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New Technology Tests the Old Rules--The Challenge of Regulating Horizontal Well Development--A Four State Comparison

OR

Thinking Inside and Outside the Box (Both At The Same Time)

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INTRODUCTION

Many experts believe that the future of United States onshore natural gas development lies in its unconventional resources, such as the shales located within Texas, Louisiana, Arkansas and Oklahoma. These tight reservoirs cannot be successfully developed using traditional widely spaced vertical wells. Rather, horizontal wells, each with several staged completions, hydraulically fractured, have become the development choice. As our title suggests, these wells, sometimes extending more than a mile outward from their surface locations, present many interesting challenges to traditional well spacing and density regulation, whether the jurisdiction's tradition prefers geological units, political units, or some hybrid.

We assembled a group of four experienced regulatory attorneys, one from each of Arkansas, Louisiana, Oklahoma and Texas for the question and answer session below:

How are units for horizontal wells formed in your state (i.e. voluntary, compulsory or both)?

Bob Costello—Oklahoma:

There are two distinct steps in creating a unit to drill any well (vertical or horizontal) in Oklahoma. A drilling and spacing unit is created. Then, if all parties with the right to drill are not in agreement (voluntary) with the drilling of a proposed well, an application to force pool the unit (compulsory) is filed.

A horizontal well may be drilled on any established drilling and spacing unit. OCC Rule 165:10-3-28(e)(1). However, there are rules for the creation of separate horizontal drilling and spacing units for a particular common source of supply.

A horizontal well unit will supersede any existing non-developed “traditional” drilling and spacing units covering the same geographic area. OCC Rule 165:10-3-28(e)(4)(B). If there is a producing traditional/vertical well unit, both orders can exist concurrently. OCC Rule 165:10-3-28(e)(4)(A). However, an order for a horizontal unit may not cover an existing unit producing from the same common source unless at least 50% of the working interest owners consent to the creation of the horizontal unit. OCC Rule 165:5-7-6(h).

An order establishing a horizontal well unit is valid for a period of twelve months from the date of issuance. OCC Rule 165:5-7-6(g).

Ray Oujesky—Texas

Units for horizontal wells are formed on a voluntary and compulsory basis. The Mineral Interest Pooling Act, Tex. Nat. Res. Code Ann. § 102.001 (Vernon 1993), allows for compulsory pooling, but has only recently been used to force pool small, unleased tracts into larger units. The MIPA was designed to permit small, unleased tracts to “muscle in” to larger units.

Tom Daily—Arkansas

Arkansas’ original conservation statute (Act No. 105 of 1935) defined a “unit” as the largest area drainable by a single well. However, a 2003 amendment substantially modernized that statute, effectively eliminating the requirement of the one-well unit. The statute now reads:

As used in this subchapter, “drilling unit” means a single governmental section or the equivalent unless a larger or smaller area is requested by an owner, as defined in Sec. 15-72-102, within the drilling unit to be established and a larger or smaller area is established by order of the commission.

Thus, the legislation gives the Commission broad discretion to specify unit size, well location, and well density. The Commission then promulgates field rules or field-wide spacing rules, defining units within specific reservoirs or, more recently, entire resource plays. We will focus upon the Commission’s spacing rule which regulates the Fayetteville Shale Play, General Rule B-43. That rule specifies governmental section (m/l 640 acre) units.

Rick Revels—Louisiana

Insofar as statutory drilling units are concerned, the Commissioner of Conservation is authorized to prevent waste and avoid the drilling of unnecessary wells by establishing a drilling unit or units for each pool. La. R.S. 30:9(B). This can be done prior to drilling the proposed unit well, while drilling, or after the well has been completed. The Commissioner has issued rules of procedure by which establishment of such units is accomplished. In summary, an applicant must file a pre-application notice at least 20 days before the application is filed and, should any party at interest request one, schedule a conference. At the pre-application conference, the applicant is required to present bases for the unit that the applicant is requesting. After the application is filed, and any counterplans are filed by opponents, a hearing is scheduled before the Commissioner and his staff. At the hearing, the applicant establishes with exhibits and testimony of witnesses the following matters: that the well (if already drilled) is completed in a certain defined sand or zone and producing or capable of producing oil or gas; that the proposed unit or units are entirely underlain by the productive sand or zone; that the unit is reasonable and equitable for all concerned; and that a single well will efficiently and economically drain the unit. Generally, within about 30 to 60 days after the hearing, the Commissioner will issue an order establishing the unit. The order is made effective the date of the hearing.

What is the normal unit size and shape or is there no “normal?”

Ray Oujesky—Texas:

There is no normal unit size and shape in Texas. In the Barnett Shale field, which covers the Fort Worth metropolitan area, units created out of urban neighborhoods may be comprised of 250 or more lots containing one-third to one-quarter of an acre.

Tom Daily—Arkansas:

Units for gas wells in Arkansas are normally 640 acres. Most conventional South Arkansas oil units are smaller, ranging from 160 acres to less than 40 acres. Though Arkansas' statute contains no such mandate, the Commission appears inclined to approve increasingly larger oil units, for deeper formations.

Rick Revels—Louisiana:

There is no “normal” size or shape of drilling units in Louisiana. The writer has personally created units from about 3 acres to 3,000 acres in size. Drilling and production units must be established for a particular sand or zone. Geologic units are uncommon in North Louisiana, but are frequently created in South Louisiana in areas for which sufficient subsurface information and well control are available. Units for horizontal wells are formed in the same fashion as vertical wells. Beginning in about 1993 and continuing for roughly ten years thereafter, the Commissioner of Conservation established numerous units for the Austin Chalk Formation. Although there is

considerable variation, the most common size of the Austin Chalk units is 1,920 acres. Typically, the applicant requesting this size unit testified that it planned to develop the unit with dual opposing laterals of sufficient length to extend the entire north/south dimension of the unit.

With respect to the Haynesville Zone, by far the most common drilling unit is a governmental sectional 640 acre square. Haynesville Zone units are virtually all geographic units; that is, the boundaries are geographic in nature and not precisely fixed based upon geologic or other technical, scientific data. Attached to this paper is a plat depicting the over 2,000 Haynesville Zone units upon which over 1,800 wells have been permitted. To date there have been several units created which are two (2) or three (3) times larger than the typical 640 acre unit. Many of these larger units are situated along the Louisiana/Texas boundary. In some cases, the sections along this boundary are undersized and combined with adjacent sections to form drilling units. In other cases, the operators convinced the Commissioner to form larger units that would accommodate land locations to drill out underneath Toledo Bend Reservoir. Several other larger units have been justified due to urban development or other topographic or subsurface difficulties making it overly burdensome and/or uneconomic to develop regular-sized units.

Bob Costello—Oklahoma:

As an industry norm in Oklahoma, square 640 acre units for a horizontal well are standard; however, a horizontal well may be drilled in any size unit created under the OCC rules. The OCC rules also permit the creation of a “standup” or “laydown” 640 unit, stacking 320s north/south or east/west to accommodate longer lateral horizontal wells. The basic statutory authority is derived from the following:

“[T]he Corporation Commission...shall have the power to establish well spacing and drilling units of specified and approximately uniform size and shape covering any common source of supply, or prospective common source of supply, of oil or gas within the State of Oklahoma. . .” 52 O.S. § 87.1(a), OCC Rule 165:5-7-6.

Standard square drilling and spacing units shall be those containing approximately 10, 40, 160, or 640 acres; standard rectangular units shall contain approximately 20, 80, or 320 acres. OCC Rule 165:10-1-22(d).

Are there statutory restrictions on unit size and shape?

Tom Daily—Arkansas:

No. The statute defers to the sound discretion of the Arkansas Oil and Gas Commission. The commissioners appear resistant to units larger than 640 acres out of a concern that excess acreage would thus be held with “insufficient” production. That has not been a problem, however, because of Arkansas’ cross-unit well rules.

Rick Revels—Louisiana:

There is no minimum or maximum size of drilling units in Louisiana although a drilling unit is defined as the maximum area which may be efficiently and economically drained by one well.

Bob Costello—Oklahoma:

Except for units established along the state lines, the maximum size of a drilling and spacing unit in Oklahoma is 640 acres. However, as mentioned above the Commission may create a non-standard horizontal well unit covering contiguous lands in any configuration or shape deemed by the Commission to be necessary for the development of a conventional reservoir or an unconventional reservoir by the drilling of one or more horizontal wells. A non-standard horizontal well unit may not exceed 640 acres plus the tolerances allowed pursuant to 52 O.S. § 87.1. OCC Rule 165:10-3-28(e).

Ray Oujesky—Texas:

640 acre units for natural gas are permitted as a general rule, but special field rules have been adopted for the Barnett Shale and other fields. Barnett Shale special field rules provide for 320 acre standard proration units plus a 10% tolerance. The minimum size proration unit in the Barnett Shale is 20 acres.

Does your state’s regulatory agency prohibit or discourage “windows” between units?

Bob Costello—Oklahoma:

No acreage is ever left out of a unit due to the uniform spacing patterns established under the rules and statute mentioned above, and particularly because of Oklahoma’s force pooling.

Due to the set back requirements between a wellbore path and the unit boundaries - particularly between units east and west of the wellbore – there is the possibility of a “window” or strip of undeveloped reserves. However, location exceptions are frequently granted to avoid the problem.

Ray Oujesky—Texas:

There is no formal prohibition against unleased, or “window” tracts, between units, but they are discouraged. The Railroad Commission of Texas prefers that unit boundaries exclude “window” tracts, but “window” tracts are common in interior portions of units. While not counted for proration purposes, “window” tracts are depicted on unit plats.

Rick Revels—Louisiana:

The Commissioner of Conservation will approve creation of statutory units which do not adjoin neighboring units for the same sand or zone in some instances although his

preference is not to leave “gaps.” If opposition is expressed regarding leaving a “gap” between units, the operator should attempt to demonstrate that future units could be reasonably formed for the omitted acreage to allow orderly development and to prevent such acreage from becoming “stranded.” With respect to the Haynesville Zone, there are some areas yet to be fully unitized, but over 1.3 million acres have been included in units and generally these units are in a regular pattern. By looking at the plat attached, one can easily see a fairly large area in the Shreveport-Bossier City area that has not yet been included in Haynesville Zone units obviously due to the difficulty in developing in an urban environment and also the less favorable results obtained so far by operators drilling North of Interstate 20.

Tom Daily—Arkansas:

Arkansas’ regulatory culture (embodied in the mindset of its commission) abhors leaving anyone out of a resource play. Thus, the Commission is extremely unlikely to approve a pattern of development which excludes “window” acreage.

Does your state allow shared cross-unit wells? If so, what are the rules? If not, at present, do you foresee cross-unit wells in the jurisdiction in the future? What do you foresee the rules on cross-unit wells will be?

Tom Daily—Arkansas:

Arkansas has formal cross-unit rules (General Rule B-43 (o) and General Rule B-44 (p), for the Fayetteville Shale and Middle Atoka Plays, respectively.) It is the first jurisdiction to have adopted such formal rules.

Cross-unit wells have become a vital component within Arkansas’ regulation of the development of unconventional reservoirs, enabling multiple wells from common surface locations, and increasingly longer productive laterals, as well as simply preventing the waste of hydrocarbons, stranded near unit boundaries. Indeed, in 2010, less than six years after the first horizontal Fayetteville Shale well was drilled, over 50% of all Arkansas horizontal well permits issued were for cross-unit wells. (The exact numbers are 927 horizontal well permits, 524 of which were for cross-unit wells.)

When a cross-unit well is permitted, its tentative sharing area is defined as the area having a radius of 560 feet from the entire completed interval of the proposed well (the well’s “band-aid.”) That area is overlain upon the unit(s) plat, enabling a calculation of the band-aid’s acreage within each affected unit. Each unit’s share of the cross-unit well is its acreage contained within the band-aid, divided by the band-aid’s total acreage. After the well is completed, the band-aid is redrawn and interests are adjusted to reflect the well’s actual, as-drilled, location.

Applications for cross-unit wells may be approved administratively if they are supported by persons having at least 50% of the right to drill in each of the sharing units, subject to one other important requirement. The rule requires that each such unit ultimately have

either an entirely in-unit well, at a non-exceptional location or, alternatively, 4,160 feet of completed lateral within the unit, in order to produce a cross-unit well affecting the unit. Applicants are given one year following the spud date of the cross-unit to comply with that requirement.

Ray Oujesky—Texas:

Currently, shared cross-unit wells are permitted, but there are no formal rules for such. The Railroad Commission of Texas staff has proposed rules for “production sharing agreements” that could be adopted by the Commission in 2011. Proposed rules define a “PSA” as a private, contractual agreement between the operator of a proposed well and non-operating mineral interest owners in two or more leases or pooled units that will be penetrated by a horizontal wellbore that provides for the sharing of production proceeds. The percentage of participation in the PSA for working and royalty interest owners within each lease or pooled unit contributing acreage to the PSA cannot be less than 65%.

Rick Revels—Louisiana:

At this point, there are no special regulations dealing with cross-unit wells, nor have any such wells been approved by the Commissioner of Conservation. Several active Haynesville operators are in favor of the Commissioner of Conservation’s granting the opportunity to drill such wells in order to improve the economics of the play and to more efficiently drain the acreage under lease to these operators. An industry committee has looked at rules in various states and found the Arkansas model as perhaps the best model to follow. The writer has recently filed for the approval of cross-unit laterals which would be classified as alternate unit wells for the units under which they are perforated. The affected owners of production have agreed to share production based upon the perforated lateral length in each unit served by the cross-unit lateral. This matter has been scheduled for hearing and the Commissioner of Conservation will be ruling in this matter in the near future. It is possible that in the future specific rules and regulations relative to cross-unit wells will be promulgated by the Commissioner of Conservation. Statutory changes requiring legislative action may also be enacted at some future time.

Bob Costello—Oklahoma:

Acting without any specific statutory authority or OCC rule, the OCC entered a series of orders in the Fall of 2010 in an unprotested matter allowing Devon Energy Corporation to drill cross-unit wells in the Woodford shale where a regional fault bisected a section. The fault presented Devon with a development plan that justified drilling multiple laterals with perforations in the faulted section and the section to the north.

Motivated by this commission case and the success of the Arkansas regulatory scheme a committee of industry members and mineral owner advocates was formed to consider adapting Arkansas rules on cross-unit drilling to Oklahoma. A bill is likely to be

presented this legislative session which will enable the OCC to draft rules for cross unit drilling similar to the Arkansas rules.

This same committee is considering draft legislation which would add to our existing field wide unitization statute to allow for up to a 4 section “unit” to permit the drilling of long lateral wells in shale formations.

The preamble for the proposed legislation (Senate Bill 242), which has not been finalized, reads, as follows:

STATE OF OKLAHOMA
1st Session of the 53rd Legislature (2011)

SENATE BILL 242

By: Branan

AS INTRODUCED

An Act relating to oil and gas well spacing; stating Legislative findings related to current statutes governing horizontal well spacing requirements; declaring need for new governing statutes for certain procedures; providing for noncodification; and declaring an emergency.

BE IT ENACTED BY THE PEOPLE OF THE STATE OF OKLAHOMA:

SECTION 1. NEW LAW A new section of law to be codified in the Oklahoma Statutes reads as follows:

The Legislature finds that advances in horizontal drilling techniques for oil and gas wells drilled and completed in shale formations in this state have advanced beyond the historical spacing requirements found in current statutes. The Corporation Commission, as the agency charged with the protection of the correlative rights of those owning oil and gas interests in this state, the prevention of waste and the promotion of full development of these resources, is constrained in its ability to adequately accomplish the balancing of these goals by the limitations place upon it by existing law. In order to prevent waste, better protect the correlative rights of the owners of oil and gas rights, and harmonize Oklahoma’s historical regulatory authority over such matters with the expanding technology of drilling and completing horizontal wells in shale reservoirs in this state, the Legislature finds it necessary to modify current statutes to authorize:

1. The drilling of certain horizontal wells in shale formations across unit boundaries, with the costs, production and proceeds allocated to each of the affected units; and

2. Unitization of two or more, but not to exceed four, governmental sections into a single unit for the uniform development of the shale formation through the use of extended lateral horizontal wells.

SECTION 2. It being immediately necessary for the preservation of the public peace, health and safety, an emergency is hereby declared to exist, by reason whereof this act shall take effect and be in full force from and after its passage and approval.

Are non-consenting interests force pooled/integrated?

Rick Revels—Louisiana:

All owners of potential unit production within a statutory unit are force pooled and integrated by the Commissioner of Conservation in the order creating a drilling unit. An unleased landowner/mineral owner's share of costs incurred in the drilling, testing, completing, operating and equipping a unit well is withheld out of production by the unit operator. Should the unit well be unsuccessful, the unleased owner is not personally liable for any unrecouped sums. The unit operator may also give other working interest owners in the unit the opportunity to participate in the drilling of a unit well.

Bob Costello—Oklahoma:

Yes, non-consenting interests may be force pooled. An applicant, however, must make a bona fide effort to reach an agreement as to how the unit will be developed before filing its pooling application. OCC Rule 165:5-7-7(a).

52 O.S. § 87.1(e) directs that “[w]here, however, such owners have not agreed to pool their interest...the Commission, to avoid the drilling of unnecessary wells, or to protect correlative rights, shall upon a proper application therefore and a hearing thereon, *require such owners to pool and develop their lands in the spacing unit as a unit.*”

Often there are complex mixed questions of whether a party is subject to a force pooling proceeding or whether its interest(s) are subject to an existing operating agreement. The existence of a dispute as to whether an operating agreement covers an interests acquired by one of the parties to the dispute “does not function to deprive the Commission of its jurisdiction to apply the state police power to pool the other party’s interest in a well.” *Chesapeake Operating, Inc. v. Burlington Resources Oil & Gas Co.*, 60 P.3d 1052, 1055 (Okla. Civ. App. 2002).

While there were wellbore only pooling orders entered in the early 1980s, it is now settled law in Oklahoma that a force pooling order pools the working interest on a unit-wide basis, rather than a well-by-well borehole basis. *Amoco Production Co. vs. Corporation Commission*, 1986 OK CIV APP 16, 751 P.2d 203 (Okla. Civ. App. 1986).

Ray Oujesky—Texas:

Non-consenting interests may be force pooled into a unit under the MIPA. Non-consenting interest owners may be assessed a risk penalty of up to 100%.

Tom Daily—Arkansas:

Yes, almost every Arkansas gas unit is integrated (integration is Arkansas' work for pooling) prior to the drilling of the first unit well. While it is theoretically possible for every unit owner to execute a lease and/or JOA, it almost never happens, forcing resort to a pretty streamlined integration process. By statute, Arkansas units are either established (containing or offset by production or, at least, a completed well), or exploratory (not yet established.) Any party with the right to drill may apply to integrate an established drilling unit. Applications to integrate an exploratory drilling unit must be supported by at least 50% of the right-to-drill.

If you have force pooling/integration how does the process work; what are the elections?

Rick Revels—Louisiana:

Should non-consenting owners elect not to participate, their costs are held out of production, and in addition, a risk charge may be recouped against non-participating working interest owners (200% of the owner's allocated share of the cost of drilling, testing and completing the unit well). See La. R.S. 30:10. Generally, the process of providing a risk fee notice to other working interest owners entails furnishing a letter and certain information, including the location of the well, an estimate of the cost of drilling such well, and any non-public data relative to the well should it have already been spudded. The receiving party has 30 days from receipt of the notice to elect whether to participate or not. Failure to respond is deemed an election not to participate. The unit operator may offer to farm in the interests of the working interest owner who does not want to participate and may offer to execute a JOA, but neither option is mandated by statute. The operator will often offer to lease any unleased interest; however, the owner is not required to lease or pay costs upfront.

Ray Oujesky—Texas:

To force pool a non-consenting interest into a unit, a written voluntary offer to pool and participate in the unit must be given to the non-consenting interest. If the offer is refused or ignored, an application can be filed with the Commission to force pool the non-consenting interest. The applicant carries the burden to show that forced pooling is necessary to achieve one or more of the following purposes: (1) to avoid the drilling of unnecessary wells; (2) to protect correlative rights; or (3) to prevent waste. The commission must dismiss the application if it finds that a "fair and reasonable offer to pool voluntarily" has not been made. The time-frame is lengthy and expensive for all parties involved.

Bob Costello—Oklahoma:

The terms of the pooling order will allow the respondents to either 1) participate in the development of the unit by paying their proportionate share of costs and share in production from the unit, or 2) “lease” by accepting compensation determined by the Commission to be fair, just and reasonable. There are usually three “leasing” options provided for, with the choices scaled between more cash bonus or more royalty.

If the respondent does nothing, the respondent will nonetheless be determined to have forfeited the right to participate in return for the default compensation determined by the Commission.

An election not to participate in a horizontal well will not affect the ability to elect into a vertical well if there are concurrent existing units. It does mean, however, that the owner will not be eligible to participate in any future horizontal well in the pooled unit. OCC Rule 165:5-15-3(g).

Modern pooling orders often incorporate subsequent well provisions similar to that found in a standard Joint Operating Agreement to afford a pooled party the ability to opt out of a the unit (excepting its rights in the initial wellbore), if it has participated in the initial unit well.

Tom Daily—Arkansas:

The integration order deals with unleased mineral owners and uncommitted working interest owners separately. Mineral owners are given three options:

1. Lease on terms judged fair and reasonable by the Commission. (As a matter of practice, that means the best terms previously paid in the unit, unless those terms are clearly not representative.) Sometimes there are multiple representative transactions (different bonus and royalty combinations,) offered in the alternative. Somewhat incongruously, the Commission’s mandated lease is for a one-year term, regardless of the term provisions of the market-representative leases used to fix its monetary terms. This Commission mandated lease will remain in effect, subject to the usual implied lease covenants, for the life of commercial production in the unit.
2. Participate in the initial well and be subject to the unit JOA for that well and all subsequent operations.
3. Be carried non-consent in the initial unit well until recovery of a risk factor penalty set by the Commission. That penalty is typically 400% of drilling and completion costs (100% cost recovery, plus 300% penalty) plus 100% of JIB expenses incurred prior to that 400% payout. A non-consenting owner is also subject to the unit JOA for all future events.

An unleased mineral owner who fails to affirmatively elect is deemed to have chosen the lease option unless there is already a completed well in the unit capable of commercial

production. In that event, the lease is offered, but the default election, by statute, is non-consent. If there are multiple lease options, the applicant is allowed to specify the default.

Non-consenting working interest owners are given options 2 and 3 above, with the default being 3 (non-consent.) In either case, the election period is normally 15 days after the date the order is issued.

Does the regulatory agency mandate sharing of pooled/integrated interests or does it all go to the applicant?

Ray Oujesky—Texas:

Sharing of the pooled interests is mandated. If an applicant makes an offer to share on the same “yardstick basis” as other owners in the unit, the offer “shall be” considered fair and reasonable. Pooling orders will generally allocate production on the basis of surface acreage.

Rick Revels—Louisiana:

For primary production, the order creating the drilling unit will generally provide that costs and production are to be allocated and shared on a surface acre basis of participation. The unit operator usually bears a non-participating party’s share of costs and retains its share of production proceeds prior to payout absent an operating agreement with other participating working interest owners. A unit operator would often gladly allow other participating working interest owners to assume their proportionate part of any non-consent interests, particularly on a high risk well; however, that result is not mandated by statute or rule.

Tom Daily—Arkansas:

Yes, Arkansas’ form of integration order contains a provision requiring the applicant to offer integrated leased and non-consent interests to all participating parties. Exceptions exist where the integrated interest is not marketable or completes a party’s leasehold (such as the integration of a remainder interest when one party has a lease from the life tenant.) In that last case, the party with the partial leasehold has the option to acquire the integrated interest, at cost.

Bob Costello—Oklahoma:

Participants have the equitable right to share in force-pooled acreage. Absent a written agreement a request to participate must be made at the time of the hearing.

How does the jurisdiction resolve contested operatorships?

Tom Daily—Arkansas:

A.O.G.C. General Rule B-43 (g) and (h) provide detailed methodology for resolving disputes over operatorship of integrated exploratory and established units, respectively. While these rules are a bit complex, the simple explanation is that the person with the greatest amount of acreage support within the unit is named operator.

Bob Costello—Oklahoma:

Generally, the working interest owner with the largest leasehold interest in the unit will be designated as operator. Other factors, however, such as working interest owner's experience in the area, proposed AFE costs, and experience with the type of well being proposed may be considered.

“Each order force pooling the rights and equities in a drilling and spacing unit shall designate at least one operator to operate the well or unit.” OCC Rule 165:5-7-11.

“If the applicant anticipates that some other owner of the right to drill may be designated as the operator of the unit well, the body of the application and notice shall so state. In the notice, the request that the applicant or some other owner may be designated operator shall be placed in the special relief paragraph.” OCC Rule 165:5-7-7(e).

When there is a dispute over operations, the OCC does on occasion enter orders with alternative operators stated. If, for example, the proposed well is not spud within 30 days before the expiration of the order, the alternative operator will have the right to commence the well and become the operator of the unit.

Rick Revels—Louisiana:

Most of the Haynesville Zone units have been created without designation of a unit operator because the Commissioner of Conservation does not typically designate an operator in the absence of a well permit. In the majority of cases, the units have been created prior to drilling. The unwritten policy relative to determination of operator when two (2) or more parties seek such designation is for the Commissioner of Conservation to designate the working interest owner who owns or controls the majority interest in the unit, provided the operator is ready, willing and able to develop within a reasonable period of time. There have been very few hearings before the Commissioner of Conservation in which he is asked to resolve operatorship disputes relative to Haynesville Zone units. Typically, the operators resolve their differences without involving the Commissioner. In some cases, an acreage swap is agreed upon or a minority working interest owner is allowed to drill and complete the well in order to save expiring leases. In such a case, the parties may agree that the minority working interest owner will turn over operatorship to the majority interest owner after the unit well is completed.

Ray Oujesky—Texas:

Because a joint operating agreement is utilized in voluntary poolings, contested operatorships are contractual disputes that should follow the dispute resolution mechanism

of the JOA. When that fails, the dispute is resolved in court. In forced poolings, an operator is designated in the Commission order establishing the force pooled unit. A form JOA is also approved by the Commission for the force pooled unit. Disputes would then follow the dispute-resolution mechanism of the JOA.

Does the jurisdiction define the location of the horizontal well, for purposes of spacing regulation, as the total perforated interval, each individual perforation or otherwise?

Ray Oujesky—Texas:

Where the horizontal portion of the well is cased and cemented back above the top of the Barnett Shale formation, the distance to any property line, lease line or subdivision line is calculated based on the distance to the nearest perforation in the well and not based on the penetration point or terminus.

Bob Costello—Oklahoma:

The location of the horizontal well is based on the completion interval. The completion interval is defined to mean, “for open hole completions, the interval from the point of entry to the terminus and, for cased and cemented completions, the interval from the first perforations to the last perforations”. OCC Rule 165: 10-3-28(5).

Rick Revels—Louisiana:

With respect to horizontal and directional wells that are fully cased and cemented up above the zone of completion, the Commissioner of Conservation has indicated that the nearest perforation rather than the penetration point or terminus will be used to determine compliance with applicable spacing. Exceptional locations may be approved upon a proper showing at a public hearing. Spacing exceptions are more commonly granted for subsequent wells in the unit rather than for the initial well.

Tom Daily—Arkansas:

The Arkansas definition, contained within A.O.G.C. General Rule B-2 (2) (C), is the entire length of the perforated lateral. Thus, unlike in Texas, an Arkansas operator cannot avoid encroaching upon an unleased or non-consenting by strategic placement of individual perforations within the wellbore.

What are the offset spacing rules, from unit boundaries, from other unit wells, from unleased tracts (if you do not force pool)?

Bob Costello—Oklahoma:

For a horizontal well drilled in a traditional (established for a vertical well) drilling and spacing unit, the well spacing rules are the same as for a vertical well. In a 640 acre unit, a well can not be drilled any closer than 1320 feet from the unit boundary. In a 160 acre

units, no closer than 660 feet, and 40 acre units require a 330 foot set back. However, location exceptions and increase density orders are freely granted by the OCC to accommodate the smaller drainage radius of most horizontal wells drilled today.

Horizontal well spacing in a horizontal spacing unit is different than such wells drilled in a traditional spacing unit. The completion interval shall be 330 feet from the unit boundaries in 80 and 160 acre units, and 660 feet from the unit boundary in 320 and 640 acre units.

Horizontal wells in the same common source of supply above 2500' shall not be closer than 300 from the next well, and no closer than 600 feet below 2500 feet.

In a horizontal well drilled in an unspaced common source of supply (which is rare), “the completion interval of a horizontal well may not be located closer to the boundaries of the applicable mineral estate, oil and gas leasehold estate, or voluntary unit than...165 feet when the common source of supply is less than 2,500 feet in true vertical depth [and] not less than 330 feet when the common source of supply is 2,500 feet or more in true vertical depth.” OCC Rule 165: 10-3-28(e).

Finally, there is a special rule for wells drilled in the Woodford Shale in selected counties. The completion interval of a horizontal well drilled in the Woodford shall not be closer than 330 from the east/west boundaries, and not less than 165 feet from the north/south boundaries. OCC Rule 165:10-29-2 (b).

Tom Daily—Arkansas:

That number varies from 280 feet to 1,320 feet, across all of the producing areas in Arkansas. In the Fayetteville Shale Play, which has the most current importance to horizontal well development, it is 560 feet. In conventional areas, location exceptions are common (See A.O.G.C. General Rule B-40.). In the B-43 (Fayetteville Shale Play) area, extensive use of shared cross-unit wells, obviates the need for location exceptions in almost all cases.

Ray Oujesky—Texas:

The state-wide spacing rule is 1,200 feet from other unit wells and 467 feet from unit boundaries and unleased tracts. Pursuant to Texas Administrative Code Rule §3.86, no point (penetration point, perforation point or terminus point) on a horizontal well shall be drilled nearer than 1,200 feet, or other between-well spacing requirement under applicable field rules, to any point along any other horizontal well or another well completed or drilling in the same field on the same lease or pooled unit. Further, no point on a horizontal well shall be drilled nearer than 467 feet, or other lease-line spacing requirement under applicable field rules, from any property line, lease line or subdivision line.

The Barnett Shale has adopted special field rules establishing a 330 foot lease-line spacing requirement, but no between-well spacing requirement. The special field spacing rule for the Barnett Shale is 330 feet from unit boundaries and unleased tracts and no spacing requirement from other unit wells. An exception may be granted to these distances by the Commission without force pooling, known as a “Rule 37 exception.”

Rick Revels—Louisiana:

Statewide Order 29-E is the general spacing provision for oil and gas wells in the State of Louisiana. This order applies in the absence of special field rules. Oil wells completed at depths less than 3,000 feet are exempt from application of Statewide Order 29-E. Minimum spacing between oil wells completed below 3,000 feet is 900 feet. Minimum spacing between gas wells completed in the same interval is 2,000 feet. Absent special spacing provisions, a well cannot be produced on a lease basis unless it is at least 330 feet from a property line. Field rules applicable to virtually all Haynesville Zone units require wells to be perforated no closer than 330 feet from the nearest unit line and no closer than 660 feet from any offset Haynesville well, provided that the Haynesville lateral is fully cased and cemented up above the zone of completion. The Commissioner of Conservation has indicated that the nearest perforation rather than the penetration point or terminus will be used to determine compliance with applicable spacing in such cases. With respect to Haynesville Zone wells in particular, substantial fines have been levied for spacing violations, but exceptional locations may be approved upon a proper showing at a public hearing.

Do horizontal wells have restricted or prorated production allowables?

Ray Oujesky—Texas:

Horizontal wells have maximum daily production allowables determined by multiplying the applicable allowable for a vertical well in the field with a proration unit containing the maximum acreage authorized by the applicable rules for the field, exclusive of tolerance acreage, by a fraction: (a) the numerator of which is the acreage assigned to the horizontal well for proration purposes; and (b) the denominator of which is the maximum acreage authorized by the applicable field rules for proration purposes, exclusive of tolerance acreage.

Bob Costello—Oklahoma:

“The allowable for a horizontal gas well shall be computed in the manner prescribed for a non-horizontal gas well in the same common source of supply. The allowable for a horizontal well unit with multiple horizontal gas wells shall be the sum of the allowables for the separate horizontal gas wells. For this summation, the allowable for each horizontal gas well will be calculated as if it were the only well in the unit.” OCC Rule 165:10-3-28(h)(2).

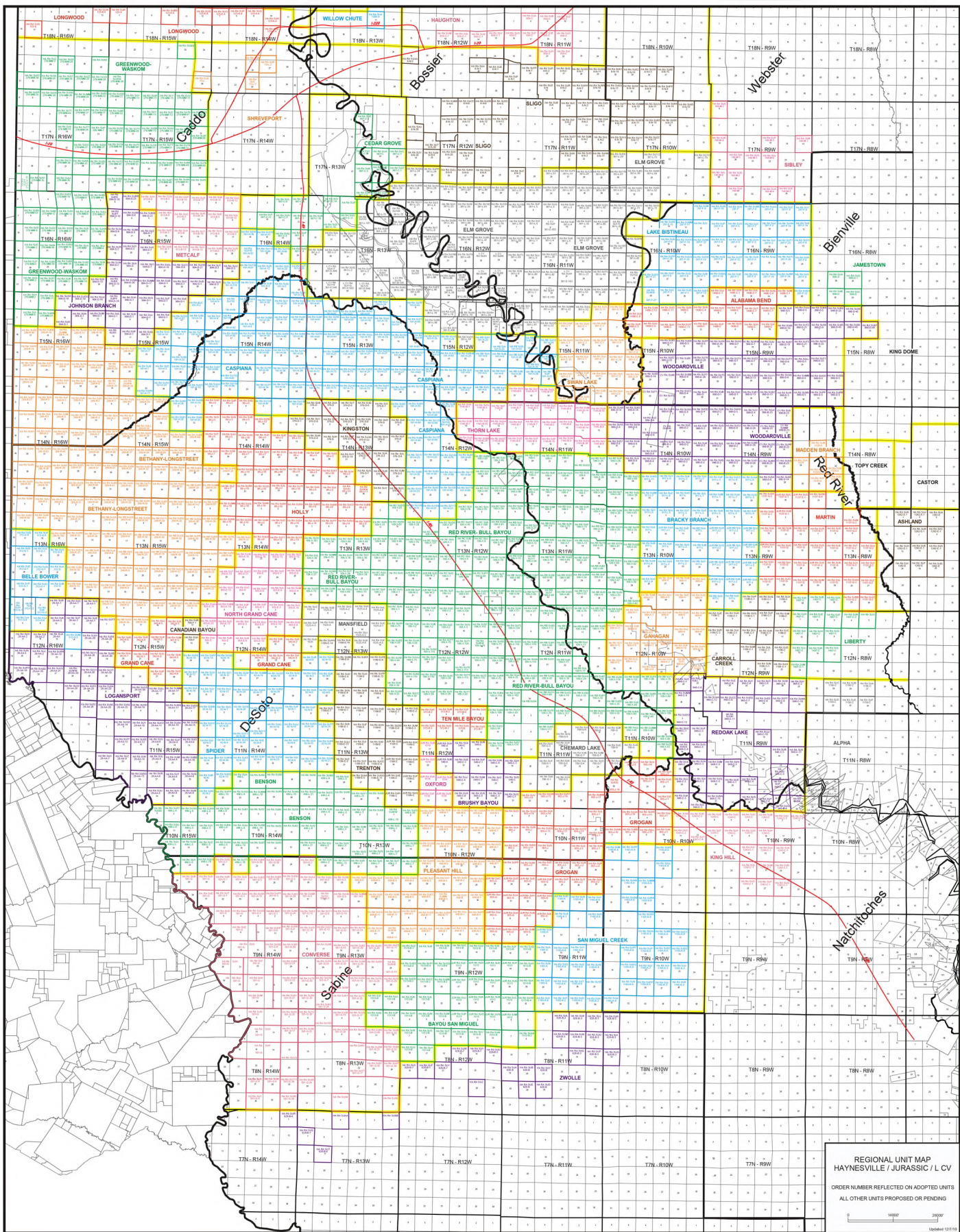
Tom Daily—Arkansas:

Wells completed in unconventional zones (i.e. shales or coals) are permitted to produce without allowable restriction in Arkansas.

Rick Revels—Louisiana:

Gas allowables in Louisiana are addressed in Statewide Order 29-F. In general, tight gas sands and unconventional shale zones have been allowed to produce at their maximum efficient rate (MER). MER allowables were formally granted for Austin Chalk horizontal unit wells. To this point in time, the Commissioner of Conservation has not issued a blanket grant of MER allowables applicable to all Haynesville Zone units, but that is the practical result of current practice.

APPENDIX I: MAP SHOWING HAYNESVILLE SHALE UNITS



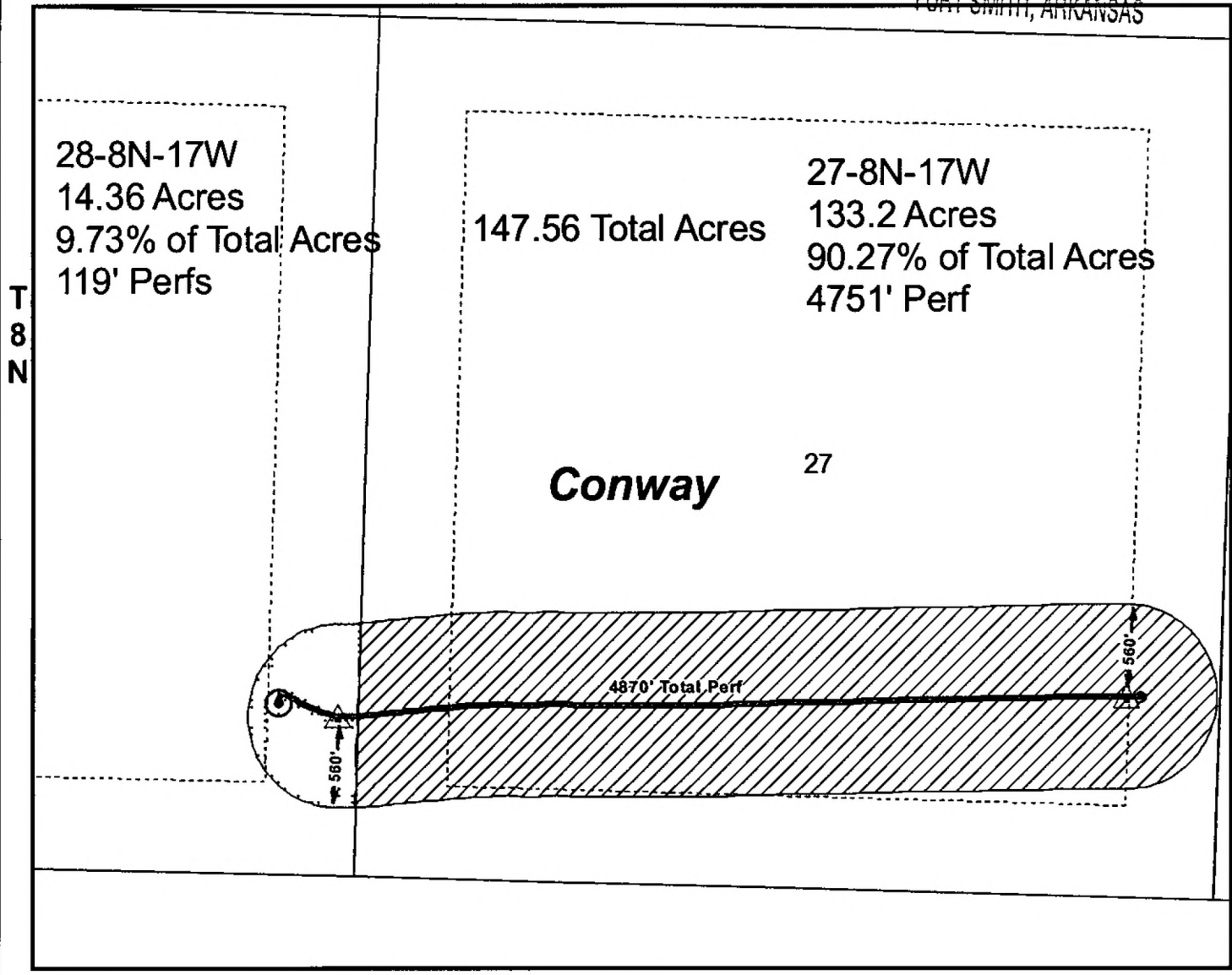
REGIONAL UNIT MAP
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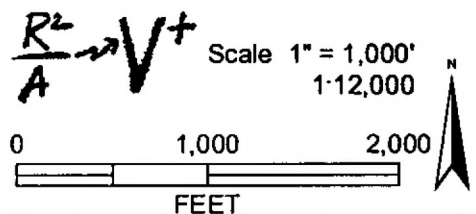
Section 27, Township 8N, Range 17W, Conway County
 Section 28, Township 8N, Range 17W, Conway County

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 AUG 12, 2010
 ARKANSAS OIL & GAS COMMISSION
 FORT SMITH, ARKANSAS

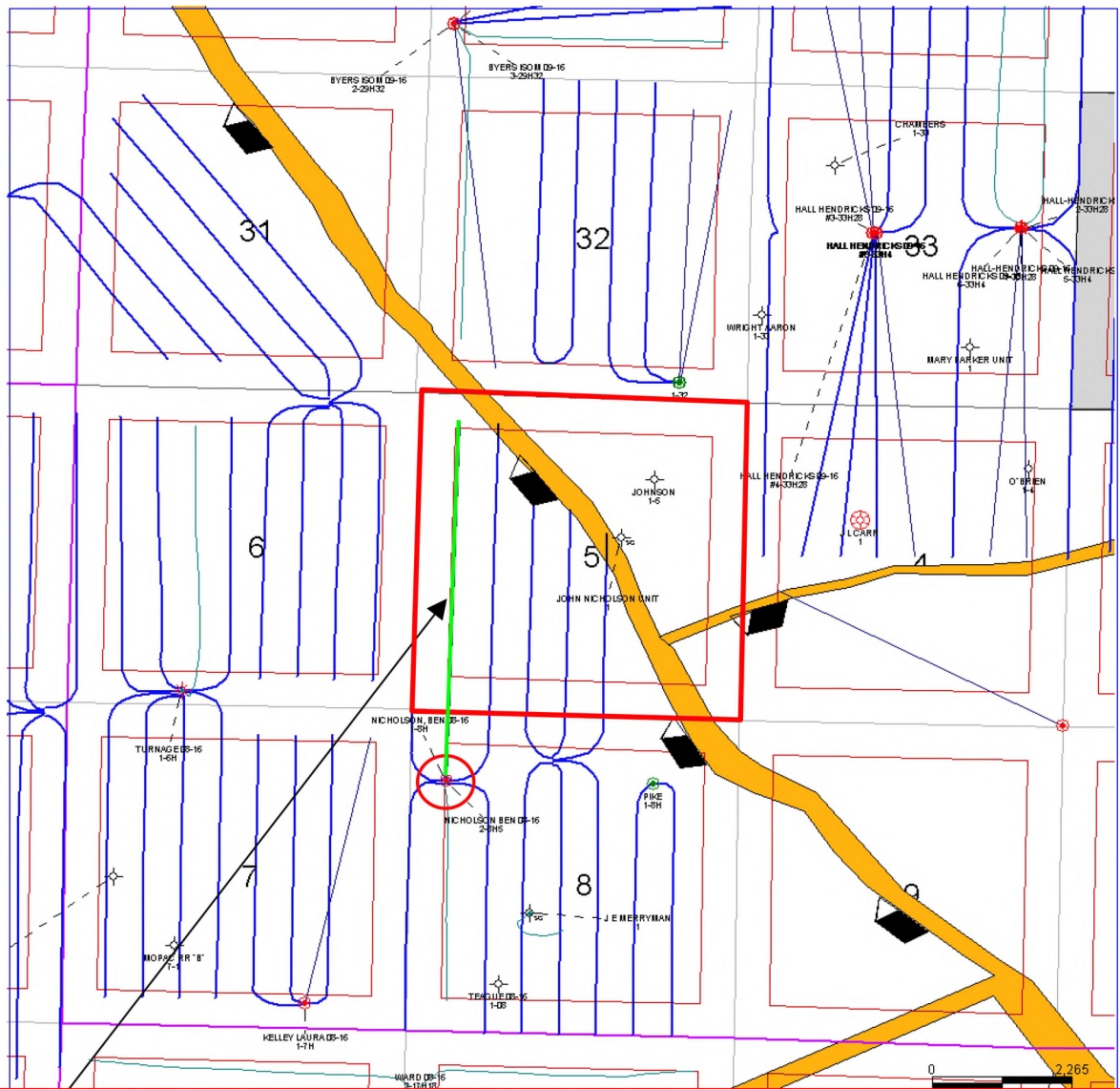


Legend

- △ First & Last Perf Locations
- Bottom Hole
- ⊙ Surface Hole
- Perforated Lateral
- Path
- Participation Area**
- 27-8N-17W
- 28-8N-17W



SWN
 Southwestern Energy
 2350 N Sam Houston Pkwy E
 Suite 125
 Houston, Texas 77032



APPENDIX III: HYPOTHETICAL DEVELOPMENT PLAN WITH CROSS-UNIT WELLS

50th Annual Natural Resources Law Institute

Hot Springs, Arkansas
February 24, 2011

**NEW TECHNOLOGY TESTS THE OLD RULES – THE CHALLENGE OF
REGULATING HORIZONTAL WELL DEVELOPMENT – A FOUR STATE
COMPARISON**

LOUISIANA

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Liskow & Lewis
Lafayette, Louisiana
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The following is a brief overview of statutory unitization in Louisiana with a particular focus on unitization of the Haynesville Shale. The writer has attempted to highlight selected topics also being addressed by co-presenters from Arkansas, Texas and Oklahoma. Although I will emphasize development of the Haynesville Shale utilizing horizontal laterals, I will first provide some background information on how statutory or Commissioner's drilling units are created in Louisiana.

A. Creation of Drilling Units

Insofar as statutory drilling units are concerned, the Commissioner of Conservation is authorized to prevent waste and avoid the drilling of unnecessary wells by establishing a drilling unit or units for each pool. La. R.S. 30:9(B). This can be done prior to drilling the proposed unit well, while drilling, or after the well has been completed. The Commissioner has issued rules of procedure by which establishment of such units is accomplished. In summary, an applicant must file a pre-application notice at least 20 days before the application is filed and schedule a conference should any party at interest request it. At the pre-application conference, the applicant is required to present bases for the unit that the applicant is requesting. After the application is filed, and any counterplans are filed by opponents, a hearing is scheduled before the Commissioner and his staff. At the hearing, the applicant establishes with exhibits and testimony of witnesses the following matters: the well (if already drilled) is completed in a certain defined sand or zone and producing or capable of producing oil or gas; the proposed unit or units are entirely underlain by the productive sand or zone; that the unit is reasonable and equitable for all concerned; and that a single well will efficiently and economically drain the unit. Generally, within about 30 to 60 days after the hearing, the Commissioner will issue an order establishing the unit. The order is made effective the date of the hearing.

B. Minimum and Maximum Size of Drilling Units

There is no minimum or maximum size of drilling units in Louisiana although a drilling unit is defined as the maximum area which may be efficiently and economically drained by one well. The writer has personally created units from about 3 acres to 3,000 acres in size. Drilling and production units must be established for a particular sand or zone. Geologic units are uncommon in North Louisiana, but are frequently created in South Louisiana in areas for which sufficient subsurface information and well control are available. Units for horizontal wells are formed in the same fashion as vertical wells. Beginning in about 1993 and continuing for roughly ten years thereafter, the Commissioner of Conservation established numerous units for the Austin Chalk Formation. Although there is considerable variation, the most common size of the Austin Chalk units is 1,920 acres. Typically, the applicant requesting this size unit testified that it planned to develop the unit with dual opposing laterals of sufficient length to extend the entire north/south dimension of the unit.

C. Haynesville Zone Units

With respect to the Haynesville Zone, by far the most common drilling unit is a governmental sectional 640 acre square. Haynesville Zone units are virtually all geographic units; that is, the boundaries are geographic in nature and not precisely fixed based upon

geologic or other technical, scientific data. Attached to this paper is a plat depicting the over 2,000 Haynesville Zone units upon which over 1,800 wells have been permitted. To date there have been several units created which are two (2) or three (3) times larger than the typical 640 acre unit. Many of these larger units are situated along the Louisiana/Texas boundary. In some cases, the sections along this boundary are undersized and combined with adjacent sections to form drilling units. In other cases, the operators convinced the Commissioner to form larger units that would accommodate land locations to drill out underneath Toledo Bend Reservoir. Several other larger units have been justified due to urban development or other topographic or subsurface difficulties making it overly burdensome and/or uneconomic to develop regular-sized units.

D. Selected Rules, Regulations and Policies Applicable to Haynesville Zone Wells

1. Windows or Gaps

The Commissioner of Conservation will approve creation of statutory units which do not adjoin neighboring units for the same sand or zone in some instances although his preference is not to leave "gaps." If opposition is expressed regarding leaving a "gap" between units, the operator should attempt to demonstrate that future units could be reasonably formed for the omitted acreage to allow orderly development and to prevent such acreage from becoming "stranded." With respect to the Haynesville Zone, there are some areas yet to be fully unitized, but over 1.3 million acres have been included in units and generally these units are in a regular pattern. By looking at the plat attached, one can easily see a fairly large area in the Shreveport-Bossier City area that has not yet been included in Haynesville Zone units obviously due to the difficulty in developing in an urban environment and also the less favorable results obtained so far by operators drilling North of Interstate 20.

2. Cross-Unit Wells

At this point, there are no special regulations dealing with cross-unit wells. Several active Haynesville operators are in favor of the Commissioner of Conservation's granting the opportunity to drill such wells in order to improve the economics of the play and to more efficiently drain the acreage under lease to these operators. An industry committee has looked at rules in various states and found the Arkansas model as perhaps the best model to follow. The writer has recently filed for the approval of cross-unit laterals which would be classified as alternate unit wells for the units under which they are perforated. The affected owners of production have agreed to share production based upon the perforated lateral length in each unit served by the cross-unit lateral. This matter has been scheduled for hearing and the Commissioner of Conservation will be ruling in this matter in the near future. It is possible that in the future specific rules and regulations relative to cross-unit wells will be promulgated by the Commissioner of Conservation. Statutory changes requiring legislative action may also be enacted at some future time.

3. Non-consenting interest

All owners of potential unit production within a statutory unit are force pooled and integrated by the Commissioner of Conservation in the order creating a drilling unit. An unleased landowner/mineral owner's share of costs incurred in the drilling, testing, completing, operating and equipping a unit well is withheld out of production by the unit operator. Should the unit well be unsuccessful, the unleased owner is not personally liable for any unrecouped sums. The unit operator may also give other working interest owners in the unit the opportunity to participate in the drilling of a unit well. Should such owners elect not to participate, their costs are held out of production, and in addition, a risk charge may be recouped. See La. R.S. 30:10. Generally, the process of providing a risk fee notice to other working interest owners entails furnishing a letter and certain information, including the location of the well, an estimate of the cost of drilling such well, and any non-public data relative to the well should it have already been spudded. The receiving party has 30 days from receipt of the notice to elect whether to participate or not. Failure to respond is deemed an election not to participate. Typically, the unit operator will bear the unleased owner's share of costs and recoup such costs out of production absent an operating agreement with other participating working interest owners.

4. Statutory Joint Operating Agreement or Default Lease

Under Louisiana law, there is no mandated joint operating agreement, nor is there a statutory lease. An unleased landowner/mineral owner will receive no revenues until the unit well pays out at which time he would be entitled to receive 8/8ths of his allocated share of production proceeds less severance tax and operating expenses.

5. Determination of Operator

Most of the Haynesville Zone units have been created without designation of a unit operator because the Commissioner of Conservation does not typically designate an operator in the absence of a well permit. In the majority of cases, the units have been created prior to drilling. The unwritten policy relative to determination of operator when two (2) or more parties seek such designation is for the Commissioner of Conservation to designate the working interest owner who owns or controls the majority interest in the unit, provided the operator is ready, willing and able to develop within a reasonable period of time. There have been very few hearings before the Commissioner of Conservation in which he is asked to resolve operatorship disputes relative to Haynesville Zone units. Typically, the operators resolve their differences without involving the Commissioner. In some cases, an acreage swap is agreed upon or a minority working interest owner is allowed to drill and complete the well in order to save expiring leases. In such a case, the parties may agree that the minority working interest owner will turn over operatorship to the majority interest owner after the unit well is completed.

6. Designation of Location

As mentioned above, most of the Haynesville Zone units have been created in advance of drilling and therefore prior to any drilling permit being issued. Thus, no location for the unit

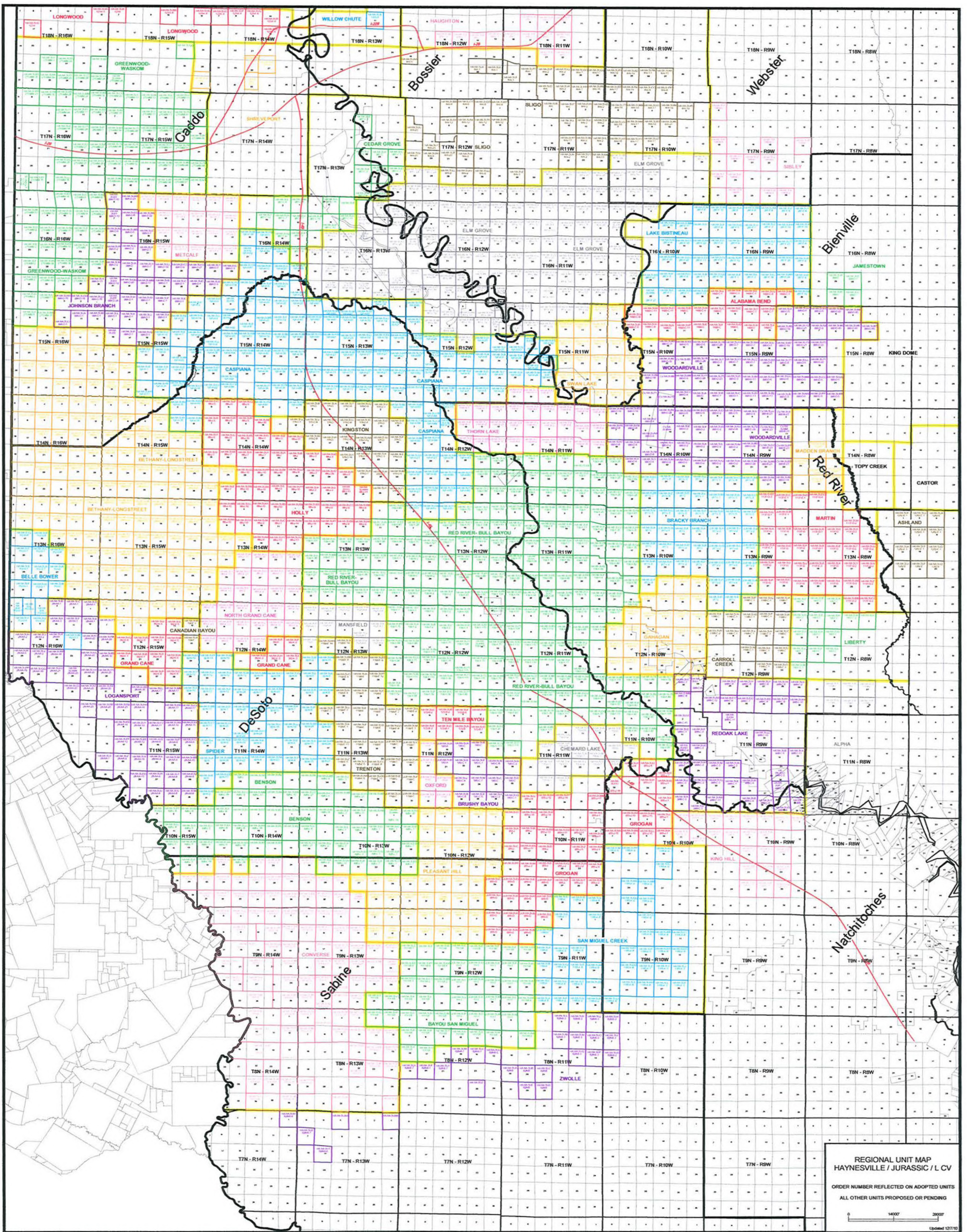
well is set forth in the order. In such cases, an operator may permit and drill a unit well at any legal location within the unit without the need for additional authority to be granted after notice and hearing.

7. Spacing

Statewide Order 29-E is the general spacing provision for oil and gas wells in the State of Louisiana. This order applies in the absence of special field rules. Oil wells completed at depths less than 3,000 feet are exempt from application of Statewide Order 29-E. Minimum spacing between oil wells completed below 3,000 feet is 900 feet. Minimum spacing between gas wells completed in the same interval is 2,000 feet. Absent special spacing provisions, a well cannot be produced on a lease basis unless it is at least 330 feet from a property line. Field rules applicable to virtually all Haynesville Zone units require wells to be perforated no closer than 330 feet from the nearest unit line and no closer than 660 feet from any offset Haynesville well, provided that the Haynesville lateral is fully cased and cemented up above the zone of completion. The Commissioner of Conservation has indicated that the nearest perforation rather than the penetration point or terminus will be used to determine compliance with applicable spacing in such cases. Substantial fines may be levied for any spacing violation but exceptional locations may be approved upon a proper showing at a public hearing.

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REGIONAL UNIT MAP
 HAYNESVILLE / JURASSIC / L CV

ORDER NUMBER REFLECTED ON ADOPTED UNITS
 ALL OTHER UNITS PROPOSED OR PENDING

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Updated 12/7/10