Chapter 8  
POOLING FOR HORIZONTAL WELLS: CAN THEY TEACH AN OLD DOG NEW TRICKS?

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§ 8.01 Historical Antecedents and Basic Definitions

This chapter will explore the issues arising from the pooling of mineral, leasehold, and royalty interests for the purpose of accommodating the drilling of a horizontal well. It will analyze the history of state well spacing and compulsory pooling statutes and then provide an update of legislative and regulatory changes that have occurred in the past 25 years to deal with the problems that horizontal wells create under the traditional paradigm of pooling. The chapter will also cover the issues that arise from the voluntary pooling of mineral, leasehold, and royalty interests, including trespass, surface use, and the need for rewriting leasehold pooling clauses to better deal with horizontal wells.

“Pooling” or a “pooled unit” will refer to the “joining together of small tracts or portions of tracts for the purpose of having sufficient acreage to receive a well drilling permit under the relevant state or local spacing or drilling laws and regulations.” The term “communitization” refers to the pooling of interests when one of those interests is owned by either the

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1 Cite as Bruce M. Kramer, “Pooling for Horizontal Wells: Can They Teach an Old Dog New Tricks?” 55 Rocky Mt. Min. L. Inst. 8-1 (2009).

2 Bruce M. Kramer & Patrick H. Martin, The Law of Pooling and Unitization § 1.02 (3d ed. 2008) [hereinafter Kramer & Martin]. See also 8 Williams & Meyers Oil and Gas Law 780 (2008) [hereinafter Williams & Meyers].
federal government or a federal oil and gas lessee. Compulsory pooling refers to the use of the state police power to combine separately owned interests within a designated spacing and/or drilling unit. Compulsory pooling arose largely in the context of the development of state spacing and/or drilling regulation.

[1] Basics of Horizontal Drilling

Normally a horizontal well can be broken down into three operational segments: the vertical section, the build section, and the lateral section. The vertical section is drilled as any vertical well would be, depending on the depth and the type of rock that will be encountered. Prior to drilling, the engineers will have determined the depth at which the “kick-off point” is reached. The kick-off point is the depth at which the vertical drilling rig will be replaced by a horizontal drilling rig. Reaching the kick-off point leads to the build section of a horizontal well. The build section entails the building of the angle from 0° to about 90° at the end of the build section. The subsurface tools needed to conduct the build operation segment include the drill bit, mud motor, bent subs, and measurement-while-drilling (MWD) devices. In drilling the build section, the motor is located behind a drill bit and the bent sub is located behind the motor. A bent sub is merely a bent piece or pieces of pipe with variable angles. The motor operates without rotating the bent sub so that it stays pointing in one direction. During the build section operations, an MWD will be used to provide the directional measurements necessary to steer the mud motor and bit along the proper azimuth. The build section operations are continued until the inclination of the bit is at or near 90° or the intended production formation is reached. The last operational segment is the lateral section. The same equipment used in the build section is used in the lateral section although the bent subs employed are bent less severely. An MWD is employed to continuously monitor the angle and length of the horizontal well bore. The length will be determined by the formation being drilled, any need for the horizontal well bore to make “doglegs,” and appropriate spacing rules. It is not uncommon for laterals to be 3,000–5,000 feet in length.

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3 Law of Federal Oil and Gas Leases § 18.01[2].


The domestic oil and gas industry has been in existence for around 150 years.\(^5\) Government regulation of the oil and gas industry, including the enactment of compulsory pooling and unitization statutes, has been in existence for only a slightly shorter period of time.\(^6\) The need for well spacing and pooling regulation was a direct result of the early and widespread adoption of the rule of capture as the basic ownership principle for oil and gas.\(^7\) Because the only protection a mineral owner had under a rule-of-capture property regime was to drill a well to prevent drainage from a well located on a neighboring tract, there was a built-in incentive for such owners to drill as many wells as quickly and as close to the property line as possible.\(^8\)

Two Kansas municipalities, in response to the threat of over-drilling in urban areas, enacted the earliest well spacing and pooling ordinances in 1927.\(^9\) The City of Oxford’s ordinance resolved the problem of who would get the one drilling permit allocated per drilling unit or block, by using a first-in-time procedure but then requiring the permit owner to make pro rata royalty payments to all mineral owners within the block based on a surface acreage formula.\(^10\) The other leasehold interest owners in the

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\(^5\) The 1859 drilling of the Drake well near Titusville, Pennsylvania, is considered the “birth” of the modern oil and gas industry, although there are published reports of an oil spring existing in Allegany County, New York, as early as 1833 and a productive oil well in Washington County, Ohio, that may have been drilled as early as 1814. See 1 Kramer & Martin, supra note 2, § 1.01; Eugene Kuntz, A Treatise on the Law of Oil and Gas §§ 1.4-1.6 (2008).

\(^6\) See 1 Kramer & Martin, supra note 2, § 1.01. See generally A.B.A., Legal History of Conservation of Oil and Gas (1938). Professor Walter L. Summers identifies Pennsylvania as having adopted conservation statutes in 1878, New York in 1879, Ohio in 1883, and West Virginia in 1891.


\(^8\) 1 Kramer & Martin, supra note 2, § 2.01.

\(^9\) Id. at § 3.02[1]. See also 1938 ABA Legal History, supra note 6, at 55-56. The City of Winfield’s ordinance set a minimum spacing or drilling unit of either 90,000 or 300,000 square feet and then required the drilling permit applicant to prove ownership or control of that minimum area before it would issue a permit. The Winfield ordinance also provided for a pooling of interests within such drilling permit areas in order to qualify for a permit. The City of Oxford’s ordinance, on the other hand, combined spacing and pooling into one process, proportionately reducing the royalty to be paid mineral owners within the drilling block based on surface acreage. 1 Kramer & Martin, supra note 6, 3-8 & n.20.

block would receive their pro rata share of production if they tendered to the permit owner their pro rata share of the costs of drilling and operating the well.\(^\text{11}\) Other municipalities in Oklahoma and Texas followed suit with their own compulsory pooling ordinances.\(^\text{12}\)

In 1935, two states enacted compulsory pooling legislation: New Mexico\(^\text{13}\) and Oklahoma.\(^\text{14}\) The New Mexico provision used the proration unit system as the primary inducement for voluntary pooling but also authorized the state to force-pool separate interests within the proration unit. The Oklahoma provision used the drilling unit system both to space wells and to declare that if there were two or more owners located within a designated drilling unit, their interests would be pooled on a surface acreage basis.\(^\text{15}\) The constitutionality of compulsory pooling was upheld in *Patterson v. Stanolind Oil & Gas Co.*\(^\text{16}\) The court’s analysis of the inverse condemnation/regulatory taking claim is superficial at best, merely denoting that all property interests are held subject to the valid exercise of the police power.\(^\text{17}\) The drill site royalty owner’s claim that its interest had been taken as a result of dilution to accommodate the other royalty interest owners within the drilling unit was dismissed.

The interplay between spacing regulation and pooling regulation was recognized in a series of California cases and legislative amendments that replaced a well spacing system with a well spacing and compulsory pooling system in order to deal with the inverse condemnation claims of parties who were unable to receive a well drilling permit.\(^\text{18}\) The Texas response to...

\(^{11}\) 1 Kramer & Martin, *supra* note 2, § 3.02[1].

\(^{12}\) 1 Kramer & Martin, *supra* note 2, § 3.02[1].

\(^{13}\) 1935 N.M. Laws, Ch. 72. *See also* 1938 ABA Legal History, *supra* note 6, at 106-07; 289-302.


\(^{15}\) 1 Kramer & Martin, §§ 3.02[1]; 10.02.


\(^{17}\) *Patterson*, 77 P.2d at 89.

the regulatory takings issue was to allow Rule 37 exception well permits so that small tract owners could get a drilling permit even though they owned substantially smaller tracts than would otherwise support the issuance of a Rule 37 well permit. After enactment of the Mineral Interest Pooling Act in 1965, Kansas became the only major producing state that did not have a compulsory pooling statute. In an article written in 1997, the author concluded that only four states had any active regulation of horizontal wells under their well-spacing, proration, and/or pooling statutes or regulations. Those states included North Dakota, Oklahoma, Texas, and Wyoming. To the extent to which horizontal wells were regulated in other jurisdictions, those regulations would typically fall under the deviated or slant-hole regulation. A short synopsis of state regulations is provided in § 8.06, infra, that shows that state conservation agencies are responding to the increase in the use of horizontal drilling operations.


Voluntary pooling has been greatly increased because of the widespread inclusion of pooling clauses in oil and gas leases. Without a pooling clause the lessee could pool the leasehold interest but would be powerless to pool the royalty interest. As the Texas Supreme Court noted: “Absent express authority, a lessee has no power to pool interests in the estate retained by the lessor with those of other lessors.” While pooling clauses vary in length and detail, most pooling clauses contain provisions that may hinder pooling for a horizontal well development. There is some disagreement as to how courts should interpret pooling clauses. One Texas court of appeals took the following approach:

Anticipatory provisions in leases for the commitment by the lessee of such leases to unitization, of necessity must be in general terms. Neither the lessor nor the lessee has any way of knowing at the time the lease is taken the facts with respect to which it will be necessary for the lessee to apply his power. It is not practicable for the lessee to await the ascertaining of such facts. He knows from experience that because of the possibility of many changes in ownership

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19 Kramer & Martin, §§ 5.01[4][g]; 5.02[2][a].


21 Id.

22 For several examples of pooling clauses, see 1 Kramer & Martin, supra note 2, § 8.02 and 4 Williams & Meyers, supra note 2, § 668.

23 Jones v. Killingsworth, 403 S.W.2d 325, 328, 24 O.&G.R. 508 (Tex. 1965) (citing Brown v. Smith, 141 Tex. 425, 174 S.W.2d 43 (1943)).
of the lessor’s interest as time goes on, it may be difficult to effect an agreement if the right to unitize is not included in the lease itself. 24

On the other hand, there are decisions that interpret pooling clauses narrowly or hewing closely to the language used by the parties. 25 This author takes the position that while the courts could require strict compliance with any conditions precedent to the exercise of the pooling power, the interpretation of the pooling clause should be construed in light of the purpose of the clause, which is to encourage the pooling of interests. 26

In addition to any express conditions or limitations placed on the lessee pursuant to the leasehold pooling clause, courts have imposed upon lessees a duty of fair dealing (good faith) in the exercise of the pooling power. 27 While the cases tend to poorly define this particular duty, sometimes referring to the subjective standard of good faith while at other times referring to an objective standard akin to the reasonable and prudent operator test, courts regularly review the pooling decision and on occasion will overturn such decisions. Inquiries into why a particular lessee pooled leasehold acreage suggest that a good faith standard is being applied and that pooling of acreage merely to hold a lease into the secondary term may constitute bad faith. 28 Where a pooling causes financial injury to the lessor and financial benefits to the lessee, there may be a finding of bad faith pooling. 29

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26 4 Williams & Meyers, supra note 2, § 670.

27 1 Kramer & Martin, supra note 2, § 8.06; 4 Williams & Meyers, supra note 2, § 670.2.


29 Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008), rev’g on other grounds, Mission Resources, Inc. v. Garza Energy Trust, 166 S.W.3d 301 (Tex. App.—Corpus Christi 2005).
§ 8.02 Horizontal Pooling and Trespass Issues

One of the reasons horizontal drilling creates problems necessitating pooling is the potential for trespass and surface use issues. Figure 1, below, shows what may be a typical situation with a horizontal well.

![Diagram of horizontal drilling](image)

This hypothetical horizontal drilling situation is drawn from an unpublished paper written by H. Phillip Whitworth, Jr. and Richard P. Marshall, Jr. of Scott, Douglass & McConnico of Austin, Texas: “Land and Legal Problems Related to Horizontal Drilling Including Pooling, Trespass and Retained Acreage.” The author is indebted to them for their insights and understanding of the issues.

The surface location of the well is located on Blackacre. Vertical drilling occurs until the kick-off point is reached, at which time the build section operations begin where the well bore is deviated from the vertical. The engineers have determined that the penetration point, or the point at which the well bore enters the correlative interval, is to be located under Grayacre. At that point the well bore will travel within a few degrees of being parallel to the surface and will extend until a terminus is reached. The terminus of the well is located under Whiteacre. This last section of the well is sometimes referred to as the lateral section.

Under this hypothetical there are three tracts of land involved. If all tracts are under lease to the same operator no problems will arise. But if there are severed surface estates and separate leasehold estates, numerous problems may arise. Let us presume that Whiteacre and Grayacre are separately leased to Alpha Oil by different lessors. In order to locate the lateral section under both Whiteacre and Grayacre, Alpha Oil will have to pool the respective estates. Depending on the size of each and the inclusion

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of a pooling clause in the respective leases, pooling may be easier said than done. Furthermore, the leases may contain anti-dilution provisions that do not allow for pooling unless the pooled interest is entirely included or remains a majority interest after the pooling.\(^{31}\) Blackacre, on the other hand, is leased to Beta Oil. The lessor of Blackacre is also the surface owner.

Presuming further that Beta Oil does not want to pool Blackacre with Grayacre and Whiteacre, where does Alpha Oil go to seek permission to have the surface location on Blackacre? It is an axiomatic rule of oil and gas law that “the use of the surface by a mineral owner or lessee in connection with operations on other premises constitutes an excessive user of his surface easements.”\(^{32}\) Thus even if Alpha Oil were the lessor of the minerals under Blackacre, it would not have an implied easement of surface use that would allow it to produce oil and gas from under Grayacre and Whiteacre.\(^{33}\) In our hypothetical, however, it is clear that Alpha Oil cannot enter onto the surface of Blackacre without the permission of the surface owner of Blackacre.\(^{34}\) That permission may be denied and thus Alpha Oil will not be able to place its surface location on Blackacre.

Does Beta Oil have any veto power over the surface location since it has been granted the exclusive right to drill for and produce oil and gas from underneath Blackacre? Note that under our hypothetical the well bore does not reach the correlative interval or common source of supply until it is on Grayacre. The case authority on this issue is divided. In *Humble Oil & Refining Co. v. L. & G. Oil Co.*,\(^{35}\) the court specifically allowed the lessee of Grayacre to purchase the surface estate of Blackacre and drill a well that would be bottomed on Grayacre, over the opposition of the

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\(^{31}\) The issues relating to anti-dilution clauses will be discussed *infra* at § 8.03.


\(^{33}\) Many of the cases involving use of the surface estate for the benefit of other interests involve the injection of brine, salt water, and/or produced water from wells not located on the surface estate. See, e.g., Corbello v. Iowa Production, 850 So.2d 686, 157 O.&G.R. 1120 (La. 2003); Farragut v. Massey, 612 So.2d 325 (Miss. 1992); Grimes v. State, 2005 Tex. App. LEXIS 6963 (Tex. App.—Austin 2005).


\(^{35}\) 259 S.W.2d 933, 2 O.&G.R. 1429 (Tex. Civ. App.—Austin 1953, writ ref’d n.r.e.).
mineral owner of Blackacre. So long as the surface use of Blackacre does not unreasonably interfere with the Blackacre mineral owner’s ability to produce the minerals under Blackacre, the surface owner is free to drill a directional well. But where the mineral owner of Blackacre can show that the proposed surface use would preclude the development of the Blackacre mineral estate, the surface use may be enjoined. As is usually the case in Texas, there is a contrary holding. In *Chevron Oil Co. v. Howell*, the court enjoined a drilling operation on the surface estate of a third party because it concluded that there would be inevitable damage to the mineral estate where the vertical, nonproducing portion of the horizontal well was located. The court apparently relied on a presumption of injury to the mineral estate that appeared to be conclusive but may not have been based in fact. If followed, *Howell* would require that permission be sought not only from the surface owner of Blackacre but from the mineral owner as well. In our hypothetical, where the common source of supply is not even penetrated underneath Blackacre, the mineral owner of Blackacre should bear the burden of proof to show that there has been damage done to the common source of supply.

A view contrary to *L. & G. Oil* is taken by the California courts. In *Hancock Oil Co. v. Meeker-Garner Oil Co.*, the surface owner of Blackacre, which was under lease to the plaintiff, granted an easement to the lessee of Grayacre to make a surface location on Blackacre for the purpose of drilling a directional well bottomed on Grayacre. The parties stipulated that the surface location would not interfere with the existing or contemplated activities of the plaintiff in producing oil and gas from under Blackacre. Nonetheless, the court concluded that while there might not be any direct injury, there would be injury caused by the drainage of oil from Blackacre

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36 See also *Atlantic Refining Co. v. Bright & Schiff*, 321 S.W.2d 167, 10 O.&G.R. 566 (Tex. Civ. App.—San Antonio 1959, writ ref’d n.r.e.); *Grubstake Investment Association v. Coyle*, 269 S.W.854 (Tex. Civ. App.—San Antonio 1925, writ dism’d). The basic concept being applied in these cases is that the surface owner, while subject to the implied easement of surface use, has free use of the surface so long as it does not interfere with the implied easement. *Parker v. Texas Co.*, 326 S.W.2d 579, 582 (Tex. Civ. App.—El Paso 1959, writ ref’d n.r.e.).


to Grayacre. While the rule of capture should govern that issue, along with the implied covenant to prevent drainage doctrine, the court found, surprisingly, that the well bore constitutes a trespass on the mineral estate. That finding is incorrect, in the author’s opinion, because in California the mineral and leasehold estates are non-possessory in nature so that a trespass action is probably not the proper way to characterize the injury.40

The Williams and Meyers treatise provides the following recommendations to deal with this issue:

(a) The consent of the surface owner should be required for operations on Whiteacre for the purpose of exploring for and developing minerals in Blackacre, whether such operations are a geophysical survey or a surface location of a well. . . .

(b) Where drainage of oil and gas from Whiteacre or the prevention of drainage to Whiteacre will not be the consequence of the particular operation involved, consent of the surface owner alone should be sufficient, and joinder by owners of operating or nonoperating interests in minerals should not be required, . . . .

(c) Where drainage of oil and gas from Whiteacre or the prevention of drainage from Blackacre to Whiteacre will be the consequence of the particular operation involved, the problem is much more difficult. It may be argued that severance of minerals by deed or lease debars the surface owner by implication from such conduct on the premises as will cause drainage from the premises or will impair the mineral owner’s right to capture oil by drainage. . . .

Even though these recommendations were made in an era before the widespread use of horizontal drilling techniques, they are still valid. The issue of drainage that concerned the authors should be minimized because horizontal wells must still comply with the appropriate spacing regulation so that the penetration point in the target depth or correlative interval will be far enough away from a property line, making drainage unlikely.

If the mineral estate owner of the tract being crossed by a nonproducing portion of the well must consent to the drilling of the well, it is not likely that the owner is going to be willing to give its consent. Voluntary pooling would offer a potential solution to the problem, but would require a reconfiguration of the well so that the penetration point is now on Blackacre. Without participation in the well it appears to this author to be unlikely that the Blackacre mineral owner would consent to allowing a well to be located beneath the surface of Blackacre. If the parties are unable to come to an agreement regarding the use of the Blackacre subsurface to access the minerals under Grayacre and Whiteacre, and the jurisdiction follows the California or Howell approach, the compulsory pooling process would have to be utilized. Only Kansas, among the major producing states, does


41 1 Williams & Meyers, supra note 2, § 230.
not have a compulsory pooling statute. But in order to put Blackacre into a pooled unit, the operator will have to show that the common source of supply underlies Blackacre, because state oil and gas conservation agencies are loathe to pool areas which might be nonproductive.

§ 8.03 Horizontal Pooling in Light of Vertical Pooling Clauses

As noted above, most pooling clauses contained in oil and gas leases were drafted with vertical well drilling in mind. In addition, a number of widely used pooling clause forms make reference to governmental regulations to govern the maximum size of the area that may be pooled. Recent leases also may contain anti-dilution provisions that further restrict the power of the lessee to pool the lessor’s interests. Anti-dilution provisions may require that the pooled acreage not constitute less than a specified percentage of the pooled unit; if that cannot be accomplished, the entire leasehold acreage must be included in the proposed pool. All of these provisions may have ramifications for a lessee seeking to create a horizontal well pooled unit.

Some of these issues and the problem of how to deal with an improperly pooled lease in a horizontal pooled unit were analyzed in *Browning Oil Co. v. Luecke*. The lease contained a pooling clause that had been amended several times after the execution of the lease. One of the amendments to the pooling clause added the following anti-dilution provision: “Notwithstanding paragraph number four (4) hereof, if any pooled unit is created with respect to any well drilled on the land covered hereby, at least sixty percent (60%) of such pooled unit shall consist of the land covered hereby.” Another provision allowed the lessor’s lands to be pooled even if the lands constituted less than 60% of the pooled unit, where all of the lessor’s lands were included in the unit or such non-lesser lands were needed to comply with established field rules. After unsuccessfully seeking to amend the pooling clause again, the lessee drilled two horizontal wells. One horizontal well crossed through seven tracts of land and one of the three tracts that were subject to the lease. The vertical portion of the horizontal well bore and a portion of the lateral is located on the lessor’s tract. A second horizontal well crosses the other two lessor tracts although the vertical portion of the well is not located on

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43 *Browning*, 38 S.W.3d at 637.
44 Id. at 638.
the lessor tracts.\textsuperscript{45} It is all but conceded by the lessee that it did not comply with the anti-dilution provisions of the lease.

In Texas, a lessee purporting to act pursuant to the pooling power must strictly comply with any conditions precedent to the exercise of that power.\textsuperscript{46} Having conceded that the horizontal pooled units violated the anti-dilution provision, the lessee tried to argue that a reasonable and prudent operator would not have pooled the acreage for a horizontal well using the 80-acre spacing patterns that the Railroad Commission had adopted. The court rejected the notion that a lessee may ignore express limitations on the pooling power. The parties’ intentions as expressed in the written instrument will govern their relationship. The fact that the lessee feels constrained by the limitations does not excuse its compliance with the anti-dilution provision.

The trial court measured damages based on the traditional rules for the owner of a drill site tract whose interests have been improperly pooled. That measure of damages would be an undiluted royalty on all production coming through the well bore that is located on the leased tract.\textsuperscript{47} Because the second horizontal well crossed two of the tracts under lease, in theory, the lessor would have received a “double royalty” based on the illegal pooling. In rejecting this recovery the court articulated the reasons why a different rule should apply to wrongful pooling of royalty interests in vertical and horizontal wells. It stated:

> Horizontal wells can extend across several tracts of land in a linear configuration to accommodate the length of the horizontal drainhole. Consequently, all the tracts are not contiguous. Several tracts of land may separate the penetration point of the drainhole from the terminus point. And each of the tracts traversed by the horizontal drainhole is considered a drill site tract, which likely includes underlying fractures that are being drained by the well bore. Thus, each point along the drainhole is contributing to production from isolated fractures, and no one drill site is naturally draining minerals from all of the penetrated tracts. Even though the rule of capture and other principles of oil and gas law would afford the Lueckes royalties on all production if a vertical well were drilled on their land without valid pooling, these principles have no application in the case of horizontal wells that contain multiple drill sites on tracts owned by multiple owners.

\textsuperscript{45} \textit{Id.} at 638-39.


\textsuperscript{47} \textit{Browning}, 38 S.W.3d at 645. The wrongfully pooled tract is treated as having never been pooled so that it is entitled, under the rule of capture, to 100% of the production or, in this case, 100% of the leasehold royalty.
Absent the ability to naturally drain neighboring tracts, the Lueckes are not entitled to production from other lessors’ tracts unless there has been a cross-conveyance of property interests. Because the purported units were invalid, there has been no cross-conveyance of interests, and the Lueckes are not entitled to royalties on production from lands they do not own.\textsuperscript{48}

The court limited the award to those royalties on production that could be attributed to the Lueckes’ tracts.

In \textit{Manzano Oil Corp. v. Chesapeake Operating, Inc.},\textsuperscript{49} a top lessee sought to take advantage of the fact that a horizontal well was commenced off of the leasehold acreage to claim that a well had not been commenced prior to the end of the primary term. Chesapeake entered into a three-year primary term lease. Because of municipal regulations, Chesapeake needed a variance in order to drill a well on a surface location within the boundaries of the lease.\textsuperscript{50} Instead of seeking a variance, they purchased an adjacent three-acre parcel from which they began to drill a deviated well. The well was spudded on the adjacent tract prior to the end of the primary term, but the well bore did not enter the leasehold estate until after the end of the primary term. The lateral section of the proposed horizontal well would have been entirely within the boundaries of the leasehold estate. The court rejected the claim by the top lessees that, since there was no activity on or beneath the surface of the described leasehold estate, the savings provision allowing the lessee to complete a well that had been commenced, but not completed, in the primary term, was not triggered. Even though there was no formal pooling of the three-acre tract with the leasehold estate either by voluntary or compulsory action, the court found that the spudding of the well on the three-acre tract was to be treated as if it were on a “pooled” or “combined” tract, which under the express terms of the lease would amount to constructive operations. This author does not necessarily agree with the court that the purchase of the adjacent tract amounted to a pooling or combination so as to trigger the pooling clause, but would nonetheless have upheld the validity of the lease because the permit to drill clearly called for a horizontal well that would be located on the leasehold estate. The fact that the spudding and drilling prior to the end of the primary term had not occurred on the leasehold estate should not prevent the savings clause of the lease from being triggered.

\textsuperscript{48} \textit{Id.} at 646.


\textsuperscript{50} For a discussion of local regulation of oil and gas operations, see Bruce M. Kramer, “Local Regulation of Oil and Gas Operations: Don’t All Homeowners Want a Pumpjack in Their Backyard,” 41/2 Rocky Mt. Min. L. Fdn. J. 213 (2004); Bruce M. Kramer, “The Pit and the Pendulum: Local Government Regulation of Oil and Gas Activities Returns from the Grave,” 50 Oil & Gas Inst. 4-1 (Sw. L. Fdn. 1999).
Many pooling clauses have areal limits. Obviously, to the extent to which a horizontal pooled unit exceeds those areal limits, the lessee will have to seek an amendment to the lease or have the lessor ratify the expanded unit. Most of the areal restrictions will differentiate between the maximum size allowed for oil units, typically 40 acres, and the maximum size allowed for gas units, typically 640 acres. Many of these provisions contain references to state spacing regulations or “governmental authority” provisions that may allow for the expansion of the size of the pooled unit if the state conservation agency adopts a larger unit size as part of either special field rules or changes in statewide spacing rules.\(^{51}\) One specific type of pooling clause language has been narrowly interpreted by the Texas courts so as to limit the authority of the lessee to pool.

In *Pioneer Natural Resources USA, Inc. v. W.L. Ranch, Inc.*,\(^{52}\) the original leasehold pooling clause limited the maximum size of the pooled or proration unit to 320 acres. Desirous of creating a horizontal pooled unit of nearly 380 acres, the lessee negotiated an amendment to the lease authorizing such pooling. As with *Manzano*, the vertical portion of the well was spudded-in nine days prior to the end of the primary term, but the horizontal well bore did not enter the lessor’s lands until after the end of the primary term. The well produced sporadically for about five years and was then plugged and abandoned, never having achieved payout.\(^{53}\) The court applied the traditional rule that operations commenced on lands pooled with the leasehold acreage operate to maintain the lease into the secondary term.\(^{54}\) It did not discuss the fact that the well bore did not cross the lessor’s property line because, unlike *Manzano*, the surface where the vertical portion of the well was being drilled was pooled with the lessor’s acreage.

In *Jones v. Killingsworth*,\(^{55}\) the court was interpreting a pooling provision that limited pooled unit sizes to 40 acres for oil and 640 acres for gas, but further stated: “[P]rovided that should governmental authority having jurisdiction prescribe or permit the creation of units larger than those specified, units thereafter created may conform substantially in size with those prescribed by governmental regulations.”\(^{56}\)

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\(^{51}\) See generally 1 Kramer & Martin, *supra* note 2, § 8.05.


\(^{53}\) *Id.* at 904.

\(^{54}\) See 2 Kramer & Martin, *supra* note 2, ch. 20.

\(^{55}\) 403 S.W.2d 325, 24 O.&G.R. 508 (Tex. 1966).

\(^{56}\) *Id.* at 327.
Commission had adopted 80-acre proration units for the Fairway (James Lime) Field, but also allowed a tolerance allowable credit for an additional 80 acres. The lessee created a pooled unit for oil of 160 acres. The Texas Supreme Court, however, found that since the additional 80 acres allowed by the Railroad Commission was optional, and therefore not prescribed, the pooling clause would be interpreted so as to restrict the lessee’s pooling power to the 80 acres otherwise prescribed by the Commission. This narrow interpretation has been followed in several other Texas cases.57 Fortunately, this type of language does not appear to have been included in leases outside of Texas, although pooling clauses oftentimes do refer to state conservation agency regulation.58

§ 8.04 Horizontal Pooled Units

[1] The Caselaw

There have been few cases dealing with pooled units for horizontal wells. In Continental Resources, Inc. v. Farrar Oil Co.,59 the court applied traditional compulsory pooling principles in dealing with a pooling order issued by the North Dakota Industrial Commission that created a pooled unit for a horizontal well. After the Commission adopted a temporary rule allowing two horizontal wells in a 640-acre tract, Continental, which owned the northwest and southeast quarter-sections, sought and received a Commission order force-pooling the other two quarter-sections owned by Farrar.60 Even after the Commission entered its force pooling order, Farrar argued that, where the lateral sections crossed through its acreage, Continental was committing a trespass. Continental filed a declaratory judgment action seeking to determine that it had the right to drill its horizontal well in the Farrar leasehold estate.

While the penetration of a lateral line underlying the mineral estate of another would clearly be a common law trespass not protected by the rule of capture, the adoption of state conservation legislation effectively changes the common law rule of trespass.61 The issuance of the compulsory pooling order was a proper exercise of the state’s police power to prevent


58 See Debetaz v. Chevron U.S.A., Inc., 891 F.2d 562 (5th Cir. 1990).


60 Continental had initially sought to voluntarily pool in order to drill the proposed horizontal well but Farrar refused to participate. 559 N.W.2d at 843.

61 Id. at 844-45 (citing both Kramer & Martin, supra note 2, and Williams and Meyers, supra note 2).
waste, protect correlative rights, and conserve natural resources. Since Continental was authorized by the Commission to place its horizontal drainhole underneath lands owned by Farrar, the horizontal well, even though it crossed through, and produced from, Farrar’s leasehold estate, was not a trespass. If Farrar had been allowed to claim a trespass, it would have frustrated the compulsory pooling statute, the spacing statute, and regulations, effectively making the Commission order “ineffectual.” Continental was free to act consistent with the Commission’s compulsory pooling order without the threat of a trespass claim.

As with *Farrar Oil, Egeland v. Continental Resources, Inc.* applied traditional compulsory pooling principles to a case involving a horizontal pooled unit. The parties to two leases had nullified the printed form pooling clause and substituted a clause requiring the lessee to get the lessor’s consent prior to any pooling. Furthermore, the leases contained a Pugh clause stating that a well or wells would only maintain the lease beyond the primary term to the extent the leasehold acreage was within a producing or spacing unit. The lease was in an area where the Industrial Commission had created field rules for horizontal wells limiting such wells to two per 640 acres, just as in *Farrar Oil*. Both of the leases were in excess of 320 acres in size. The Commission spacing order designated five separate spacing units for the two leases. Instead of seeking consent from the lessor to create five pooled units, the lessee applied for compulsory pooling orders from the Commission for the five units. The Commission issued the five orders, force-pooling the interests committed to the five units.

Plaintiff claimed that the lease expired because no well was drilled on her lease and that the compulsory pooling order was ineffective as to her interests because she never consented. While it is clear that Continental could not voluntarily pool Egeland’s interest, there was nothing in the lease to prevent Continental from seeking a compulsory pooling order from the Industrial Commission. To allow a private party to veto the exercise of the police power by the Commission would have inhibited

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62 Id. at 846.

63 In *Egeland v. Continental Resources, Inc.*, 2000 ND 169, 616 N.W.2d 861, 145 O.&G.R. 469, the court was dealing with another compulsory pooling order involving horizontal wells, but the fact that horizontal wells were being drilled did not affect the outcome of the litigation. Essentially the court found that a lessee could avoid the restrictions contained in a Pugh clause by seeking a compulsory pooling order since the Pugh clause only dealt with voluntary pooling by the lessor. *See* 1 Kramer & Martin, *supra* note 2, § 9.06.

64 2000 ND 169, 616 N.W.2d 861 (2000).

65 616 N.W.2d at 863.
the Commission’s ability to achieve the strong public policy objective of fostering the efficient development of the state’s oil and gas resources. The court concluded that Continental’s actions in initiating the compulsory pooling process did not breach the pooling clause of the lease.\textsuperscript{66}

In \textit{Samson Resources Co. v. Corporation Commission},\textsuperscript{67} there was a direct challenge to the promulgation of Oklahoma Corporation Commission Rule 8-2(H)\textsuperscript{68} that deals with horizontal pooled units. Under Rule 8-2(H), the Commission may not create a Horizontal Well Unit that includes any existing well producing from the same common source of supply unless consent is obtained from 50% of the ownership having the right to drill in the spacing unit. Samson argued that the rule was both ultra vires and unconstitutional as an improper delegation of legislative power to private entities.

The ultra vires argument is easily dismissed because the enabling statute\textsuperscript{69} clearly gave the Corporation Commission the power “to promulgate rules necessary for the proper administration of this subsection.” The Commission’s adoption of this rule clearly is part of its authority to regulate oil and gas operations through the creation of spacing units. On the issue of whether or not the consent provisions amounted to an unconstitutional delegation of legislative authority, the court relied on the approval of the Oklahoma compulsory unitization statute,\textsuperscript{70} which, like most other state compulsory unitization statutes, requires a minimum level of consent from working interest and/or royalty interest owners before the state conservation agency will enter such an order.\textsuperscript{71} While there are some circumstances where regulatory decisions may not be subject to either approval or veto by private entities, in general having a consent requirement prior to the exercise of the police power usually is found to be constitutional.\textsuperscript{72}

\begin{flushleft}
\textsuperscript{66} \textit{id.} at 865-66. The court also found that the Pugh clause did not apply so as to terminate the lease as to those portions of the lease that were either not committed to a drilling unit or under active operations, relying in part on 1 Kramer & Martin, \textit{supra} note 2, § 9.06.


\textsuperscript{68} OCCRP Rule 8-2(H).

\textsuperscript{69} Okla. Rev. Stat. tit. 52, § 87.1(f).

\textsuperscript{70} Okla. Rev. Stat. tit. 52, §§ 287.1 et seq.


\textsuperscript{72} 2 Kramer & Martin, \textit{supra} note 2, § 24.02[1].
\end{flushleft}
[2] Compulsory Pooling Statutes

Compulsory pooling statutes come in all shapes and sizes. Since the 1930s they have served the tripartite public policy objectives of preventing waste, conserving natural resources, and protecting correlative rights. Since the 1930s they have served the tripartite public policy objectives of preventing waste, conserving natural resources, and protecting correlative rights.\(^{73}\) Horizontal drilling operations, to date, have been incorporated into the extant compulsory pooling regimes with few complications.\(^{74}\) As noted in the 54th Annual Institute of the Rocky Mountain Mineral Law Foundation (in 2008), horizontal drilling operations create more headaches for spacing regulation than they do for pooling regulation.\(^{75}\) The nature of horizontal drilling operations, when combined with spacing and/or density rules designed for vertical wells, will probably “encourage” operators to use the compulsory pooling process more frequently than in the past. Therefore, it is important to know the types of compulsory pooling statutes for the jurisdiction so that the horizontal well operator may utilize the relevant procedures to create a force-pooled horizontal unit.

One of the major issues in dealing with a compulsory pooling regulatory regime is how to afford those working interest owners who have not consented a fair opportunity to participate in the drilling of the pooled unit well.\(^{76}\) There are three general approaches to resolving this issue, and some states may utilize more than one approach. They are: (1) surrender of working interest, (2) risk penalty, and (3) free ride. In some states, such as Oklahoma, the non-consenting working interest owners are given an election to choose among a number of different options.\(^{77}\) Such is also


\(^{74}\) The Oklahoma Corporation Commission had a special meeting on June 30, 2009, to discuss the “emerging spacing and unitization issues related to the application of horizontal drilling technology.” See Randy Ellis, “Horizontal Drilling Raises Questions About Changes to State Regulations,” The Oklahoman (May 29, 2009).


\(^{77}\) 1 Kramer & Martin, supra note 2, § 12.03[1][a].
the case with a recent amendment to the Virginia compulsory pooling statute. Under the surrender of working interest approach, the state conservation agency requires the non-operator to assign its working interest to the consenting owners in exchange for compensation in the form of a bonus payment, royalty, or a combination of the two. Among the states using the surrender of working interest approach are Arkansas, Idaho, Illinois, Oklahoma, South Dakota, and West Virginia. The risk penalty approach is similar to that used in the various model form joint operating agreements for non-consenting working interest owners; namely, their interest is carried until such time as their pro rata share of revenue equals their pro rata share of expenses plus an additional sum as set forth in the compulsory pooling order. States that use this approach include: Colorado, Louisiana, Michigan, Mississippi, Montana, Nebraska, New Mexico, New York, North Dakota, Ohio, Texas, Wyoming, Idaho, and Nebraska. 

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80 Idaho Code § 47-322.  
83 S.D. Codified Laws Ann. § 45-9-33.  
84 W. Va. Code § 22C-9-7 dealing with deep wells only.  
85 1 Kramer & Martin, supra note 2, § 12.03[2].  
88 Mich. Comp. L. § 324.61513 does not specifically authorize the use of the risk penalty approach but the Natural Resources Commission has interpreted its powers to impose a risk penalty on non-consenting owners. 1 Kramer & Martin, supra note 2, § 12.03[2][c].  
90 Mont. Code Ann. § 82-11-202(2).  
91 Neb. Code § 57-909(2).  
93 N.Y. Env’tl. Conserv. Law. § 23-0901(3).  
94 N.D. Cent. Code § 38-08-08. Prior to 2004, North Dakota was a free ride state.  
95 Ohio Rev. Code § 1509.27.  
Utah,97 Washington,98 and Wyoming.99 The Colorado and Wyoming compulsory pooling provisions are nearly identical in that the risk penalty is set at 100% of the non-consenting owner’s share of certain costs, such as surface equipment and operating costs, and either 200% or 300% of the costs of drilling, reworking, deepening, or plugging back and completion. Even without an express statutory mandate, some state compulsory pooling statutes, such as in Michigan, merely provide that the order shall be on terms that are “just and fair” or “just and equitable,” giving the state conservation agency the discretion to impose risk penalties.100

A number of states use the “free ride” approach, namely that the non-consenting owner’s share is carried, and the carried owner’s pro rata share of expenses are recouped from that owner’s pro rata share of revenues. There is no additional payment over the actual and reasonable costs that should have been, but have not been, paid up front by the non-consenting owner. In these states voluntary pooling is discouraged because parties who become subject to a compulsory pooling order bear none of the risk of a dry hole or a marginally producing well, while sharing in the full benefits of a “gusher.” States that incorporate the free ride option include Alabama,101 Alaska,102 and Arizona.103

Where agencies have discretion, either in terms of the election or in setting the amount of risk penalty, courts usually take a “soft glance” scope of judicial review.104 In Oklahoma, which has the most cases dealing with the election process, the courts review the election options under a very deferential reasonableness standard.105 Likewise, in South Dakota, where a non-consenting owner was given the option of participating or being carried with a 100% risk penalty, the South Dakota Supreme Court upheld the Board of Natural Resource Development’s authority to impose a 100%

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97 Utah Code Ann. § 40-6-6.5.
98 Rev. Code Wash. § 78.52.250(2).
99 Wyo. Stat. § 30-5-109(g).
101 Ala. Code § 9-17-13(c).
102 Alaska Stat. § 31.05.100(c).
risk compensation.\textsuperscript{106} In general the courts have been receptive to state conservation agencies’ exercise of the power to impose risk penalties on non-consenting owners.\textsuperscript{107}

Another common problem with compulsory pooling orders relates to the effective date of the order. When the pooling order precedes drilling and production there is usually no difficulty with its effective date. When the pooling order, however, follows production from the well, the effective date can be very important.\textsuperscript{108} The possible effective dates for a pooled unit order can range from the date of first drilling operations to the actual date the state conservation agency issues the order. In \textit{Ward v. Corporation Commission},\textsuperscript{109} the court upheld a commission pooling order allowing the non-operator to share in production from the date of the spacing order, not the date of the pooling order. In Oklahoma there are statewide spacing rules that, \textit{ipso facto}, pool the interests within the spacing unit. Pooling orders are used to resolve issues between working interest owners who cannot agree to a joint operating agreement. Since the non-operator was prohibited from drilling a well on the spacing unit after the spacing order was entered, the court reasoned that making the pooling order retroactive to the date of the spacing order was required to avoid a regulatory takings issue. A similar type of retroactive order was upheld in North Dakota against an attack by an operator, who asserted that the order was a regulatory taking of its property interest, by giving the non-consenting owner retroactive rights in the well.\textsuperscript{110} In Utah a series of cases held that the effective date of the spacing/pooling order cannot be made any earlier than the date that the spacing order is entered even if production is achieved prior to the entry of the order.\textsuperscript{111}

Because of the potentially larger areas that may need to be pooled for horizontal wells, the likelihood that one may encounter an unleased mineral owner increases. There are several different approaches taken in

\textsuperscript{106} \textit{In re Kohlman}, 263 N.W.2d 674, 60 O.&G.R. 402 (S.D. 1978).


\textsuperscript{108} These issues are discussed in more depth at 1 Kramer & Martin, \textit{supra} note 2, §13.03.


dealing with such owners. A number of states treat the unleased mineral owner as a royalty owner and a working interest owner and then apply whatever approaches the state follows as to the working interest share.\footnote{112} In Louisiana, the unleased mineral owner is treated as an 8/8ths working interest owner and given a free ride.\footnote{113} Colorado, Montana, and Utah treat the unleased mineral owner as a royalty owner until payout and then convert the royalty interest into a working interest.\footnote{114} This latter approach is very favorable to the unleased owner, since the unleased owner gets a free ride with the potential of sharing in the profits from the well after payout without a risk penalty and also receives payments from the date of first production.

§ 8.05 Examples of Horizontal Pooled Unit Orders\footnote{115}

Examples of horizontal pooled unit orders from Colorado, Oklahoma, Texas, and Wyoming are available at the Rocky Mountain Mineral Law Foundation website.\footnote{115.1}

§ 8.06 Annotated List of State Statutes and Conservation Agency Regulations

The following list of statutory and regulatory provisions is designed to point out how particular states deal with horizontal or deviated wells from a spacing perspective since only a few states have dealt with the impact of horizontal wells on the compulsory pooling process. An article presented at the 54th Annual Institute of the Rocky Mountain Mineral Law Foundation (in 2008) provides a more detailed review of state spacing rules.\footnote{116}

\footnote{112} Oklahoma treats the royalty interest as a 1/8th royalty while North Dakota and Utah will average the royalty in the leases that are committed to the pooled unit. 1 Kramer & Martin, \textit{supra} note 2, § 12.02.

\footnote{113} 1 Kramer & Martin, \textit{supra} note 2, § 12.02.

\footnote{114} Colo. Rev. Stat. § 34-60-116(7); Mont Code Ann. § 82-11-202(2)(c); Utah Code Ann. § 40-6-6.5.

\footnote{115} The author thanks Mary Viviano of Encana Corp.; George Mueller of Burns, Wall, Smith and Mueller; Tim George, my colleague at McGinnis, Lochridge & Kilgore; and Mark Christensen and Jim George of Crowe and Dunleavy for providing examples of horizontal pooled unit orders.

\footnote{115.1} These documents are available at http://www.rmmlf.org/proceedings.

[1] Arizona

Arizona has statewide spacing rules for oil and gas. For wells with horizontal segments, the segments must be located at least 330 feet from the boundary of a spacing unit in the case of an oil well and at least 1,660 feet from the boundary of a spacing unit in the case of a gas well.

[2] Arkansas

Arkansas has specific rules for horizontal wells. Well location for a horizontal well is determined by the estimated productive portion of the lateral, projected to the surface. The well location is the entire perforated length of the lateral section as shown on a directional survey. Spacing rules attach to the entire perforated section of the lateral line so that at no point in the lateral may the relevant spacing rules be violated.

[3] Colorado

The recently adopted Colorado Oil and Gas Conservation Commission rules do not define the term “horizontal well” but do deal with horizontal drilling in a number of ways. There is a general requirement that, unless authorized by Rule 321, well deviation must be minimized. Rule 321 provides that if an operator intends to drill a horizontal or deviated well bore, the permit to drill application must include additional information showing both surface and bottom hole locations. In addition, within 30 days of completion the operator must submit the Drilling Completion Report with a copy of the directional survey coordinate listing and the well bore deviation plots. The report must show the location of the well bore from the base of the surface casing to the kick-off point and from that point to total depth. The operator must ensure that the well bore complies with the setback requirements contained in Rule 318 that require all wells drilled to a depth of 2,500 feet or greater to be set back at least 600 feet from any lease line and 1,200 feet from any producible or drilling oil or gas well.

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120 Id.
120.1 See http://cogcc.state.co.us.
121 COGCC Rule 317(b).
122 Id. Rule 321.
122.1 Id.
[4] **Florida**

Florida imposes an 1,840-foot spacing rule from all other wells on all “producing sections” of a horizontal well.\(^{123}\) All 10-acre blocks whose nearest boundary is within 920 feet of the productive section of a horizontal well must be included in the drilling unit. Likewise, horizontal wells within productive sections penetrating the 400-foot square in the center of a routine drilling unit must include the entire 160-acre drilling unit. The regulations further provide that productive horizontal wells are to be “unitized” as soon as possible after testing is completed.\(^{124}\) Horizontal well operators must also comply with the special requirements for nonroutine drilling units, including showing why the horizontal well will prevent waste or protect correlative rights.

[5] **Illinois**

The Illinois regulations specifically deal with the drilling of horizontal wells and the appropriate spacing. A horizontal well is one where the lateral length is at least twice the thickness of the reservoir.\(^{125}\) The regulations further allow for multiple horizontal drainholes from a single well. Depending upon whether the horizontal well is designed for primary or enhanced oil recovery purposes, the spacing requirements will differ.\(^{126}\) The operator must also provide additional information both prior to getting the permit to drill and upon filing of the required well completion and well drilling reports.\(^{127}\)

[6] **Kansas**

Under the regulations of the Kansas Corporation Commission, a horizontal well “may be permitted by the commission only after application to the conservation division and notice pursuant to K.A.R. 82-3-135a. The application may be set for hearing by the commission.”\(^{128}\) There is a statewide drilling unit size of 10 acres for both oil and gas wells and a spacing regulation that does not allow for wells to be drilled within 330 feet of any lease or unit boundary line.\(^{129}\)

\(^{123}\) Fla. Admin. Code r. 62C-26.004.

\(^{124}\) *Id.*

\(^{125}\) 62 Ill. Admin. Code § 240.455(a).

\(^{126}\) *Id.*

\(^{127}\) 62 Ill. Admin. Code § 240.245.

\(^{128}\) Kan. Admin. Regs. § 82-3-103a(b).

\(^{129}\) Kan. Admin. Regs. §§ 82-3-207; 82-3-312(c).
Kentucky

Kentucky has two parallel rules relating to horizontal wells, one dealing with coalbed methane (CBM) wells and the other dealing with all other wells. Both rules apply to directional and horizontal well bores. The horizontal well bore in either case must satisfy the spacing requirements for the well in terms of distance from the lease line and from other producing wells. There are special platting requirements imposed on the permit application to ensure compliance with the applicable spacing rules. The CBM rule imposes additional requirements relating to coal seams that may be intersected.

Louisiana

In 1998, the Louisiana Department of Natural Resources, Office of Conservation, promulgated Statewide Order No. 29-S regulating the drilling of horizontal wells in the Austin Chalk Formation. A horizontal well is defined as one where the lateral section is drilled at an angle of at least 80° to the vertical with a horizontal displacement of at least 50 feet from the penetration point into the Austin Chalk Formation. The regulations exempt horizontal wells from the statewide well spacing rules. Where no special or field rules have been created for Austin Chalk Formation horizontal wells, spacing rules require that the lateral section shall not encroach into a rectangle formed by drawing north-south lines 3,000 feet east of the most easterly point and 3,000 feet west of the most westerly point and east-west lines 100 feet north of the most northerly point and 100 feet south of the most southerly point of any horizontal well completed in, drilling to, or for which a permit shall have been granted.

The otherwise-applicable gas proration rules also do not apply to horizontal wells, which are to be given an allowable based on the Maximum Efficient Rate (MER) of the well. The size and shape of horizontal spacing units are to be based on the proposed design of the well. The regulations further provide that the “party who owns or controls a majority working interest in a drilling unit . . . for a . . . horizontal well shall have the right to be designated the operator of the unit.” The normal requirements for the running of a directional survey for all directional wells may be waived by

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132 Id. § 4305(2)(a).
133 Id. § 4305(6).
the Office of Conservation as to the requirement to run the survey for the entire length of the lateral section.\textsuperscript{134}

[9] \textbf{Michigan}

Michigan has no special rules for horizontal wells but does regulate directional drilling and re-drilling operations.\textsuperscript{135}

[10] \textbf{Montana}

Montana, in 1995, adopted a specific rule relating to how horizontal wells are to comply with the otherwise-applicable spacing regulations. Initially, the projected depth of the well as used in the spacing regulation to determine the relevant restrictions must be based on the “projected true vertical depth of the deepest horizontal drainhole.”\textsuperscript{136} The minimum distance requirements must be met at the penetration point and along the entire lateral line until the terminus. A horizontal well operator is given the discretionary power to designate an optional drilling unit, containing between two and four contiguous drilling units of the size and shape otherwise applicable to a vertical well. The horizontal well operator has 30 days after completion of the well to file an accurate directional survey showing location, direction, and length of each horizontal drainhole.

[11] \textbf{Nebraska}

Nebraska has no specific rules for horizontal wells but does regulate directional drilling through the permitting process.\textsuperscript{137} Compliance with the statewide spacing rules requiring 40-acre drilling units and requiring well locations for deeper wells to be no closer than 500 feet from a boundary line would otherwise be applicable.\textsuperscript{138}

[12] \textbf{Nevada}

Nevada has no specific rules for horizontal wells but requires wells that are intentionally deviated from the vertical to be approved by the Division of Minerals of the Commission on Mineral Resources prior to

\textsuperscript{134} \textit{Id.} § 4305(7). Statewide Order No. 29-B sets forth the requirements for surveys for intentionally deviated wells.


\textsuperscript{136} Mont. Admin. R. 36.22.703. The general spacing regulations are set forth in section 36.22.703. Montana has a default statewide spacing rule and individually set field rules.

\textsuperscript{137} 267 Neb. Admin. Code ch. 3, 014.

\textsuperscript{138} \textit{Id.} ch. 3, 013.02.
the commencement of operations.\textsuperscript{139} After well completion, a directional survey of the well must be submitted to the division.

[13] **New Mexico**

In the past few years, the New Mexico Oil Conservation Division (OCD) has been engaged in substantial and substantive changes to its oil and gas regulations. The new compulsory pooling regulations authorize the OCD to impose a risk penalty relating to the cost of drilling or reentering a well. Parties may contest what is a reasonable cost under a compulsory pooling order.\textsuperscript{140} Well spacing is determined by either county-specific rules, field rules, or statewide rules.\textsuperscript{141} The director of OCD may grant permits to drill at unorthodox locations after a notice and hearing.\textsuperscript{142} The new regulations do not use the term horizontal well, but do define the term “directional well” as a “well bore that is intentionally deviated from vertical with an intentional azimuth.”\textsuperscript{143} The regulations also use the standard definitions for kick-off point, lateral, penetration point, and producing interval.\textsuperscript{144} For directional well bores, the approval process differs when the well bore is entirely within a producing area, as defined by the regulations, or outside of the producing area.\textsuperscript{145} Typically a party will apply to OCD for a communitization order that is not specifically tied to a horizontal or directional well but will give the operator the permission to produce from the horizontal well. In addition, directional surveys are required for directional well bores. No allowable is to be assigned to a directional well bore until the survey has been submitted.\textsuperscript{146}

[14] **North Dakota**

North Dakota has extensive rules relating to spacing for existing and wildcat wells.\textsuperscript{147} The state has a specific rule for horizontal wells drilled at


\textsuperscript{140} N. Mex. Rules 19.15.13.8, 19.15.13.13.

\textsuperscript{141} Id. Rules 19.15.15.8, 19.15.15.9, 19.15.15.10.

\textsuperscript{142} Id. Rule 19.15.15.13.

\textsuperscript{143} Id. Rule 19.15.16.7.

\textsuperscript{144} Id.

\textsuperscript{145} Id. Rule 19.15.16.14(B).

\textsuperscript{146} Id. Rule 19.15.16.14(A)(4).

\textsuperscript{147} N.D. Admin. Code § 43-02-03-18.
an angle of at least $80^\circ$ within the productive formation and at least 500 feet in length.\textsuperscript{147} Horizontal wells must be drilled upon a full governmental section or upon two adjacent quarter sections. The horizontal well must be no closer than 500 feet to the outside boundary of the tract, and no more than one horizontal well may be drilled to the same pool on any such tract without the permission of the Industrial Commission.\textsuperscript{148}

[15] **Oklahoma**

Oklahoma also has a specific rule dealing with horizontal wells.\textsuperscript{149} Instead of the term “penetration point,” as is used in Texas, Oklahoma uses the term “point of entry” to describe the point where the “bore hole first intersects the top of the common source of supply.”\textsuperscript{150} For a horizontal well that is not drilled within an established horizontal well unit, no allowable will be assigned until the operator submits a downhole survey showing the location of each lateral for purposes of compliance with the spacing rules applicable to that location.\textsuperscript{151} Horizontal wells can be drilled on any drilling and spacing unit, and a horizontal unit may be created after notice and hearing.\textsuperscript{152} Because Oklahoma has statewide spacing, the regulations recognize that a horizontal well unit may be established for a common source of supply for which there may already exist a non-horizontal drilling and spacing unit. Horizontal well units may exist concurrently with producing non-horizontal drilling and spacing units. The regulations further provide that all laterals in the same common source of supply shall constitute a single well bore as long as one of the laterals is greater than 150 feet in length.\textsuperscript{153} As with Texas and most other states, compliance with the spacing requirements is determined at the point of entry to the terminus along any and all lateral lines that are drilled.\textsuperscript{154} For wells drilled deeper than 2,500 feet, the laterals must be at least 600 feet from any other producible or drilling oil and gas well that will be bottomed in the same common source of supply. Likewise, for horizontal wells, the spacing requirements from other horizontal

\textsuperscript{147} Id. § 43-02-03-18(2).

\textsuperscript{148} Id. § 43-02-03-18(1)(b). Horizontal wells may qualify for certain tax incentives otherwise provided for by North Dakota. See N.D. Admin. Code §§ 43-02-11-01 et seq.

\textsuperscript{149} Okla. Admin. Code § 165:10-3-28.

\textsuperscript{150} Id. § 165:10-3-28(b)(3).

\textsuperscript{151} Id. § 165:10-3-28(c).

\textsuperscript{152} Id. § 165:10-3-28(e).

\textsuperscript{153} Id. § 165:10-3-28(f).

\textsuperscript{154} Id. § 165:10-3-28(g).
well units depend on the size of those units. For example, a lateral may not be located less than 330 feet from the boundary of any 80- or 160-acre horizontal well unit.\textsuperscript{154.1} As with Texas, the regulations provide for “bonus” allowable for horizontal well unit production.\textsuperscript{154.2}

[16] Oregon

Oregon has no specific rules for horizontal wells but does regulate directional drilling through the imposition of additional permit disclosure requirements and directional surveys upon completion of the directional well.\textsuperscript{155}

[17] Pennsylvania

Pennsylvania has one of the most active shale plays in the United States, the Marcellus Shale Formation.\textsuperscript{155.1} The Pennsylvania Department of Environmental Protection regulates oil and gas operations in the state. While the department acknowledges the existence of horizontal well operations in the Marcellus Shale, there are no statutory or regulatory provisions that specifically relate to horizontal wells. Horizontal wells must be permitted under the Oil and Gas Act.\textsuperscript{156} The regulation dealing with deviated wells merely requires a well drilling permit and an angular deviation and directional survey of the well.\textsuperscript{157}

[18] South Carolina

South Carolina has no specific rules relating to horizontal wells, but has a regulation relating to directional drilling with additional reporting requirements attached to such operations.\textsuperscript{158}

[19] Texas

Texas had issued Rule 37 permits for nearly 12,000 wells through the end of 2005. That number clearly has increased in the feverish activity that occurred in the Barnett Shale play in the ensuing years. The Railroad Commission has adopted field rules for about 40 different fields, including rules for the Barnett Shale (also known as the Newark, East Field). Texas

\textsuperscript{154.1} Id. § 165:10-3-28(i)(2)(B).

\textsuperscript{154.2} Id. § 165:10-3-28(j)(3).

\textsuperscript{155} Or. Admin. Rules 632-010-0142.


\textsuperscript{157} 25 Pa. Code § 79.16

was one of the first states to adopt rules relating to horizontal drilling, promulgating Rule 86 in 1990.\textsuperscript{159} Rule 86 applies to all horizontal wells drilled in the state, except for those drilled in areas where specific field rules are applicable. Many of the definitions contained in Rule 86 have become the standard definitions used to describe horizontal drilling. For example, Rule 86 defines the “penetration point” as “[t]he point where the drainhole penetrates the top of the correlative interval.”\textsuperscript{160} The penetration point will normally be uphole from the “kick-off point,” depending on the sharpness of the angle used to move from the build section to the lateral section. The term “terminus” is defined as “[t]he farthest point required to be surveyed along the horizontal drainhole from the penetration point and within the correlative interval.”\textsuperscript{161}

Horizontal wells must comply with the otherwise applicable spacing regulations dealing with distances from lease lines and other wells, as to every point as measured from the lateral line in the correlative interval.\textsuperscript{162} If there is any point where the spacing and/or distance rules are violated the operator must seek a Rule 37 exception well permit.\textsuperscript{163} Because horizontal drainholes generally will produce more than vertical drainholes, Rule 86 rewards horizontal well operators through the proration/allowable system. Rule 86 contains a chart that provides for additional acreage assignment for proration/allowable purposes based on the field’s density rule.\textsuperscript{164} For example, in fields with a density rule of 40 acres or less and with a horizontal drainhole displacement (lateral section) of between 586 and 1,170 feet, the operator is entitled to an additional 40 acres of allowable acreage. Essentially, for each segment of horizontal drainhole displacement the operator gets an additional 20 acres. Likewise, in fields with a density rule greater than 40 acres and with a horizontal displacement of between 828 and 1,654 feet, the operator earns an additional 80 acres towards its allowable. In these larger-spaced fields the increments go up by 40 acres for each of the designated segments. Finally, Rule 86 provides that multiple horizontal drainholes may be drilled from a single vertical well bore.\textsuperscript{165}

\textsuperscript{159} 16 Tex. Admin. Code § 3.86.
\textsuperscript{160} Id. § 3.86(a)(4). The correlative interval is the depth interval between the top and base of the productive reservoir as defined by the Railroad Commission. Id. § 3.86(a)(1).
\textsuperscript{161} Id. § 3.86(a)(6).
\textsuperscript{162} Id. § 3.86(b).
\textsuperscript{163} Id. § 3.86(b)(3).
\textsuperscript{164} Id. § 3.86(d).
\textsuperscript{165} Id. § 3.86(e).
Where this happens the multiple well bores are treated as a single well and the acreage assigned for allowable purposes is determined by measuring the longest of the lateral sections.\textsuperscript{166}

\textbf{[20] Utah}

Utah has adopted specific spacing rules for horizontal wells. A statewide rule creates a temporary 640-acre unit for all horizontal wells consisting of the governmental section upon which the well is drilled.\textsuperscript{167} The surface location may be anywhere on the lease, precluding the option of placing it off the leasehold estate. No portion of the lateral section may be within 660 feet of any lease boundary or drilling unit boundary. No portion of the lateral section may be within 1,320 feet of any vertical well producing in the same formation that is being targeted by the horizontal well. The Board of Oil, Gas, and Mining may grant exceptions to any of the horizontal well spacing requirements. The directional, deviation, or MWD surveys that are required during the drilling of a horizontal well must be filed with the board within 30 days of completion of the horizontal well.\textsuperscript{168}

\textbf{[21] Wyoming}

Wyoming is one of the few states to adopt extensive separate regulations for horizontal wells.\textsuperscript{169} The regulations define a horizontal well as one where the well bore is at an angle of at least 80° to the vertical and with a lateral section of at least 100 feet as measured from the penetration point through the terminus.\textsuperscript{170} The surface location can be anywhere on the leased premises. The regulations contain no reference to having a surface location off the leased premises. There are additional disclosures required in the application for a permit to drill for a horizontal well.\textsuperscript{171} In the absence of specific spacing rules, no portion of the lateral section of the horizontal well may be closer than 660 feet to a drilling or spacing unit boundary, federal unit boundary, uncommitted mineral interest, or lease boundary line. The spacing distance is increased to 1,320 feet for certain formations in the Powder River Basin. No lateral section of a horizontal well can be within 1,320 feet of an existing, producing vertical well bore. A temporary 640-acre spacing unit is also established, consisting of the

\begin{enumerate}
\item[166] Rule 86 also imposes a directional survey requirement to ensure compliance with Rules 11 and 12 that deal with directional wells. \textit{Id.} § 3.86(f).
\item[167] Utah Admin. Code R649-3-2.
\item[168] \textit{Id.} R649-2-12; R649-3-21.
\item[169] Wyo. Admin. Oil Gen. ch. 1, § 2(f).
\item[170] \textit{Id.} ch. 1 § 2(x).
\item[171] \textit{Id.} ch. 3, § 2(f)(ii).
\end{enumerate}
governmental section where the horizontal well is located. Horizontal wells located in federally supervised or API units are exempt from some of the spacing regulations. Where parties entitled to notice of spacing unit orders object to a horizontal well spacing unit, the permit to drill and spacing unit may be created upon a finding that to do so will prevent waste or protect correlative rights. The horizontal well operator is also burdened by additional reporting requirements, including a MWD survey to be filed within 30 days after completion of the lateral section and different plugging requirements.

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172 Id. ch. 3, § 2(f)(vii).
173 Id. ch. 3, §§18(d), 21(c).