since the 1930s. Acid, in small quantities, is also used in many consumer products, including laundry detergents and swimming pool cleaners.

[107] SERNOVITZ, *supra* note 21, at 66-88.
[108] *Id.* at 69.
[109] 3 ERNEST E. SMITH & JACQUELINE LANG WEAVER, TEXAS LAW OF OIL AND GAS § 14.11(A) (2d ed. 2015).
[110] TAMEST, *supra* note 35, at 113.
[111] HYDRAULIC FRACTURING L&P, *supra* note 22, § 2.06[1][a].
[112] SERNOVITZ, *supra* note 21, at 79-81.

That leaves about .05% of frack fluids comprising non-acid chemical additives. These additives generally include:

- Guar—thickening agent, edible, also in ice cream, chewing gum, and toothpaste;
- Friction reducers—petroleum distillates, also in dyes, synthetic detergents, and fabrics;
- Scale inhibitors—methanol and ethylene, also in anti-freeze and windshield wiper fluid.

As the list illustrates, most all the chemicals in frack fluids are no more dangerous than chemicals typically in and around the average household's kitchen sink. Not that it is wise to drink anti-freeze. However, because frack fluid contains roughly 180 times more water than chemicals, whatever toxic chemicals there might be are diluted.[113] This brings to mind the instance of a Halliburton executive drinking a glass of frack fluid at an industry conference in 2011.[114]

However, as opponents of fracking are quick to point out, oil companies can obtain trade secret protection that exempts them from disclosing all chemical ingredients of frack fluids.[115] A widely publicized 2011 congressional report made much of the fact that in a study of 780 million gallons of fluid used in hydraulic fracturing operations between 2005 and 2009, over 750 chemicals were used, including 29 that contained known or possible carcinogens.[116]

For example, benzene and naphthalene are known or possible carcinogens and are present in hydraulic fracturing fluids. Benzene is also present in cigarette smoke and naphthalene is found in mothballs and toilet cleaners. Given the small overall percentage of chemicals found in frack fluids, most of which are not toxic, common sense suggests that the percent of benzene, naphthalene, and other carcinogens in frack fluids would be extremely minimal—perhaps near-microscopic.

In rebuttal, opponents of fracking can correctly point out that though the percentage of dangerous chemical additives in frack fluids may be small, the volumes of fluids injected in hydraulically fracked wells are so great[117] that even a small percentage of chemical additives can be significant. Even if frack formations are buried too deep for there to be any realistic chance of direct contamination of water supplies, indirect contamination of water supplies through casing leaks or surface spills is always a possibility.

In this instance the opponents of fracking have a valid point—the real threat to water supplies from fracking is not from direct contamination of water supplies by frack fluids leaching up from miles below the surface, but from indirect contamination of frack fluids coming from casing leaks or surface spills. As TAMEST explains, the "…evidence suggests that any direct impacts of fracturing or formation fluids on potential

[113] *Id*. at 79.
[114] *Id*. at. 77-78.
[115] For example, Section 91.851 of the Texas Natural Resources Code contains provisions that allow companies to protect their proprietary frack formulas as trade secrets. *See* HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[2][a] and Part VIII.A below.

[116] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.05[3].
[117] See *infra* Part III.B. Four to six million gallons per well is typical, but twenty-five million gallons per well is not unheard of.

drinking water zones in Texas are more likely to be caused by near surface leaks during injection or production, or by spills at the surface rather than migration from the point of injection."[118] TAMEST continues: "…because of the industrial nature of [oil and gas activities], there is, and always will be some probability of casing failure leading to near surface contamination or contributing to surface spills due to flow up the failed casing."[119]

But what is the actual risk that the 1% to 2% component of frack fluids that might include acid or toxic chemicals would return in significant quantities back to the surface and find its way, through leaks in failed casing, into drinking water aquifers? In a 2011 study of 211 groundwater contamination incidents in Texas associated with oil and gas well drilling and completion, none were associated with hydraulic fracturing.[120] Furthermore, most incidents occurred prior to 1969, before the Texas Railroad Commission had revised its regulations on well casings and cementing.[121]

The U.S. Environmental Protection Agency (EPA) came to a similar conclusion in 2016. After conducting a multi-year study of the potential effects of fracking on drinking water, the EPA wrote that fracking "can impact drinking water resources under some circumstances," but noted that such impacts" range in frequency and severity "depending on operational, local and regional factors.[122] A prior version of the same report said that hydraulic fracking had not caused "widespread, systemic" impacts on drinking water. That sentence, however, was removed in the final EPA report at the behest of the agency's Science Advisory Board—raising suspicions once again that politics and fracking walk hand in hand.[123]

In any event, casing leaks and surface spills are as likely to occur due to conventionally drilled vertical wells as horizontally fracked wells. For example, Cabot Oil in 2008 drilled some of the first test wells in the Marcellus formation near Dimock in northeast Pennsylvania. Cabot's early operations in Pennsylvania suffered due to the lack of experience of its drilling crews in a state that had not seen significant oil and gas development in over a hundred years. The wells were poorly cased and cemented, and natural gas leaked into nearby water wells. Dimock then became the battle cry for opposition to fracking in the Eastern U.S. and elsewhere. However, the leakage from Cabot's wells occurred before the wells were fracked—and the gas came from formations several thousand feet above the Marcellus Shale. But in *Gasland* and elsewhere, it was implied that what happened at Dimock was the norm in the oil and gas business, not an aberration.

[118] TAMEST, *supra* note 35, at 122.

[119] *Id*. at 123.

[120] *Id*. (*citing* Scott Kell, Report to the Groundwater Protection Council, State Oil and Gas Agency Groundwater Investigations And their Role in Advancing Regulatory Reforms, A Two-State Review: Ohio and Texas (Aug. 2011), http://fracfocus.org/sites/default/files/publications/state_oil__gas_agency_groundwater_investigations_optimized.pdf.)

[121] TAMEST, *supra* note 35, at 123. Since the Railroad Commission's 1969 rule revisions, well construction practices with cemented steel casing have significantly mitigated the risk of contamination of groundwater supplies by casing leaks and surface spills. Furthermore, the Railroad Commission in 2014 revised Rule 13 to require additional oversight for hydraulic fracturing within 1,000 feet of the base of protected water. *Id*. at 121. This is discussed *infra* Part VII.

[122] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.05[1].

[123] *Id*., n. 115. The EPA had previously (in 2015) concluded that there were "few, if any, documented cases of frack fluids contaminating groundwater." SERNOVITZ, *supra* note 21, at 175.

Statistics, however, do not support such a conclusion. The Pennsylvania Department of Environmental Protection determined there were 256 cases of water well contamination due to oil and gas drilling in the period from 2008 to first quarter of 2015, a period in which over 21,000 oil and gas wells were drilled in the state.[124] Statistics from other states are similar. In North Dakota, it was estimated that during an eight-year period with 61 billion gallons of oil produced, only 18 million gallons of oil were spilled or leaked.[125] The Colorado Oil and Gas Commission reported that oil spills in Colorado were only 0.003% of the state's total oil production in 2014.[126]

Obviously the oil and gas industry does not have a perfect record in preventing oil and gas casing leaks and pipeline spills. The broader question is whether the number of such leaks and spills has been catastrophic, or, conversely, are such leaks so rare and sporadic that they are eclipsed by the benefits of fossil fuels?

About 1.5 million oil and gas wells have been drilled in Texas since the inception of its oil and gas industry almost 150 years ago.[127] Yet, Texans have lived with the risks of leaks from oil and gas wells for all this time without the state becoming an environmental wasteland.

Furthermore, the oil and gas industry has no monopoly on pollution. Industrial societies live with manifold other risks to water supplies coming from a multitude of sources. Flint, Michigan serves as a recent reminder.[128]

Though accidents can happen, oil companies spend a lot of money and effort in preventing surface spills and leaks from storage facilities and pipelines. This is because oil companies are not in the business of leaking or spilling oil; they are in the business of selling it. Oil companies also want to avoid litigation and the costs of remediation.

This is mostly lost, however, on the opponents of hydraulic fracking, for two reasons. First, it is much easier to talk about banning hydraulic fracking than it is to talk about banning conventional oil and gas drilling. Most Americans are not yet willing to give up their gasoline-powered automobiles or do without the other modern conveniences brought on by fossil fuels. The public realizes that a certain amount of oil and gas drilling is necessary to sustain both the economy and living standards. Banning all oil and gas well drilling would be pushing the envelope too far.

Second, some opponents of fracking exploit the lack of knowledge that most Americans, understandably, have of shale geology and modern well casing and cementing practices. Fanning the flames of technophobia is much easier than having a rational, data driven dialogue on the risks of hydraulic fracking. The water quality debate over hydraulic fracking epitomizes this perhaps as much as any other issue associated with the process.

[124] SERNOVITZ, *supra* note 21, at 98.
[125] *Id*.
[126] *Id*.
[127] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.01.
[128] Merrit Kennedy, *Lead-Laced Water in Flint: A Step-by-Step Look at the Makings of a Crisis*, NAT'L PUB. RADIO: THE TWO-WAY (Apr. 20, 2016), https://www.npr.org/sections/thetwo-way/2016/04/20/465545378/lead-laced-water-in-flint-a-step-by-step-look-at-the-makings-of-a-crisis.

B. Water Usage

It has been said that, "Whiskey is for drinking, but water is for fighting."[129] Water usage in Texas, where half the state is desert or semi-arid, is always a concern. Despite recent hurricanes, periodic droughts continue to plague the state.

According to the TAMEST report, less than 1% of total water usage in Texas is devoted to hydraulic fracking, though in some regions and locales, the percentage can be much higher.[130] There has been much recent publicity, for example, about Apache Corporation's Alpine High project in West Texas, which has generated controversy over potential impact of its water withdrawals in the area around the Balmorhea Springs.[131]

The topic of water usage conflicts in Texas forms a subject in itself.[132] However, use of water for fracking purposes should not be viewed in isolation:

- Coal fired gas plants also use water. A typical 500-megawatt coal fired plant uses as much water in a year as 500 to 600 hydraulic fracking operations.[133] Natural gas fired electricity generating plants use 4 times less water than coal-fired plants do.[134]
- In 2015, 34% of freshwater usage in the U.S. was for cooling in power generation.[135] Freshwater usage for cooling power plants is now on the decline, thanks to fracking, and the displacement of coal by natural gas.[136]
- Biofuels are a much talked about and government supported form of alternative energy. But biofuels need water to grow corn for ethanol, biodiesel, and much of that is from irrigated water.
- Of all the forms of alternative energy, solar power from panels uses the least water. However, the most efficient and productive use of solar power is with solar thermal energy, which uses a lot of water. Even pure solar energy production requires water for panel cleaning.

Critics of fracking might point out the freshwater used for fracking is injected

[129] Attributed to Mark Twain, though not by all researchers. https://quoteinvestigator.com/2013/06/03/whiskey-water/.

[130] TAMEST, *supra* note 35, at 116.

[131] *See, e.g.*: David Hunn, *Scrutiny of Drilling Near West Texas Balmorhea Springs Intensifies*, HOUS. CHRON. (Oct. 24, 2016, 9:15 AM), https://www.houstonchronicle.com/business/article/More-environmentalists-scrutinize-Balmorhea-area-10096473.php; David Hunn, *Apache "Disappointed" in Earthworks Tactics at Balmorhea*, HOUS. CHRON.: FUEL FIX (Nov. 3, 2016), https://fuelfix.com/blog/2016/11/03/report-apache-drilling-could-contaminate-balmorhea-pool/; Naveena Sadasivam, *Huge Oil Discovery May Endanger Solace of Balmorhea*, TEX. OBSERVER (Nov. 22, 2016, 9:41 AM), https://www.texasobserver.org/balmorhea-fracking-endangered/.

[132] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[4][b] – 24.02[5].

[133] *Id.* § 3.03[2][b].

[134] *Water Use Declining as Natural Gas Grows*, CLIMATE CENTRAL (June 30, 2015), http://www.climatecentral.org/news/water-use-declines-as-natural-gas-grows-19162.

[135] *Summary of Estimated Water Use in the United States in 2015*, U.S. GEOLOGICAL SURVEY & U.S. DEP'T OF INTERIOR., 42 (2018), https://pubs.usgs.gov/circ/1441/circ1441.pdf.

[136] *Id.*

underground, whereas water used for cooling in power plants can be more easily reused. Use of brackish water, including recycled produced water, is on the upswing in fracking operations.[137] Regardless, the amount of water used for fracking is relatively small when compared to almost all other energy sources. But concerns about water withdrawals for fracking purposes persist. This is one of the reasons why hydraulic fracturing has not taken root in California.[138]

Given these facts, is using 1% of Texas's water resources for hydraulic fracturing inordinate, particularly when the positive economic impact on the state is considered? Whether or not devoting 1% of freshwater supplies in Texas to fracking is a good or a bad idea is once again a question of perspective, and sympathies either for or against hydraulic fracturing and the oil and gas industry more generally will inevitably play into the analysis.

C. Air Quality & Climate Change

Perhaps the biggest controversy involving the risks of fracking concerns greenhouse gas emissions. The TAMEST report recognizes that production of shale resources results in emissions of greenhouse gases, photochemical air pollutants, and air toxins.[139] However, the real question when it comes to air emissions and climate change is how the impacts of emissions from shale gas development compare to coal, the most commonly used fuel for power generation in the world.

As discussed in Part V, natural gas fired electric generating plants emit 50% less CO_2 than that of coal.[140] However, methane leakage from wellheads, pipelines, and compressors can also cause air pollution. According to the EPA, methane emissions account for $1/10^{th}$ of all U.S. greenhouse emissions.[141] According to a 2011 Cornell University study heavily publicized by the national media, because of this, natural gas produced by fracking is actually worse for the environment than coal.[142]

Cornell's researchers reached this conclusion by estimating that between 3.6% and 7.9% of all produced natural gas is leaked into the atmosphere during the extraction and transportation process.[143] Since methane, the primary component of natural gas, is eighty times more potent a greenhouse gas than is CO_2,[144] The Cornell study concluded that the benefits derived from reduced CO_2 emissions from fracking are offset when compared to coal by a factor of somewhere between 20% and 50% over a twenty year horizon.[145]

Scientists at the University of Texas subsequently challenged the conclusions of the Cornell scientists.[146] The UT scientists agreed with an earlier EPA estimate that methane leakage from all U.S. natural gas and petroleum systems was only around 1.5%.[147] At those levels, according to the UT researchers, the conclusion of the Cornell scientists that natural gas is worse for the environment than coal would appear suspect. The Cornell scientists subsequently scoffed

[137] TAMEST, *supra* note 35, at 117-18.
[138] SERNOVITZ, *supra* note 21, at 78.
[139] TAMEST, *supra* note 35, at 90.
[140] Some contrarians argue that this is not necessarily a good thing. *See* GREGORY WRIGHTSTONE, INCONVENIENT FACTS: THE SCIENCE THAT AL GORE DOESN'T WANT YOU TO KNOW (2017).
[141] SERNOVITZ, *supra* note 21, at 175.
[142] *Id*. at 175-76.
[143] *Id*. at 176.
[144] John Schwartz & Brad Plumer, *The Natural Gas Industry Has a Leak Problem*, N.Y. TIMES (June 21, 2018), https://www.nytimes.com/2018/06/21/climate/methane-leaks.html; *see also* TAMEST, *supra* note 35, at 93-94.
[145] SERNOVITZ, *supra* note 21, at 176.
[146] *Id*. at 176-77.
[147] *Id*. at 176.

at the UT scientists and their "fatally flawed" study.[148]

TAMEST says using natural gas instead of coal produces a climate benefit if methane emissions (leaks) along the entire supply chain are kept at less than 1% for transportation or 3% for electricity generation.[149] A more recent national study puts the combined threshold at 4%.[150] Swinging the other way, the World Resources Institute claims that even a 1% methane leakage rate is too high for natural gas to have a net benefit over coal.[151] Contrary to that report, the *New York Times* cited Richard Miller, a Berkeley physicist and leading climate change scientist, as having concluded that it would be acceptable (but not good) to assume a 10% methane leakage rate in order for natural gas to have a net benefit over coal.[152]

Given the inconsistencies and incompleteness of data on methane emissions and thresholds for net benefit over coal, TAMEST concluded that more research is needed, and that comprehensive assessments of direct and indirect impacts on air quality from production from shale resources are complex (which is rather obvious).[153] However, TAMEST cited "observational studies" that would place most methane emissions from natural gas sources in Texas in the 0.5% to 1.5% range, and nationally from 0.5% to 5% or more.[154]

As the Cornell and UT debate evidences, and as is so often the case with any technical conclusions about hydraulic fracking, air emission impacts of hydraulic fracturing are the subject of proliferating and often conflicting studies and commentaries.[155] So how can researchers isolate the air quality impacts of fracking and how large a percentage of total air pollution is caused by fracking? As TAMEST suggests, isolating the impact of shale resource development on air quality from the impact of other sources is very complex and very difficult.[156] There are other sources of air pollution from fracking besides CO_2 and methane leaks. Recall the 1,700 trucks per frack job referenced in Part III. Each truck trip has associated air pollution leading to increased amounts of ozone, volatile organic compounds (VOCs), sulphur dioxides and nitrogen oxides (NOx) being leaked into the atmosphere.[157] Air pollutants are also released from natural gas compressor stations and processing plants.[158]

However, ozone and NOx are leaked into the atmosphere by many other industrial sources, including automobiles. So is methane. For example, humans have helped to cultivate about 1.5 billion cows on the planet.[159] By one estimate, 16% of worldwide methane emissions are caused by cow flatulence, burping, and manure deposits, notwithstanding contributions from other agriculturally related sources (*e.g.*, pigs).[160] The EPA considers the agricultural sector to be the primary methane-emitting industrial sector in the United States, edging out the oil and gas industry, the second highest

[148] *Id.* at 177.
[149] TAMEST, *supra* note 35, at 94.
[150] Schwartz & Plumer, *supra* note 144.
[151] SERNOVITZ, *supra* note 21, at 177.
[152] *Id*.
[153] TAMEST, *supra* note 35, at 112.
[154] *Id*. at 94.
[155] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.05[2].
[156] TAMEST, *supra* note 35, at 101.
[157] *Id*. at. 99, 101.
[158] *Id*. at 91.
[159] George Dvorsky, *We've Grossly Underestimated How Much Cow Farts are Contributing to Global Warming*, GIZMODO (Sept. 29, 2017), https://gizmodo.com/we-ve-grossly-underestimated-how-much-cow-farts-are-con-1818993089.
[160] *Id*.

emitter.[161] Buildings, landfills, and the coal industry are other sources of methane emissions.[162]

Both sides of the fracking debate argue over whether methane leakage is a growing or a shrinking problem. During the Obama Administration, the EPA issued new methane emission rules that went into effect in 2015. These rules require operators to use "green completion" technology for fracked gas wells—ending an era of flaring gas.[163] Essentially, "green completion" technology involves containing the loss of methane and other hydrocarbons during flowback,[164] or controlling flaring to convert methane into carbon dioxide and water.[165]

Corporate self-interest has also plays a part in decreasing methane emissions—capturing and selling methane is more profitable than leaking it. Devon Energy boasts it has been using "green completion" technology exclusively since 2004, well before the EPA required it.[166]

In addition, EPA data shows that methane released in the United States has been declining since at least 1990. There was a 10% decline in methane releases between 2003 and 2013, which is 23% more than the decline rate of CO_2. During the same period, U.S. gas production rose 32%, and this was even before the EPA's new green completion rules went into effect.[167]

But the record of accomplishment of the United States in reducing methane and CO_2 releases should not be viewed in isolation. Reducing greenhouse gas emissions from China, India and other emerging countries has been called the "grand battle in the fight against climate change."[168] China's CO_2 emissions have grown 3.5 times since 1993 while U.S. CO_2 emissions have declined by 4%, making China responsible (in 2015) for 29% of the world's total CO_2 emissions as compared to 15% for the U.S. (in 2015).[169] The proponents of fracking argue that if shale gas can displace the burning of coal in developing countries through exports of LNG from the U.S. and other places, growth in CO_2 emissions worldwide have a shot, at least, at being reduced or at least slowed, giving renewable energy more time to expand and ultimately take hold.

This, however, circles back to the fundamental issue of whether wholesale conversions from coal to natural gas generated power plants internationally will be a solution to global warming (through reductions of CO_2 emissions), or potentially disastrous for the planet because of the generation of sizable volumes of atmospheric methane?[170] Proponents of fracking argue that concerns about methane emissions are overblown. Though methane is unquestionably a more potent greenhouse gas than CO_2, it dissipates in about a dozen years versus CO_2 which stays around for thousands.[171] Furthermore, there is no consensus on the threshold at which methane leakage offsets CO_2 reductions. As pointed out earlier, estimates of the "threshold" leakage range at which methane is worse for

[161] *Overview of Greenhouse Gases: Methane Emissions*, U.S. ENVTL. PROTECTION AGENCY, https://www.epa.gov/ghgemissions/overview-greenhouse-gases#methane.
[162] *Id*.
[163] MARK S. GURALNICK, FRACKING: LAW AND POLICY § 20.01[D] (2016).
[164] *Id*. § 20.01[D][1].
[165] SERNOVITZ, *supra* note 21, at 178.
[166] *Id*.
[167] *Id*. at 177.
[168] *Id*. at 192.
[169] *Id*. at 190.
[170] GURALNICK, *supra* note 163, § 6.19.
[171] SERNOVITZ, *supra* note 21, at 177.

the environment than coal range from 1% to 10%.[172]

Furthermore, is the oil and gas industry being unfairly singled out to blame for methane leakage and its impact on climate change? Given the significant role of cow flatulence in worldwide methane emissions, and at risk of sounding flippant, perhaps humans, as the advertisement of one well-known fast food chain suggests, should "eat more chicken?"

Opponents of fracking might correctly point out that the incompleteness and inconsistencies in research[173] on the methane emissions "threshold" are unsettling given the gravity of the question. Furthermore, the success of the U.S. in reducing its methane emissions may not be easily replicated in China, India and other less developed countries where the infrastructure and regulatory processes may not be up to the challenge, at least in the short run.

The question of methane emissions aside, another serious criticism of fracking is that the very success of industry in both reducing emissions and making oil and gas more affordable, is postponing the switch to renewable forms of energy and thereby aggravating global warming.[174] As another author of *Hydraulic Fracturing Law and Practice* put it, there is concern that "cheap and plentiful oil and natural gas may prove too popular, thereby diminishing the market penetration of renewable resources and resulting in a bridge that leads nowhere."[175]

D. Earthquakes

Fracking is often blamed for the increase in seismic activity in Oklahoma and elsewhere. For example, in November 2011, a magnitude 5.7 earthquake—the largest in Oklahoma history—occurred near Prague, Oklahoma, destroying at least sixteen homes.[176] One homeowner, Sandra Ladra, suffered a leg injury when her stone fireplace broke off onto her legs during the earthquake.[177] Though the Oklahoma Geologic Society concluded that the earthquake was likely attributable to natural causes,[178] other scientists disagreed[179] and pointed to nearby injector wells as the probable cause. Prague soon became another battle cry for anti-fracking activists.

The recent increase in the number of magnitude 3.0 or greater earthquakes[180] in Oklahoma has been dramatic, rising from 2.2 annually in 2008 to 890 annually in 2015.[181] As discussed in Part III.C, there is a growing consensus in the scientific community that these increases in seismic activity are a result of disposal of produced wastewater in proximity to existing faults.[182]

[172] *Id*.
[173] TAMEST, *supra* note 35, at 112; *see also* GURALNICK, *supra* note 163.
[174] SERNOVITZ, *supra* note 21, at 177.
[175] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.04[3].
[176] SERNOVITZ, *supra* note 21, at 94.
[177] Powell, *supra* note 46, at 1002.
[178] Hall, *supra* note 47 at 5-25.
[179] *Id*.
[180] Typically an earthquake must have a magnitude of 3.0 to 3.9 to be felt, though magnitude 3.0 to 3.9 earthquakes rarely cause damage. Magnitude 4.0 to 4.9 earthquakes are usually felt, but seldom cause significant damage. For an earthquake to cause significant damage, it must be magnitude 5.0 or higher on the Richter scale. An earthquake of 6.0 to 7.0 on the Richter scale would be considered strong, and one higher than 7.0, such as the San Francisco earthquake of 1906 (7.8 on the Richter scale) would likely be considered catastrophic. Hall, *supra* note 47, at 5-9.
[181] Powell, *supra* note 46.
[182] *Id*.

Texas has likewise been susceptible to earthquake activity, though not at so high a rate as Oklahoma. The ratio of the number of magnitude 3.0 earthquakes between Oklahoma and Texas is approximately 60 to 1.[183] This is because, according to TAMEST, the majority of faults in Texas are stable and not prone to generating earthquakes.[184] Nevertheless, according to TAMEST, from 1980 to 2007 there were an average of two magnitude 3.0 or more earthquakes in Texas per year.[185] From 2007 to 2017, the number increased to twelve magnitude 3.0 or greater earthquakes per year.[186]

But is it fair to blame fracking for the upsurge of earthquakes in Oklahoma, Texas and elsewhere? Scientists almost uniformly agree that hydraulic fracturing very rarely causes seismicity.[187] The National Research Council has reported that hydraulic fracturing "does not pose a high risk for inducing felt seismic events" largely because of the relatively short duration of the injection process and short volumes of fluids involved."[188] It is commonly estimated that over 1 million wells have been hydraulically fracked worldwide, but there are only about a half dozen instances where evidence suggests that hydraulic fracturing may have induced seismicity.[189]

The rebuttal from opponents of fracking might be that even if there is no direct causal relationship between fracking and seismicity, there is indirect causation because, but for fracking, the large volumes of produced water would not have been injected in the first instance. For example, from 2010 to 2014, oil production in Oklahoma increased by 90% and gas production by 26%. Water production rose commensurately, at ten times the volume.[190] Much of this water is disposed of in injection wells. Fracking is responsible for much of the increase in oil, gas and water production in Oklahoma, especially in the Woodford, STACK and SCOOP shale play areas. It would be tempting to conclude, therefore, that fracking is responsible for the increased number of earthquakes caused by produced water injection.

But the causal link between fracked well produced water disposal and earthquakes is very speculative. As mentioned in Part III.C, over 100,000 injection wells have been drilled in the United States for secondary recovery purposes and another 30,000 drilled for wastewater injection purposes. Most of these injection wells are used for conventional oil and gas operations and have nothing to do with fracking. Most of the earthquakes in Oklahoma, for example, are occurring outside the areas of the two most active shale plays, the STACK and SCOOP, which are located in West Central and South Central Oklahoma.[191]

Furthermore, there is conflicting and inconsistent data on how many of the earthquakes in recent years occurring in Texas, Oklahoma, and elsewhere have been induced by industrial activities as distinguished from natural causes.[192] There is also conflicting data on how serious a problem injector wells really are. In the

[183] TAMEST, *supra* note 35, at 16.
[184] *Id*. at 44.
[185] *Id*.
[186] *Id*.
[187] Hall, *supra* note 47, at 5-23.
[188] HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.05[4].
[189] Hall, *supra* note 47, at 5-23.
[190] SERNOVITZ, *supra* note 21, at 94.
[191] *See* HYDRAULIC FRACTURING L&P, *supra* note 22, § 1.05[4].
[192] Hall, *supra* note 47, at 5-28. "Some people are skeptical of the conclusion that injection disposal is responsible for the overall increase [in detected seismicity], believing that the available evidence does not yet justify such a conclusion."

Barnett Shale region of North Texas, according to a 2015 SMU study, 99% of injection wells have not been associated with earthquakes that could be felt by citizens.[193]

The SMU study was consistent with other studies which have concluded that the great majority of injection activities in the U.S. will not induce seismic activity.[194] This is because a very specific set of geologic conditions must be present in order for seismicity to be induced.[195] For this reason, of the approximately 30,000 injection wells in the U.S. that are permitted for disposal of waste water generated by oil and gas activities, only a small fraction are suspected of having induced seismicity.[196] The question becomes, of this relatively small set of injector wells, how much fracking well produced water was disposed of versus produced water from conventional wells? Conventional well production still accounts for more than half of U.S. production.[197]

As with so many other technical issues associated with fracking, data on produced water injections is both difficult to obtain and can be inconsistent and conflicting. According to TAMEST, ongoing research efforts, both academic and industrial, are needed to fully inform the public, the Texas legislature, and the Texas Railroad Commission of the risks of earthquakes that may occur due to produced water injection.[198]

Regardless of the cause, and the seemingly low magnitude of the overwhelming majority of earthquakes associated with injection wells, dangers posed by earthquakes should not be minimized. Because of these risks, regulators in Texas, Oklahoma and other states are more closely scrutinizing injector well applications and are putting in place what have been called "traffic light systems" designed to halt produced water disposal near known faults, as discussed in more detail in Part VIII.D. In addition, the Texas legislature in 2015 provided funding for installation of the TexNet seismic monitoring system to improve statewide seismic monitoring capability by increasing the number of seismic monitoring stations in Texas from 18 to 43.[199]

Despite regulatory progress, and as with practically everything else about fracking, the opponents of fracking are prone to exaggerate the risks of earthquakes, and media attention is unrelenting. But the oil and gas industry has no monopoly on industrially induced earthquakes. Although the oil and gas industry's injection activities receive most of the attention, dams, geothermal operations, and other activities besides oil and gas can also induce seismicity.[200] In the 1960s, the U.S. military injected waste water into the Rocky Mountain Arsenal near Denver, allegedly causing earthquakes.[201]

So is the threat of earthquakes a reason to ban hydraulic fracking? If so, should hydro-electric powering dams be banned, or use of geothermal energy, for the same reason? Should all 130,000 injector wells in the U.S. be banned in order to eliminate any risk that they may contribute to

[193] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.01.
[194] Hall, *supra* note 47, at 5-16.
[195] *Id*. at 5-16–5-17.
[196] *Id*. at 5-22.
[197] *Frequently Asked Questions (Oil)*, U.S. ENERGY INFO. ADMIN. (Mar. 8, 2018), https://www.eia.gov/tools/faqs/faq.php?id=847&t=6; *Frequently Asked Questions (Natural Gas)*, U.S. ENERGY INFO. ADMIN. (Mar. 8, 2018), https://www.eia.gov/tools/faqs/faq.php?id=907&t=8.
[198] TAMEST, *supra* note 35, at 65.
[199] *Id*. at 61.
[200] Hall, *supra* note 47, at 5-13, 17.
[201] *Id*. at 5-13.

earthquakes, irrespective of the crippling effect that might have on U.S. conventional oil production? Conversely, and regardless of the cause, given the relatively small number of earthquakes in Texas and Oklahoma over the past ten years that have caused significant property damage or injuries (and so far, no fatalities), are the risks of earthquakes from fracking reasonably acceptable? Once again, the answer to those questions often depends as much on a person's political perspective on the oil and gas industry as it does on science and engineering analysis.

Though the evidence is strictly anecdotal, news accounts of earthquakes in Texas and Oklahoma appear to be on a downward trajectory despite the fact that fracking activities are still robust in both states. Whether this is because new regulations are doing their job, or because there never was a proved causal relationship between earthquakes and fracking in the first place,[202] is a question for further study.

E. Land Resources

The reduced surface footprint that multi-well pad drilling provides is one benefit of hydraulic fracturing. But as with everything else about fracking, its impact on land resources is complex.

There are winners and losers when it comes to the surface impact of hydraulic fracking. Oil and gas companies, royalty owners and taxing authorities are among the winners. However, what about the severed surface owner whose land withstands the worst of surface operations for fracking but who enjoys none of the royalty income? In Texas and most other oil producing states, the mineral estate is dominant over the surface estate. This means that an implied easement is held by the mineral lessee to reasonable use of the surface limited (in Texas) only by the "accommodation doctrine" per the 1971 Texas Supreme Court decision in *Getty Oil Co. v. Jones.*[203]

Texas, unlike some other oil producing states, has no Surface Damages Act. Such laws level the playing field more between surface owners and oil companies by requiring larger damage payments and more accommodation of the surface owner than is required under common law. In Texas, given the absence of such a statute, a severed surface owner relying strictly upon contract rights is limited by whatever reservations of rights may have occurred in the original mineral severance document—which usually means few, if any, contractual rights at all.

Other losers, as alluded to earlier under the discussion of water usage, are local farmers and ranchers who may be suffering from loss of groundwater needed for agricultural operations due to groundwater withdrawals for hydraulic fracturing purposes. This has led some Groundwater Conservation Districts (GCDs) in Texas to back-door their way into regulating hydraulic fracking by either charging fees for permits or restricting water usage for hydraulic fracking purposes, citing agricultural or drinking water needs. This raises a question under Section 81.0523 of the Texas Natural Resources Code as to whether GCDs have authority to do this, as discussed in Part VIII.E.[204]

[202] Hall, *supra* note 47, at 5-17–5-19.

[203] *Getty Oil Co. v. Jones*, 470 S.W.2d 618, 623 (Tex. 1971).

[204] HB 40, passed by the 84th Texas Legislature effective May 18, 2015, and codified in Tex. Nat. Res. Code § 81.0523, preempts municipal and other local regulation of hydraulic fracturing except for certain limited exercises of municipal police powers in § 81.0523(c). Even then, the ordinances cannot be commercially unreasonable and cannot prohibit oil

Other losers are breeds of wildlife not protected by the Endangered Species Act, and their enthusiasts. Can the oil and gas industry co-exist with the Dunes Sage Brush Lizard and the Lesser Prairie Chicken? Some may flippantly say, "Who cares?". However, this is a real issue for wildlife enthusiasts and regulators and is one that the oil and gas industry should not take lightly. Much concern arose among Texas oil and gas operators during the Obama Administration when the EPA proposed adding the Dunes Sage Brush Lizard and the Lesser Prairie Chicken to the federal endangered species list. Were such listings to occur, they could severely affect, or even halt, shale development in parts of Texas and New Mexico. In Texas, both species are now covered by voluntary conservation plans overseen by state agencies.[205]

F. Transportation

Earlier mention was made of the approximately 1,700 truck trips per frack job needed to develop Eagle Ford Shale resources in South Texas. Frack trucks are not the only trucks using Texas roads as part of shale development. Often, oil must be trucked out due to lack of pipeline capacity. Drilling contractors and other service companies also use Texas roads. Most Texas rural and county roads were not designed to carry the extent of truck traffic currently associated with shale oil and gas development.[206] Developing a typical shale oil or gas well was estimated by TAMEST to be the rough equivalent of over 20 million passenger cars a year in resulting pavement impacts.[207]

TAMEST estimated the road impact in Texas caused by shale resource development to be 1.5 to 2.5 billion dollars in damages a year.[208] In 2017, this was offset by 11 billion dollars in increased state tax revenues.[209]

But with the road impacts comes air pollution, noise, increased risks of oil spills and, sadly, traffic injuries and fatalities.[210] The quality of life in communities through which shale-related truck traffic must travel is prone to deteriorate.[211] Increased economic benefits and tax revenues do not necessarily compensate for such losses.

G. Social Impacts

Much of shale development occurs in rural areas or near small towns that withstand the worst from increased traffic congestion, road impact, wastewater disposal, and traffic fatalities and injuries. Non-local mineral owners are often the prime beneficiaries of shale gas development. Much of the increased tax revenues from shale development go to state and federal, not local, tax coffers. On the other hand, the influx of shale workers and their employers into such areas can create opportunities and jobs in service industries such as motels, restaurants, and stores.

Social justice issues also arise in connection with fracking operations. A study conducted in the Eagle Ford Shale region of

and gas operations which are conducted by a reasonably prudent operator. § 81.0523(c)(2) & (3).

[205] TAMEST, *supra* note 35, at 80.

[206] *Id*. at 132.

[207] *Id*. at 135.

[208] *Id*. at 145.

[209] Katherine Blunt, *Texas Mineral Taxes and Royalties Increased in 2017*, HOUS. CHRON. (Mar. 29, 2018, 8:02 AM), https://www.chron.com/business/energy/article/Texas-mineral-taxes-and-royalties-increased-in-12710678.php. The article says this was up from $9.4 billion paid in 2016, according to the Texas Oil and Gas Association.

[210] TAMEST, *supra* note 35, at 140.

[211] *Id*. at 158.

Texas indicated that injection wells were disproportionately permitted near communities with large percentages of minorities and high levels of poverty.[212] The study also suggested that "…discrepancies in locations of new wastewater disposal wells may be driven by and contribute to differences in political capital between people of color and white communities and between high and low-wealth areas."[213]

Religious issues have also arisen due to shale development. The best-known shale development confrontation involving religion has been the Standing Rock episode regarding the Keystone Pipeline and protests of Native American tribes in the Dakotas. However, such religious objections to shale development are not limited to Native Americans. Leaders of many other religious denominations, including mainline Christian denominations, have expressed concern, or opposition, related to hydraulic fracturing and its effects.[214]

VII. State Regulation of Hydraulic Fracturing: One Size Does Not Fit All

Earlier the law of hydraulic fracturing was compartmentalized into seven areas, which at risk of redundancy, are repeated again (non-exclusive): (a) fracking fluid chemical disclosures; (b) wellbore integrity requirements; (c) air and water pollution; (d) nuisance; (e) notices; (f) induced seismicity; and (g) local government preemption.[215]

So how do U.S. states approach regulation of fracking? One approach is to ban it completely, or place a moratorium on it, as has been done in Vermont (2012), New York (2015), Massachusetts (2016), and Maryland (2017).[216]

A second approach is to regulate it comprehensively—to the point of extinction. The best example of this is the Illinois Hydraulic Fracturing Regulatory Act,[217] also called the Illinois Frack Act, which was signed by Illinois Governor Pat Quinn in 2013. The Illinois Frack Act, which runs 40 pages not counting its accompanying "Illinois Hydraulic Fracturing Tax Act,"[218] is easily the most extreme fracking statute in the United States.

Under the Illinois Frack Act, practically anyone has standing to object to fracking permits, with or without a nexus to the state. The Act includes highly detailed notices and public comment periods. Its accompanying Frack Tax Act[219] includes a special tax on fracked wells to offset road impacts, administration of the law, regulating, and more. Local government regulation is not only not preempted, it is required for approval of fracking permits.

The net result of the Illinois Frack Act of 2013 has been that as the summer of 2018, only one fracking permit had been applied for

[212] *Id*. at 162 (citing Jill E. Johnston, Emily Werder & Daniel Sebastien, *Wastewater Disposal Wells, Fracking, and Environmental Injustice in Southern Texas*, 106(3) AM. J. PUB. HEALTH 550 (2016)).
[213] *Id*.
[214] Dennis Sadowski, *Catholic Voices Raise Moral Concerns in Country's Fracking Debates*, CATHOLIC NEWS SERVICE (Dec. 11, 2013, 12:00 AM), http://www.catholicnews.com/services/englishnews/2013/catholic-voices-raise-moral-concerns-in-country-s-fracking-debates.cfm; *see also* Jeff Goliher, *Why I'm Opposed to Fracking*, THE EPISCOPAL CHURCH (Jan. 30, 2012), https://www.episcopalchurch.org/library/article/why-i%E2%80%99m-opposed-fracking.
[215] *See infra* Part II.
[216] *See infra* note 15.
[217] 225 ILL. COMP. STAT. 732/1-1 *et seq*. (2013).
[218] GURALNICK, *supra* note 163, § 3.02[I].
[219] 35 ILL. COMP. STAT. 450/2-5 *et seq*. (2013).

under the Act. That permit was later withdrawn when the operator, Woolsey Petroleum, decided it could not live with the conditions of the permit.[220] Thus, the Illinois Frack Act has effectively halted fracking in Illinois, home of the Illinois Basin, which is the largest and arguably most unexplored oil and gas basin in the U.S. Some say the New Albany Shale, which lies within the Illinois Basin, could rival the Eagle Ford and the Bakken as a major oil shale oil producing formation.[221]

Meanwhile, Illinois in 2018 is having a financial crisis and is at risk of becoming the first U.S. state with a junk bond credit rating due to massively underfunded public employee pension plans.[222] So how much tax revenue from oil and gas in Illinois is being left on the table due to the Illinois Frack Act? As it is sometimes said—"Go figure."

Though not to such an extreme as Illinois, other states have comprehensive fracking regulation statutes as well. These states include Pennsylvania,[223] California,[224] and Alaska.[225] Though comprehensive regulations are imposed, none of these states, unlike Illinois, have regulated fracking to extinction (though California is close[226]). Pennsylvania is one of the leading states in the United States in shale gas production, accounting for 19% of total U.S. natural gas production in 2017, which places it second to Texas in total U.S. natural gas production.[227]

The third, and more mainstream approach to regulation of hydraulic fracturing, is incremental regulation. Instead of passing comprehensive statutes like the Illinois Frack Act, these states have added, incrementally, to their existing regimes of oil and gas regulation to address some of the main concerns of citizens, particularly with regard to drinking water protection. These categories of states could be further divided into more incremental (Colorado,[228] Ohio,[229] and Louisiana[230]), and more measured incremental (Oklahoma,[231] North Dakota,[232] Montana,[233] Wyoming,[234] Alabama,[235] and Texas[236]).

The last category of states are those states that have only minimally addressed hydraulic fracking with new regulations. The attitude in these states is that except for frack fluid disclosure, few other new regulations are needed because existing oil and gas law rules and regulations already address the major concerns. States in this category

[220] Alex Ruppenthal, *Fracking Permit is First to be Approved in Illinois*, WTTV: CHICAGOTONIGHT (Sept. 1, 2017), https://chicagotonight.wttw.com/2017/09/01/fracking-permit-first-be-approved-illinois.
[221] Keith Schaefer, *Illinois Basin's New Albany Shale: The Next Big U.S. Horizontal Oil Play?*, OIL AND GAS INVS. BULL. (Sept. 23, 2013), https://oilandgas-investments.com/2013/oil-and-gas-financial/illinois-new-albany-shale-oil/.
[222] Tina Sfondeles, *State's Bond Rating "Uncommonly Low" due to "Crisis-like Budget Environment*, CHI. SUN-TIMES (Apr. 6, 2018, 10:47 PM), https://chicago.suntimes.com/business/states-bond-rating-uncommonly-low-due-to-crisis-like-budget-environment/.
[223] HYDRAULIC FRACTURING L&P, *supra* note 22, § 34.
[224] *Id*. § 7.
[225] *Id*. § 5.
[226] *See Fracking in California: Production*, BALLOTPEDIA, https://ballotpedia.org/Fracking_in_California#Production.
[227] *Pennsylvania's Natural Gas Production Continues to Increase*, U.S. ENERGY INFO. ADMIN.: TODAY IN ENERGY (Apr. 23, 2018), https://www.eia.gov/todayinenergy/detail.php?id=35892.
[228] HYDRAULIC FRACTURING L&P, *supra* note 22, § 8.
[229] *Id*. § 33.
[230] *Id*. § 22.
[231] *Id*. § 23.
[232] *Id*. § 15.
[233] *Id*. § 11.
[234] *Id*. § 20.
[235] *Id*. § 25.
[236] *Id*. § 24.

include Mississippi,[237] Nebraska,[238] Kansas,[239] New Mexico,[240] and Utah.[241]

VIII. Texas Regulation of Hydraulic Fracturing

So what type of concerns do Texas regulators address regarding hydraulic fracking? Largely, Texas concerns are similar to all the other concerns discussed so far. Texas, as a state with a more measured, incremental approach to new fracking regulations than some other states,[242] relies heavily on its existing regime of regulating conventional oil and gas operations developed over the past 125 years.[243]

But Texas has added new regulations applicable to hydraulic fracturing in these five areas: (a) chemical disclosures; (b) well integrity, testing, and technical treating requirements; (c) notices; (d) seismicity; and (e) local bans on fracking (state preemption).

A. Chemical Disclosures

As Professors Smith and Weaver put it when discussing public opposition to fracking in Texas and elsewhere, "… the loudest call from citizens was for disclosure of the chemicals that were being injected down wells during the fracturing process and the threat posed to groundwater supplies."[244] Despite the actual risks associated with hydraulic fracking fluids (see Part VI.A), the public outcry after the HBO Documentary *Gasland* in 2010 was so severe that oil and gas producing states began passing Hydraulic Frack Fluid Disclosure Laws. Texas was among the first states to do this.[245]

The Texas "Disclosure of Composition of Hydraulic Fracturing Fluids" Act, also called the "Texas Hydraulic Fracturing Fluid Disclosure Act," was passed in 2011 and was signed into law by then Governor Rick Perry.[246] This was followed by Texas Railroad Commission Statewide Rule 29, titled "Hydraulic Fracturing Chemical Disclosure Requirements" and adopted on January 2, 2012.[247]

Under TRRC Rule 3.29(c)(1)(a), within 15 days following the completion of a fracking treatment on a well, the supplier or the service company must disclose to the operator of the well each additive used in the fracking fluid and the trade name, supplier, and a brief description of the intended use or function of each additive.[248] Chemical ingredients and maximum concentrations must also be disclosed.[249] The operator must then ensure that the disclosure information is posted on the FracFocus website.[250]

Texas was one of the first states to make disclosure on the FracFocus website mandatory for operators. What is FracFocus? It is a website launched in 2011, co-developed by the Oklahoma City based

[237] *Id*. § 30.
[238] *Id*. § 12.
[239] *Id*. § 10.
[240] *Id*. § 14.
[241] *Id*. § 18.
[242] *See infra* Part VII.
[243] For a history of the Texas Oil and Gas Industry and its development of oil and gas regulations, see HYDRAULIC FRACTURING LAW, *supra* note 22, § 24.01.
[244] 3 ERNEST E. SMITH & JACQUELINE LANG WEAVER, TEXAS LAW OF OIL AND GAS § 14.11(A) (2d ed. 2015).
[245] John D. Furlow & Corinne V. Snow, *In the Wake of the Shale Revolution: A Primer on Hydraulic Fracturing Fluid Chemical Disclosure*, 8 TEX. J. OIL GAS & ENERGY L. 249, 255 (2012–13).
[246] Tex. Nat. Res. Code Ann. § 91.851.
[247] 16 Tex. Admin. Code § 3.29.
[248] GURALNICK, *supra* note 163, § 3.02[H] (citing 16 Tex. Admin. Code § 3.29(c)(1)(a), implementing Tex. Nat. Res. Code Ann. § 91.851).
[249] *Id*.
[250] FRACFOCUS, https://fracfocus.org/ (last visited Aug. 6, 2018).

Groundwater Protection Council and Interstate Oil and Gas Compact Commission. Essentially, it is an online registry that operators use to disclose the content of frack fluids. The registry is then accessible to the general public, including regulators, landowners, environmental groups, and plaintiff's lawyers. The theory, at least, behind the new chemical disclosure requirements was that the more data disclosure, and transparency, the more opportunity to trace groundwater contamination caused by hydraulic fracturing.

The Texas frack fluid disclosure requirements applied only to frack operations undertaken after February 1, 2012, and were not retroactive. Critics of hydraulic fracturing did not like this, but the legislature decided it was impractical to make the law retroactive given the hundreds of thousands of wells drilled in Texas since hydraulic fracking began in the 1940s.

Another feature of the law that critics of fracking did not like was its provision for trade secret protection.[251] Oil companies had pressed for trade secret protection because without it, competitors could imitate or use reverse engineering and thus deprive operators of their proprietary technologies. This would in turn discourage investment in development of new technologies. Critics, on the other hand, look upon trade secret protection as a loophole that gives oil companies a license to inject any chemicals they wished.

Some say that the need for trade secret protection is overblown. As one commentator observed, the real secret about frack fluids is that most likely, there is little difference between one oil company's proprietary frack fluid formulas and that of others.[252] For this reason, many companies have listed all the components of frack fluids on the FracFocus website without bothering to claim trade secret protection.[253] In retrospect, the industry's obsession with trade secret protection appears to have played into the hands of opponents of fracking by notching up public paranoia.[254]

Opponents of fracking in Texas also criticized the exemption of wells fracked before February 1, 2012 from the Act's disclosure requirements despite the practical problems of including tens of thousands or more of wells and the paucity of evidence that any of them may have been responsible for groundwater contamination.[255] FracFocus itself was criticized, along with the Texas Railroad Commission, for its failure to implement procedures that would independently verify the contents of the disclosures.[256]

To assuage critics, the Act also includes provisions for challenging trade secret protection provided certain eligibility requirements are met.[257] Operators may not withhold any information requested by health care professionals or emergency responders.[258]

Despite its critics, the Texas Hydraulic Fracturing Fluid Disclosure Act and its accompanying Texas Railroad Commission Statewide Rule 29 have become models for hydraulic fracturing disclosure

[251] Tex. Nat. Res. Code Ann. §91.851(a)(3)-(7), implemented by 16 Tex. Admin. Code § 3.29(3).
[252] SERNOVITZ, *supra* 21, at 79.
[253] *Id*.
[254] *Id*.
[255] HYDRAULIC FRACTURING LAW, *supra* note 22, § 24.02[2][c].
[256] *Id*.
[257] Tex. Nat. Res. Code Ann. § 91.851(a)(4) & (5).
[258] *Id.* § 91.851(a)(7).

statues and regulations nationwide.[259] Together they "introduced a new level of transparency designed to both allay public fears of water contamination and to facilitate collection of raw data that could be used to study the impacts of hydraulic fracturing more scientifically."[260]

B. Well Integrity, Testing, Technical Treating Requirements

In Part III.C, reference was made to TAMEST's conclusion that in Texas, the depth of separation between water tables and zones where fracking occurs is generally thousands of feet of overburdening rock. This makes direct contamination of water supplies by hydraulic fracking unlikely in Texas.[261]

But due to the public outcry over fracking, in 2014 the Texas Railroad Commission revised its Statewide Rule 13, "Casing, Cementing, Drilling, Well Control, & Completion Requirements."[262] Rule 13 establishes the technical standards for casing and cementing oil and gas wells to protect groundwater and to prevent blowouts.[263] Well integrity requirements are the first line of defense in protecting water supplies from subsurface oil and gas operations, including hydraulic fracking.

TRRC Rule 13 is highly technical and not easily understood by those without a petroleum engineering degree.[264] A detailed summary of the Rule is found at § 24.02[4][a] of *Hydraulic Fracturing Law and Practice*.

In Part VI.A, it was explained that the geology in Texas is such that it is highly unlikely that a well would ever be fracked within 1,000 feet of a drinking water aquifer. However, if this happened, the Texas Railroad Commission applies a set of very specific, technical requirements that minimize the chances of public drinking water supplies ever being contaminated by fracking operations.[265]

Besides well casing requirements, TRRC Rule 13 requires surface controls to be put in place governing gas well-heads to prevent leaks and to ensure adequate safety controls to prevent blowouts. Even the Environmental Defense Fund has praised revised TRRC Rule 13 as putting Texas on the forefront among states when it comes to well integrity practices designed to prevent methane leakage, water contamination and blowouts.[266]

C. Notices

Texas, unlike Illinois and other states with more comprehensive fracking regulation, has no notice requirements in its oil and gas rules and regulations that specifically address hydraulic fracturing other than the FracFocus chemical disclosure requirements of TRRC Rule 29 already discussed.[267] There is some room for

[259] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[2][c].
[260] *Id*.
[261] TAMEST, *supra* note 35, at 113. "The depth separation between oil-bearing zones and drinking-water bearing zones in Texas makes direct fracturing into drinking water zones unlikely and has not been observed in Texas."
[262] 16 Tex. Admin. Code § 3.13 (2018).
[263] HYDRAULIC FRACTURING L&P, supra note 22, § 24.02[4][a].
[264] *Id*.
[265] 16 Tex. Admin. Code § 3.13 (a)(7)(A)-(D).
[266] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[4][a].
[267] TRRC form W-2, upon which well completion reports are to be filed, asks whether a hydraulic fracturing operation was performed, and if so, what type (acid, fracking, or others). Form W-2 also requires disclosure of the amount and kind of material used and the depth intervals where the operation

municipalities to expand notice requirements if "commercially reasonable" under Section 81.0523 of the Texas Natural Resources Code, discussed in Part VIII.E below.

As with any other well drilled in Texas, the Railroad Commission requires operators under Statewide Rule 16 to file a completion report with the Commission within 90 days after completion of an oil or gas well or within 150 days after the date drilling operations were completed, whichever is earlier.[268] The completion report is filed on a form W-2 which has a blank to indicate if a hydraulic fracking operation was performed.[269]

D. Seismicity

A mentioned in Part VI.D, regulators in Texas and elsewhere have developed what is often called a "traffic light" system to address induced seismicity. This is provided for by Texas Railroad Commission Statewide Rules 9[270] and 46,[271] which were amended in 2014. The amendments to Statewide Rules 9 and 46 apply to injector wells, not to hydraulic fracturing per se.

What is a "traffic light" system? A "traffic light system" consists of monitoring injection rates and pressures and the surrounding area for seismic activity.[272] If no activity is detected, or if only low magnitude seismic events are detected, the company has a "green light" to continue its injection operations.[273] If seismic events above a certain magnitude are detected, the company has a "yellow light" which allows it to go forward, but requires precautions to be taken. Such precautions can include reducing injection rates, reducing pressures, and or increasing monitoring.[274] Finally, if seismic events above a certain magnitude are detected, or perhaps multiple events that individually might only trigger a "yellow light," then the company has a "red light" and must cease operations.[275]

Upon application for a Class II injection well permit,[276] the TRRC requires printed screen shots showing all historical seismic events within 100 miles of the proposed well. TRRC then determines whether the well should be permitted with no restrictions (green light), not be permitted (red light), or allowed to proceed, but with caution (yellow light), and subject to shut down based on future data.

The Commission may also require additional information such as logs, geologic cross sections, and pressure front boundary calculations to show that the disposal fluids will remain confined if the well is operated in areas where there is an increased risk of fluid migration.[277] Operators must perform monthly monitoring and report annual injection rates and pressures.[278] The Commission may require more frequent

occurred. HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[3][b].

[268] 16 Tex. Admin. Code § 3.16(b)(1).

[269] *See supra*, text accompanying note 267.

[270] 16 Tex. Admin. Code § 3.9.

[271] *Id*. § 3.46.

[272] Hall, *supra* note 47, at 5-20.

[273] *Id*. at 5-21.

[274] *Id*.

[275] *Id*.

[276] A Class II injection well is defined by the EPA for purposes of amendments to the Safe Drinking Water Act of 1974 (as amended in 1986 and 1996) as a well used only to inject fluids associated with oil and natural gas production. Class II fluids are primarily brines (salt water) that are brought to the surface while producing oil and gas. *See Underground Injection Control (UIC) - Class II Oil and Gas Related Injection Wells*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/uic/class-ii-oil-and-gas-related-injection-wells.

[277] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[8].

[278] *Id*.

monitoring and reporting in areas where conditions warrant.[279]

E. Local Bans on Fracking (State Preemption)

Local versus state control over hydraulic fracking is a contentious issue within oil producing states. (See *infra* Part IX.A). Texas has been no exception. The first municipal ban on hydraulic fracking in the United States arose in Texas. Denton, Texas, the home of the University of North Texas, is a suburban community located north of Dallas/Fort Worth. Voters in Denton became concerned about Barnett Shale development and its potential impact on their community. On November 4, 2014, Denton voters passed a hydraulic fracturing ban, criminalizing a standard industry practice.[280] The ban was immediately challenged with a lawsuit filed by the Texas Oil and Gas Association (TXOGA) claiming that the ban conflicted with Texas Railroad Commission and Texas Commission on Environmental Quality Rules and was therefore invalid under the preemption doctrine.[281]

In response, the 84th Texas Legislature passed HB 40, effective May 18, 2015, codified in Section 81.0523 of the Texas Natural Resources Code. The law preempts municipal and other local regulation of hydraulic fracturing except for certain limited exercises of municipal police powers in Section 81.0523(c). Even then, the ordinances cannot be commercially unreasonable and cannot prohibit oil and gas operations conducted by a reasonably prudent operator.[282]

Following the passage of HB 40, the City of Denton repealed its ordinance banning hydraulic fracturing on June 17, 2015.[283] The TXOGA lawsuit was rendered moot and was dismissed.[284]

It is tempting to say that HB 40 resolved the question of whether or not Texas localities may ban or unreasonably burden fracking operations.[285] Under HB 40, with some very narrow exceptions for municipalities, such efforts appear preempted by statewide regulation of drilling permits by the Texas Railroad Commission.[286]

However, the statute leaves many questions unanswered.[287] Did the legislature intend HB 40 to strip local governments and other political subdivisions of all ability to regulate hydraulic fracturing within their borders? For example, what about Groundwater Conservation Districts? Do they have no ability to control water withdrawals for hydraulic fracturing in drought prone areas?[288] One commentator

[279] *Id*.

[280] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[4][a]; *see* Jim Malewitz, *Texas Drops Suit over Dead Denton Fracking Ban*, TEX. TRIB. (Sept. 18, 2015, 11 AM), https://www.texastribune.org/2015/09/18/texas-drops-suit-over-dead-denton-fracking-ban/.

[281] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.01.

[282] Tex. Nat. Res. Code Ann. § 81.0523(c)(2)-(3).

[283] Mose Buchle, *Denton Repeals Fracking Ban*, TEX. TRIB. (June 17, 2015, 9:00 AM), https://www.texastribune.org/2015/06/17/denton-repeals-fracking-ban/.

[284] Jim Malewitz, *Texas Drops Suit over Dead Denton Fracking Ban*, TEX. TRIB. (Sept. 18, 2015, 11 AM), https://www.texastribune.org/2015/09/18/texas-drops-suit-over-dead-denton-fracking-ban/.

[285] HYDRAULIC FRACTURING L&P, *supra* note 22, § 24.02[9].

[286] *Id*.

[287] *See* Stephen Elkind, Note, *Preemption and Home-Rule: The Power of Local Governments to Ban or Burden Hydraulic Fracturing*, 11 TEX. J. OIL GAS & ENERGY L. 415, 416 (2016).

[288] HYDRAULIC FRACTURING L&P, *supra* note 22, at § 24.02[9], referring to discussions in §24.01 and §24.02[5].

implies that HB 40 merely took the preemption debate to the next level.[289]

IX. Case Law Development

The last major component of the law of hydraulic fracturing is case law. The body of hydraulic fracturing case law in the United States is more sparse than what may be anticipated, given the intensity of opposition to fracking. This dearth of case law is partly explainable because hydraulic fracturing has come of age relatively recently and many cases involving fracking settle prior to reaching the appellate courts for review. So far, most hydraulic fracturing litigation can be divided into three areas of law: (a) local government preemption; (b) tort law; and (c) a miscellaneous hodgepodge of rulemaking challenges, permit challenges, citizen's suits, and contract claims involving fracking.

A. Local Government Preemption

Preemption occurs when a more powerful governmental authority enacts laws and regulations that govern a lesser governmental authority.[290] The most common type of preemption is when federal authorities preempt state authorities. Usually, federal preemption occurs in situations where no regulation exists on a subject, or low-level regulation is implemented in piecemeal fashion. Then, to develop consistent standards, the federal authority will pass a law that overrides all state level laws. States can also preempt laws and regulations at the local level. This latter kind of preemption, called intrastate preemption,[291] is the focus of this subsection. Preemption generally can occur in three ways: by express preemption, implied (or field) preemption, and operational (or conflict) preemption.[292]

Historically, oil and gas regulation has occurred primarily at the state level. However, following an explosion of development in shale plays across the country and accompanying negative media coverage, several local government entities became particularly aggressive in their attempts to regulate fracking. The 2014 Denton fracking ban was the first attempt in the nation by a local municipality to ban fracking within its city limits. As discussed above, the state authorities effectively wiped out Denton's regulations by passing a state law that overrode the local ordinance.

Preemption can also happen in the reverse order, with a state preempting the local authorities even before the local authorities pass any regulations related to the area. In the 2012 case of *Robinson Twp. v. Commonwealth*,[293] municipalities in Pennsylvania challenged a state law which restricted their ability to adopt local regulations regarding oil and gas operations. In order to promote the development of the Marcellus Shale, the legislature and governor

[289] *See* Elkind, *supra* note 287.

[290] *Preemption Conflicts between State and Local Governments*, BALLOTPEDIA, https://ballotpedia.org/Preemption_conflicts_between_state_and_local_governments (last visited Nov. 20, 2018).

[291] *See* Uma Outka, *Intrastate Preemption in the Shifting Energy Sector*, 86 U. COLO. L. REV. 927, 941 (2015).

[292] A state law that expressly states an intention to override local government authority effectuates express preemption. Field preemption occurs when state law is so extensive in its scope and purpose that it impliedly occupies an entire field of law. Operational, or conflict preemption, is also a type of implied preemption that involves analyzing the extent to which state and local interests create policy conflicts. The analytical rules of conflict preemption differ among jurisdictions. Conflict preemption appears to be the most effective preemption claim.

[293] 52 A.3d 463 (Pa. Commw. Ct. 2012), *aff'd in part, rev'd in part*, 83 A.3d 901 (Pa. 2013).

of Pennsylvania enacted Act 13.[294] The Act was intended to promote reasonable development of the Commonwealth's oil and gas resources by restricting the ability of local municipalities to adopt their own patchwork of regulations on oil and gas operations.[295] In a battle over the legality of Act 13, the courts ultimately affirmed in part, and reversed in part, finding some provisions of the act to be unconstitutional. Namely, the legislature's attempt to specify that statewide rules on oil and gas preempted local zoning rules and to allow oil and gas operations in all zoning areas was struck down. The main remaining effect of the law is the Impact Fee, which will raise over $209 million in 2018.[296]

In the Louisiana case of *St. Tammany Parish Gov't v. Welsh* [297], Helis Oil & Gas Company, LLC, obtained a drilling permit to drill a well in the a suburban area as designated in the parish zoning map. The St. Tammany Parish sued the Office of Conservation Commissioner, seeking declaratory relief that the local zoning ordinance made the drilling permit illegal. A Louisiana statute, La. Rev. Stat. Ann. § 30:28F (2018), provides that a political subdivision is "hereby expressly forbidden…to prohibit or in any way interfere with the drilling of a well…by the holder of…a [duly-authorized] permit." Citing the statute and part of the Louisiana Constitution, the appeals court found express preemption and explained that it was clearly the legislature's intent for state regulation to preempt local municipalities from enacting zoning ordinances that restrict oil and gas activity. The Louisiana Supreme Court declined to hear the case[298] and Helis was allowed to proceed with its drilling plan. Ultimately, after drilling an exploratory well and analyzing the results, Helis abandoned the project.

In a New York case, *Wallach v. Town of Dryden*[299], the town of Dryden amended its zoning ordinance to ban all activities related to oil and gas exploration, extraction, and storage, thus effectively banning hydraulic fracturing. The Court of Appeals of New York heard this case in a consolidated appeal, also considering another New York town, Middlefield, that had similarly prohibited fracking through zoning provisions. Norse Energy Corp. (which had leased 22,000 acres in Dryden) challenged the ban on the grounds that it was preempted by the state Oil, Gas and Solution Mining Law (OGSML). Norse's preemption argument centered around a supersession clause in OGSML, which stated that "The provisions of this article shall supersede *all local laws or ordinances relating to the regulation of the oil, gas and solution mining industries*…"[300], with the exception of local government rights related to roads or property taxes. The court narrowly interpreted the supersession clause to apply only to local ordinances regulating oil and gas operations, not to land use restrictions and prohibitions. Consequently, the court affirmed the intermediate appellate court's finding that the OGMSL did not expressly or impliedly preempt the ordinance

[294] In February 2012, the Pennsylvania General Assembly passed, and the governor signed into law, P.L. 87, No. 13, referred to as "Act 13," which effectively repealed parts of the existing Oil and Gas Act of 1984. Act of Feb. 14, 2012, P.L. 87, No. 13, 2012 Gen. Assembly Reg. Sess. (Pa. 2012).

[295] 58 Pa.C.S. § 3301-04; *Robinson Twp. v. Commonwealth*, 147 A.3d 536, 544 (2016).

[296] Marie Cusick, *Pennsylvania's Gas Impact Fees Rise to $209 Million This Year*, STATEIMPACT PA. (June 21, 2018, 2:40 PM), https://stateimpact.npr.org/pennsylvania/2018/06/21/pennsylvanias-gas-impact-fees-rise-to-209-million-this-year/.

[297] 199 So. 3d 3 (La. Ct. App. 2016).

[298] *St. Tammany Parish. Gov't v. Welsh*, 194 So. 3d 1109, 1109 (La. 2016).

[299] 16 N.E.3d 1188 (N.Y. 2014).

[300] *Id*. at 1195-96.

in either of the towns. However, the issue was rendered moot by New York State's subsequent 2015 ban on fracking.

Colorado has been a particularly active state in the preemption arena when it comes to hydraulic fracturing.[301] In *City of Longmont, Colo. v. Colo. Oil & Gas Ass'n*,[302] the residents of Longmont, Colorado had voted in 2012 to ban hydraulic fracturing within the city. The Colorado Oil and Gas Association (COGA) sued the city to invalidate the regulation based on preemption. COGA prevailed and the case was then appealed and transferred directly to the Colorado Supreme Court. The Colorado Supreme Court found that that there was implied, operational preemption and invalidated the ordinance. The Court reasoned that because state law expressly allows hydraulic fracturing, all bans are preempted. A second, similar Colorado case, *City of Fort Collins v. Colo. Oil and Gas Ass'n*,[303] had the same outcome when the court held that a five-year moratorium on hydraulic fracturing was preempted by the Conservation Act.

B. Tort Cases Involving Hydraulic Fracking

As of mid-2017, fewer than 100 tort cases involving hydraulic fracturing had been filed nationwide, with most of the lawsuits in eight states (Arkansas, Colorado, Louisiana, New York, Ohio, Pennsylvania, West Virginia, and Texas). Of those filed cases, only a handful have been tried. Claims usually include nuisance, negligence, trespass, strict liability for an abnormally dangerous activity, and negligence.[304]

While referred to as hydraulic fracturing cases, many of the actual allegations concern other aspects of oil and gas operations such as ground or surface water contamination, air emissions, seismic activity, noise, light, traffic and other disturbances.[305] Opponents of hydraulic fracking tend to make no distinction between injuries allegedly caused by fracking and injuries arising from more conventional oil and gas operations.

The reasons for the sparsity of tort cases is a matter of speculation, but difficulties in proving causation and a lack of commonality for class action certification purposes undoubtedly have a bearing. For example, in *Tucker v. Sw. Energy Co.*,[306] the plaintiffs claimed that hydraulic fracturing contaminated the Tuckers' water well and the Berrys' air and they sued Southwestern Energy Company alleging nuisance, trespass, negligence and strict liability. The complaints were based on conclusions and general statements (*e.g.* wells have been fractured within a mile of the property; the water well used to be fine, but then started to smell (to paraphrase)). Neither plaintiff showed proof that Southwestern's wells did anything to cause the contamination. The

[301] In recent times, Colorado courts have ruled on various express and implied preemption issues that can affect hydraulic fracturing. These issues have involved complete bans on oil and gas drilling (*Voss v. Lundvall Bros.*, 830 P.2d 1061 (Colo. 1992)); land use regulations (*Bd. of Cty. Comm'rs v. Bowen/Edwards Assocs.*, 830 P.2d 1045 (Colo. 1992), *Colo. Mining Ass'n v. Bd. of Cty. Comm'rs*, 199 P.3d 718, 722 (Colo. 2009)); and other preemption issues involving regulatory requirements, such as fees and operator obligations regarding record access (*Town of Frederick v. N. Am. Res. Co.*, 60 P.3d 758 (Colo. Ct. App. 2002), *Bd. of Cty. Comm'rs v. BDS Int'l, LLC*, 159 P.3d 773 (Colo. Ct. App. 2006)).

[302] 369 P.3d 573 (Colo. 2016).

[303] 369 P.3d 586 (Colo. 2016).

[304] *See* HYDRAULIC FRACTURING L&P, *supra* note 22, § 36.03.

[305] *Id.* § 36.01.

[306] No. 1:11-cv-44-DPM, 2012 U.S. Dist. LEXIS 20697, (E.D. Ark. Feb. 17, 2012).

court found that the plaintiffs' allegations were "too thin on some critical facts" because they only used general statements and did not plead specific facts. Ultimately, the court granted a joint motion to dismiss all claims against one of the defendants. The parties then settled and the case was dismissed.[307]

In a 2008 Pennsylvania case, *Ely v. Cabot Oil & Gas Corp.*,[308] the plaintiffs sued Cabot for injuring their access to safe water from the wells on their property. The water pollution was allegedly the result of the defendants' natural gas drilling operations near their homes. The allegations included breach of contract, fraudulent inducement, private nuisance, negligence, negligence per se, violations of environmental laws, and that natural gas drilling was an abnormally dangerous activity subject to strict liability. All claims were dismissed, except for negligence and private nuisance. During trial, the plaintiffs put on evidence outside the proper scope of their claims still at issue. The jury found for the plaintiffs and awarded $4.24 million in damages; however, the appellate court vacated the judgement. Before a new trial occurred, the parties settled.[309]

In another recent Arkansas tort case,[310] it was demonstrated how public opinion has been swayed by anti-fracking public sentiment. The plaintiff sought to recover for damage to her house allegedly caused by XTO's drilling operations. Hydraulic fracturing had not been discussed during the trial by either party. However, during deliberations it was reported that several jurors discussed hydraulic fracturing and asked the court whether hydraulic fracturing operations had been conducted. The court responded by advising the jurors that they had all of the evidence necessary for the case. The jury ultimately found for the Plaintiff and awarded her $100,000. XTO moved for a mistrial based on the jurors' conversation. The court denied the motion, holding that the court's instruction to the jury eliminated any risk of prejudice and that XTO did not show that the hydraulic fracturing discussion has prejudiced or altered the verdict.[311]

In still another Arkansas fracking case, *Hill v. Sw. Energy Co.*,[312] the plaintiffs claimed that hydraulic fracturing waste deposited by Southwestern in an abandoned and plugged well had migrated onto their property. The well Southwestern drilled—the "Campbell well"—was 180.3 feet from the property line. Southwestern leased a surface area of 3.29 acres and disposed of approximately 7.6 million barrels of fracking waste. It was shown that if the leased area were 100% porous (which it was not), it would hold just under 1.1 million barrels. The 8th Circuit Court of Appeals held that the trial judge abused its discretion by excluding an expert report, and that the jury, not the trial court, should be the one to "decide among the conflicting views of different experts." The appellate court also held that it was "a reasonable inference" that the fracking waste may have migrated across the property line. According to a Judgment issued November

[307] *Tucker v. Sw. Energy Co.*, No. 1:11-cv-44-DPM, 2012 U.S. Dist. LEXIS 97238, at *3 (E.D. Ark. 2012).
[308] 2017 U.S. Dist. LEXIS 49075 (M.D. Pa. Mar. 31, 2017).
[309] David DeKok, *Cabot Oil & Gas Settles Fracking Lawsuit with Pennsylvania Families*, REUTERS (Sept. 26, 2017, 12:14 PM), https://www.reuters.com/article/us-pennsylvania-fracking-cabot-oil-gas/cabot-oil-gas-settles-fracking-lawsuit-with-pennsylvania-families-idUSKCN1C12GO.
[310] *Hiser v. XTO Energy, Inc.*, No. 4:11CV00517 KGB, 2013 U.S. Dist. LEXIS 57841 (E.D. Ark. Apr. 23, 2013) and 2013 U.S. Dist. LEXIS 140667 (E.D. Ark. Sept. 30, 2013).
[311] *Id.*
[312] 858 F.3d 481 (8th Cir. 2017).

13, 2018, a number of the plaintiffs had dismissed their claims in this case.[313]

The most significant reported tort case in Texas involving hydraulic fracturing to date has been *Coastal Oil & Gas Corp. v. Garza Energy Trust*,[314] which involved a claim that Coastal's hydraulic fracturing operations crossed a leased boundary and drained gas under the neighboring tract. The district court found for the plaintiffs upon the jury's determination that Coastal's fracking operations involved trespass and caused substantial drainage, which was affirmed on appeal. The Texas Supreme Court reversed, holding that the rule of capture barred such an outcome and the recovery of damages.[315]

A case similar to *Coastal* in Oklahoma, *Max Oil v. Range Resources*,[316] involved trespass and nuisance claims based on allegations that Range's hydraulic fracturing treatments in the Mississippian formation decreased oil and gas production from three older wells completed in the Red Fork and Oswego Formations. The matter was ultimately dismissed as being barred under Oklahoma's two-year statute of limitations.

A court in a more recent case in Pennsylvania examined similar facts to those brought forward in *Coastal* in Texas but came to a different conclusion. In *Briggs v. Sw. Energy Prod.*,[317] a trial court granted summary judgment against a plaintiff who had argued that hydraulic fracturing constituted conversion and trespass. The trial court sided with Southwestern, which claimed that the rule of capture, which had been long recognized in Pennsylvania, allowed its fractures emanating from a well on an adjoining tract that it had under lease, to drain natural gas from beneath plaintiff's property, even though it did not have a lease with the plaintiff. When the landowner appealed the judgment, three judges heard the case and overturned the trial court, finding that the rule of capture did not apply and reviving plaintiff's trespass claim against Southwestern. Southwestern petitioned for the Superior Court to rehear the case *en banc*, but the court declined. Southwestern has now appealed the case to the Pennsylvania Supreme Court.[318] If the case returns to the trial court, the burden will be on the plaintiffs to provide technical proof that Southwestern's fractures entered the plaintiffs' property and collected gas as a result. The Pennsylvania appellate court noted these "evidentiary difficulties."[319]

As discussed in Part III.C, the relationship between hydraulic fracking and wastewater disposal causing earthquakes is indirect. Nevertheless, and fairly or not, the words "hydraulic fracturing" and "earthquakes" have become nearly synonymous in national media accounts and on anti-fracking websites. Thus, though not involving hydraulic fracking per se, in an Oklahoma tort case, *Ladra v. New Dominion, LLC*,[320] Sandra Ladra, a Prague, Oklahoma, resident, brought suit against New Dominion and a number of other oil and gas companies. She alleged that their operation of wastewater disposal wells had caused an earthquake, which in turn caused her injuries. Ms. Ladra's injuries resulted in 2011 when a magnitude

[313] *Hill v. Sw. Energy Co.*, No. 4:12-cv-500-DPM (E.D. Ark. Nov. 13, 2018).
[314] 268 S.W.3d 1 (Tex. 2008).
[315] *Id*.
[316] 2017 U.S. App. LEXIS 4424 (10th Cir. Mar. 14, 2017).
[317] 185 A.3d 153 (Pa. 2018).
[318] *PA Superior Court Rejects Southwestern "Briggs" Trespass Appeal*, MARCELLUS DRILLING NEWS (June 12, 2018), https://marcellusdrilling.com/2018/06/pa-superior-court-rejects-southwestern-briggs-trespass-appeal/.
[319] *Briggs*, 185 A.3d at 163.
[320] 353 P.3d 529 (Okla. 2015).

5.7 earthquake caused pieces of her stone fireplace to break off and fall onto her legs.

Proceeding under theories of negligence and strict liability, Sandra Ladra appears to be the first plaintiff in the nation to seek to impose tort liability on oil and gas companies for injuries associated with allegedly man-made earthquakes caused by injector wells. Her trial was reportedly scheduled for November 2018.

In another Oklahoma case involving earthquakes, *Pawnee Nation of Okla. v. Eagle Road Oil LLC*,[321] the Pawnee Nation alleged that disposal of wastewater from wells that were hydraulically fractured induced earthquakes and damaged tribal buildings. The case was filed in Pawnee Nation District Court. On October 2017, arguments were made that the Pawnee Nation did not have jurisdiction to hear the case and that it should have been brought in state district court. However, the court ruled that the Pawnee Nation had jurisdiction and the case would continue. A class action suit involving similar claims was also filed by the Pawnee Nation in federal district court on May 17, 2018.[322]

C. Rulemaking Challenges and Miscellaneous

The third wave of fracturing litigation has been a hodgepodge of rulemaking challenges, permit challenges, citizen's suits, and contract claims. Perhaps the most noteworthy rulemaking challenge to hydraulic fracturing to date was *Wyoming v. U.S. Dep't of the Interior*.[323] In 2015, during the Obama Administration, the Bureau of Land Management promulgated a hydraulic fracturing rule applicable to onshore development of federal and Indian lands and minerals.[324] A federal district court in Wyoming in June 2016 subsequently vacated the BLM rule on the merits, holding that Congress had not delegated the Department of the Interior legal authority to regulate hydraulic fracturing.[325] The BLM rescinded the rule in December 2017, after the election of Donald Trump, resulting in the case being dismissed as unripe.[326] However, California and a number of environmental groups are now suing over the rescission of the rule.[327]

In another rulemaking challenge, opponents of hydraulic fracking in Colorado petitioned the Colorado Oil and Gas Conservation Commission (COGCC) to promulgate a new rule that would require the COGCC to not issue drilling permits unless a third-party consultant determines that oil and gas operations will not adversely impact the environment. The COGCC declined to make such a rule, and the decision was appealed to the Denver District Court, which held that the COGCC must balance development of oil and gas with the protection of public, health, safety and welfare and that COGCC's denial was rational. The decision was then appealed to the Colorado Court of Appeals, which reversed the decision 2-1. Upon petition filed by the Colorado Attorney General on behalf of the COGCC, the Colorado Supreme Court granted certiorari and heard oral arguments on October 16, 2018.[328]

[321] Case No. Civ-2017-803 (Dist. Ct. Pawnee Nation).
[322] *Pawnee Nation of Okla. v. Eagle Road LLC*, Case No. 18-cv-263-JED-JFJ (N.D. Okla., filed May 17, 2018).
[323] 136 F.Supp. 1317 (D. Wyo. 2015).
[324] *Id*. at 1326.
[325] *Wyoming v. U.S. Dep't of the Interior*, 2016 U.S. Dist. LEXIS 82132 (D. Wyo. 2015 June 21, 2016).
[326] *Wyoming v. Zinke*, 871 F.3d 1133, 1146 (10th Cir. 2017).
[327] 2018 U.S. Dist. LEXIS 119379 (N.D. Cal. July 17, 2018).
[328] *Martinez v. Colo. Oil & Gas Conservation Comm'n*, 2017 Colo. App. LEXIS 339 (Colo. Ct. App. Mar. 23, 2017), *cert. granted*, Case No. 2017SC297 (Colo. 2018).

Federal environmental rules generally allow "citizen suits" or actions by which private citizens, including activist organizations, can sue governmental and private entities for violations of federal rules. One such example arose in Oklahoma when the Sierra Club sued Chesapeake Operating, LLC, alleging that injection of liquid waste from oil and gas activities had increased the number and severity of earthquakes.[329] The federal district court dismissed the case on two grounds: (i) the *Burford*[330] abstention doctrine and (ii) the primary jurisdiction doctrine. The *Burford* abstention doctrine allows for dismissal when federal jurisdiction would interfere with state administrative agencies. Since the Oklahoma Corporate Commission holds the authority to regulate injection wells in Oklahoma, the court held that the Sierra Club could seek redress by petition to the Oklahoma Corporate Commission for the primary relief requested (*i.e.*, the immediate reduction of wastewater disposal).

For a more comprehensive summary of hydraulic fracturing case law, see Section 36 of *Hydraulic Fracturing Law and Practice* and its upcoming 2019 update.

X. The Future?

It seems as though the wave of new regulations governing hydraulic fracking has abated over the past couple of years. At the state level, this abatement has occurred in part because most oil producing states have passed statutes or new regulations governing hydraulic fracking and the need for additional regulations has not seemed pressing. The election of Donald Trump as President in 2016 and his administration's emphasis on easing regulatory burdens explains the lightening of regulations at the federal level.[331]

In Texas, the economic boost to the state's economy provided by shale development plus the legislature's confidence in the ability of the Texas Railroad Commission and the Texas Commission on Environmental Quality to oversee regulation of oil and gas activities consistent with environmental protections is, for now, keeping the legislature's focus away from new fracking regulations. But the legislature meets again in 2019. Anti-fracking activism in Texas remains a strong force.[332] Only time will tell whether activism will move the needle of public opinion to support bans or other forms of more extreme fracking regulation in Texas and elsewhere.

Likewise, fracking litigation still seems to be in its infancy. Despite causation and class certification problems, new cases will likely arise over hydraulic fracking and related oil field operations; to the extent they succeed, they will breed other cases. Once again, time, as always, will tell.

[329] *Sierra Club v. Chesapeake Operating, LLC*, 248 F.Supp. 3d 1194 (W.D. Okla. 2017).

[330] *Burford v. Sun Oil Co.*, 63 S. Ct. 1098 (1943).

[331] See *infra* Part IX.C for a discussion of *Wyoming v. U.S. Dep't of the Interior*, 136 F.Supp. 1317 (D. Wyo. 2015) and the rescission of Obama-era BLM fracking rules in Part IX.C.

[332] *See, e.g.*, the website of anti-fracking activist Sharon Wilson, TXSHARON'S BLUE DAZE, http://www.texassharon.com/ (last visited Aug. 9, 2018).

Contract and Policy in the Wake of *Murphy v. Adams*

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I. Introduction

On June 1, 2018, the Texas Supreme Court delivered its opinion in *Murphy Exploration & Production Co.—USA v. Adams*.[1] In this case, the Supreme Court redefined the term "offset well," as used in an express offset provision, from its long-understood meaning of a well "drilled to protect against drainage," to "a well drilled *anywhere* on the leased premises."

While this case initially perplexed the oil and gas bar, it was not completely unexpected. The current state of our jurisprudence has caused some to believe that the deck has been stacked in favor of the industry for some time now.[2] One commentator succinctly, and with only slight hyperbole, described the theme of the past two decades of Texas oil and gas law as simply, "The producer wins."[3]

To fully explain the reasoning behind the Court's move to this extreme position is beyond the scope of this Paper, and has been addressed by other authors.[4] But the simple answer is that the efficient and orderly extraction of oil and gas is an overarching public policy goal of this state.[5] And when that goal is impeded by landowners and their "*private property"* rights, the former is sometimes given priority over the latter.[6]

But while the bar has been aware of this trend for the past few decades, *Murphy v. Adams* is particularly troubling. Even while established legal doctrines and remedies related to trespass, co-tenancy, adverse possession, limitations, and drainage were being abrogated in the name of "efficient oil and gas production,"[7] landowner attorneys had the consolation that unfavorable rulings could be negated by private contract—the issues could be "drafted around" in the next lease. It was thought, by *some*, that the overt

[1] 61 Tex. Sup. Ct. J. 1247, No. 16-0505, 2018 Tex. LEXIS 516 (June 1, 2018). This Paper will refer to this case as "*Murphy v. Adams*."

[2] *See generally* John Burritt McArthur, *How the Texas Supreme Court Lost Its Position as a Leading Oil and Gas Royalty Court: A Tale of 18 Cases*, 49 TEX. TECH L. REV. 263 (2017).

[3] *Id.* at 392.

[4] *See, e.g., id.*; Laura Burney, *The Texas Supreme Court and Oil and Gas Jurisprudence: What Hath* Wagner & Brown v. Sheppard *Wrought?*, 5 TEX. J. OIL GAS & ENERGY L. 220 (2010).

[5] As stated in *Browning Oil Co. v. Luecke*, disputes between producers and landowners are not simply disputes "between two private parties . . . . Factors such as the prevention of waste . . . and maximized recovery of minerals bear upon this area of law and necessarily affect the rights of the parties." 38 S.W.3d 625, 646 (Tex. App.—Austin 2000, pet. denied).

[6] *See generally French v. Occidental Permian Ltd.*, 440 S.W.3d 1, 10 (Tex. 2014) (charging the royalty owners with production expenses because the royalty owner "benefitted" from such expenses and "must share in the cost").

[7] *See generally* McArthur, *supra* note 2.

judicial modification of contractual terms was a line no court would not cross.

The offset clause at issue in *Murphy v. Adams* was itself a result of this belief, being drafted for the purpose of abrogating unfavorable case law relating to drainage protection.[8] This case law has made prevailing on a claim for drainage expensive and nearly impossible, while at the same time reducing the damages available to the rare plaintiff who can actually carry its burden. For all the Court's assurances about the narrowness of its holding, if the Court is willing to modify this clause, what part of an oil and gas lease is safe?

The purpose of this Paper is to give an overview of *Murphy v. Adams*, the background, the arguments of the parties, and the reasoning of the majority opinion and the dissenting opinion.

It will then point out the flaws in the majority's opinion and show why, in spite of the Court's purported reliance on contractual construction canons, the majority opinion is a policy-based contractual modification.

The Conclusion will then offer what advice can be offered to attorneys drafting leases in a post-*Murphy v. Adams* world and give some closing thoughts on the current state of Texas oil and gas law and its future direction.

II. *Murphy v. Adams*

A. Background

Shirley Adams, Charlene Shirley Adams, Charlene Burgess, Willie Mae Herbst Jasik, William Albert Herbst, Helen Herbst and R. May Oil & Gas Company, Ltd. (collectively, the "Herbsts") were the royalty owners under two contiguous oil and gas leases on two 302-acre tracts in Atascosa County. The tracts were originally leased in August of 2009 to Alvin M. Barrett & Associates Inc. on lease forms drafted by Al Steinle, a well-respected attorney practicing in Jourdanton (the Leases). Murphy Exploration & Production Co.—USA (referred to herein as "Murphy") later acquired the Leases. Each of the Leases contained an express offset clause (the Offset Clause) that should look familiar to most oil and gas attorneys. The Offset Clause provided that "if a well is completed as a producer of oil and/or gas on land adjacent and contiguous to the leased premises and within 467 feet of the premises covered by this lease," the lessee has 120 days after completion of the well on the adjacent acreage to do one of the following:

> (1) Commence drilling operations on the leased acreage and thereafter continue the drilling of such off-set well or wells with due diligence to a depth adequate to test the same formation from which the well or wells are producing from on the adjacent acreage; or
>
> (2) Pay the Lessor royalties as provided for in this lease as if an equivalent amount of production of oil and/or gas were being obtained from the off-set location on these leased premises as that which is being produced from the adjacent well or wells; or
>
> (3) Release an amount of acreage sufficient to constitute a spacing unit equivalent in size to the spacing unit that would be allocated under this lease to such well or wells on the adjacent lands, as to the zones or strata producing in such adjacent well.

[8] *See, e.g.*, *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 18–19 (Tex. 2008) (suggesting that traditional drainage damages may "overcompensate" the lessor).

The Offset Clause was included in the Leases in order to avoid having to prove up the elements of a breach of the implied covenant to protect against drainage. An action under the implied covenant requires a plaintiff to prove (1) substantial drainage from an adjacent well and (2) that a reasonably prudent operator would have acted to prevent that substantial drainage.[9]

Proving "substantial" drainage is a heavy burden for a plaintiff. And even if it is met, the plaintiff must then prove that a reasonably prudent operator would have drilled an offset well, requiring the plaintiff to show that the amount of oil that could be recovered is equal to or greater than the "cost of administrative expenses, drilling or re-working and equipping [an offset] well, producing and marketing the oil, and yield to the lessee a reasonable expectation of profit."[10]

And even if a plaintiff can prove all of this, the Supreme Court has reduced the damages available to a plaintiff from what an offset well would have produced to the value of the oil and gas *actually drained away.*[11]

The Offset Clause was intended to circumvent all of this by doing away with the plaintiff's burden to prove substantial drainage and profitability. If an adjacent well was brought in within the distance trigger, it would be *presumed* that substantial drainage was occurring. The lessee would then have to comply with one of the three alternate obligations, one of which being the drilling of an "offset well," or a well that a reasonably prudent operator would drill for the purpose of protecting the leasehold against drainage—or at least this is what oil and gas attorneys believed.

In early 2012, Comstock Oil & Gas, LP drilled the Lucas A #1H horizontal well (the Lucas Well) on a tract adjacent to and southwest of the leased premises. The Lucas Well was completed in the Eagleville (Eagle Ford-1) Field and began producing in March 2012. The lateral of the Lucas Well was located 350 feet from the boundary of the leased premises, which triggered the Offset Clause. At this point, Murphy was required to pay compensatory royalties, release acreage or drill an "offset well."

Murphy refused to pay royalties or release acreage. Instead, Murphy drilled a well, the Herbst Unit B #1H (the Herbst Well), on the opposite side of the leased premises, more than 2,100 feet from the Lucas Well, and claimed that this well was an "offset well" and satisfied Murphy's obligations under the Offset Clause.[12] The Herbsts disagreed.

On May 24, 2013, the Herbsts filed a lawsuit against Murphy, seeking substitute royalties under subparagraph (2) of the Offset Clause based on production from the Lucas Well. Both parties filed competing motions for partial summary judgment on whether or not Murphy breached the Offset Clause. After a hearing, the trial court granted Murphy's partial motion. The Herbsts appealed to the Fourth Court of Appeals and argued that the term "offset well" meant a well drilled to protect against drainage—a meaning confirmed by a century of Texas jurisprudence.

The Fourth Court agreed with the Herbsts and reversed, holding that Murphy failed to establish as a matter of law that the Herbst Well protected the leasehold against drainage

[9] *Amoco Prod. Co. v. Alexander*, 622 S.W.2d 563, 568 (Tex. 1981).
[10] *Id.*
[11] *Coastal Oil*, 268 S.W.3d at 18–19.
[12] *See* Respondent's Brief on the Merits at 3.

and was therefore an "offset well."[13] Murphy petitioned the Supreme Court for review.

B. The Fourth Court opinion

While the Fourth Court of Appeals agreed with the Herbsts, its opinion strayed far beyond what was necessary to dispose of the case. On appeal, all the Herbsts had to show was that Murphy failed to conclusively prove that the Herbst Well was an "offset well" in order to have the case remanded. At the Fourth Court, the Herbsts argued that an "offset well" was a well that was drilled to protect against drainage, and Murphy failed to conclusively prove that the Herbst Well was drilled to protect against drainage. The Fourth Court agreed but added a requirement into its ruling that the Herbsts *did not* argue and *did not* request.

Instead of remanding the case because Murphy failed to prove that the Herbst Well was *drilled for the purpose* of protecting against drainage, the Fourth Court remanded because Murphy failed to conclusively prove that the Herbst well *was actually* protecting against drainage.

This is a huge distinction. The Herbsts had never argued that an offset well must *actually* protect against drainage; they argued that it must be drilled *for the purpose* of protecting against drainage. The standard under the implied covenant was what action a reasonably prudent operator would take to protect the leasehold—if such action was taken, whether or not it was *actually successful*, the lessee had complied with its obligation.[14] For the Herbsts, the issue was, correctly, about *location* not *function*. An offset well had to be drilled near the adjacent well in order for it to have a chance of protecting the leasehold against drainage—it was immaterial whether it actually did, so long as it was where a reasonably prudent operator would have placed it.

Murphy was justifiably concerned with the Fourth Court's opinion. Murphy argued that this was a "radical new rule," as it required Murphy to demonstrate that an offset well drilled under a "deemed drainage" provision was *actually* protecting the lease from drainage, even though a showing of actual drainage from the adjacent well was not required. Theoretically, this could have placed Murphy is a position in which it was impossible to comply with subparagraph (1) of the Offset Clause, no matter how many wells it drilled.

The Herbsts agreed with Murphy's criticisms of the Fourth Court's opinion, stating in their brief on the merits to the Supreme Court:

> The Herbsts agree with Murphy that Murphy did not have to show that the well it drilled actually protected against drainage. What it had to show to obtain summary judgment was that the well it drilled was in close proximity to the lease line adjacent to the tract where the triggering well was drilled. It is, however, undisputed that Murphy did not drill such a well and, therefore, the court of appeals correctly reversed the district court.[15]

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[13] *Adams v. Murphy Exploration & Prod. Co.—USA*, 497 S.W.3d 510 (Tex. App.—San Antonio 2016, pet. granted) *rev'd*, 61 Tex. Sup. Ct. J. 1247 (Tex. 2018)..

[14] Indeed, as Murphy pointed out, an operator could drill an offset well that failed to *actually* protect against drainage. *See Coastal Oil*, 268 S.W.3d at 14.

[15] *See* Respondents' Brief on the Merits at 32, *Murphy Exploration & Production Co.—USA v. Adams*, 61 Tex. Sup. Ct. J. 1247 (2018) (No.16-0505).

Because of the novel and onerous burden placed on the operator by the Fourth Court's opinion, the Supreme Court was guaranteed to grant Murphy's petition, which it ultimately did. The question was whether the Court would affirm with modifications or reverse.

C. Murphy's Arguments at the Supreme Court

Murphy's main argument at the Supreme Court was that the Herbst Well qualified as an "offset well" under the plain meaning of the Offset Clause, which was the argument under which Murphy had prevailed at the trial court. Murphy argued that the Offset Clause internally defined the term "offset well" as simply being a well drilled with "due diligence" to be located "on the leased acreage" and completed to a "depth adequate to test the same formation" as the triggering well.[16] As the Herbst Well was drilled with due diligence, on the leased acreage, and completed in the Eagle Ford formation, Murphy argued that it qualified as an "offset well" under the Offset Clause.

Murphy believed that the Fourth Court's decision improperly read a drainage protection function into the term "offset well," which, according to Murphy, was improper because the Offset Clause did not explicitly mention anything regarding drainage protection. However, even if Murphy was technically correct that the Offset Clause did not explicitly mention the term "drainage," the term "offset well" had long been understood in the industry and by the bar to be a well drilled "to protect against drainage." The general idea of "drainage protection" was subsumed in the term "offset well" itself.

To overcome this obstacle, Murphy argued that the long-understood meaning of "offset well" was limited to vertical wells drilled in traditional formations.[17] Murphy stated that the term "offset well" can have "different meanings depending on the legal context (contractual provision or implied covenant) and the type of oil and gas operation (traditional vertical drilling in conventional reservoirs or horizontal drilling in tight shale drilling)."[18] Murphy stated that the cases relied upon by the Fourth Court and by the Herbsts that defined the term "offset well" were inapplicable, as "the conventional concept of drainage across lease lines has limited application in the [Eagle Ford Shale], where wells can be spaced 'as close as 225 feet' without reducing production."[19] In this environment, Murphy believed that the proper definition of "offset" was not the legally understood definition but a well that "counterbalanced or compensated for" a triggering well, using the definition of "offset" as found in *Merriam-Webster's Online Dictionary*.[20]

Murphy's argument hinged on a belief that drainage protection simply was not a reasonable function of an offset well in the Eagle Ford Shale "in which it is undisputed that little to no drainage exists."[21] To Murphy, the Offset Clause was merely a "free well" clause—not a drainage protection clause. In support of this belief, Murphy pointed to an affidavit drafted as summary judgment evidence by John C. McBeath, P.E. (the

[16] *See* Petitioner's Reply in Support of Its Petition for Review at 7, *Murphy Exploration & Production Co.—USA v. Adams*, 61 Tex. Sup. Ct. J. 1247 (2018) (No.16-0505).

[17] *See* Petitioner's Brief on the Merits at ix, *Murphy Exploration & Production Co.—USA v. Adams*, 61 Tex. Sup. Ct. J. 1247 (2018) (No.16-0505).

[18] *See* Petition for Review at 11, *Murphy Exploration & Production Co.—USA v. Adams*, 61 Tex. Sup. Ct. J. 1247 (2018) (No.16-0505).

[19] *Id.* at 16 (quoting Murphy's expert's affidavit).

[20] *Id.* at 10.

[21] *See* Petitioner's Reply in Support of Petition for Review at 4–5.

McBeath Affidavit), which opined on the minimal drainage context of the Eagle Ford Shale. The same affidavit which was dismissed by the Fourth Court as speculative and conclusory *ipse dixit*.[22]

D. The Herbsts' Arguments at the Supreme Court

The Herbsts' main argument was that the term "offset well" had a long-understood industry and legal definition, being a well drilled to "protect against drainage." For the Herbsts, this did not mean the well had to *actually* protect against drainage; it merely meant that the well had to be drilled for the purpose of protecting against drainage, at a location where a reasonably prudent operator would have placed it had the triggering well been actually draining the leased premises. The Herbts pointed to dozens of cases and industry documents that reinforced this definition.[23]

The Herbsts argued that a well "drilled more than 2,100 feet from a well that triggers a duty to drill an offset well does not 'offset' the triggering well."[24] The Herbsts also pointed out that Murphy rendered the term "offset" meaningless by arguing that it was internally defined. Under Murphy's interpretation, the word "offset" could be completely removed from the Offset Clause and the meaning of the Offset Clause would not change. To the Herbsts, this was a clear violation of the canons of contract construction.

The Herbsts and amicus curiae Texas Land and Mineral Owners Association reiterated that the purpose of the Offset Clause was to protect against drainage but avoid fights about whether substantial drainage was actually occurring:

> Murphy's arguments here boil down to the assertion that an express offset clause is not intended to protect against drainage. This assertion is meritless. That an express offset clause like the one here eliminates the need to prove drainage is actually occurring does not mean that protection against possible drainage is not the purpose of the offset well. By incorporating an express clause into the Leases, the parties simplified both the lessor's and the lessee's obligations, plainly demarcating when the lessee's offset obligations were triggered and the options available to the lessee to meet those obligations. The potential factual dispute of whether drainage is actually occurring is thereby eliminated.[25]

According to the Herbsts, once an adjacent well triggered the Offset Clause, drainage is presumed *whether or not it is actually occurring*, and an "offset well" must be drilled where a reasonably prudent operator would drill a well if the triggering well was *actually* draining the leased premises. This is true whether or not the "offset well" actually protects the leased premises—in fact, whether or not any hydrocarbons were being drained one way or the other was *irrelevant.*

E. The Supreme Court Decision

On June 1, 2018, the Supreme Court issued its decision.[26] In a 5–4 split, the majority sided with Murphy and reversed the Fourth Court of Appeals. The foundation of

[22] *Adams*, 497 S.W.3d at 517.
[23] *See* Respondents' Brief on the Merits at 20–21.
[24] *Id.* at 3.
[25] *See id.* at 29.

[26] The majority opinion was delivered by Justice Lehrmann, in which Chief Justice Hecht and Justices Devine, Brown, and Blacklock joined.

the Court's majority decision was Murphy's argument that the Offset Clause was "drafted with horizontal shale wells in mind" and the parties "recognized that there is little to no drainage in the Eagle Ford shale, and therefore no reason to locate the offset well near the lease line."[27] The Court based this presumption upon the McBeath Affidavit and a law review article co-authored during the pendency of the lawsuit by Murphy's trial counsel (the Newman Article),[28] which discussed the inapplicability of modern offset clauses in unconventional formations.

For the majority, these presumptions supplied the "context" in which the leases and the Offset Clause were negotiated. The Court then used this context to interpret the Offset Clause pursuant to the "surrounding circumstances" doctrine, which states that the "facts and circumstances surrounding [a] contract's execution" may "inform [the court's] construction of the [contract]."[29] The Court stated that in the "no drainage" context of the Eagle Ford, the term "offset well" means a well that "serves to counterbalance or to compensate for" a triggering well on adjacent property, and that such well could be drilled anywhere on the leased premises.[30]

The majority also agreed with Murphy's "four-corners" argument, stating that the term "offset well" was internally defined by the Offset Clause itself. The Court considered this the only "reasonable interpretation," stating,

> While the leases do not provide a formal definition of the term "offset well," the phrase is nevertheless internally defined by the leases' description of where and to what depth the offset well must be drilled. And these requirements qualify such a well as one that "serves to counterbalance or to compensate for" a triggering well on the adjacent property. The fact that the leases specify exactly what is to be done once the offset provision is triggered, and do not mention proximity, is significant. . . . Murphy was thus required to drill a well in accordance with this specific instruction, and no more. . . .
>
> . . . . While this would not prevent drainage, it would compensate Herbst by counterbalancing against production on the adjacent tract. And this is the only reasonable interpretation of the provision in light of the parties' recognition of the horizontal shale drilling at issue.[31]

The Court concluded by purporting to limit its holding to "unconventional production in tight shale formations," stating that it expressed "no opinion as to the proper interpretation of similar clauses outside this context."[32]

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[27] *Murphy Expl. & Prod. Co.—USA*, 2018 Tex. LEXIS 516 at *5.

[28] As the Herbsts point out in their motion for rehearing, "The majority cites this purported authority *eight* times, including five times in its section titled 'Context'. . This article -- Jason Newman & Louis E. Layrisson, III, *Offset Clauses in a World Without Drainage*, 9 TEX. J. OIL GAS & ENERGY L. 1 (2013-2014) . . . -- was published in the Spring of 2014, almost a year *after* the Herbsts filed this lawsuit against Murphy and five years after the leases were executed." Respondents' Motion for Rehearing at 4, *Murphy Exploration & Production Co.—USA v. Adams*, 61 Tex. Sup. Ct. J. 1247 (2018) (No.16-0505) (citation and footnote omitted).

[29] (quoting *URI, Inc. v. Kleberg County*, 543 S.W.3d 755, 758 (Tex. 2018)).

[30] *Murphy Expl. & Prod. Co.—USA*, 2018 Tex. LEXIS 519 at *10.

[31] *Id.* at *16–17 (quoting *Offset*, WEBSTER'S THIRD INT'L DICTIONARY 1567 (2002)).

[32] *Id.* at *18.

F. The Dissent

The dissenting opinion, written by Justice Johnson and in which Justices Green, Guzman, and Boyd joined, argued that the Court ignored the "consistent longstanding industry use of the word [offset] in regard to wells" and the "Court's treatment of offset well as an internally defined term that does not import any of the phrase's well-established meaning in the industry" did not account for the term's use by the parties.[33]

The dissent believed that the parties obviously intended "offset well" to refer to a *location*, and the main question to be answered was "where?" For the dissent, the answer was, '"In a location that a reasonably prudent operator would consider sufficient to protect from potential drainage.' Otherwise, the word offset in the provision has no meaning."[34]

The dissent also disagreed with the majority's use of the surrounding circumstances doctrine and the "context" of the Eagle Ford formation. The dissent stated that in August 2009, when the leases were executed, "the traditional and widespread industry meaning of offset well was a well that protected the leasehold from being drained of its minerals."[35] The dissent then followed with four pages of citations, stating, "In short, before, at the time of, and even after the Leases were executed, offset well meant and continues to mean a well that protects a lease from the possibility of drainage."[36]

Additionally, the dissent disagreed with the majority's belief that Eagle Ford drainage patterns should determine the meaning of the Offset Clause, arguing that under *Coastal Oil*, the rule of capture and offset well concepts "continue to apply in situations where tight formations such as the Eagle Ford are concerned." The dissent noted that in *Coastal Oil*, the Court held that fracing across lease lines was not a trespass because, in part, "mineral owners and lessors have adequate means of protecting themselves by drilling offset wells."[37]

The dissent further pointed out that the purpose of the Offset Clause was to avoid the "expense, difficulty, and risk associated with litigating [a drainage] suit against a lessee . . . . Offset well provisions developed in the context of lessors having the difficult task of prevailing on a claim for breach of the lessee's implied covenant to protect against drainage."

Finally, the dissent argued that the Eagle Ford's drainage characteristics should not be invoked for the simple reason that "the Leases say we should not do so," stating,

> In asking that we consider the drainage characteristics of the Eagle Ford Shale, Murphy invites us to rewrite the Leases and re-institute the burden the Leases relieved the Herbsts of as lessors: in order to obtain relief regarding the Lucas Well, the Herbsts would have to prove that the Lucas was or is actually draining minerals from the leased premises. That result would deprive the Herbsts of the benefit of their bargain with Barrett in obviating the need for the Herbsts to prove actual drainage of minerals where the 'material facts are hidden below miles of rock.'[38]

[33] *Id.* at *33 (Johnson, J., dissenting).
[34] *Id.* at *37.
[35] *Id.* at *39.
[36] *Id.* at *45.
[37] *Id.* at *46.
[38] *Id.* at *51 (quoting *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 16 (2008)).

III. Discussion

A. The "Surrounding Circumstances" Argument

As stated above, the *Murphy v. Adams* majority based its decision on the context of Eagle Ford drainage patterns, which it considered pursuant to the surrounding circumstances doctrine. However, the Court's use of the surrounding circumstances doctrine grossly exceeded the scope and limitations of the doctrine as recently set forth by the Court:

> What "facts and circumstances" may be consulted will naturally vary from case to case, but reasonably well-defined contours can be mined from our jurisprudence. Because objective intent controls the inquiry, only circumstantial evidence that is objective in nature may be consulted. . . . In deciding what facts and circumstances are informative rather than transformative, ascertaining objective meaning is the touchstone.
>
> A certain degree of latitude is inherent in the inquiry, but absolute limits on the use of surrounding circumstances are abundantly clear. Parties cannot rely on extrinsic evidence to give the contract a meaning different from that which its language imports, add to, alter, or contradict the terms contained within the agreement itself, make the language say what it unambiguously does not say, or show that the parties probably meant, or could have meant, something other than what their agreement stated.[39]

Under this standard, there would have had to have been objective evidence that the original parties to the Leases *knew* about the drainage characteristics of the Eagle Ford Shale and that this knowledge shaped the negotiations.

However, the Court's ruling assumed that the Herbsts were aware of the assertions regarding Eagle Ford drainage characteristics contained in the McBeath Affidavit and the Newman Article in 2009 without any supporting evidence in the record, objective or otherwise. As the dissent correctly pointed out, *there was no evidence in the record whatsoever* showing that the original parties to the Leases had any knowledge as to the drainage characteristics of *any* formation, let alone that there was "little to no drainage" in the Eagle Ford shale.[40]

And more troubling, the Court then *removed* the term "offset well" from the Offset Clause and replaced it with the term "offset." The Court stated that "offset," as used in the Offset Clause, meant a well that served to "counterbalance or to compensate for" a triggering well on adjacent property. To reach this conclusion, the Court followed Murphy and used one of the several definitions of the *noun* "offset" given in *Merriam-Webster's* dictionary.

However, the Offset Clauses did not use the term "offset" as a noun. The Offset Clause used the compound noun "offset well," made up of the *adjective* "offset" and the noun "well." A compound noun can "often have a meaning that is different, or more specific, than the two separate words,"[41] which is the case with the term "offset well." And *Merriam-Webster's* dictionary, the *same dictionary used by the Court*, also contianed a

[39] *URI, Inc. v. Kleberg County*, 543 S.W.3d 755, 767–68 (Tex. 2018) (quotations and footnotes omitted).
[40] *Murphy Expl. & Prod. Co.—USA*, 2018 Tex. LEXIS 519 at *29–30.

[41] *Compound Nouns*, EDUC. FIRST, t https://www.ef.edu/english-resources/english-grammar/compound-nouns/ (last visited Nov. 12, 2018) .

definition for the compound noun "offset well". *Merriam-Webster's* defined "offset well" as "an oil well drilled opposite another oil well on an adjoining property," which definition conformed with its industry-accepted meaning urged by the Herbsts.[42] This is not mere semantics. If the Court was going to ignore the industry-accepted meaning of an unambiguous term and use a common dictionary's definition, it could not substitute an entirely different word and grammatical form. The omission and addition of terms is strictly prohibited by the surrounding circumstances doctrine.

The Court's use of the surrounding circumstances doctrine leads to no other conclusion than that the Court used the doctrine as pretext for a policy-based balancing of private contractual rights with public policy. It should be noted that the Newman Article, quoted extensively by the majority, emphasizes the "balance" struck by Texas courts between "efficient development" and the "lessor's rights," and counsels the courts to "decline to apply . . . 'deemed drainage' provision[s] . . . [to] signal an approach committed to restoring [such] balance."[43] The Court's true motive is also revealed in its conclusion, where it states that Murphy's compliance with the plain meaning of the Offset Clause would have constituted a "significant windfall" for the Herbsts. It is troubling that freely contracted terms are now "windfalls" for landowners.

The Texas Supreme Court has, of course, been accused before of subordinating private property rights in favor of "efficient development,"[44] and has arguably done so in many cases involving certain common law remedies.[45] The Court has also modified many long-standing doctrines to favor the industry in various scenarios.[46] However, some believed the blatant modification of private contracts had always been a bridge too far. Until *Murphy v. Adams*, Texas courts had consistently refused to modify the plain language of oil and gas leases, even when the results were arguably inconsistent with efficient, economic development.[47] Texas courts had recognized that parties to private

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[42] *See Offset Well*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/offset%20well (last visited Nov. 12, 2018).

[43] Newman & Layrisson, *supra* note 28, at 36.

[44] *See, e.g.*, McArthur, *supra* note 2.

[45] *See, e.g.*, *Lightning Oil Co. v. Anadarko E&P Onshore, LLC*, 520 S.W.3d 39, 50 (Tex. 2017) ("Whether the small amount of minerals lost . . . will support a trespass action must, in the end, be answered by balancing the interests involved. . . . [W]e have no doubt that individual interests in the oil and gas lost through being brought to the surface as part of drilling a well are outweighed by the interest of the industry as a whole and society in maximizing oil and gas recovery."); *R.R. Comm'n of Tex. v. Manziel*, 361 S.W.2d 560, 568–69 (Tex. 1962) ("[T]echnical rules of trespass have no place in the consideration of the validity of the orders of the Commission.").

[46] *See, e.g.*, *French v. Occidental Permian Ltd.* 440 S.W.3d 1 (Tex. 2014) (ruling that CO_2 extraction was a "post production" expense); *Wagner & Brown, Ltd. v. Sheppard*, 282 S.W.3d 419 (Tex. 2008) (ruling that the lessor's possibility of reverter was pooled and that the lessor was responsible for production expenses incurred prior to lease termination).

[47] *Endeavor Energy Res., L.P. v. Discovery Operating, Inc.*, 554 S.W.3d 586, (Tex. 2018) (enforcing a retained acreage clause despite resulting in economic loss and stating that "Lessees who agree to leases like those at issue here must meet 'the condition which they imposed upon themselves . . . . [T]hey have only themselves to blame." (quoting *Freeman v. Magnolia Petroleum Co.*, 171 S.W.2d 339, 342 (Tex. 1943))); *Browning Oil Co. v. Luecke*, 38 S.W.3d 625, 641-42 (Tex. 2000) (upholding an onerous pooling provision and stating that "if . . . drilling a horizontal well on an eighty acre unit was economically impractical, they could have attempted to expand their pooling authority" and "[f]ailing that, they could have exercised the option of not drilling a well" but that"[w]hat they could not do was [breach the lease]"); *Tex. Oil & Gas Corp. v. Vela*, 429 S.W.2d 866, 871 (Tex. 1968) (refusing to grant relief due to changing

contracts are masters of their own agreements, and it was not for any court to decide what the parties *should* have negotiated.[48]

Additionally, the Court's policy-based decision ignored the purpose of private contracts. While the Court's ruling states that there is an "absence of a *significant* possibility that drainage was in fact occurring," the Lucas Well *may actually be draining* oil and gas from the Herbsts' property. There was no evidence in the record either way, and for good reason. As the dissent acknowledged, by tying the offset obligation to a specified distance but without a requirement that the well be actually draining the property, the Herbsts "avoided . . . having to shoulder the burden of proving the lessee breached the 'substantial drainage' element of the implied covenant to protect the lease in the event a controversy such as this arose."[49]

The Offset Clause was a negotiated hedge, a method of avoiding debates about geology, formation characteristics, or whether any individual well was draining the Herbsts' minerals. Private parties regularly use contracts to allocate risk and provide for protection from even unlikely scenarios in a variety of situations. The mere fact that drainage is *possible*, no matter how remote, supplies more than enough justification for the Herbsts' inclusion and interpretation of the Offset Clause, if justification is needed for the enforcement of freely negotiated contractual terms.

The Court's reliance on the surrounding circumstances doctrine should be troubling to all landowner attorneys because it casts uncertainty upon almost every term and provision in every oil and gas lease. Attorneys will no longer be able to reasonably advise their clients as to the legal effect of long-understood terms and provisions when each term and provision can be transformed, omitted, or replaced based on whatever future "context" is expedient to the operator. While this may benefit the industry in the short term, without faith in the law to uphold private contracts, landowners may be forced to find other methods of developing their minerals or ensuring performance that could ultimately backfire for producers. As stated by one commentator:

> Leases are useful as long as both sides think they are fair. If leases end up being reinterpreted so that they reward only producers, landowners will have less and less incentive to use them. Their incentive will be to seek other outlets—other contracts, political protection, and litigation. At the very time when producers would benefit from support of their landowning partners on contentious issues, such as climate change, pipeline rights-of-way,

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market realities, noting the royalty obligation "may prove financially burdensome to a lessee who has made a long-term contract without protecting itself against increases in market price"); *Jones v. Killingsworth*, 403 S.W.2d 325 (Tex. 1965) (finding that the lessee breached the pooling clause even though the lessee was acting in good faith, was authorized to pool, and had a valid permit from the Railroad Commission); *ConocoPhillips Co. v. Vaquillas Unproven Minerals, Ltd*., No. 04-15-00066-CV, 2015 Tex. App. LEXIS 8194 (Tex. App.—San Antonio Aug. 5, 2015, pet. granted, judgm't vacated w.r.m.) (mem. op) ("ConocoPhillips further argues that the trial court's construction of the retained acreage clause would adversely affect the provision in the lease allowing for pooling. This argument, however, only establishes that parties must be careful in drafting oil and gas leases to avoid conflicts.").

[48] *Thedford Crossing, L.P. v. Tyler Rose Nursery, Inc.*, 306 S.W.3d 860, 867 ("We cannot change the contract simply because we or one of the parties comes to dislike its provisions or thinks that something else is needed in it.").

[49] *Murphy Expl. & Prod. Co.—USA*, 2018 Tex. LEXIS 516 at *49 (Johnson, J., dissenting).

environmental permits, and carbon emissions, the decisions of the last two decades in Texas have pushed landowners away. These changes have given Texas royalty owners good reason to be cynical about lease enforcement and to be hostile to their producers. Producers may gamble that the short-term gains from changed law outweigh the loss of lessor goodwill and long-term trust, but the changes bode ill for the efficiency of this leading Texas industry.

B. Schrödinger's Clause

While the Court purported to limit its holding to "unconventional production in tight shale formations," the Court based its decision not only on the "context" of the Eagle Ford shale but also on the unambiguous language contained within the four corners of the Offset Clause.[50] The Court's ruling thus leads to uncertainty as to whether the Offset Clause functions differently as applied to different well types and formations. If an "offset well," as the Court opined, is simply a well drilled "with due diligence" to a "depth adequate to test the same formation" as the adjacent well "and no more," then it would seem the Court's reasoning must be applied to all well types and all formations, including vertical wells drilled in conventional formations. This will lead to several inequitable and unintended results depending upon whether the Offset Clause is an express drainage protection clause—another question which the Court did not explicitly answer. However, the Offset Clause must be one or the other. It cannot be a "free well" clause and a drainage protection clause at the same time.

If the Offset Clause is found to be an express drainage protection clause, it would supplant the implied covenant to protect against drainage.[51] In such case, the majority opinion will deprive landowners with similar offset clauses of all drainage protection. If the implied covenant is supplanted, the express offset clause is the only drainage protection the landowner will have. But under the majority's ruling, even if the landowner could prove actual drainage is occurring from an adjacent well (regardless of the well type or formation), the lessee would only be obligated to drill a well "with due diligence" to a "depth adequate to test the same formation," whether or not such well was actually protecting the leasehold from drainage. It is difficult to see how this would "counterbalance" or "compensate" the aggrieved landowner when oil and gas is being drained from their property with no available remedy.

If the Offset Clause is not found to be an express drainage protection clause, then the implied covenant would still be operative.[52] In this case, if the landowner could prove up the elements of the implied covenant as to an adjacent vertical or horizontal well, the lessee would have to drill two wells; one under the implied covenant and one under the Offset Clause. This would also mean that the Herbsts could still bring an action against

[50] McArthur, *supra* note 2, at 398.

[51] *Middle States Petroleum Corp. v. Messenger*, 368 S.W.2d 645 (Tex. Civ. App.—Dallas 1963, writ ref'd n.r.e.) ("The duty of the lessee to prevent drainage ordinarily requires him, in the absence of contrary agreement, to drill necessary offset wells, but where there is an express provision covering the subject the court will not imply inconsistent obligations.").

[52] *Texas Co. v. Ramsower*, 7 S.W.2d 872 (Tex. Comm. App. 1928), *aff'd on rehearing* 10 S.W.2d 537 (Tex. Comm'n App. 1928, judgm't aff'd) (ruling that delay rental clause refers to an initial exploratory or development well to be drilled at the will of the lessee and does not relate to the subject matter of the drainage covenant; the two covenants include different subjects).

Murphy based on the implied covenant to protect against drainage.

The fact that the Court's ruling inexorably leads to one of these two absurd results is further proof that the ruling was results driven and policy based—using established legal principles only as covering words for a foregone conclusion.

IV. Conclusion—What Now?

After *Murphy v. Adams,* how are attorneys to draft leases with certainty? As the Court has now demonstrated that even contractual terms with long-understood and enforced meanings may be changed at will, will landowner attorneys have to explain and define each and every term in their leases?

Attorneys could modify offset clauses to explicitly define the location in which offset wells should be drilled, but this does not solve the problem. The Offset Clause at issue was itself drafted to abrogate previous unfavorable case law and was completely unsuccessful. If attorneys are required to explain in detail the intent of every clause, not only will leases become much longer and cumbersome, the new language used must then stand the test of judicial interpretation itself, leading to more uncertainty.

Attorneys draft contracts with the expectation that certain terms will be enforced according to an established precedent. Predictability and faith in a consistent judicial enforcement of contractual terms is an absolute necessity to our economic system and the rule of law. If the Courts can now modify contracts at will, based on a court's subjective belief in what is "fair", or on whatever utilitarian end the Court wishes to support, the result will inevitably, and ironically, be an *increase* in transaction costs, inefficiency and waste:

> *Every freely entered contract is an expression of faith in the rule of law*. The contract and property underpinnings that protect the outcomes of unplanned economic exchange enable the "marvel" that Austrian economist F.A. Hayek famously perceived in market systems as the price mechanism and the individually orented actions that lead to the best use of resources "without an order being issued, without more than perhaps a handful of people knowing the cause." Were law a mere exercise in power, those without preexisting wealth and power would have no reason to trust market transactions. The marvel of the free market would not occur. The frequent subversion of development by corruption in developing countries is a reminder of how essential it is to hold courts to the rule of law.[53]

The efficient development of Texas mineral resources is an important policy goal, but at this point it appears that the State has completely forgotten that these resources are not State property—they are privately owned. Oil and gas is the property of the landowners, and landowners have the absolute right to dictate on what terms it will be extracted and what benefits they will receive. The Texas Supreme Court must return balance to Texas oil and gas jurisprudence and acknowledge that the enforcement of private contracts cannot be subordinated to the economic benefit of oil and gas producers. Only under the free market and the rule of law will Texas resources be allocated to their most efficient use.

[53] McArthur, *supra* note 2, at 267.

V. Postscript

After the Supreme Court issued its opinion on June 1, 2018, the Herbsts' filed a motion for rehearing. The Herbsts argued that the Court had misapplied the surrounding circumstances doctrine, and had erred by considering the arguments presented in the Newman Article. The Motion for Rehearing stated:

> Mr. Newman's article is essentially a brief with self-serving parol testimony for Murphy. . . . The majority has accepted Mr. Newman's arguments as the undisputed factual context in which the leases were negotiated and has used Mr. Newman's policy arguments to rewrite the leases. . . . The majority ignores articles provided by amici that contradict Mr. Newman. These articles, written by scientists (not lawyers for clients with offset well obligations) and a Chesapeake Energy engineer, indicate that actual drainage occurs in the Eagle Ford beyond the 467-foot trigger distance in the leases.[54]

An Amicus Curiae Letter was also filed in support of the Herbsts by the National Association of Royalty Owners-Texas, the Texas Land and Mineral Owners Association, G. Wade Caldwell, David Drez, James Holmes, Alfred A. Steinle, Walker C. Friedman, Allen D. Cummings, Richard L. Leshin, George Parker Young, Catherine M. Stone, John Petry, Stephen Ahl, Dick Watt, Jim Drought, Calhoun Bobbitt, Joseph Fitzsimons and Robert Park.

On November 30, 2018, the Supreme Court denied the motion for rehearing, but issued a corrected opinion.[55] The "corrected" opinion removed all references to the Newman Article, but did not change any of the Court's conclusions. Conclusions that were based, in large part, on the Newman Article. As the author puzzled over this corrected opinion upon its release, an associate offered an apt concluding remark—"forget it Jake, it's the Texas Supreme Court."

[54] Respondents' Motion for Rehearing at 5-7

[55] 2018 Tex. LEXIS 1225*

Murphy v. Adams: A Reasoned Decision

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I. Introduction

The Texas Supreme Court's decision in *Murphy Exploration and Production Co.--USA v. Adams* in June 2018[1] immediately led to a chattering chorus of commentators offering both criticism and support for the decision. In response to *Contract and Policy in the Wake of* Murphy v. Adams,[2] which falls into the criticism camp, the following response and counterpoint is offered.

As set forth below, the Court's interpretation of the offset provision in the *Murphy* lease is not an "overt judicial modification" but rather a straightforward application of contract interpretation principles. It stays true to both the plain language of the lease and the state's interest in preventing waste, and ultimately works to the benefit of both lessors and lessees.

II. Is the Term "Offset" *Really* "Long Understood" to Mean "Drilled to Protect Against Drainage"?

The plaintiffs in *Murphy*, and subsequent commentators, have suggested that the Court ignored the fact that "offset" has a common meaning in the industry—alternatively suggesting that an "offset" well must "protect against drainage," be "designed" to protect against drainage, or even "have a chance" to protect against drainage. But is that really the common meaning in the industry? And even if that is so, is it consistent with the language of the clause itself?

Any discussion of *Murphy* must begin with the plain language of the lease:

> 25.) It is hereby specifically agreed and stipulated that in the event a well is completed as a producer of oil and/or gas on land adjacent and contiguous to the leased premises, and within 467 feet of the premises covered by this lease, that Lessee herein is hereby obligated to, within 120 days after the completion date of the well or wells on the adjacent acreage, as follows:
>
> > (1) to commence drilling operations on the leased acreage and thereafter continue the drilling of such off-set well or wells with due diligence to a depth adequate to test the same formation from which the well or wells are producing from on the adjacent acreage; or
> > (2) pay the Lessor royalties as provided

[1] *Murphy Expl. & Prod. Co.—USA v. Adams*, 560 S.W.3d 105 (Tex. 2018).

[2] Robert Park, *Contract and Policy in the Wake of* Murphy v. Adams, 43 ST. B. TEX. OIL, GAS & ENERGY RES. L. SEC. REP. (2019) [hereinafter, *Contract and Policy*].

> for in this lease as if an equivalent amount of production of oil and/or gas were being obtained from the off-set location on these leased premises as that which is being produced from the adjacent well or wells; or
>
> (3) release an amount of acreage sufficient to constitute a spacing unit equivalent in size to the spacing unit that would be allocated under this lease to such well or wells on the adjacent lands, as to the zones or strata producing in such adjacent well.[3]

The *Murphy* offset clause itself contains no reference to drainage or protection from drainage. Moreover, the evidence presented to the trial court fell far short of establishing that the commonly understood meaning of the term requires that an offset well protect against drainage. On the contrary, the evidence demonstrated that the term "offset" has different meanings in different contexts.

The San Antonio Court of Appeals' conclusion that "the commonly understood meaning of offset well is a well used to protect against drainage" relied on references in case law to "offset" wells in the context of discussions of protection against drainage.[4] But none of the cited cases squarely addressed the issue of what exactly an "offset" well means, and while they may support the proposition that the "the drilling of an offset well *can be* a method of protecting against drainage,"[5] the cases cited do not establish that the commonly understood meaning is that a well *must* do so in every context in order to be an "offset well" at all.

The meaning of "offset well" must be considered in the context of the plain language of the lease, which, here, contained an express definition of a qualifying "offset" well: a well drilled "on the leased acreage" and drilled "to a depth adequate to test the same formation from which the well or wells are producing from on the adjacent acreage."

III. If "Protection Against Drainage" Is Required, How Can an Operator Meet such a Standard in a World *Without* Drainage?

At the heart of the *Murphy* dispute is how to reconcile the requirement to drill an "offset" well that "protects against drainage" with the reality that a well drilled in a shale play at a legal location are not substantially draining the adjacent tract at all. If that is the case, how can an "offset" well be required to protect against drainage? How could a lessee establish that a (real) well protects against (fictional) drainage? In the absence of actual drainage, an "offset well equals drainage protector" standard is impossible to meet.

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[3] *Murphy*, 560 S.W.3d at 107.

[4] *See Adams v. Murphy Expl. & Prod. Co—USA*, 497 S.W.3d 510, 515 (Tex. App.—San Antonio 2016), *rev'd*,560 S.W.3d 105 (Tex. 2018). For example, the court of appeals cites to *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 14 (Tex. 2008), in support of the court's conclusion that the term "offset" includes a protection against drainage component. But the use of the term "offset" well in the *Coastal* opinion is preceded by a statement clarifying the meaning: "If the drained owner has no well, *he can drill one to offset drainage from his property*." *Coastal Oil*, 268 S.W.3d at 14 (emphasis added). It is only after providing this context that the Court refers to the term "offset well."

[5] *Murphy*, 560 S.W.3d at 110 (emphasis added).

The *Murphy* Court reached the only conclusion that could reconcile the language of the lease with the commercial reality of oil and gas production in tight shale plays.

Cognizant of this problem, the *Murphy* lessors and critics of the *Murphy* decision have run away from the court of appeals' holding that an offset well must *actually* protect against drainage, no doubt because the *Murphy* lessors understood that they could not establish any actual drainage, much less the substantial drainage required by the implied covenant to protect against drainage. Instead, they assert that the "offset" well must only "be drilled near the adjacent well in order for it to *have a chance of* protecting the leasehold against drainage," or that it be "drilled *for the purpose of* protecting against drainage," and ultimately claim that it is "immaterial" whether it the offset actually protects against drainage, as long as the well is located where a "reasonably prudent operator" would have placed it in order to protect against drainage.[6]

But without knowing the location, and amount, of this fictional drainage, how can a "reasonably prudent operator" determine where, and how, to drill a well to protect against it? To say that a qualifying "offset" well must be "near" the adjacent well is no standard at all. And if the standard is that a qualifying offset well be "drilled *for the purpose of* protecting against drainage," must the lessee prove that it drilled the well with the intent to protect against pretend, fictional drainage? Whether a well qualifies as an offset well should not be dependent on the subjective intent of the lessee.

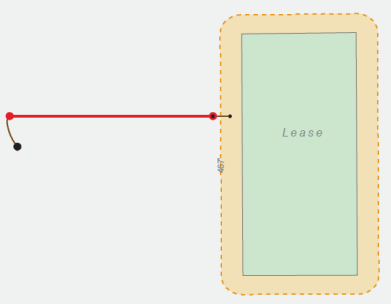
The struggle to reconcile the lessors' proposed standard with commercial reality was readily apparent in the *Murphy* oral argument, during which counsel was asked repeatedly: "How close is close enough?"[7] How "near" the lease line, or the triggering well, would a reasonably prudent operator need to drill a well to protect against *fictional* drainage? Counsel for the lessors struggled to articulate any standard at all, suggesting variously that the lessee should have "some flexibility" but that the well must be in "close proximity"; that the "best" standard would be for the wells to "bisect" the lease line "approximately"; and that "it is possible" that a well 467 feet from the lease line would qualify as an offset but that 600 feet would be "too far."

The unworkability of such a standard is further highlighted by the myriad potential orientations of the adjacent and qualifying offset wells. It may seem simple to state that if an adjacent well is drilled parallel to the lease line, the operator must drill a corresponding well parallel to the lease line and at the same distance from the lease line as the adjacent well. But again, in the absence of drainage, why should that standard be imposed, and how close is close enough?

Moreover, the *Murphy* lessors' requested "near" or "equidistant" distance standard completely falls apart outside of the parallel well situation. For example, when the adjacent well is drilled *away from* (perpendicular to) the lease line, or at an angle, so that only a portion of the adjacent well falls within the set trigger distance, as shown below:

[6] *See Contract and Policy*, at 4.

[7] The *Murphy* oral argument can be viewed at http://www.texasbarcle.com/CLE/SCPlayer.asp?sCaseNo=16-0505, and a transcript is available at 2017 WL 6513950.



How would a reasonably prudent operator "design" a well to protect against fictional drainage in this situation, where there is clearly no drainage at all? To pretend that *any* well would be "designed" to protect against drainage or would be drilled "for the purpose of" protecting against drainage in this situation is nonsensical in the context of a horizontal well in a shale play.

IV. The *Murphy* Decision Neither Harms Lessors nor Leaves Them Without a Remedy.

Lessors could have—and can—draft leases that require the drilling of a well on their lease, in a certain location, upon the drilling of a well within a certain distance of the lease line, and thereby excuse the lessor from the burden of proving actual drainage. However, they must do so in express terms, and not rely on a disputed "industry meaning" of a general term, such as "offset," that has varying meanings in varying circumstances. Lessors could require that the lessee drill an "offset" well with the productive portion of the wellbore within "X" feet of the lease line, or "X" feet of the adjacent well, or state that the well must be "equidistant" from the lease line or that the lease line must "bisect" the wells. But the clause in *Murphy* did none of these things, leaving the lessee (and the Court) without any specific standard other than what *was* expressly stated in the lease: that the offset well must be drilled "on the leased acreage" and completed to a "depth adequate to test the same formation" as the triggering well.

However, is it in a lessor's best interest to impose such restriction? In a world without drainage, there is no difference—in terms of benefit to the lessor—in royalties that the lessor receives from a well drilled 330 feet from the lease line and one drilled 1800 feet from the lease line. In fact, imposing an arbitrary location or distance standard ignores the practical realities of drilling.

The lease, for example, may be shaped in such a way that the only well that could be drilled within the arbitrary distance is a short lateral that is both uneconomic to the lessee and will result in much lower royalties to the lessor than a longer well drilled farther away. Or a fault or other geologic hazard may impede the ability of the lessee to drill a well within the stated distance. Or surface issues or pad placement may affect the ability to drill in that particular location. And, as noted above, what if the triggering well is drilled away from the lease line? Is an offset required, even though only a small portion of the productive wellbore is located within the trigger distance, and if so, how?

The *Murphy* lessors would likely contend that if it is not possible or practical to drill an offset well at the required location, a lessee may exercise the option of not drilling at all and paying "compensatory royalties" as if the well were drilled. But is that really an equitable or acceptable solution—requiring that the lessee pay the lessor hundreds of thousands (or millions) of dollars in royalties for hydrocarbons that are still in the ground?

On the contrary, it is oppressive, unreasonable, and penal.[8]

Logic dictates that the lessor may in fact be better served by permitting the lessee to drill the well at a location that maximizes production potential, rather than a location set within some unknown distance standard.[9] The *Murphy* lessors tried to walk this line by not insisting on a set distance, but yet still requiring that a qualifying offset be within some undefined, arbitrary range. That is clearly not a workable standard.

V. *Murphy* Is Loyal to Both Contract Construction Principles and the Interests of the State of Texas.

The Court did not, as some critics have suggested, sacrifice contract construction principles in the name of commercial oil and gas production; it adhered to both. Courts "construe contracts 'from a utilitarian standpoint bearing in mind the particular business activity sought to be served.'"[10] Courts also "avoid when possible and proper a construction which is unreasonable, inequitable, and oppressive."[11] Similarly, courts should avoid constructions that lead to absurd results.[12]

The struggle to reconcile the concept that an "offset" well must protect against drainage with the practical reality that there is no drainage to prevent in a tight shale formation serves to highlight the need for the Court to consider the evolving technical realities of oil and gas production. In a conventional play, absent a contractually agreed upon definition, it may make sense to construe the phrase "offset well" to be a well that protects against drainage, but having a one-size-fits-all definition of offset well does not work in a shale play that requires induced and propped fractures in order to recover any hydrocarbons at all.

Texas courts regularly take into account the technical aspects of production when construing lease royalty provisions in the context of horizontal wells like those at issue here. The Austin Court of Appeals in *Browning Oil v. Luecke*, for instance, specifically noted the differences between conventional vertical wells and horizontal wells:

> We note the physical characteristics that distinguish horizontal wells from vertical wells: Horizontal wells traverse several tracts owned by different individuals, not all of which are contiguous; *they include multiple points along the drainhole rather than a single drillsite*; and

[8] *EOG Res., Inc. v. Killam Oil Co.*, 239 S.W.3d 293, 298 (Tex. App.—San Antonio 2007, pet. denied) ("[W]e avoid when possible a construction that is unreasonable, inequitable, and oppressive.").

[9] The same argument could be made about the imposition of an arbitrary timing requirement. Is it in a lessor's best interest to dictate *when* a well must be drilled? If, for example, an operator on an adjacent tract drills a well during a period of low or decreasing prices (to hold the lease or comply with a continuous development clause, for example), an offset requirement to drill within a set (and short) time period may result in the drilling of a well during a time of low prices and/or high costs that may not result in an economic well and may not maximize royalties to the lessor. In a world without the risk of hydrocarbons draining off the lease, a lessor may very well be better served by allowing an operator to not only choose where to drill, but also when to drill.

[10] *Springer Ranch, Ltd. v. Jones*, 421 S.W.3d 273, 285 (Tex. App.—San Antonio 2013, no pet.) (quoting *Frost Nat'l Bank v. L&F Distribs., Ltd.*, 165 S.W.3d 310, 312 (Tex. 2005) (per curiam)).

[11] *See Reilly v. Rangers Mgmt., Inc.*, 727 S.W.2d 527, 530 (Tex. 1987).

[12] *Pavecon, Inc. v. R-Com, Inc.*, 159 S.W.3d 219, 222 (Tex. App.—Fort Worth 2005, no pet.).

> they penetrate . . . formations that do not facilitate the natural migration of oil and gas.[13]

The court therefore "decline[d] to apply legal principles appropriate to vertical wells that are *so blatantly inappropriate to horizontal wells*."[14]

Here, as set forth above, the lease spelled out exactly what would and would not be an offset well, and the Court honored that in its ruling. The Court's refusal to impute a distance requirement into a lease—or a requirement that a well be designed to "protect against drainage"—is not an "extreme position." The Court simply interpreted the plain language of the lease in the only way that made sense, based on solid contract interpretation principles.

However, the Court's ruling also had the added benefit of furthering the state's goals of preventing waste and conserving natural resources.[15] In the absence of actual drainage—and thus the absence of any need to protect against it—requiring that a well be drilled in an arbitrary location that may or may not be the optimal location furthers neither the interests of the state nor the interests of lessee *or* lessor. The Court's ruling is also consistent with the long-standing reasonably prudent operator principle, which recognizes that the "large expense incident to the work of exploration and development, and the fact that the lessee must bear the loss if the operations are not successful, require that he proceed with due regard to his own interests, as well as those of the lessor."[16]

Finally, as counsel for Murphy noted during oral argument, the *Murphy* lessors knew before the well was spud where it would be located yet did not file suit until after the well was drilled, completed, producing, and generating substantial royalty checks to the lessors. Then, and only then, did the lessors file suit and contend that the well was not a qualifying offset well and insist that Murphy drill them a *second* well. Not only was the Court's holding based on sound legal principles and consistent with public policy—it led to the right result.

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[13] *Browning Oil Co. v. Luecke*, 38 S.W.3d 625, 632–46 (Tex. App.—Austin 2000, no pet.) (emphasis added); *see also Springer Ranch, Ltd.*, 421 S.W.3d at 285 (noting the importance of "takepoints" in horizontal wellbores, and that "[p]roduction . . . is not obtained from the entire length of the well, but from that part of the well that pierces and drains the reservoir in which hydrocarbons reside").

[14] *Luecke*, 38 S.W.3d at 647 (emphasis added).

[15] *See Coastal Oil*, 268 S.W.3d at 15.

[16] *Clifton v. Koonz*, 325 S.W.2d 684, 695–96 (Tex. 1959) (quoting *Tex. Pac. Coal & Oil Co. v. Barker*, 6 S.W.2d 1031, 1036 (Tex. 1928)).