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Frac Sand, Hydraulic Fracturing, and Implied Covenants: The Potential for Liability

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ONE J

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FRAC SAND, HYDRAULIC FRACTURING, AND IMPLIED COVENANTS: THE POTENTIAL FOR LIABILITY

SLATE OLMSTEAD*

Table of Contents

I. Introduction	1396
II. Hydraulic Fracturing	1397
A. The History and Evolution of Fracing	1397
B. What is Hydraulic Fracturing.....	1398
C. The Importance of Frac Sand.....	1399
D. Shift Towards In-basin Frac Sand	1401
III. Implied Covenants of Oil and Gas.....	1402
A. The Oil and Gas Lease.....	1402
B. The Reasonably Prudent Operator Standard.....	1403
C. Implied Duty to Develop	1404
D. Development Through Operations Other Than Drilling.....	1405
E. Implied Duty to Protect Against Drainage.....	1407
F. Implied Duty of Prudent Operation.....	1410
G. State Laws Regarding the Implied Covenants.....	1411
1. Texas	1411
2. Oklahoma	1411
3. Kansas	1412

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4. New Mexico	1413
5. Colorado	1414
6. Wyoming.....	1414
7. North Dakota.....	1415
8. Louisiana.....	1416
IV. Potential for Litigation.....	1418
A. Hypothetical Development and Drainage Issues.....	1419
1. Breach of Duty to Develop.....	1419
2. Breach of Duty to Protect Against Drainage.....	1420
3. Breach of Duty to Protect Against “Fraudulent” Drainage	1421
B. Hypothetical Obstacles in Litigation	1422
V. Conclusion	1425

*“Let wealth come in by comely thrift, And not by any sordid
shift; ‘Tis haste Makes waste; Extremes still have their fault.
Who gripes too hard the dry and slipp’ry sand, Holds none at
all, or little, in his hand.”*¹

I. Introduction

The excerpt from Robert Herrick’s poem, “*Connubii Flores, or The Wellwishers at Weddings*” was written as advice given from the chorus of old men to the newlyweds on their wedding day, but perhaps it could be taken as sound business advice for those in the oil and gas industry as well.

Horizontal drilling and hydraulic fracturing, for all practical purposes, have been synonymous in the United States’ rise to becoming one of the world’s leaders in oil and gas production. Horizontal drilling provides for greater production than wells drilled vertically because it allows operators to access more of the wellbore in the production zone. Perhaps even more important, hydraulic fracturing provides a method to increase the production exponentially by allowing for oil and gas extraction from tight formations that were at one time thought impossible. While the industry has expanded and prospered greatly during this innovative era, it has also had the unintended effect of contributing to a considerable drop in oil and gas prices. But, with any boom and bust, the result is often a reorganization of operational strategies aimed at becoming more efficient and streamlined to sustain the bust, while preparing for the next boom.

1. Robert Herrick, *HESPERIDES: OR, THE WORKS BOTH HUMANE & DIVINE* (1648).

Even so, being more efficient in certain areas can sometimes have its downside too. Recently, operators have turned their efficiency focus towards frac sand. Traditionally, operators have obtained frac sand from the Northern Midwest, where the highest quality and best-suited sand is located. Transportation and logistics, however, can account for as much as two-thirds of the cost because the sand must often travel thousands of miles to reach where it is needed. Mindful, operators have started looking for cheaper alternatives closer to their operations due to the climate of the market. One thing operators have perhaps not considered are the implications for the lessor and his interests that arise from the implied covenants of the oil and gas lease.

This comment argues that the development of new sources of frac sand in the United States, while economically beneficial to operators, nonetheless inferior in quality, might lead to litigation between lessors and lessees over obligations arising from the development and protection of the lease. Part II introduces the history and method of hydraulic fracturing, the value of frac sand to the process, and discusses new developments in the frac sand needed to carry out these operations. Part III outlines the obligations that arise through implied covenants in oil and gas leases, discusses the standard of performance for such obligations, and compares how oil and gas states' case law and statutes recognize these implied covenants. Part IV discusses the potential for new litigation that could arise from hydraulic fracturing operations when an operator chooses to use sand from an in-basin sand mine and examines three hypothetical situations that could arise.

II. Hydraulic Fracturing

A. The History and Evolution of Fracing

Hydraulic fracturing has revolutionized oil and gas production in the United States by making it both accessible and financially feasible. The process of hydraulic fracturing, however, is not new to the oil and gas industry. Despite its recent prevalence, hydraulic fracturing technology has been used to stimulate the production of oil and gas wells for almost seventy years.² The continued improvement of hydraulic fracturing technology has allowed for the development of several unconventional

2. See *A Historic Perspective*, FRACFOCUS, <https://fracfocus.org/hydraulic-fracturing-how-it-works/history-hydraulic-fracturing> (last visited Oct. 18, 2017) (noting that hydraulic fracturing was first used in the United States during the late 1940s).

reservoirs, in particularly tight-shale formations.³ In fact, nearly eighty percent of production from these unconventional formations would be virtually impossible if not for hydraulic fracturing.⁴ Producers have used hydraulic fracturing in the completion of over one million producing wells, with an estimated 35,000 wells fractured each year.⁵ Oil produced from wells that are fractured account for more than half of all production of oil in the United States, with output nearly doubling over the past decade.⁶ The advent of horizontal drilling combined with hydraulic fracturing makes the production from tight shale formations economical; consequently, the United States has become one of the leading producers of oil and natural gas in the world.⁷

B. What is Hydraulic Fracturing

Once a well reaches “TD”—total depth for drilling—production casing is set, through the use of cement, in the producing formation. Alternatively, operators may plan for an open-hole production, in which, no casing is set because production will come directly from the formation. After the drilling operations have left the location, a “fracing” crew will move on and prepare to start hydraulic fracturing of the production formation. If a production string is set, perforations are made in the casing that allows for the flow of fracing fluid and eventual production. Though the process is essentially the same for each well, the design will depend on the conditions and formation of each well.⁸

Hydraulic fracturing is a multi-stage process that pumps large volumes of fracturing fluid downhole under high pressure to create and enhance the natural fractures in the production formation.⁹ The fluid used in hydraulic

3. *Id.*

4. *Id.*

5. *Id.*

6. Matt Egan, *Oil Milestone: Fracking Fuels Half of U.S. Output*, CNN MONEY, (Mar. 24, 2016, 12:40 PM), <http://money.cnn.com/2016/03/24/investing/fracking-shale-oil-boom/index.html>.

7. See Robert Rapier, *How the Shale Boom Turned the World Upside Down*, FORBES, (Apr. 21, 2017, 8:00 AM), <https://www.forbes.com/sites/rrapier/2017/04/21/how-the-shale-boom-turned-the-world-upside-down/#5711c39877d2>.

8. See *Hydraulic Fracturing: The Process*, FRACFOCUS, <https://fracfocus.org/hydraulic-fracturing-how-it-works/hydraulic-fracturing-process> (last visited Oct. 18, 2017) (“[W]hile the process remains essentially the same, the sequence may change depending upon unique local conditions.”).

9. *Id.*

fracturing consists mostly of a mixture of water and sand.¹⁰ Water carries the sand, a proppant, into the open fractures; the sand will “prop” or keep open the fractures after pressure is reduced in the wellbore.¹¹ This stimulates production of the well by “creat[ing] paths that increase the rate at which fluids can be produced from the reservoir formations, in some cases by many hundreds of percent.”¹² Because hydrocarbons would remain trapped within in the formation with no way out, hydraulic fracturing is essential to production in these formations.

C. The Importance of Frac Sand

Given the significance of hydraulic fracturing to the oil and gas industry, one can easily conceive that the demand for sand used in this process has grown exponentially. Some estimates show that total sand production in the United States has quadrupled since 2014, with the oil and gas industry share accounting for twenty-five percent in 2014 and more than seventy percent in 2015.¹³ “A hydraulic fracturing job on one well can require a few thousand tons of sand.”¹⁴ What may be less apparent is the importance of the type of sand used in the hydraulic fracturing process. “Frac sand” must meet very demanding industry specifications because it remains in the fractures, to help keep them propped open after the hydraulic fracturing process is complete.¹⁵ Frac sand standards are determined by the American Petroleum Institute (“API”) and the International Organization for Standards (“ISO”).¹⁶ The API/ISO standards criteria include among others: high silica content, homogenous grain size, high sphericity and roundness, and high crush resistance.¹⁷ High silica content (95–99 %) is indicative of

10. *Id.* (“Water and sand make up 98 to 99.5 percent of the fluid used in hydraulic fracturing.”).

11. *Id.*

12. *Id.*

13. *North American FracSand Consumption Will Grow with Drastic Shift in End Users*, UNIV. OF TEXAS BUREAU OF ECONOMIC GEOLOGY’S ECONOMIC MINERALS PROGRAM (last visited Oct. 22, 2017), http://www.beg.utexas.edu/energyecon/thinkcorner/CEE_Snapshot-Frac_Sands-Jan17.pdf.

14. *What is Frac Sand?*, GEOLOGY.COM, <http://geology.com/articles/frac-sand/> (last visited Oct. 15, 2007) (“Between 2005 and 2015, the amount of frac sand used by the oil and gas industry had increased dramatically.”).

15. *See id.*

16. *See* Benson, M.E., and Wilson, A.B., *Frac Sand in the United States—A Geological and Industry Overview*, U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 2015–1107 at 2 (2015), <http://dx.doi.org/10.3133/ofr20151107>.

17. *Id.* at 2–6.

the sand used as frac sand, with the most premium being ninety-nine percent or greater silica.¹⁸ Homogenous grain size is important in frac sand to allow for permeability.¹⁹ “The greater roundness [and] sphericity provides better porosity [and] permeability between grains, allowing better flow of oil and gas from the fractures to the wellhead.”²⁰ Another important factor of frac sand is the crush resistance necessary to hold open the fractures in the formation; the higher the percentage of silica in the sand, the higher its crush resistance.²¹

The highest-quality frac sand, designated as Tier One, is predominately found in the upper Midwest of the United States, and is referred to as “Ottawa” or “Northern White” sand.²² The API/ISO standards for frac sand are modeled after the properties of Ottawa/Northern White sands.²³ As the need for hydraulic fracturing in the oil industry continues to grow, so too will the need for frac sand—primarily Tier One. The amount of sand being used per well in the industry has, on average, increased by fifty percent on a year to year basis.²⁴ With this increase in consumption, the challenge becomes supply and logistics. For example, where it once took twenty railcar loads of sand to fracture one well, it now takes seventy-five loads; “that means that each frac job has gone from consuming 4 million pounds to 15 million pounds of sand.”²⁵ Interestingly, the cost of Tier One sand itself is only about half the cost to operators, or in some cases less; transportation costs and logistics can account for as much as two-thirds of

18. *Id.* at 5.

19. *Id.*

20. *Id.* at 6.

21. *Id.*

22. *Id.* at 53. (“In 2014, approximately 70 percent of the silica sand used for proppant was mined in the Great Lakes Region, which included Illinois, Minnesota, Michigan, and Wisconsin. Wisconsin and, to a lesser extent, Illinois and Minnesota are the primary producers of the Nation’s highest quality frac sand. Wisconsin accounts for nearly one-half of all the frac sand capacity in the United States owing to its premium sand deposits, railway infrastructure, and long-term presence in the industry.”); see also Taso Melisaris, *Not All Frac Sand is Created Equal*, FAIRMOUNTSANTROL, <http://fairmountsantrol.com/blog/oil-gas/well-challenges/not-frac-sand-created-equal/> (Oct. 11, 2016) (noting that northern white sand is premium Tier 1); Keith Schaefer, *The Big Opportunity in US Energy Right Now—and Why*, OIL AND GAS INVESTMENTS BULLETIN, <https://oilandgas-investments.com/2015/oil-and-gas-financial/the-big-opportunity-in-us-energy-right-now-and-why/> (Apr. 28, 2015) (“Wisconsin—a northern state that borders Lake Superior—holds almost all the Tier 1 frac sand in the USA.”).

23. *Id.* at 2.

24. Schaefer, *supra* note 22.

25. *Id.*

the end cost.²⁶ This adds huge costs to get Tier One sands to tight shale plays in areas such as Texas and Oklahoma. “Depending on the modes of transport, distances traveled, and number of transfer points, the cost of white silica frac sand proppant may reach \$170 per ton by the time it arrives at the well site.”²⁷ Down turn in oil market prices and the need to control cost for profit margins, have led many operators to look for frac sand closer to home.²⁸

D. Shift Towards In-basin Frac Sand

The decline in oil prices have made operators contemplate different areas where they can reduce costs. Until a few years ago, Northern White frac sand was the “industry standard” used in 100% of wells that were hydraulic fractured.²⁹ Now, Northern White only accounts for about two-thirds of the frac sand used in the United States.³⁰ In Texas, the Permian Basin alone is expected to double its share of frac sand consumption by the year 2020.³¹ With this in mind, several new sand mining operations have recently started development in Texas and surrounding areas.³² These new “in-basin” mines are different from the “Brown sand” typically associated with Texas because the “[f]rac sand produced from the in-basin mines is sourced from sand dunes rather than from formations beneath the Earth’s surface that require mining.”³³ Estimations show that these new mines could provide as much as forty-five million tons of sand each year, with transportation costs being much lower because of the proximity to where the hydraulic fracturing jobs take place.³⁴ In comparison, Northern White sand would have to travel almost ten times the distance as sand mined in Texas; with

26. *Id.*

27. Benson, *supra* note 16.

28. Schaefer, *supra* note 22.

29. See Hana Askren, *Texas Frac Sand in Demand*, FORBES, (Sept. 14, 2017, 1:41 PM), <https://www.forbes.com/sites/mergermarket/2017/09/14/texas-frac-sand-in-demand/#41ae6f7e469e>.

30. *Id.*

31. *North American FracSand Consumption Will Grow*, *supra* note 13.

32. Askren, *supra* note 29 (noting that tens of new mines are starting up in Texas and surrounding states.); see also Rich Kremer, *Texas Frac Sand Boom May Hurt Wisconsin Mines*, WISCONSIN PUBLIC RADIO, (July 30, 2017, 4:14 PM), <https://wpr.org/print/texas-frac-sand-boom-may-hurt-wisconsin-mines>.

33. Thomas Parambil Jacob, *How the Brown Sand Bonanza Impacts US Shale Plays*, IHS MARKIT, (Aug. 17, 2017), <https://ihsmarket.com/research-analysis/how-brown-sand-supply-impacts-us-shale-plays.html>.

34. Kremer, *supra* note 32.

cost of transportation potentially exceeding \$100 per ton versus \$20–\$50 per ton for Texas sand.³⁵

One potential drawback, however, is the quality of the sand produced. “Wisconsin frac sand has an advantage over sand from Texas and other states because it is exceptionally round and hard, which makes it better at unlocking oil from deeper deposits of rock.”³⁶ One of the major differences between Texas’ Brown sand and Northern White is the compressive strength, also known as “crush strength.” Brown sand has a lower compressive strength of 4,000 to 8,000 psi, compared with Northern White which has a compressive strength of over 8,000 psi.³⁷ In other words, Brown sand is more suitable for shallow wells and formations that have low fracture closure stress, while Northern White sand can withstand deeper wells and formations with higher stresses. “[Northern White] sand actually does a better job in the long run, but right now cheaper costs are the most important factors for producers.”³⁸ Furthermore, several risk factors exist because “new in-basin sand is very different than northern white and other brown sands”³⁹ and there is “very little data to quantify the effect of usage of in-basin sands on well productivity, estimated ultimate recovery[,] and initial production rates.”⁴⁰

III. Implied Covenants of Oil and Gas

A. The Oil and Gas Lease

Lessors and lessees enter into oil and gas leases with the purpose of exploring, developing, and operating the premises to their mutual benefit. Lessors prefer more encompassing provisions, while lessors would prefer less. Because lessors and lessees cannot anticipate every possible situation that will arise under the terms of the lease, courts have created legal rights

35. *North American FracSand Consumption Will Grow*, *supra* note 13.

36. *Id.*; see also Jordan Blum, *Texas Frac Sand Mines Keep Opening, but Halliburton Says Usage Slows*, HOUSTON CHRONICAL (July 25, 2017, 2:12 PM), <http://www.chron.com/business/energy/article/Texas-frac-sand-mines-keep-opening-but-11368797.php>.

37. *North American FracSand Consumption Will Grow*, *supra* note 13.

38. Keith Schaefer, *The #1 Efficiency Gains in Energy Come From . . . Sand?*, OIL AND GAS INVESTMENTS BULLETIN, (Aug. 10, 2016), <https://oilandgas-investments.com/2016/stock-market/the-1-efficiency-gains-in-energy-come-fromsand/>.

39. Tim Beims & Colter Cookson, *Permian Driving Frac Sand Supply Shift*, THE AMERICAN OIL & GAS REPORTER, (Jan. 26, 2018), <https://www.aogr.com/magazine/frac-facts/permian-driving-frac-sand-supply-shift>.

40. Jacob, *supra* note 33.

called implied covenants that are inferred from the agreement between the two parties when the lease remains silent.⁴¹ There are six major oil and gas implied covenants:

(1) the implied duty to develop; (2) the implied duty to explore, including a duty of further exploration in some states; (3) the implied duty to protect against drainage; (4) the implied duty to market, including the “marketable-product” rule with its effect upon who bears marketability costs; (5) the implied duty to accommodate; and (6) the implied duty of prudent operation for the mutual benefit of the lessor and lessee.⁴²

For the purposes of this Article, the implied duty to develop, the implied duty to protect against drainage, and the implied duty of prudent operation for the mutual benefit of the lessor and lessee will be the main focus.

B. The Reasonably Prudent Operator Standard

Implied covenants have been created by courts because leases do not expressly define every duty or standard of a lessee. Most jurisdictions follow the reasonably prudent operator standard to govern the duties of a lessee under the lease. The reasonably prudent operator standard requires “[w]hatever, in the circumstances, would be reasonably expected of operators of ordinary prudence, having regard to the interests of both lessor and lessee, is what is required.”⁴³ The reasonably prudent operator standard has the same purpose in oil and gas law as does the reasonable man standard in negligence law:

This analogy to the reasonable man of tort law also helps to explain the meaning of the prudent-operator standard. The prudent operator is a reasonable man engaged in oil and gas operations. He is a hypothetical oil operator who does what he ought to do not what he ought not to do with respect to operations on the leasehold. Since the standard of conduct is objective, a defendant cannot justify his act or omission on personal grounds or by reference to his peculiar circum-

41. Kenneth M. Klemm, *Implied Covenants: Recent Developments in Failure-to-Develop Cases and Other Implied Obligations Under Mineral Leases*, 57 ROCKY MT. MIN. L. INST. 20-1, 3-4 (2011).

42. John Burrirt McArthur, *U.S. Oil and Gas Implied Covenants and Their Functions: “As Much a Part of the Contract—Is as Effectually One of Its Terms—As if Had Been Plainly Expressed,”* 61 ROCKY MT. MIN. L. INST. 29-1, 7 (2015).

43. *Brewster v. Lanyon Zinc Co.*, 140 F. 801, 814 (8th Cir. 1905).

stances. . . . In short, the question is not what was meet and proper for this defendant to do, given his peculiar circumstances, but what a hypothetical operator acting reasonably would have done, given circumstances generally obtained in the locality.⁴⁴

C. Implied Duty to Develop

It is easy to understand why a lessor and lessee have a common interest in the development of an oil and gas lease. Both stand to profit from the development if successful. Their interests, however, are not always as common as one might think. For the lessor, more wells mean more money because they do not have to share in the expenses of drilling the wells. On the other hand, the lessee may have several reasons for delaying or deciding not to develop further. Shortage of capital, scarcity of resources, development of other leases, and belief that further development would not be financially beneficial are just a few of the reasons a lessee might have for not developing the lease. Thus, while a lessor has motivation to seek more development, the lessee's interests in development might not always be paramount.

One of the leading implied covenant cases, *Brewster v. Lanyon Zinc Co.*,⁴⁵ involved a development dispute between lessor and lessee after the express terms of the lease had been satisfied. The lease required that a well be drilled within the five-year primary term to avoid termination.⁴⁶ Lanyon Zinc drilled a well in the fifth year of the lease, satisfying the express terms of the lease.⁴⁷ Lanyon Zinc made no other efforts to develop the lease after completion of the first well, though other companies successfully drilled adjacent to the Brewster lease. Brewster notified Lanyon Zinc in writing to declare that the lease terminated and demanded surrender. After the demand was not complied with, Brewster sued.⁴⁸ Though Lanyon Zinc had satisfied the expressed terms of the lease, avoiding the lease termination, the Eight Circuit framed the question to be considered as:

The implication necessarily arising from these provisions—the intention which they obviously reflect—is that if, at the end of the five-year period prescribed for original exploration and

44. *Johnson v. Hamill*, 392 N.W.2d 55, 58 (N.D. 1986) (quoting 5 H. Williams & C. Meyers, *Oil and Gas Law* § 806.3, p. 42 (1985)).

45. 140 F. 801 (8th Cir. 1905).

46. *Id.* at 810.

47. *Id.* at 815.

48. *Id.*

development, oil and gas, one or both, had been found to exist in the demised premises in paying quantities, the work of exploration, development, and production should proceed with reasonable diligence for the common benefit of the parties, or the premises be surrendered to the lessor.⁴⁹

The court reasoned that absent express language in the lease, further work should be left to an implication of the reasonably calculated intentions of the parties as manifested in the lease, which was the production of oil and gas to their mutual benefit.⁵⁰ Furthermore, the contract did not stipulate that if Lanyon Zinc found oil and gas in paying quantities, they must engage in operation; but the agreement to pay royalties to Brewster implied that the parties intended for Lanyon Zinc to operate the well.⁵¹ In other words, “[w]hatever is necessary to the accomplishment of that which is expressly contracted to be done is part and parcel of the contract, though not specified.”⁵² Thus, the court held that the lease contained an implied covenant to continue exploration, development, and production with reasonable diligence after the primary term of the lease had expired.⁵³

A lessee’s duty to develop is an objective standard. Reasonable expectations are not based solely on the subjective view of the lessee only, or on the lessor only.⁵⁴ Therefore, a lessee only has a duty to develop if the lessor proves that it would likely be profitable to develop. A lessee’s duties, however, do not “carry the operations beyond the point where they will be profitable to him, even if some benefit to the lessor will result from them.”⁵⁵ Thus, a lessor cannot expect a lessee to conduct operations when the expense would outweigh the profit, even if the lessor would benefit.

D. Development Through Operations Other Than Drilling

Compliance with the implied duty to develop is not limited to drilling. Operators have many ways of enhancing production that have advanced as the oil and gas industry has evolved. Taking into account *Brewster*, the explanation of the reasonably prudent operator’s duty to develop can encompass development activities other than drilling. Indeed, several courts

49. *Id.* at 810.

50. *Id.*

51. *Id.*

52. *Id.*

53. *Id.*

54. *See id.* at 813–14.

55. *Id.* at 814.

have dealt with duties to develop that arise out of activities other than drilling.⁵⁶ In one case, a court held that failure to fracture a well was a breach of the implied covenant to develop. In *Crocker v. Humble Oil & Refining Co.*,⁵⁷ lessors brought an action for cancellation of an oil and gas lease after demand of additional drilling within sixty days was not met. The original lease had been divided into two parts by Humble, with wells drilled on both. But, over thirty-seven years had passed since a well had been drilled on the lease.⁵⁸ Humble contended that the delay was prudent and proper because they were in negotiations to create a waterflood unit on one part of the lease, and the drilling of an additional well would interfere with those negotiations.⁵⁹ Looking at whether the delay was prudent and proper in light of the circumstances, the court found that delay of development of the portion of the lease that included the waterflood unit was reasonably prudent.⁶⁰ The court explained, however, that “the standard of prudent operations to which a defendant should be held responsible is determined by the skills and knowledge then available.”⁶¹ During the years in which development was delayed, sandfracing had been discovered and commercially introduced; moreover, Humble and others had used sandfracing in the area.⁶² Evidence indicated that a well drilled on the other portion of the lease with the use of sandfracing would probably be profitable.⁶³ As such, the court found that Humble had not acted as a reasonable prudent operator in delaying development of the portion of the lease not included in the waterflood program.⁶⁴

In another duty to develop case, *Waseco Chemical & Supply v. Bayou State Oil*,⁶⁵ the court held that failure to employ known successful recovery

56. See e.g., *Clifton v. Kuntz*, 325 S.W.2d 684 (Tex. 1959) (discussing that operator could have been liable for unreasonable failure to rework the well had duty been breached); *Wadkins v. Wilson Oil Co.*, 6 So. 2d 720, 721 (La. 1942) (explaining that the operator was in breach for not developing wells “in accordance with the new and successful methods of development used by others in this . . . oil field.”); *Myers v. Shell*, 110 P.2d 810 (Kan. 1941) (discussing whether there was an implied duty to deepen a gas well into a gas and oil well, but holding that plaintiff had not met its burden of proof showing that a prudent operator would have done so).

57. 419 P.2d 265 (Okla. 1965).

58. *Id.* at 271.

59. *Id.*

60. *Id.* at 272–73.

61. *Id.* at 272.

62. *Id.* at 271.

63. *Id.*

64. *Id.* at 274.

65. 371 So. 2d 305 (La. App. 1979).

methods amounted to a failure to prudently operate and develop lease as a reasonably prudent operator would have. Bayou State Oil acquired the lease which contained about fifty existing wells.⁶⁶ In the following twenty-four years, Bayou State Oil drilled no additional wells on the lease.⁶⁷ During that time, lessees on adjacent properties employed a secondary recovery technique called fireflooding.⁶⁸ The fireflooding method successfully produced about sixty percent of the oil in place, while the method used by Bayou State Oil only produced about five percent.⁶⁹ Additionally, the royalties from the fireflood technique amounted to \$1200 per acre per month versus less than \$3 per acre per month under the method employed by Bayou State Oil.⁷⁰ Based upon the circumstances, the court found that Bayou State Oil “failed in its obligation of diligent development [as a reasonably prudent operator] of the Scanland lease for the benefit of itself and lessors.”⁷¹

Lessees must be mindful that the implied covenant of duty to develop is not solely limited to drilling additional wells. The duty may apply to enhanced recovery methods, horizontal drilling, reworking, and other activities as much as it does to drilling. It must be pointed out, however, that the facts must still show that a reasonably prudent operator would choose to develop under similar circumstances, while also considering profitability. Lessors cannot demand development because it would be profitable to them, the development must reasonably be to the mutual benefit of both the lessor and lessee.

E. Implied Duty to Protect Against Drainage

Oil and gas reservoirs are not perfectly located within property lines. Because oil and gas are fluid in nature, flow to different areas in the reservoir often crosses property lines. Consequently, the oil and gas industry was shaped by the “rule of capture,”⁷² under which one who brings

66. *Id.* at 311.

67. *Id.*

68. *Id.* at 311–12.

69. *Id.* at 312.

70. *Id.*

71. *Id.* at 307.

72. 5 Patrick H. Martin & Bruce M. Kramer, *WILLIAMS & MEYERS, OIL AND GAS LAW* § 822.3 (2017) (“In short, under the Rule of Capture, a landowner has title to the oil and gas he produces from his land, wherever the mineral may have been located originally. It is immaterial that some of the oil or gas now in place may have come from the land of others; the mineral is now subject to the physical control of the lessee and legally will be the property of the lessee and lessor when produced.”).

oil and gas to the surface is said to have captured and now owns the severed product. As a result, a well on an adjacent property can legally drain oil and gas from a neighboring property, as long as, the drainage is through underground migration that is then produced within the property lines of the adjoining well. Thus, drainage has the potential to deprive both the lessor and lessee of economic benefits. As a result, courts have imposed the duty to protect against drainage upon lessees before oil and gas migrates to a neighboring well.

A lessee's duty to protect against drainage requires the lessee to drill an offset well or protect the leased premises from a well drilled on neighboring property.⁷³ Like a lessee's duty to develop, courts employ the prudent operator standard in determining if the lessee has breached the implied duty to protect against drainage, by failing to drill an offset well. Furthermore, one of the key factors in the determination of whether a lessee acted as a prudent operator in protecting against drainage is profitability.⁷⁴ In other words, would a prudent operator drill an offset well to protect against drainage if doing so would be profitable, but not drill the offset well if it would be unprofitable.

To establish a breach of the implied duty to protect against drainage, the lessor must prove: "(1) that substantial drainage has taken place on the leasehold; and (2) that an offset well would produce oil and gas in paying quantities, i.e. in sufficient quantities to repay the cost of drilling, equipping, and operating the well and to return a profit on the investment."⁷⁵ Occasionally courts have suggested that substantial drainage and production in paying quantities are interchangeable; meaning that there is not substantial drainage unless there is enough oil and gas in place to recoup the costs of operation and drilling with additional profit.⁷⁶ However, courts that treat substantial drainage as an independent requirement are justified in doing so because a lessor who proves that an additional well would be profitable, but fails to prove substantial drainage, has merely

73. See, e.g., *Thoroughbred Assns., L.L.C. v. Kan. City Royalty Co., L.L.C.*, 248 P.3d 758, 771 (Kan. Ct. App. 2011); *Sundheim v. Reef Oil Corp.*, 806 P.2d 503, 508 (Mont. 1991); *Williams v. Humble Oil & Refining Co.*, 432 F.2d 165, 171 (5th Cir. 1970); *Indian Territory Illuminating Oil Co. v. Rosamond*, 120 P.2d 349, 352 (Okla. 1941).

74. See, e.g., *Olsen v. Sinclair Oil & Gas Co.*, 212 F. Supp. 332, 333 (D. Wyo. 1963); *Rosamond*, 120 P.2d at 352; *Amoco Prod. Co. v. Alexander*, 622 S.W.2d 563, 568 (Tex. 1981) (citing *Clifton v. Koontz*, 325 S.W.2d 684, 695–96 (Tex. 1959)).

75. WILLIAMS & MEYERS, *supra* note 72, § 822.

76. *Id.* § 822.1; *Monsanto Chemical Co. v. Andreae*, 245 Miss. 11, 147 So. 2d 116 (1962); *Shell Oil Co. v. James*, 257 So. 2d 488 (Miss. 1971).

proven that oil and gas exists in profitable quantities not that there has been a permanent loss of oil and gas.⁷⁷ The second element of proof, that an offset well will produce in paying quantities, is distinguishable from the meaning given in the habendum clause of an oil and gas lease. In relation to the implied duty to protect against drainage, production in paying quantities means: “such quantities as would lead a reasonably prudent operator to drill the additional or off-set well with the expectation of recovering from production the cost of drilling, equipping, and operating the well plus a reasonable profit.”⁷⁸ Thus, to establish a breach of implied duty to protect against drainage, the lessor must establish that there is drainage from the leased property, that the drainage is substantial, and that an offset well would recover the cost and make a profit.

Another situation that arises in implied duty to protect against drainage cases results when drainage is to a well drilled by the lessee on property of another lessor, sometimes referred to as “fraudulent drainage.” There are three general categories of these types of cases: (1) decisions reciting the fact that the lessee caused the drainage, but because a prudent operator would not have drilled to prevent drainage, recovery was denied; (2) cases where the lessee has caused the drainage, but does not change the common rules of liability for failure to protect against drainage; and (3) cases where the lessee’s liability has been increased when they are the cause of drainage on the leased property.⁷⁹ Some courts have even held the lessee liable without proof that an offset well would have been profitable. In *Geary v. Adams Oil and Gas Co.*,⁸⁰ the court found against lessee base upon a theory of unjust enrichment:

But here the mind is haunted by the fact that the defendant is the beneficiary of the oil drained from plaintiff’s land by the wells on the north and the south which belong to the defendant. It has not only been saved the cost of drilling, equipping, and operating a protecting well but it gets the oil anyway without plaintiffs being paid for it.⁸¹

Some scholars, however, oppose the idea that a lessee should be held liable for drainage to another of the lessee’s wells without proof that an offset

77. WILLIAMS & MEYERS, *supra* note 72, § 822.1

78. *Id.* § 822.1; *Whitaker v. Texaco*, 283 F.2d 169, 175–76 (5th Cir. 1960).

79. WILLIAMS & MEYERS, *supra* note 72, § 824.

80. 31 F. Supp. 830 (E.D. Ill. 1940).

81. *Id.* at 834.

well would be profitable.⁸² They suggest that the law should require no more of the lessee than what a reasonably prudent operator would do if he did not hold the adjoining lease.⁸³ Furthermore, these scholars suggest that only procedural changes are needed to place the burden of proof on the defendant in showing that there is not production in paying quantities, for which the lessee is usually more well informed.⁸⁴

Courts enforced the implied duty to protect against drainage in a number of ways: (1) cancellation of the lease; (2) conditional cancellation of the lease; (3) cancellation combined with damages; (4) injunction to drill offset well; and (5) damages for past and future loss.⁸⁵ There are several cases, however, which hold that cancellation of the lease is not available, and that the only remedy is damages.⁸⁶ Because the duty to protect against drainage is an ongoing duty, the statute of limitations will not bar an action brought too late after the cause first occurred.⁸⁷ Although, in such a case, the damages will be limited to those that occurred during the statutory limit beginning just before the action is filed.⁸⁸

F. Implied Duty of Prudent Operation

The implied duty of prudent operation for the mutual benefit of the lessor and lessee is a catchall duty that covers those duties that do not fall within the more recognized or specific implied covenants.⁸⁹ It is viewed as an expression of the more general duty of the lessee to perform in such a manner as to achieve the purposes of the agreement in the oil and gas lease.⁹⁰ There are four general categories of disputes that fall within the implied duty of prudent operation:

- (1) claims by lessors that operations on the land have been carelessly conducted causing damage to the royalty interests;
- (2) claims by the lessor that premature abandonment of the lease has damaged royalty interest;
- (3) claims by the lessor that lessee has failed to maximize the recovery from the land by using advanced production techniques; and
- (4) claims by the lessor that the lease

82. WILLIAMS & MEYERS, *supra* note 72, § 824.2.

83. *Id.*

84. *Id.*

85. *Id.* § 825.

86. *Id.*

87. *Id.*

88. *See Rosamond*, 120 P.2d 349.

89. WILLIAMS & MEYERS, *supra* note 72, § 861.

90. *Id.*

failed to seek favorable action by the regulatory commission that would have benefited the royalty interest.⁹¹

Some courts, however, may recognize a lessor's claim against the lessee for failure to maximize recovery from the land by using advanced production techniques, as a duty to develop through operations other than drilling.⁹²

G. State Laws Regarding the Implied Covenants

1. Texas

Texas courts view implied covenants to particular disputes under three broad categories of implied covenants: (1) development of the premises, (2) protection of the leasehold, and (3) management and administration of the lease.⁹³ Texas applies prudent operator standard to govern implied duties that exist between lessors and lessees. "The standard of care in testing the performance of implied covenants by lessees is that of a reasonably prudent operator under the same or similar facts and circumstances."⁹⁴ In failure-to-develop cases, profitability plays an important role, as the critical question is often whether the lessor can prove a reasonable expectation of profit to the lessor and lessee.⁹⁵ Thus, there is an obligation to develop a lease in Texas, but it does not require the lessee to continue development if the lessee can prove that further development would not be profitable.

In Texas, while a breach of a condition of the lease results in termination of the lease, breach of an implied covenant does not automatically result in termination.⁹⁶ Courts generally prefer to impose monetary damages before imposing cancellation of the lease.⁹⁷ The statute of limitations for a breach of implied covenant claims in Texas is four years.⁹⁸

2. Oklahoma

In Oklahoma, courts view implied covenants as a part of the contract under the oil and gas lease. Oklahoma recognizes the implied covenants to:

91. *Id.*

92. *See infra* Part III–D.

93. *Amoco*, 622 S.W.2d at 567.

94. *Id.* at 567–68.

95. *Sun Expl. & Prod. Co. v. Jackson*, 783 S.W.2d 202, 204 (Tex. 1989); *see also* *Atl. Richfield Co. v. Gruy*, 720 S.W.2d 121, 124 (Tex. App. 1986) (noting that "a prudent operator would not drill absent some evidence the drilling would be profitable").

96. *Hitzelberger v. Samedan Oil Corp.*, 948 S.W.2d 497, 506 (Tex. App. 1997).

97. *Id.*; *see also* *Coastal Oil & Gas Corp v. Roberts*, 28 S.W.3d 759, 763 (Tex. App. 2000) (noting that an oil and gas lease should be construed disfavoring forfeiture).

98. *Amoco*, 622 S.W.2d at 571.

(1) explore, (2) develop, (3) diligently and properly operate the lease, and (4) protect the lease from drainage.⁹⁹ Oklahoma courts apply the prudent operator standard to determine if an implied covenant exists. Furthermore, in Oklahoma, a duty to develop does not exist where there is not a reasonable expectation of profits.¹⁰⁰

Lessors bringing claims for breach of an implied covenant may seek termination of the lease or to recover monetary damages.¹⁰¹ Oklahoma courts, however, generally require the lessor to send notice and demand of compliance with the implied covenant and provide the lessee with a reasonable opportunity to comply before granting a termination of the lease.¹⁰² Because Oklahoma courts recognize implied covenants as being a part of the contract, lessors must be aware of the five-year statute of limitations for breach of contract claims.¹⁰³

3. *Kansas*

The Kansas legislature has given courts the authority to enforce implied covenants by passing the Kansas Deep Horizons Act.¹⁰⁴ These statutes assist the courts in analyzing these implied covenants in an oil and gas lease. Section 55–223 states:

As a matter of Kansas public policy, all oil and gas leases and subleases for the exploration, development and production of oil, gas or other minerals, or any combination thereof, which are held by production shall be presumed to contain, in addition to any expressed covenants therein, an implied covenant to reasonably explore and to develop the minerals which are the subject of such lease. Such implied covenant shall be a burden upon the lessee and any successor in interest.¹⁰⁵

Kansas courts, following the *Brewster* opinion, apply the prudent operator standard in evaluating implied covenants of an oil and gas lease. Like Texas

99. *Ramsey Petroleum Corp. v. Davis*, 85 P.2d 427, 429 (Okla. 1938).

100. *See Mitchell v. Amerada Hess Corp.*, 638 P.2d 441, 449 (Okla. 1981) (noting that “the covenant for further development as it is interpreted in this jurisdiction while limiting the duty to drill additional wells to those instances where a prudent operator would expect a probability of potential profit from the well contemplated”).

101. *See Rosamond*, 120 P.2d 349 (Okla. 1941); *Concorde Res. Corp. v. Kepco Energy, Inc.*, 254 P.3d 734 (Okla. Civ. App. 2011).

102. *Concorde*, 254 P.3d at 742.

103. *Rosamond*, 120 P.2d at 354.

104. KAN. STAT. ANN. §§ 55–223 through 229 (West 2017).

105. *Id.* § 55–223.

and Oklahoma, Kansas courts recognize the lessee's duty to develop, but allow the lessee to consider their reasonable expectation of profitability.¹⁰⁶

In failure-to-develop cases, the lessor has the burden of proving by "competent evidence" that the lessee breached the implied covenant.¹⁰⁷ Kansas courts may give a lessee, who breached an implied covenant, a reasonable time to comply. Termination or monetary damages may also be awarded at the determination of the courts.¹⁰⁸ Kansas courts recognize that implied covenants are implied in fact, and therefore are a part of the contract.¹⁰⁹ As such, a breach of an implied covenant in an oil and gas lease is subject to Kansas's five-year statute of limitations for contracts.¹¹⁰

4. *New Mexico*

New Mexico courts recognize the implied covenant of reasonable development. In *State ex rel. Shell Petroleum Corp. v. Worden*,¹¹¹ New Mexico acknowledged implied covenants in an oil and gas lease for the first time. The Supreme Court of New Mexico stated:

There is an implied covenant on the part of the lessee (in the absence of any expressed on the subject as in this lease) that after production of oil and gas in paying quantities is obtained, he will thereafter continue the work of development for production of oil and gas with reasonable diligence as to the undeveloped portion of the leased land.¹¹²

New Mexico also adopted the reasonably prudent operator standard. In *Libby v. De Baca*,¹¹³ the court held that a lessee must use "reasonable diligence, as viewed from the standpoint of a reasonably prudent operator," while accounting for his interest and the interests of the lessor.¹¹⁴

Breach of an implied covenant can result in the termination of the oil and gas lease; however, courts may provide the lessee time to comply with the

106. *See e.g.*, *Rush v. King Oil Co.*, 556 P.2d 431, 435 (Kan. 1976) ("The large expense incident to exploration and development, combined with the additional fact the lessee must bear the loss of unsuccessful exploration and development, justifies the lessee in exercising caution with regard to his own economic interests, as well as the interests of the lessor.").

107. KAN. STAT. ANN. §§ 55–224 (West 2017).

108. *Id.* § 55–226.

109. *See Smith v. Amoco Prod. Co.*, 31 P.3d 255, 268 (Kan. 2001).

110. KAN. STAT. ANN. § 60–511(1) (West 2017).

111. 103 P.2d 124, 127 (N.M. 1940).

112. *Id.* at 126 (citations omitted).

113. 179 P.2d 263 (N.M. 1947).

114. *Id.* at 265.

obligations of the covenant.¹¹⁵ There is a six-year statute of limitations in New Mexico for written contracts,¹¹⁶ but the courts have yet to decide this issue with respect to implied covenants in an oil and gas lease.

5. Colorado

Colorado views implied covenants under four simple categories: (1) duty to drill, (2) duty to develop after discovery of oil and gas in paying quantities, (3) duty to operate diligently and prudently, and (4) duty to protect against drainage.¹¹⁷ The performance required to comply with an implied covenant is the prudent operator standard. “Whether the lessee exercised the diligence proper under the circumstances to operate the lease is determined by whatever, in the circumstances, would be reasonably expected of all operators of ordinary prudence, having regard to the interests of both lessor and lessee.”¹¹⁸ Colorado courts, however, have held that “the implied covenant of reasonable development requires a determination that additional development will be profitable.”¹¹⁹ Thus, a lessee is allowed to take into account his reasonable expectation of profits when deciding whether to further develop.

In Colorado, a lessor may bring a claim for termination of the lease if breach of an implied covenant has occurred, and the termination may be full or partial, depending on the circumstances of the breach.¹²⁰ There is a three-year statute of limitations for breach of contract claims in Colorado.¹²¹

6. Wyoming

Wyoming law acknowledges implied covenants in oil and gas leases. The courts have established that oil and gas leases contain an implied covenant of development.¹²² The Supreme Court of Wyoming also follows

115. *Id.* at 266 (“We will direct the trial court to modify its decree and deny cancellation of the interests of such defendants in the lease on the forty acre tract on which the paying well was completed in December, 1938, on the condition that they proceed with reasonable diligence to market the gas from the well . . .”).

116. N.M. STAT. ANN. § 37-1-3 (West 2017).

117. *Davis v. Cramer*, 837 P.2d 218, 222 (Colo. App. 1992) (citing *Mountain States Oil Corp. v. Sandoval*, 125 P.2d 964 (Colo. 1942)).

118. *Davis*, 837 P.2d at 222-23 (internal quotations omitted).

119. *Gillette v. Pepper Tank Co.*, 694 P.2d 369, 372 (Colo. App. 1984); *see also Whitham Farms, LLC v. City of Longmont*, 97 P.3d 135, 137-38 (Colo. App. 2003).

120. *Davis*, 837 P.2d 218; *Gillette*, 694 P.2d 369; *Whitham Farms*, 97 P.3d 135.

121. COLO. REV. STAT. ANN. § 13-80-101 (West 2017).

122. *Sonat Expl. Co. v. Superior Oil Co.*, 710 P.2d 221, 225 (Wyo. 1985).

the prudent operator standard developed in *Brewster*.¹²³ Additionally, in contemplating reasonable prudence, courts “consider whether further drilling would prove profitable, not only to the lessor but also to the lessee.”¹²⁴ In other words, like other states, profitability is a critical factor in determining breach of implied covenants in Wyoming. Termination of the oil and gas lease is allowed for a breach of an implied covenant. While it is unclear how the statute of limitations would apply to a breach of an implied covenant in oil and gas leases, Wyoming has a ten-year statute of limitations for written contracts and an eight-year limit for unwritten contracts.¹²⁵

7. North Dakota

In North Dakota, while the courts do recognize implied covenants in oil and gas leases, they have referred to the covenants “to reasonably develop” and “further exploration” together.¹²⁶ With regard to the implied covenant of reasonable development, the Supreme Court of North Dakota stated:

The law is well settled that the lessee in any oil and gas lease has an implied obligation to the lessor to do everything that a reasonably prudent operator should do in operating, developing and protecting the property with due consideration being given to the interests of both the lessor and lessee, if there is no express clause in the lease relieving the lessee of this implied duty.¹²⁷

Thus, North Dakota courts use the reasonably prudent operator standard in determining whether a lessee has breached an implied covenant of an oil and gas lease.¹²⁸

The Supreme Court of North Dakota has held that several factors are taken into consideration when applying the prudent operator standard to a lessee’s actions:

(1) the quantity of oil and gas capable of being produced as indicated by prior exploration and development; (2) the local market and demand therefor; (3) the extent and results of the

123. *Id.*; see also *Phillips v. Hamilton*, 95 P. 846 (Wyo. 1908).

124. *Id.* at 228.

125. WYO. STAT. ANN. § 1–3–105(a) (West 1993).

126. *Johnson*, 392 N.W.2d at 57.

127. *Feland v. Placid Oil Co.*, 171 N.W.2d 829, 835 (N.D. 1969).

128. See, e.g., *Olsen v. Schwartz*, 345 N.W.2d 33, 39 (N.D. 1984) (noting that “whether or not there has been reasonable development of a leasehold is determined by reference to the ‘prudent operator’ standard”).

operations, if any, on adjacent lands; (4) the character of the natural reservoir—whether such as to permit the drainage of a large area by each well; (5) the usages of the business; (6) the cost of drilling, equipment, and operation of wells; (7) the cost of transportation, storage, and the prevailing price; (8) general market conditions as influenced by supply and demand or by regulation of production through governmental agencies; (9) evidence of the willingness of another operator to drill on the tract in question; (10) the attitude of the lessee toward further development; and (11) the elapsed time since drilling operations were last conducted.¹²⁹

In North Dakota, the lessor has the burden of proving breach of an implied covenant. Furthermore, the “lessor alleging breach of implied covenants is not entitled to forfeiture of a lease until he has notified the lessee of the breach, demanded that the terms of the implied covenant be complied with within a reasonable time, and given the lessee a reasonable time for such compliance.”¹³⁰ North Dakota contract law provides for a six-year statute of limitations for breach of contract claims.¹³¹

8. Louisiana

In Louisiana, the Louisiana Civil Code and the Louisiana Mineral Code provide the authority to enforce implied covenants. Section 122 of the Louisiana Mineral Code¹³² states:

A mineral lessee is not under a fiduciary obligation to his lessor, but he is bound to perform the contract in good faith and to develop and operate the property leased as a reasonably prudent operator for the mutual benefit of himself and his lessor. Parties may stipulate what shall constitute reasonably prudent conduct on the part of the lessee.¹³³

Additionally, Article 2683 of the Louisiana Civil Code stipulates the lessee has the obligation of using “the thing as a prudent administrator and in accordance with the purpose for which it was leased.”¹³⁴

129. *Johnson*, 392 N.W.2d at 57–58.

130. *Id.* at 58 (citing *Olsen*, 345 N.W.2d at 40).

131. N.D. CENT. CODE ANN. § 28–01–16 (West 2017).

132. LA. REV. STAT. ANN. §§ 31:1 through 217 (West 2017).

133. *Id.* § 31:122.

134. LA. CIV. CODE ANN. art. 2683(2) (West 2017).

While the Mineral Code and the Civil Code do not define implied covenants into specific categories, the comment to Section 122 of the Louisiana Mineral Code does provide:

In Louisiana, the general obligation to act as a “good administrator” or “prudent operator” has been clearly specified in four situations: (1) the obligation to develop known mineral producing formations in the manner of a reasonable, prudent operator; (2) the obligation to explore and test all portions of the leased premises after discovery of minerals in paying quantities in the manner of a reasonable, prudent operator; (3) the obligation to protect the leased property against drainage by wells located on neighboring property in the manner of a reasonable, prudent operator; and (4) the obligation to produce and market minerals discovered and capable of production in paying quantities in the manner of a reasonable, prudent operator.¹³⁵

Louisiana courts have held that a lessee has a duty to develop the producing formation in a manner of a reasonably prudent operator, taking into account his interests as well as the interests of the lessor.¹³⁶ The Supreme Court of Louisiana held that reasonable development is a “question of fact which must be resolved by a consideration of the facts and circumstances shown in the particular case.”¹³⁷ Louisiana courts have developed six factors to apply in determining whether a lessee has breached an implied covenant: (1) geological data, (2) number and location of wells drilled, (3) productive capacity of existing wells, (4) cost of drilling versus reasonably expected profit, (5) lapse of time between last well completed and demand for further operations, and (6) consideration of the acreage involved in the lease.¹³⁸ Thus, Louisiana courts apply a fact specific analysis to determine whether a lessee has acted as a prudent operator in breach of implied covenant cases.

Like other states, Louisiana requires the lessor to give notice and demand for default of compliance before claiming breach. By placing the lessee in

135. LA. REV. STAT. ANN. §§ 31:122.

136. *See generally* Goodrich v. Exxon Co., USA, 608 So. 2d 1019 (La. Ct. App. 1992); *see also* Carter v. Ark. La. Gas Co., 36 So. 2d 26, 28 (La. 1948) (noting that reasonable development by the lessee is what is expected of persons of ordinary prudence in similar circumstances, while having due regard for the interest of both parties).

137. *Carter*, 36 So. 2d at 26.

138. *Goodrich*, 608 So. 2d at 1023.

default, the lessor gives notice of the alleged breach of the implied covenant, and allows the lessee a reasonable opportunity to comply with the demand.¹³⁹ The courts, however, have held that notice and demand of default letters that only demand release of the oil and gas lease, are insufficient to place the lessee in default.¹⁴⁰ Failure to properly place the lessee in default can be raised as a defense to such a claim.

In Louisiana, the lessor has the burden of proof in showing that a lessee has not acted as a reasonably prudent operator in performing his obligations under an implied covenant. If the lessor proves that “a mineral lease is violated, an aggrieved party is entitled to any appropriate relief provided by law.”¹⁴¹ Comment to Section 134 of the Louisiana Mineral Code provides:

Although the remedy of specific performance has not been granted in Louisiana where the demand is for compliance with an obligation[] such as one to drill a well, the remedy can be appropriate, such as in the case of failure to pay royalties, if what the lessor desires is payment rather than some other remedy, or in the case of a lessee who seeks to have the lessor deliver the lease premises to him for his enjoyment.¹⁴²

Under Louisiana law, a claim for breach of implied covenant is subject to a ten-year statute of limitations for personal actions.¹⁴³

IV. Potential for Litigation

As previously discussed, the implied covenants of an oil and gas lease have long been recognized as playing an important role in the obligations of the lessor-lessee relationship. While implied covenant law provides a foundation for resolving traditional controversies, the oil and gas industry continues to evolve with new technologies. One thing that is certain, is that there will continue to be unanticipated problems that arise from unforeseen developments not covered by the oil and gas lease. Thus, the law of implied covenants will continue to regulate the relationship between the lessor and lessee.

With hydraulic fracturing playing an ever-expanding role in oil and gas production, the sand needed to perform this enhanced recovery method is

139. Hunt v. Stacey, 632 So. 2d 872, 876 (La. App. 2 Cir. 1994).

140. *Id.*

141. LA. REV. STAT. ANN. §§ 31:134.

142. *Id.*

143. LA. CIV. CODE ANN. art. 3499 (West 2017).

becoming a growing commodity. As consumption of frac sand has grown, oil and gas operators realized that they must make plans to address their future needs. One recent development is in-basin sand, which is in abundance with a much lower cost of transportation.¹⁴⁴ Much of the in-basin sand, however, is inferior in quality to that of the Northern White sand once used for all hydraulic fracturing jobs. Potentially, the use of this in-basin sand will result in lower production results. With this in mind, the question raised from a legal perspective is whether an oil and gas operator should have a duty to use the highest quality frac sand available in respect to his obligations to the lessor. A few theories of potential litigation that could result will now be explored.

A. Hypothetical Development and Drainage Issues

1. Breach of Duty to Develop

First, consider the following hypothetical: Texas-area operator finished drilling well and is preparing operations for hydraulic fracturing of the well. Operator, taking into account the recent downturn in the market, makes the decision to acquire frac sand for the operation from an in-basin sand mine in Texas. This sand is lower quality than that of the industry standard frac sand that have optimal qualities¹⁴⁵ typically used to fracture a well, but at a significantly lower cost because the local sand is cheaper to transport than the higher quality sand.¹⁴⁶ The lower-quality sand is used to fracture the

144. See, e.g., *North American FracSand Consumption Will Grow*, *supra* note 13 (noting that there are over 24 million metric tons of sand resource untapped in central Texas alone).

145. The qualities that make the sand optimal are hardness, sphericity, and uniformity of size. Hardness is often referred to as “crush strength.” It is important because subsurface forces will attempt to close the fractures after the fracturing fluid exits during flowback of the well. If the sand does not have the sufficient crush strength, some of the particles will be break apart under the subsurface force that is attempting to close the fracture. If the particles are crushed, they will not be as effective at propping open the fractures and the crushed particles may partially block the open spaces between the other particles. Because the oil and gas in the formation uses the spaces between the particles as pathways to flow into the wellbore, the partial blockage of those pathways can reduce production rates. Sphericity and uniformity of size are important because spherical particles that are uniform in size will pack together more neatly with more open space between particles—thus leaving more open space for fluid to flow—than particles of irregular size and shape.

146. See *North American FracSand Consumption Will Grow*, *supra* note 13 (Locally-sourced frac sand, because of the lower cost of transportation, can reduce the cost to the operator by as much as 50%–80%).

well.¹⁴⁷ The well begins producing in paying quantities but over time production rates decline, and the well is producing at a rate twenty percent less than other wells in the reservoir.

The question arises whether the operator has breached his implied duty to develop. It could be argued that the operator has drilled the well and performed additional operations to enhance production, but he has not done so as the reasonable prudent operator would. While the operator is able to offset the lower production rates with the savings from the lower cost of the in-basin sand and still be profitable, the lessor does not share in those savings but incurs a twenty-percent reduction in royalties from the lower production rate. With this in mind, it could be argued that the operator has the freedom to drill the well and conduct operations accordingly because he bears the cost of development. Thus, it stands to reason that the operator would drill the well in the most cost-efficient manner possible, without jeopardizing the integrity of the well. The lessor, not sharing in the cost of the drilling or operations, is neutral because they are unaffected until the well starts producing. Here, however, even though the lessor does not share in the costs of fracing the well, their share of royalties from the production is directly affected by the operator's decisions made during the fracing of the well.

2. Breach of Duty to Protect Against Drainage

Now, consider another hypothetical: Texas-area operator has, again, finished drilling well and is preparing operations for hydraulic fracturing of the well. Operator, taking into account the recent downturn in the market, decides to acquire frac sand for the operation from an in-basin sand mine in Texas. The lower-quality sand is used to fracture the well. The well begins producing in paying quantities but over time production rates decline, and the well is producing at a rate twenty percent less than other wells in the reservoir. Additionally, an adjacent well on the neighboring property,

147. It should be noted that not all hydraulic fracturing jobs require high quality (Tier 1) frac sand. Lower quality sands are often used in shallow depth wells where high crush strength is not needed because the subsurface forces are lower than at deeper depths. Additionally, other types of proppants might be used in hydraulic fracturing such as resin-coated sand or manufactured ceramic particles. While these types of proppants are more crush resistant, they typically are more expensive than sand.

fractured using industry standard frac sand, is causing drainage from the lessor's leased property.¹⁴⁸

Here the question arises whether the operator has breached his duty to protect against drainage. One could argue that even though the operator has drilled the well and taken steps to enhance production, he has not done so as the reasonably prudent operator would. In this hypothetical, now not only is the lessor receiving a reduced share of royalties, there is permanent loss of oil and gas from under the leased property. Of course, the lessor must show that there is substantial drainage¹⁴⁹ and in this circumstance the well has already been drilled. The lessee would likely argue that he complied with his duty and that the rule of capture¹⁵⁰ should preclude his liability. Here again, the lessor's share of royalties has been reduced not only by the lower rate of production, but quite possible, permanently by the drainage to the neighboring well as a direct result of the operator's decisions during the fracturing of the well.

3. Breach of Duty to Protect Against "Fraudulent" Drainage

Finally, consider a third hypothetical: Texas-area operator has, again, finished drilling well and is preparing operations for hydraulic fracturing of the well. Operator, taking into account the recent downturn in the market, decides to acquire frac sand for the operation from an in-basin sand mine in Texas. The lower-quality sand is used to fracture the well. The well begins producing in paying quantities but over time production rates decline, and the well is producing at a rate twenty percent less than other wells in the reservoir. Additionally, adjacent wells on the neighboring property that surround the lessor's property, fractured using industry standard frac sand, are causing drainage from the lessor's leased property. The adjacent wells are also leased and operated by the operator, who has a more favorable working interest, in regard to those wells, than provided for in the lease with the lessor of the well in subject.¹⁵¹

148. For purposes of this hypothetical the proposed adjacent well was fractured using the industry standard for frac sand for effect, but in theory it is irrelevant as long as there is drainage from the lessor's well to the adjacent well.

149. *See supra* notes 76–77.

150. *See supra* note 72.

151. For example, the lessee might have a seven-eighths working interest in the leases surrounding the property of lessor whose lease was being drained, while holding only a five-eighths working interest in the property being drained. It would be to the advantage of the lessee to have more production on those properties with a seven-eighths working interest because he would receive a larger share of the production, free from royalties.

Here the question arises whether the operator has breached his duty to protect against drainage. One might argue that even though the operator drilled the well and took steps to enhance production, he has not done so as the reasonably prudent operator would. In this third hypothetical, now not only is the lessor receiving a reduced share of royalties and incurring a permanent loss of oil and gas from under the leased property, it appears the operator has potentially taken steps that could amount to “fraudulent drainage.”¹⁵² In this situation, the lessee would likely have an even more difficult argument of precluding liability by the rule of capture.¹⁵³ Now, not only have the decisions of the lessee during the fracing of the well directly affected the lessor by reducing his share of royalties and drainage that resulted in a permanent loss of oil and gas, but it has directly affected the operator’s profitability.

B. Hypothetical Obstacles in Litigation

While each of these hypotheticals begins with the same basic premise, each brings in a different set of facts that change the dynamic such that each must be considered carefully. First, in each hypothetical situation, the operator’s decisions must be looked at from the perspective of the reasonably prudent operator standard.¹⁵⁴ It should also be pointed out that in all of these situations, the question of whether to drill a well (i.e. duty to develop), or whether to drill an offset well (i.e. duty to protect against drainage), is not at issue. The issue in these situations is whether the operator acted reasonably prudent in the secondary recovery operations done during the hydraulic fracturing stage of the operations.

In the first hypothetical, the lessor is perceivably receiving a reduced share of royalties because of the lower rate of production. One issue, here, is that the lessor would likely have to prove that the use of the lower-quality sand decreased the ultimate recovery of the oil and gas under the lease, not the rate of recovery.¹⁵⁵ The operator would likely argue that the lessor has not been damaged because the oil and gas remained in the formation until produced over time. The operator could also argue that the well could be reworked or re-fracture by a subsequent hydraulic fracturing job. However, this raises another interesting point, should the lessor wish to have the well

152. *See supra* note 79.

153. *See supra* note 72.

154. *See infra* Part III–B.

155. *See Trimble v. Hope Natural Gas Co.*, 117 W.Va. 650, 654, 187 S.E. 331, 338 (1936) (noting that there is no recognized principal by any court that would entitle a plaintiff to quickest possible rate of return from their well).

re-fractured the question becomes: whether the operator can take in to account his reasonable expectation of profits in re-fracturing the well. If the operator were allowed to take this into account, it could excuse his potential breach of duty for not properly fracing the well in the first place. Further, one might argue that once the well ceased to produce in paying quantities, the lease would terminate, and the lessor could enter into another lease to produce the remaining oil and gas. But, if it would not be profitable to the first operator, it stands to reason that a subsequent operator would not find it profitable to re-fracture the well, especially considering the well had now ceased production.

Another potential obstacle is proof of the reduced rate of production. While evidence of production rates in a particular field is likely obtainable, there is a lot of unknown in the oil and gas industry. It might prove difficult to ascertain how much the type of sand used in the hydraulic fracturing of a particular well affected its production rates. Additionally, not every hydraulic fracturing job is the same, as the number of stages and amount of sand can vary greatly depending on the particular well.¹⁵⁶ However, if it is ascertained that production has declined from the use of lower-quality sand compared with adjacent wells, then logically the lessor could argue that the operator failed to act as a reasonably prudent operator and breached his duty of reasonable development. Additionally, it would likely prove that this affected the ultimate recovery and not merely the rate of recovery, as the lower-quality sand allowed the fractures to close and clog up the passageways for the oil and gas to flow out of the formation.

In the second hypothetical, the lessor is not only perceivably receiving a reduced share of royalties because of the lower rate of production, but also there is permanent loss of oil and gas from under the leased property. In addition to the obstacles discussed in the first hypothetical, the issue here is that the lessor must show that there has been substantial drainage that resulted in permanent loss. The permanent loss may prove more difficult because the lessor is not dealing with the typical duty to protect against drainage, which usually involves the drilling of a protection well to protect the lease. Here, the theory is that the drainage from the lease stemmed from the use of lower-quality sand used in the hydraulic fracturing of the well, which in turn led to a lower rate of production. The lower-quality sand usage, therefore, led to oil and gas that was not recovered migrating outside of the lease and being recovered by adjacent wells. The most difficult part of proving this theory is connecting the dots to show the domino effect that

156. *See generally* Schaefer, *supra* note 38.

eventually led to the drainage. Indeed, it may prove difficult to ascertain how much the lower-quality sand affected the rate of production, how much oil and gas was left in the formation, how much oil and gas was drained, and if that amount was substantial.

In the third hypothetical, which is a very narrow and specific set of circumstances, not only is the lessor receiving a reduced share of royalties and incurring a permanent loss of oil and gas from under the leased property, but it appears the operator has taken steps that could amount to “fraudulent drainage.” Now, not only must the dots connect between the rate of production, how much oil and gas were left in the formation and drained by nearby wells, in addition, it must show that the operator’s operations were the cause of the drainage. While substantial drainage must be shown, some courts place a lesser burden of proof on the lessor when the operator and not a third party is the cause of drainage.¹⁵⁷ In addition, one or more of the elements generally required of the lessor is sometimes eliminated, or the usually available defenses to the operator is denied.¹⁵⁸ Here, while the difficulties of the second hypothetical remain, given the facts that the lessee caused the drainage on adjacent leases where the lessee had a more favorable working interest, it is perceivable that a lessor would have a strong suit, especially given the courts’ attitude towards fraudulent drainage cases.

In all of the hypotheticals, the first and perhaps biggest obstacle is proving that the operator has not acted as a reasonably prudent operator.¹⁵⁹ This obstacle may be difficult to overcome if several operators are also using in-basin sand because one could argue that it is an accepted practice within the industry. Further, operators may argue that they are responding to the market and its economics because the cost, logistics, and transportation of frac sand from the northern Midwest has proven difficult. Based on the large amounts of sand being consumed on a year to year basis alone,¹⁶⁰ has arguably made it necessary for operators to look for alternatives. Keep in mind, however, the reasonably prudent operator standard requires “[w]hatever, in the circumstances, would be reasonably expected of operators of ordinary prudence, having regard to the interests of both lessor and lessee, is what is required.”¹⁶¹

157. WILLIAMS & MYERS, *supra* note 72, § 824.

158. *Id.*; see also *supra* note 80.

159. See *supra* note 72.

160. See *supra* note 24.

161. *Brewster*, 140 F. at 814.

Finally, it should be pointed out that these hypotheticals are merely that, hypothetical. It is purely speculation as to how the courts would come down on these issues. But, what is important, is to keep in mind that the oil and gas industry will continue to evolve, and new technologies will continue to develop. As it does, the traditional notions of implied covenants to the oil and gas lease should evolve with it because new technologies bring about new problems. One being that Operators are usually in a much better position to understand the complexities. Courts should avoid rigid interpretation of the implied covenants to protect the lessors and royalty interest owners that are less knowledgeable. Thus, operators should have the freedom to innovate and become more efficient; it just should not be at the expense of the lessors and royalty interest owners.

V. Conclusion

Oil and gas operators must continue to be cognizant, not only of the bottom line but also of lessors and the obligations owed to them. The law of implied covenants helps to regulate the relationship between operators and lessors, but these laws must be able to adapt as new issues arise out of this relationship. New sources of frac sand while economically beneficial to the operator in the short term, could potentially have unintended consequences for lessors and operators in the long term. Operators should further consider the effects of using in-basin sand, how it could harm production rates, how that could harm them financially, how that could harm lessors and royalty interest owners, and how it could lead to potential litigation. One must remember, sometimes efficiency is not always efficient. As Robert Herrick wrote, “‘Tis haste Makes waste.”