

What the Frack?

Judicial, Legislative and Administrative Responses to a New Drilling Paradigm.



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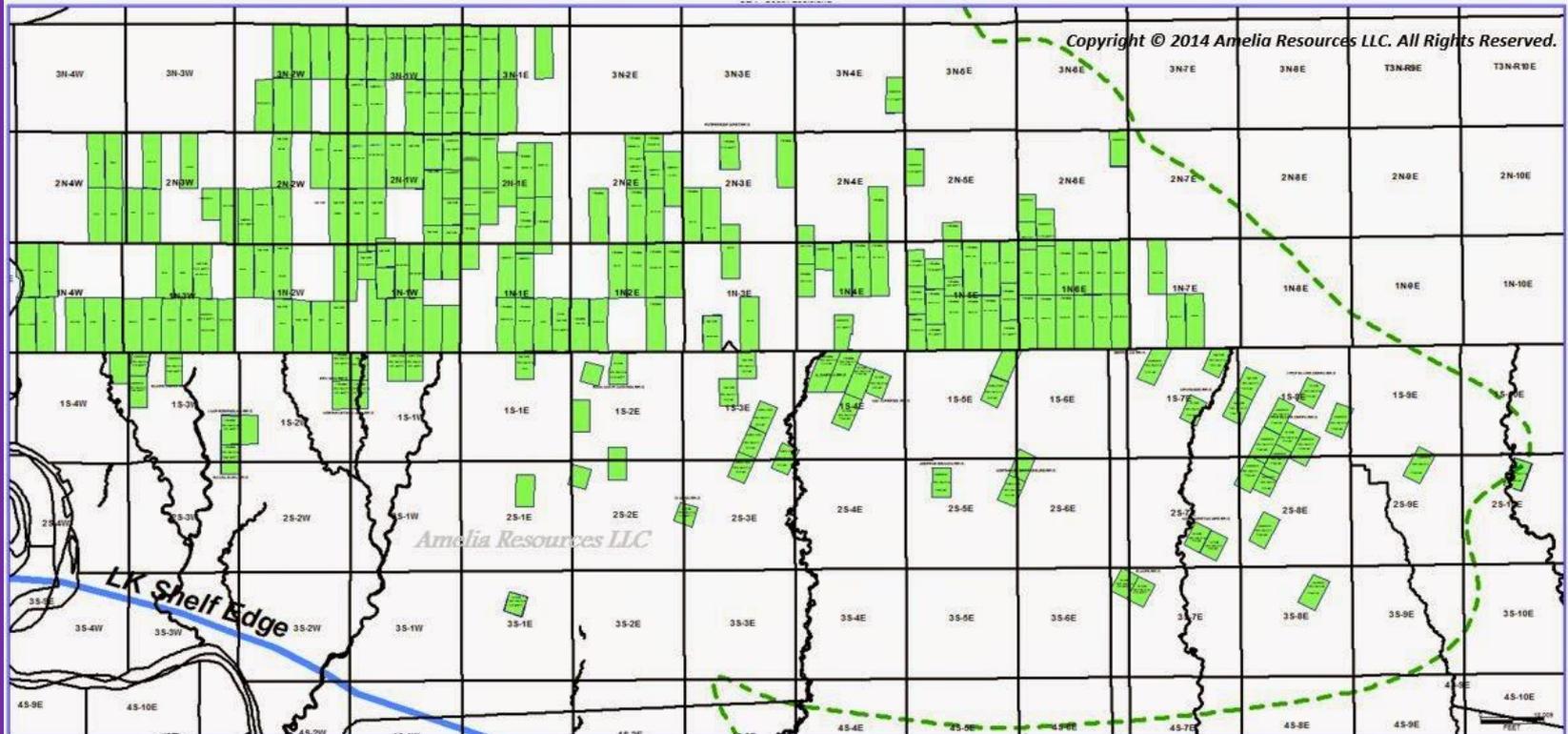
The Provinces of *Frackistan*



More recent for Tuscaloosa Marine Shale



TMS Units (Sept-2014)



Rule of Capture – Excessive Drilling

Spindle Top Oil Field, BEAUMONT, Tex.



Shale Fracking – Effective Drilling



The Effects of the Rule of Capture.

- The rule of capture leads to the drilling of wells that are unnecessary to drain a reservoir.
- It leads to excessive rates of production of oil that may cause coning, fingering, and premature loss of reservoir energy as gas cap gas or solution gas is depleted.
- Surface effects may include production in excess of storage and marketing facilities.
- Improper practices by operators can cause waste. Incorrect plugging of a well, for example, can lead to migration of oil out of a reservoir to pollute the surface or can lead to communication between formations thus damaging a productive formation.

Production Limitations

- [1] MER...Maximum efficient rate of recovery
- [2] Market Demand
- [3] Protection of correlative rights within a reservoir; prevention of net drainage.

Well Spacing

- Well spacing is concerned with the location of wells and the density of drilling into a reservoir. Rules or orders of the state conservation agency may limit the proximity of wells to property lines and to other wells.
- Such regulations have the effect of protecting correlative rights in areas of diverse ownership and of limiting the number of wells that may be drilled into a reservoir in a given area.
- Well-spacing is done both by state-wide order and by individual field or reservoir rules. Exceptions may be granted on a well-by-well basis.

Arkansas Rule B-3: Spacing of Wells

- b. The spacing of wells in oil and gas fields established by Commission Order, shall be governed by field rules for that particular field, adopted after notice and hearing.
- c. The spacing of wells in other areas designated as prospective of oil and gas production shall be governed by General Rule adopted after notice and hearing.
- d. The well location for a well drilled for oil or gas production in an exploratory drilling unit established by Commission Order shall not be located closer than 280 feet from the drilling unit boundary, except that wells drilled in exploratory drilling units established by General Rule B-43, shall be governed by the well setback provisions of General Rule B-43.
- e. The following applies to all wildcat well locations not drilled in exploratory drilling units:
 - (1) The well location for a wildcat well drilled for oil or gas production purposes, within an area not covered by Field Rules or General Rule B-43, shall not be located closer than 280 feet from a quarter, quarter division line within a governmental section.

Louisiana Statewide Order No. 29-E:

- (1) No spacing shall be required for wells drilled in search of oil to depths less than 3,000 feet subsea
....
- (2) Wells drilled in search of OIL to depths below 3,000 feet subsea shall not be located closer than 330 feet from any property line nor closer than 900 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to, the same pool.
- (3) Wells drilled in search of GAS shall not be located closer than 330 feet to any property line nor closer than 2,000 feet to any other well completed in, drilling to, or for which a permit shall have been granted to drill to, the same pool.

Texas Statewide Rule 37 (16 T.A.C. §3.37)

- No well for oil, gas, or geothermal resource shall hereafter be drilled nearer than 1,200 feet to any well completed in or drilling to the same horizon on the same tract or farm, and no well shall be drilled nearer than 467 feet to any property line, lease line, or subdivision line; provided the commission, in order to prevent waste or to prevent the confiscation of property, may grant exceptions to permit drilling within shorter distances than prescribed in this paragraph when the commission shall determine that such exceptions are necessary either to prevent waste or to prevent the confiscation of property.

Texas Statewide Rule 86 (16 T.A.C. §3.86)

- Governs the drilling of horizontal drainhole wells. In general, all portions of the horizontal drainhole must comply with the applicable lease-line and between well spacing requirements for the field. If not, a Rule 37 exception must be obtained.
- Horizontal wells qualify for the allowables for a vertical well plus the additional acreage assignment provided in the rule. Operators must conduct a directional survey on every horizontal drainhole well.
- There are special field rules for horizontal drilling in individual fields. *See generally* Richard P. Marshall, Jr., "Land Problems Related To Horizontal Drilling In Texas," *The Landman* (July/August 2008), pp 47 et seq.

Declared Unit – Pooling Clause

- The pooling clause of an oil and gas lease allows the lessee to effect the pooling of the lease, including the lessor's interest, without further consent by the lessor. Because the pooling is accomplished by filing a declaration of pooling, a pooled unit so formed is often referred to as a “declared unit.”
- While it is a form of voluntary pooling in the sense that it is pooling by consent of the parties pooled and is not the result of the compulsion of the state, a unilateral act of the lessee invokes the pooling based on the power given in the lease.
- Without such a grant of authority or a separate agreement from the lessor, the lessee has no power to pool the interest of the lessor.

Compulsory unit

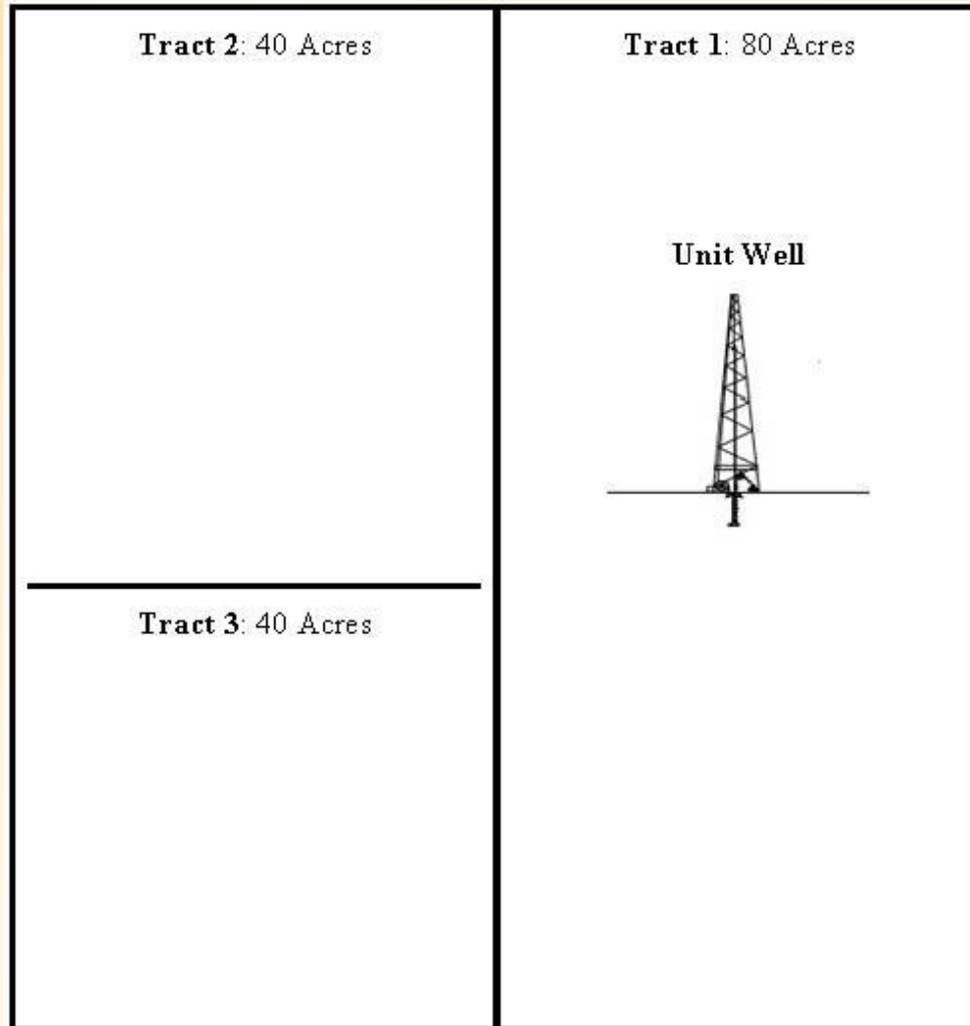
- A unit formed by order of a governmental agency.

Spacing Unit or Drilling Unit– often single well.

Pooled Unit – A spacing/drilling unit in which the rights to share in production have been merged.

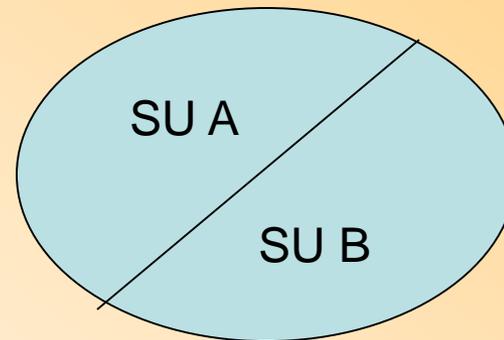
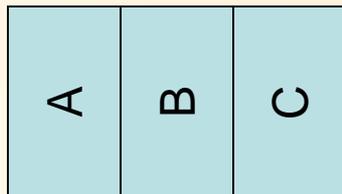
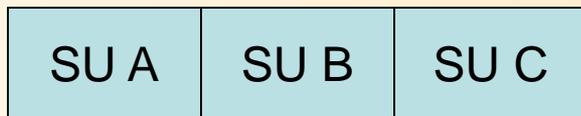
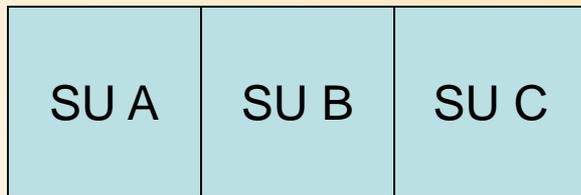
Fieldwide or Reservoirwide unit -- The consolidation of all or a substantial portion of the interests in an entire field or pool for the purpose of operating the reservoir as a single producing mechanism.

Unit Diagram – Standard Model



Unit Configuration

- Regular – Geographic
 - Rectangles - Laydown and Standup
- Geological



Unit Diagram #2

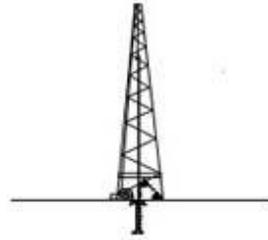
Tract 2: 40 Acres

B → Y Lease #2

Tract 1: 80 Acres

A → X Lease #1

Unit Well



Tract 3: 40 Acres

C → Unleased

Some Issues

- **Relation of X & Y**
Does Y owe costs?
- **Relation of X & B**
Does B get royalty?
From X or from Y?
- **Relation of X & C**
Does C owe costs?
Does C get a royalty?

Unit Diagram #3

Tract 2: 40 Acres

B → Y Lease #2

Y → G
[5% overriding royalty]

Tract 3: 40 Acres

C → Unleased

C → N
[1/16th non-participating
royalty owner]

Tract 1: 80 Acres

A → X Lease #1

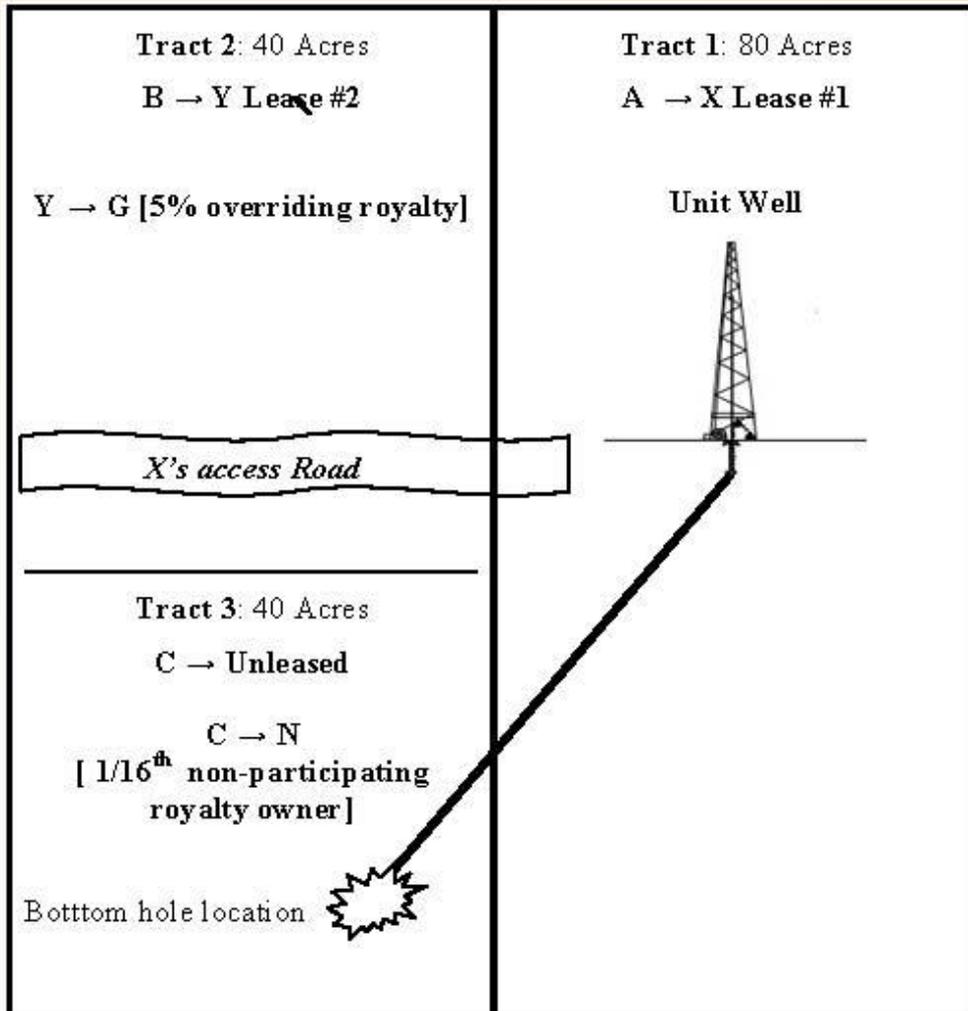
Unit Well



More Issues

- **Relation of X & G**
Does G get royalty?
From X or from Y?
Can Y create overrides to avoid/limit costs?
- **Relation of X & N**
Does N get a royalty?
Can C create royalties to improve its advantages?

Unit Diagram #4



Yet More Issues

- **Relation of X and lands in Unit**

Can X make use of surface and subsurface of unit lands not under lease to it?
- **What statutory and implied duties does X owe to other parties?**

Effects of Unit Order

- Maintenance of Leases
- Continuation of Term Interests
- Sharing of Costs and Production
- Use of Land (?)

The Technology Revolution

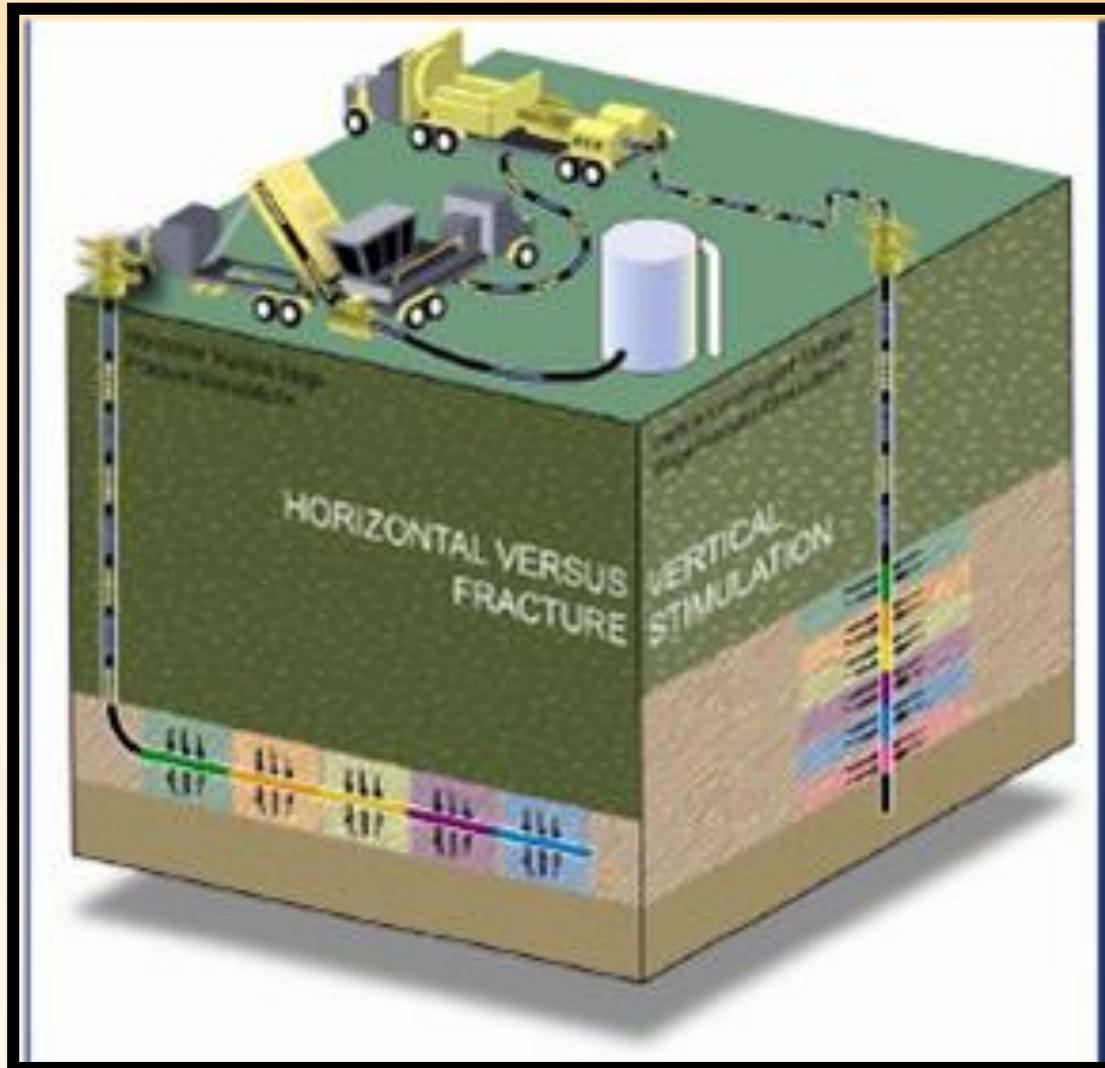
Two components:

- 1) horizontal drilling
- 2) Formation fracturing

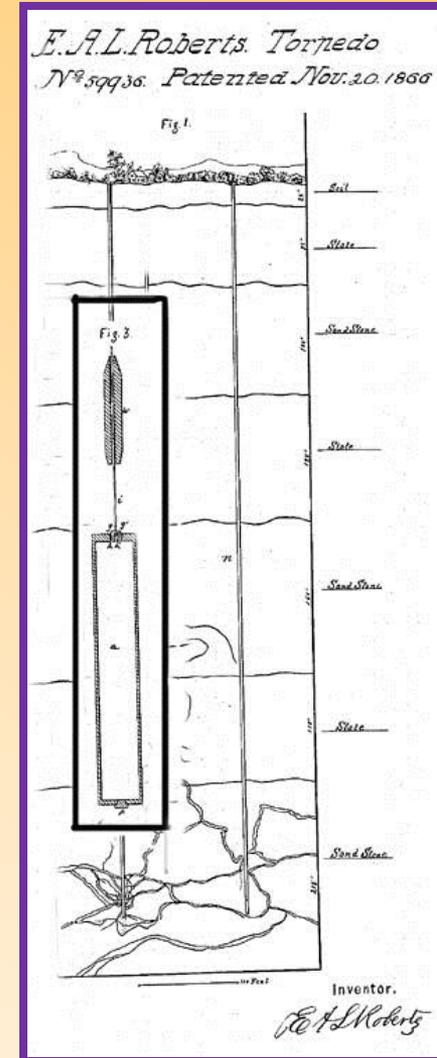
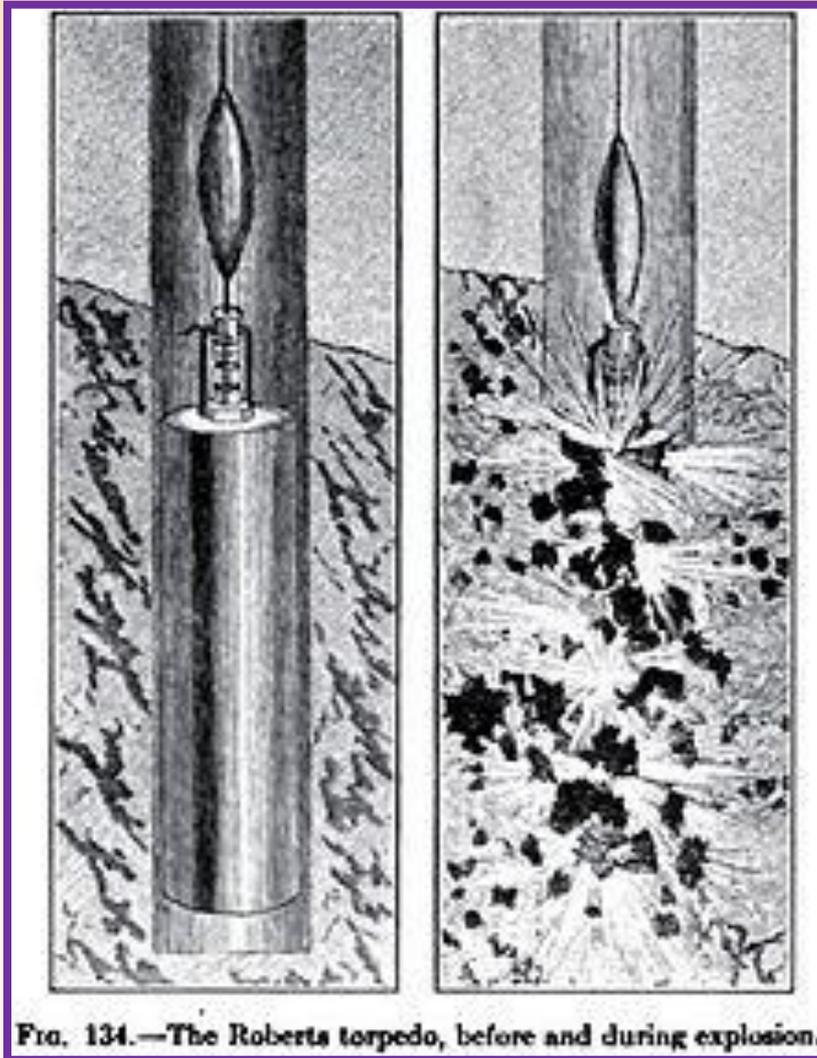
The issues they pose

- Paradigm shift in regulatory assumptions – it is as though you have many well bores, simply lacking vertical holes. Plus limited extent of drainage, so multi-well units become the norm.
- Water demands, chemicals, recovery or disposal of same
- Somewhat different surface use.
- Trespass (?).
- Correlative rights issues.
- Costs very high – risk penalty issues esp. multi-well units.

Fracking – Horizontal/Vertical

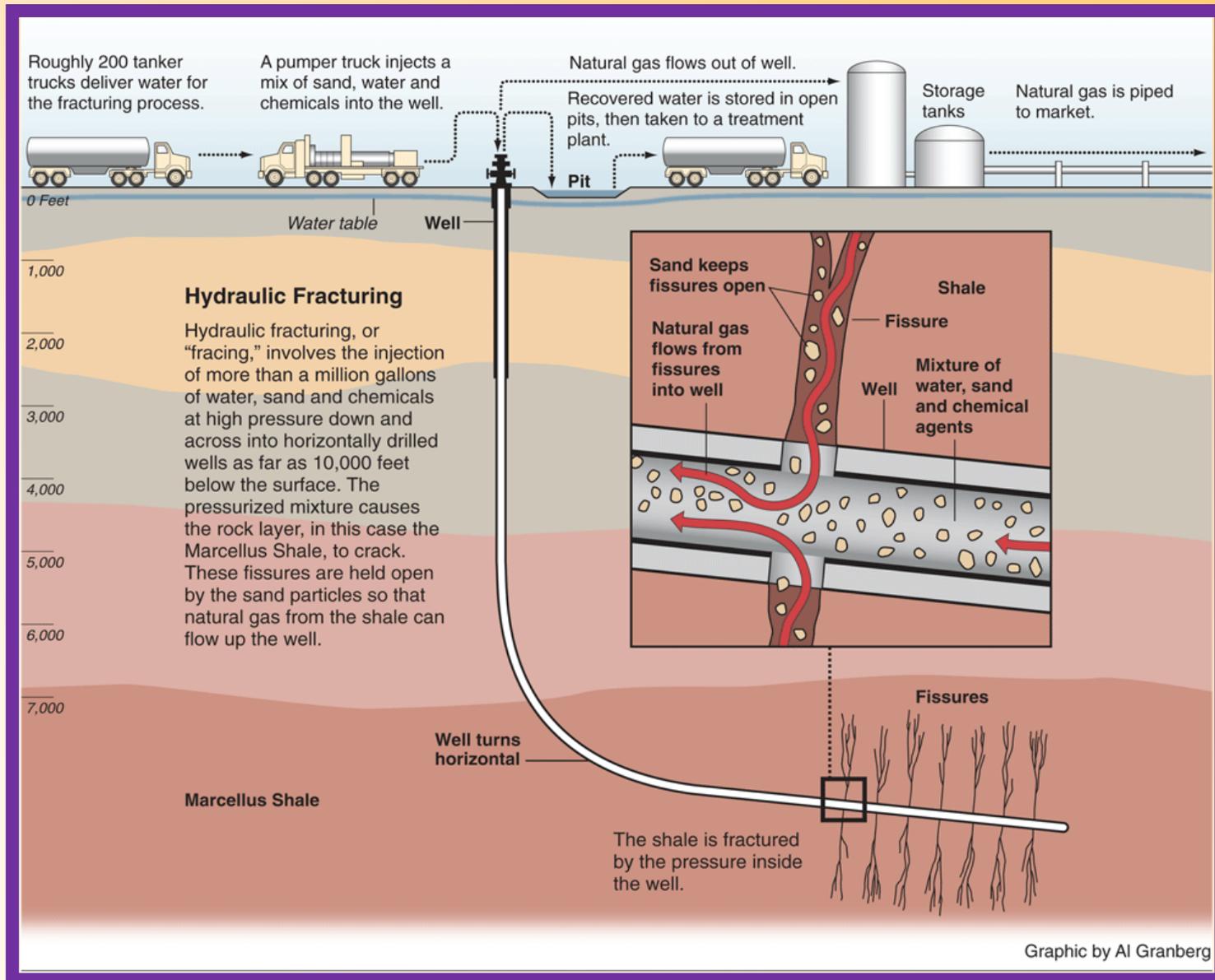


Fracturing Rock for Oil is Very Old



Nitroglycerin - 1866

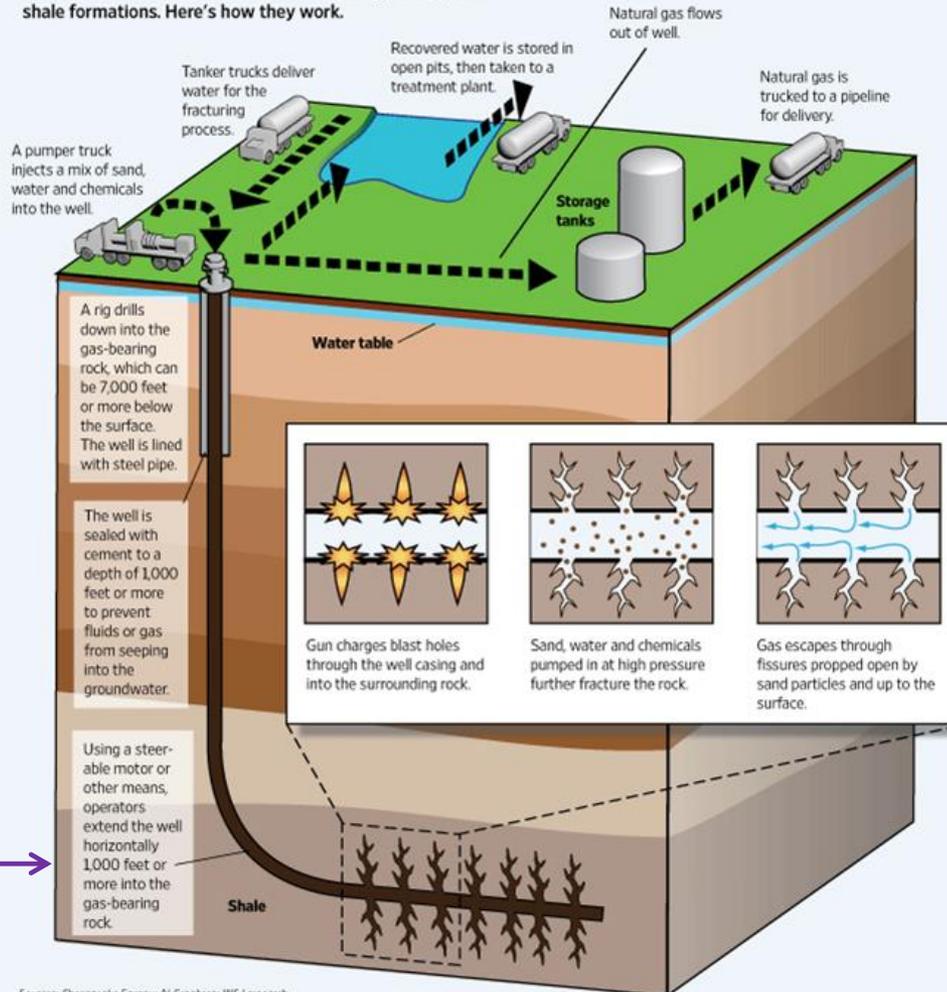
Fracking – Another Diagram



Fracking - Oil

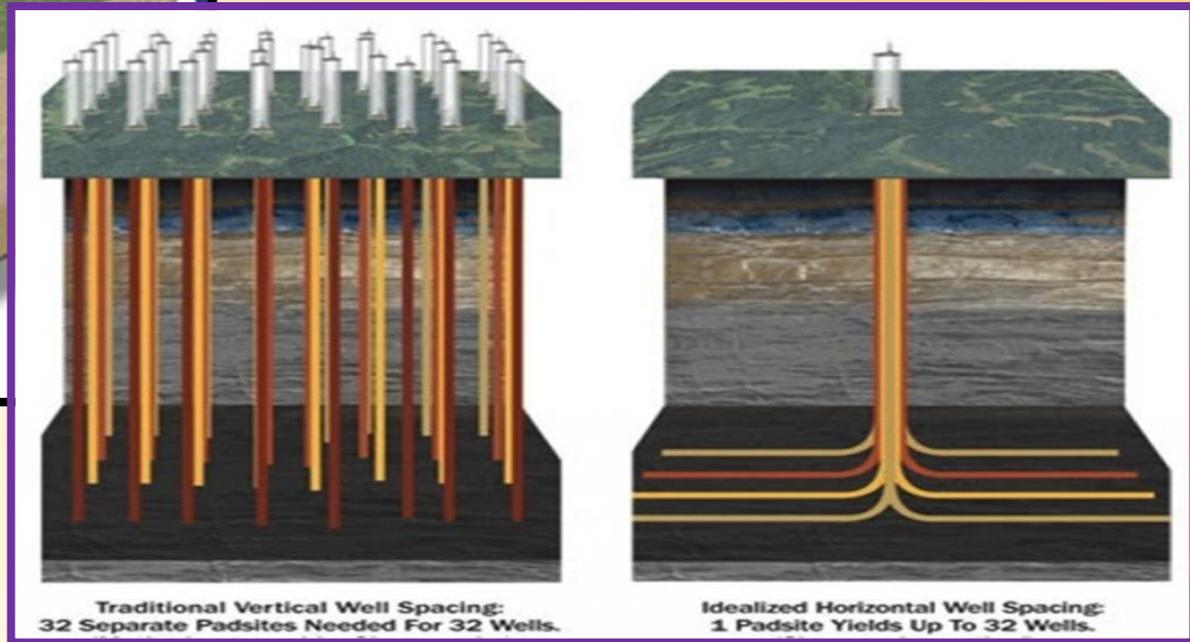
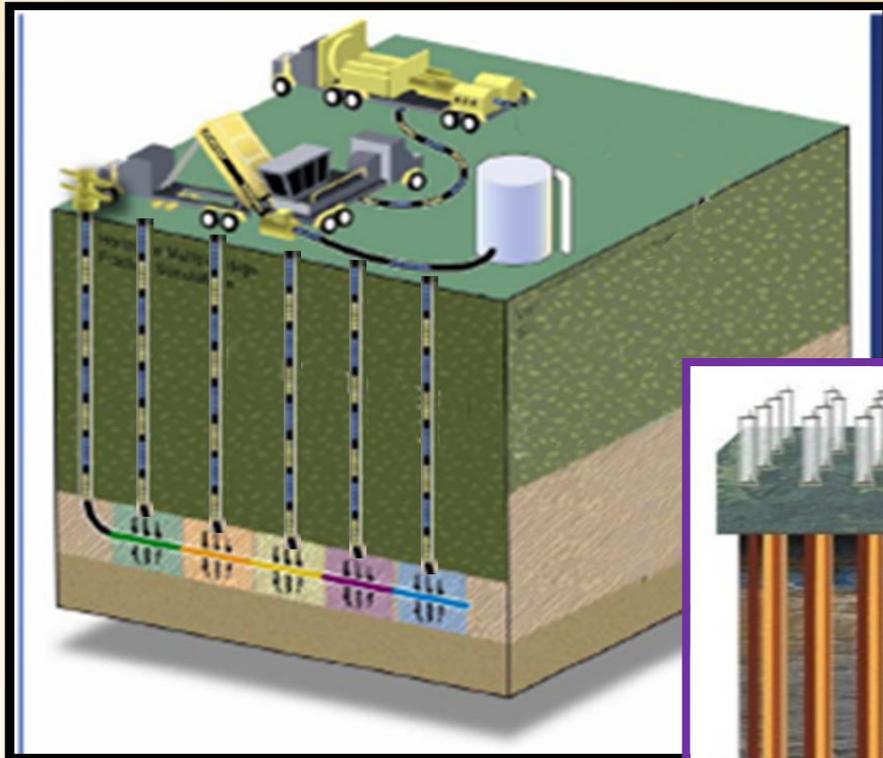
Tapping the Gas - Oil

Horizontal drilling and hydraulic fracturing have made it feasible to extract huge amounts of natural gas trapped in shale formations. Here's how they work.

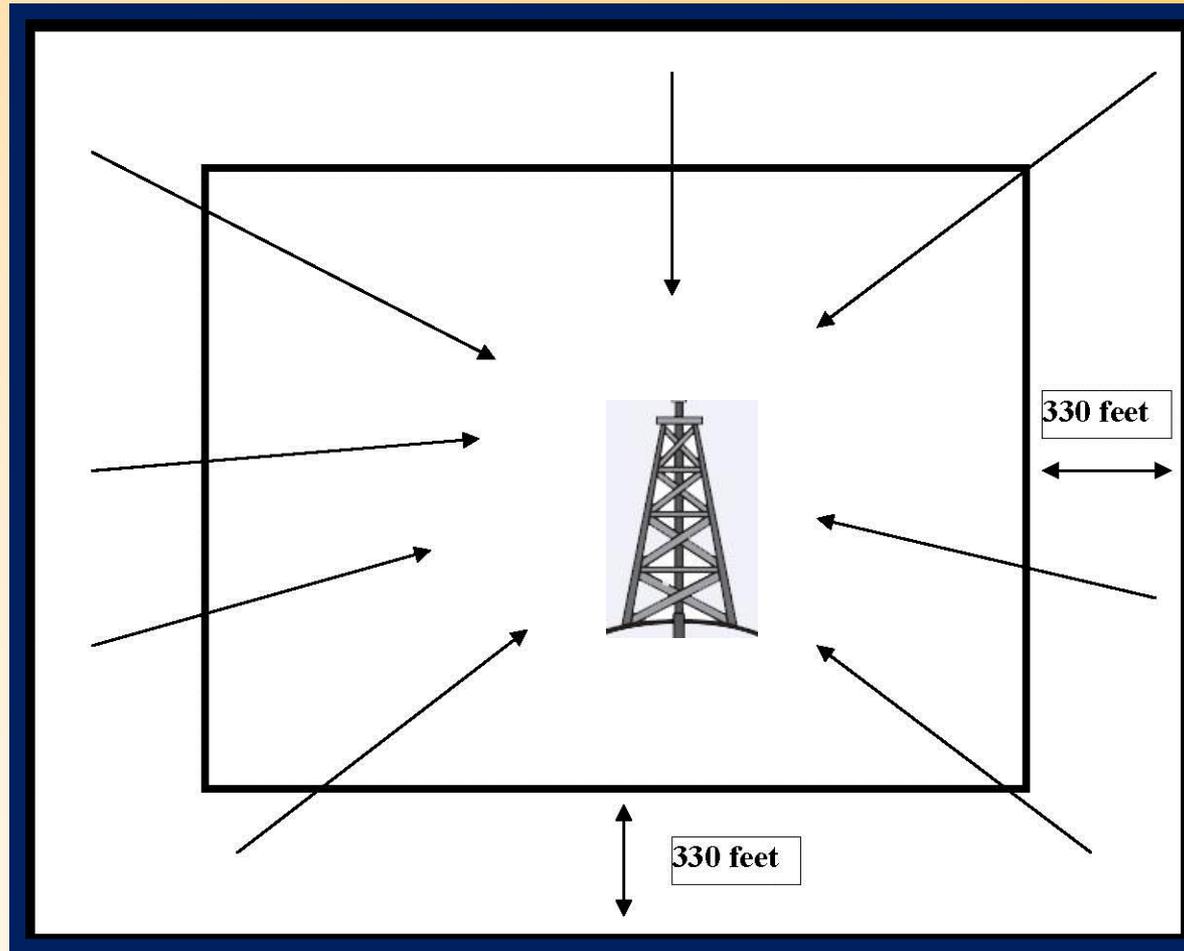


5-9,000 feet

Fracking + Horizontal like Multiple Vertical Wells

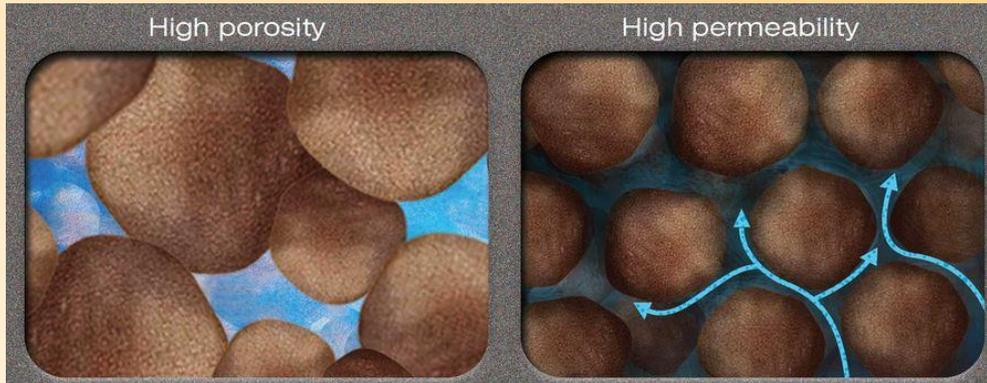


Standard Model - Single Well Unit



- Assumptions:
- 1) One well will drain entire unit
 - 2) Uniform drainage across unit
 - 3) All owners share on surface acreage

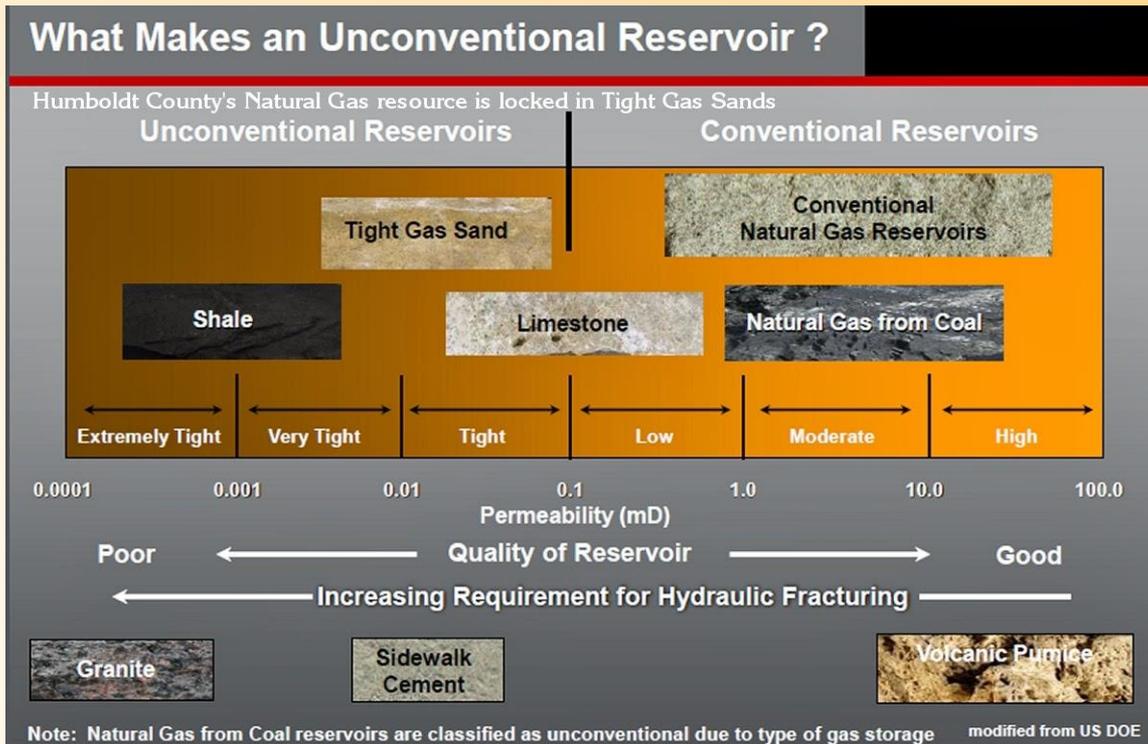
Porosity & Permeability



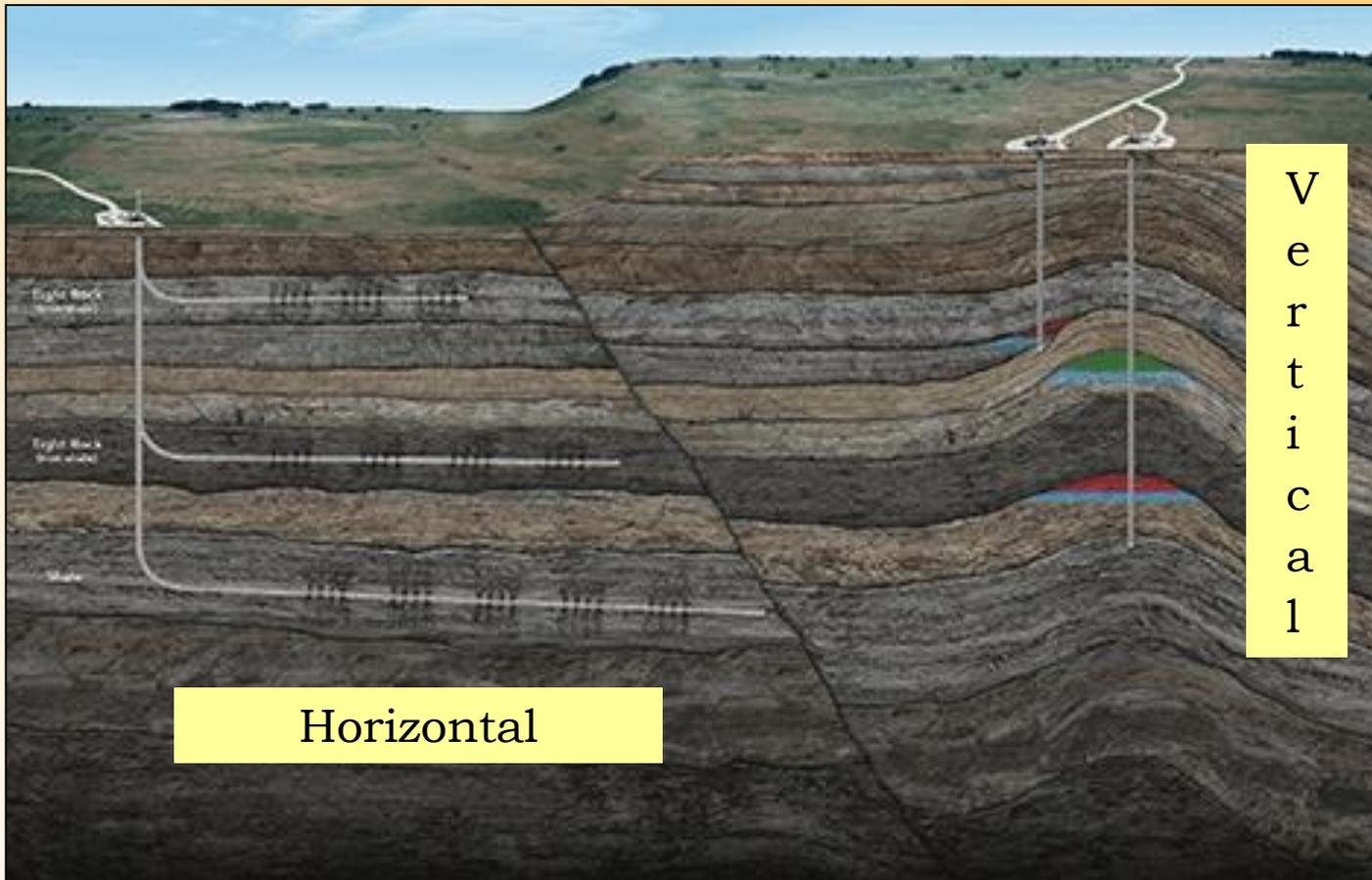
Source: <http://www.co2crc.com.au>



High porosity, low permeability



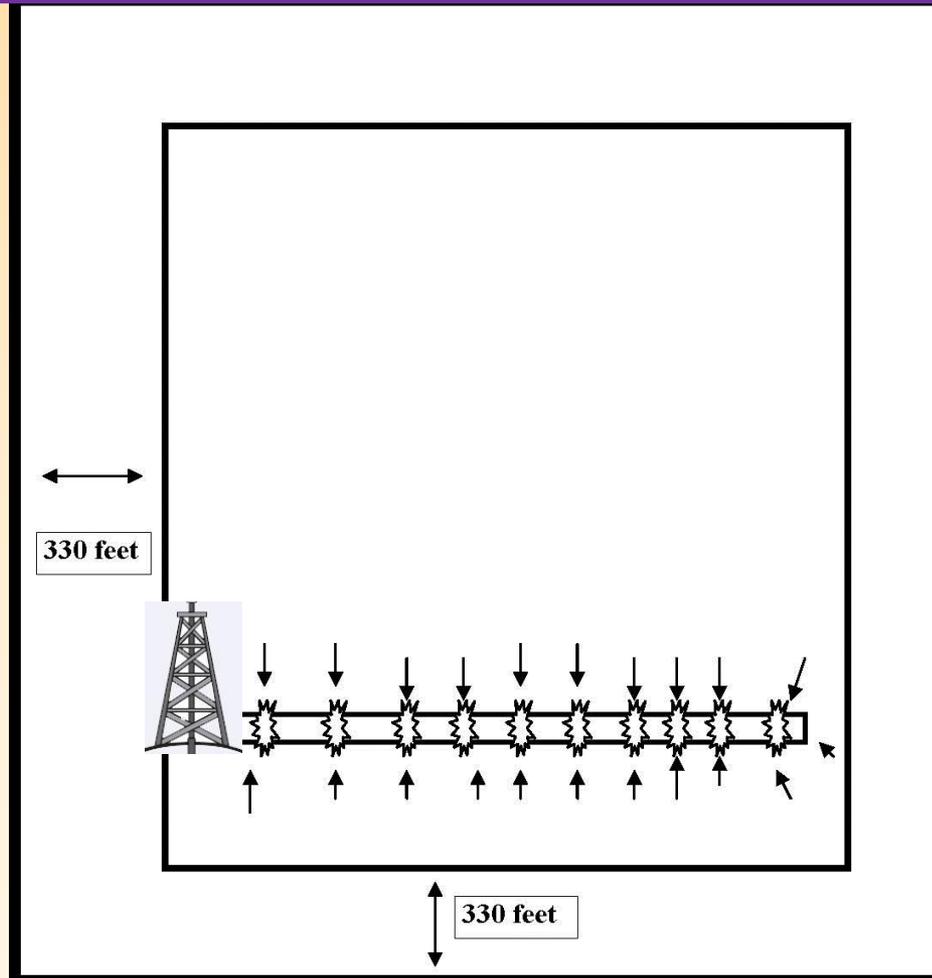
Unconventional vs. Conventional



Horizontal

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Horizontal Drilling On Standard Unit Model

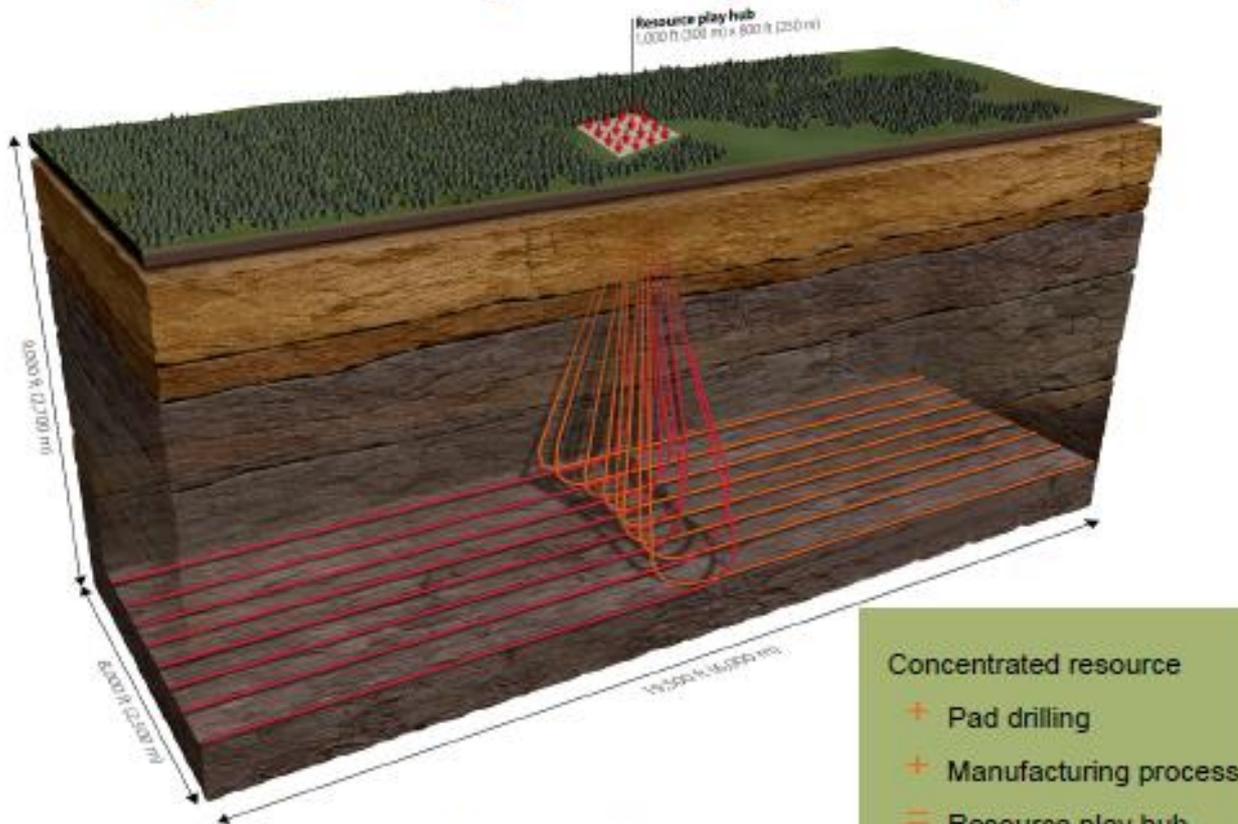


Actual drainage is relatively shorter and uncertain distance from the points of fracturing.

Use of Hub and Multiple Unit Wells in Haynesville

Low Cost Focus Advancing Resource Play Hub Design and Development

encana



Schematic represents 4-6 square miles of reservoir accessed from a single surface location.

Increasingly Longer Laterals

Haynesville Resource Play Hub Long Lateral

Encana Leading the Way

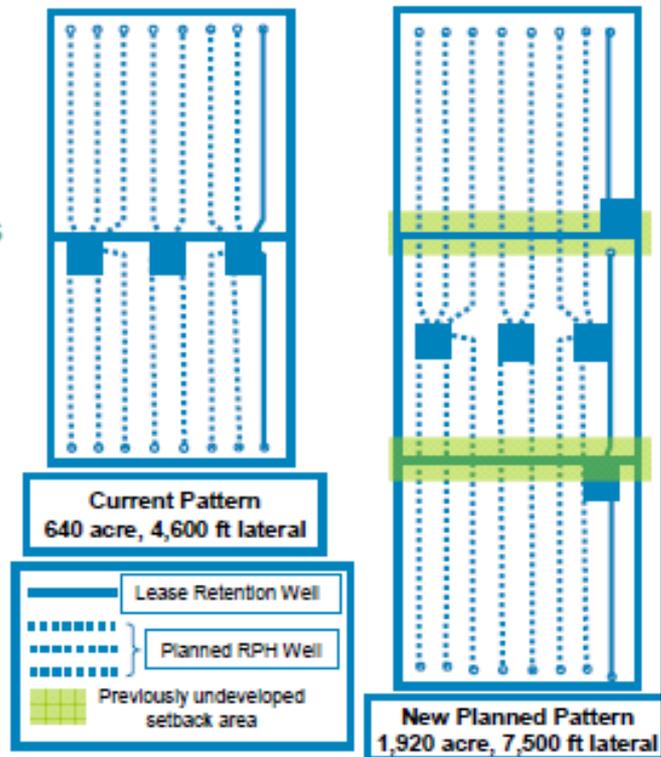
- 1st Cross Unit permits granted in the State of Louisiana
- 1st Cross Unit well drilled

Enhancement to RPH Efficiencies

- Successfully drilled two long laterals (6,879 & 8,003 feet)
- Lower supply cost with fewer vertical parent wellbores
- 13% additional recovery
- Future plans for 10,000 feet laterals

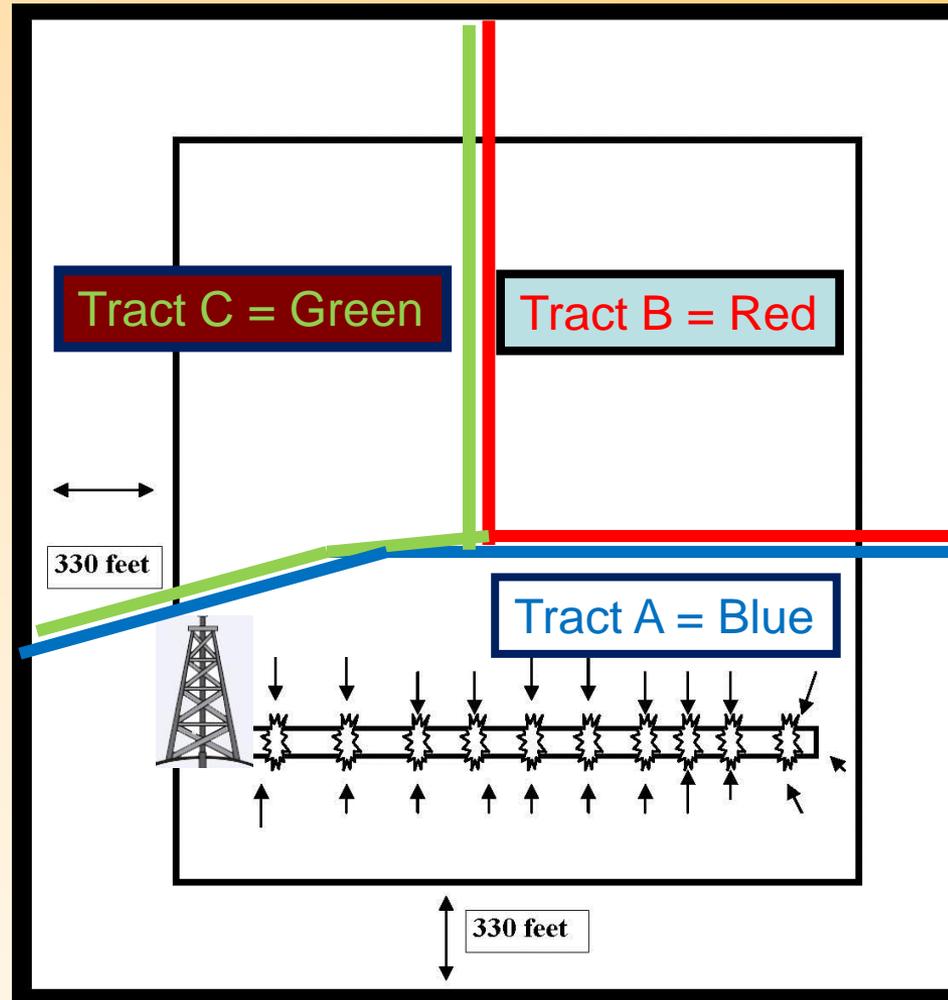
Significant Positive EHS Impact

- Reduced footprint
- Reduced development traffic



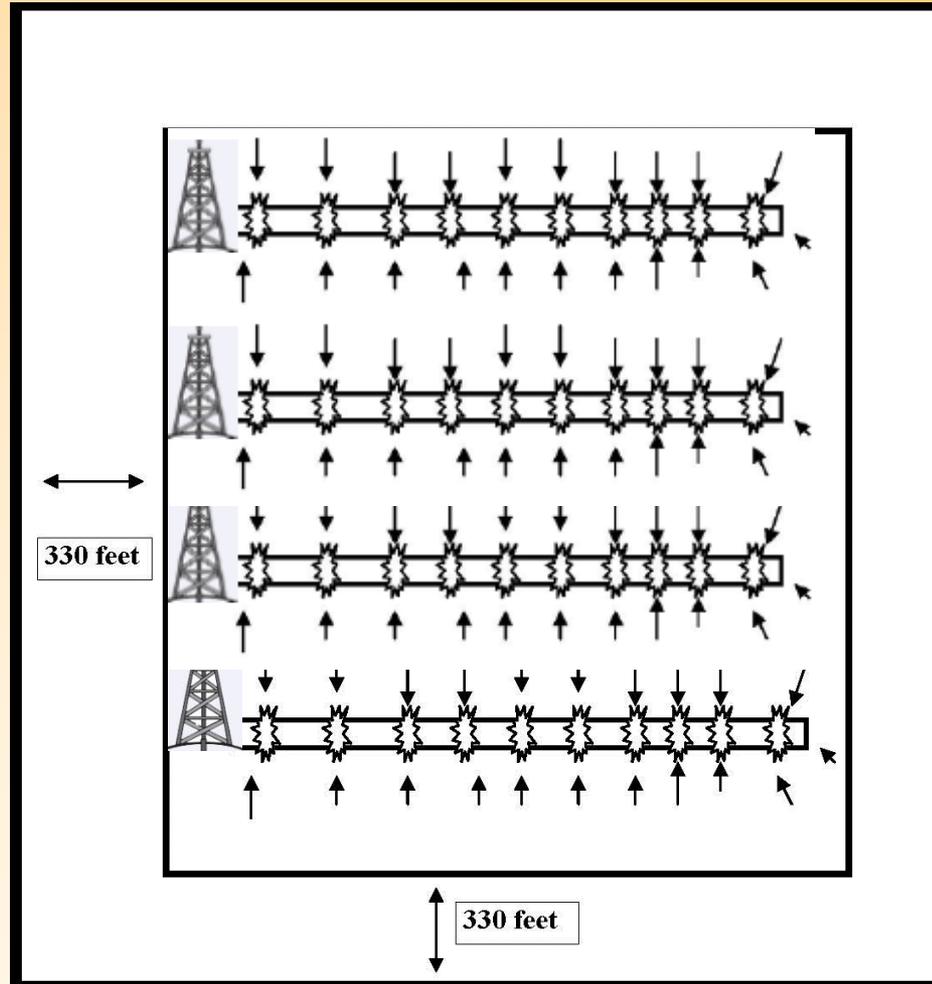
encana.

Whose oil/natural gas?



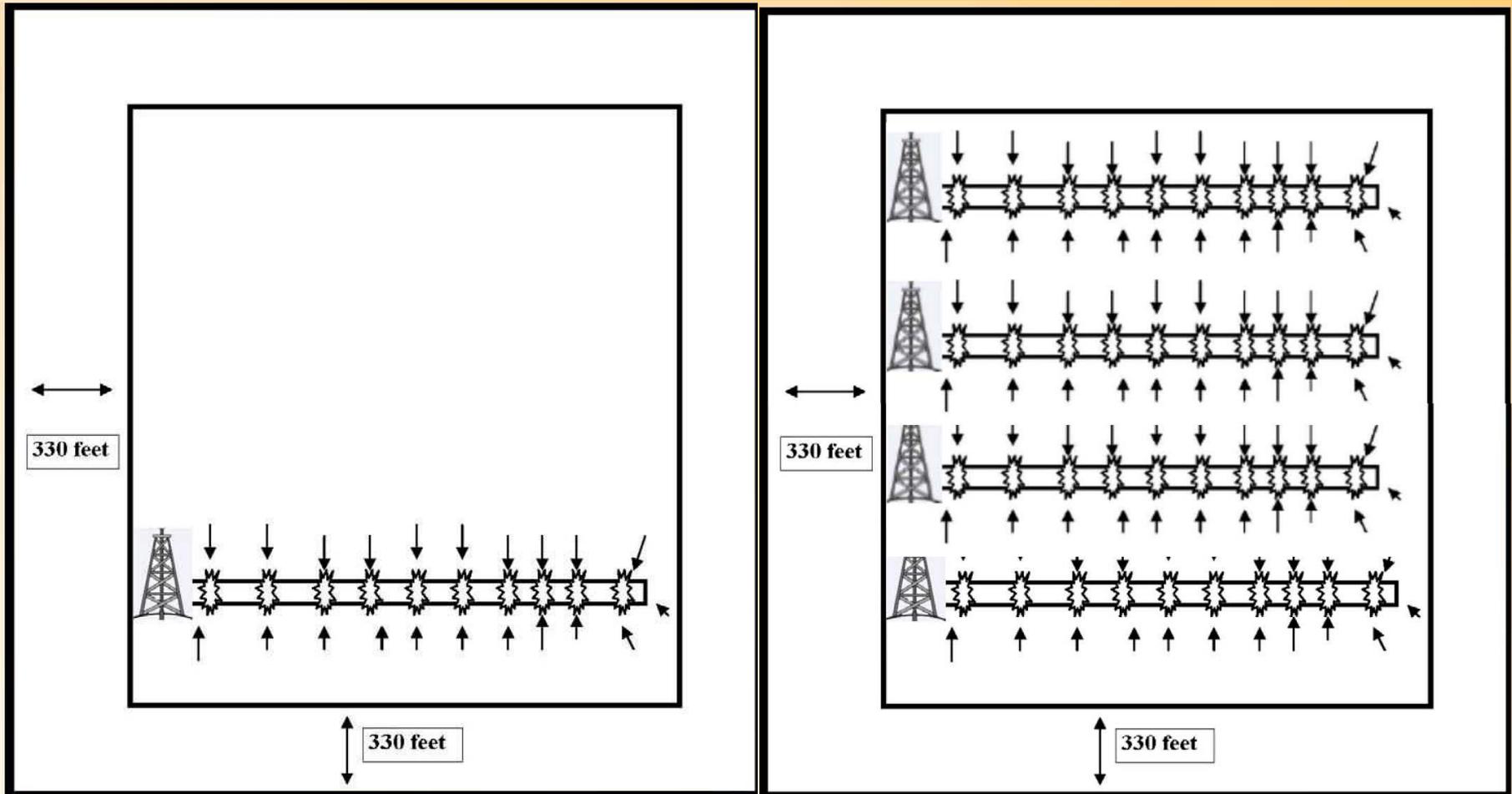
1. Additional wells will be necessary.
2. Tracts B & C share before production is from there.
3. What if later wells are not drilled or are dry?

Horizontal/Fracking Model



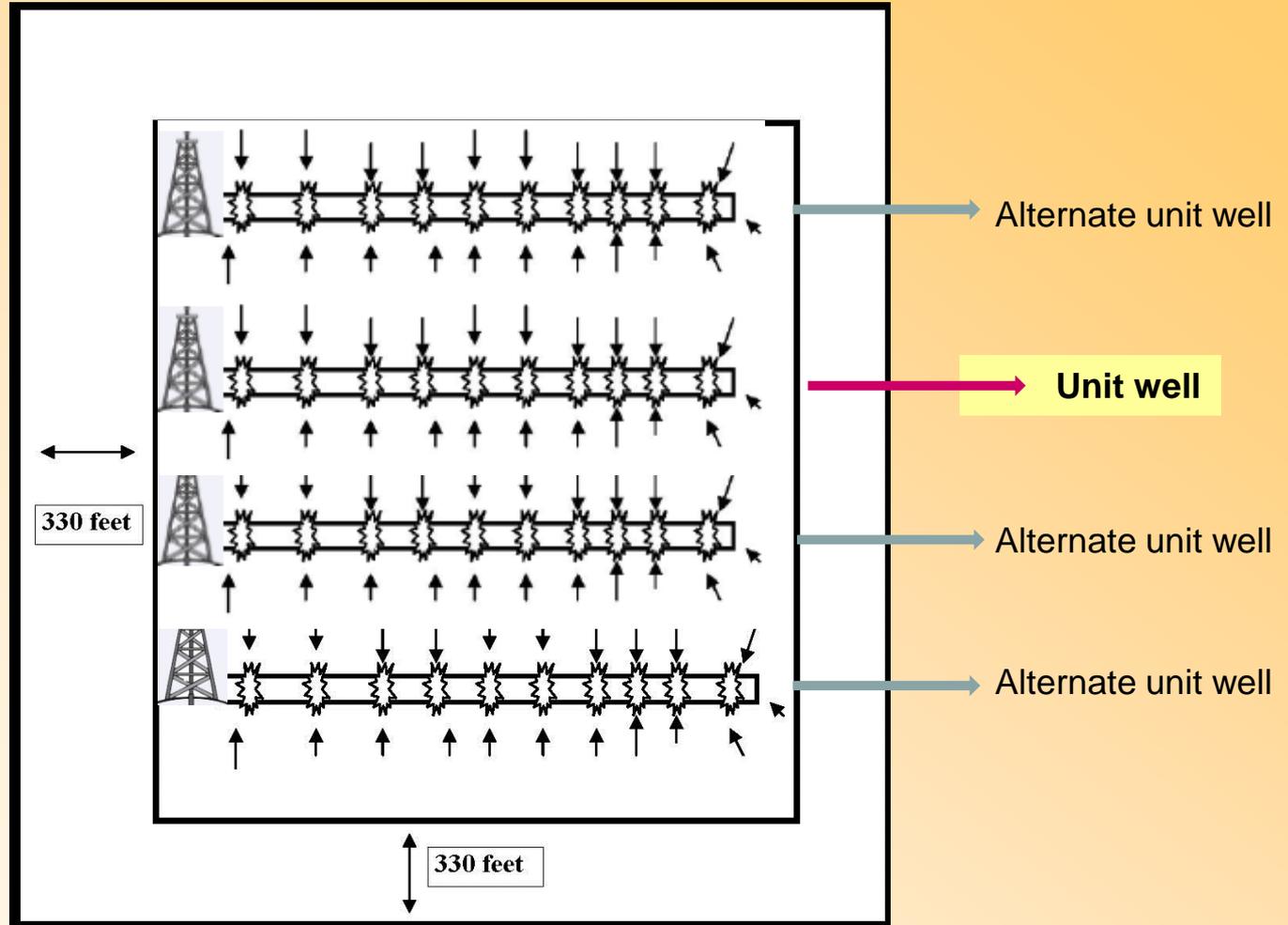
Actual drainage is relatively shorter and uncertain distance from the points of fracturing.

Allowables



Should these adjacent units have the same unit allowables?

Is it Legal?



Walker v. J-W Operating Co.

2012 La. App. Unpub. LEXIS 872; 2012 WL 6677913;
writ denied, 2013 La. LEXIS 695 (La., Apr. 1, 2013) .

- The Louisiana appeals court upheld the Commissioner's "authority to issue permits for alternate wells pursuant to its grant of authority to prevent waste and its authority to 'make ... reasonable rules, regulations, and orders' to effect that goal," citing La. Rev. Stat. Ann. §§ 30:2, 30:3, and 30:4. The court noted that for fifty years the various Commissioners for the State of Louisiana had approved alternate wells. Moreover, it observed that the Louisiana legislature had in two acts recognized the practice of permitting alternate wells, both acts providing that "nothing herein shall be construed as limiting the authority of the commissioner to approve the drilling of alternate unit wells on drilling units established pursuant to Section 30:9(B)."
- The court ruled that nothing in Section 30:9 prohibits the permitting of alternate wells on a unit previously established pursuant to Section 30:9.

Gatti v. State

2013 0289 (La.App. 1 Cir. 01/15/14), 2014 La. App. Unpub. LEXIS 7.
Reversed: 2014 La. LEXIS 1804, 2014-0863 (La. 08/25/14).

- Plaintiffs sought a declaratory judgment that no authority or power is prescribed by law for the Commissioner to establish a unit having an area in excess of the area drainable by one well, and the purported creation of a unit having an area in excess of the area drainable by one well is null and void. They further sought a declaration that alternate wells are not authorized by the statute, are beyond the legal authority granted to the Commissioner, and violate La. R.S. 30:9(B).
- The appeals court overturned the trial court judgment sustaining exceptions of no cause of action, no right of action, prescription/peremption, lack of subject matter jurisdiction, and prematurity. The appeals court rejected the defendants' assertion that La. R.S. 30:12 provides the exclusive means of reviewing the orders of the Commissioner and does not permit the use of a declaratory judgment action to adjudicate the scope of the Commissioner's statutory authority to order forced pooling of lands that cannot be economically drained by one well.
- The Louisiana Supreme Court reversed, reinstating the district court's ruling.

Risk Penalties & Alternate Wells

- Where a small minority interest owner can drill a well and look to a much larger interest owner for a 200% or 300% or 400% risk penalty under a joint operating agreement, the drilling party has little incentive to seek efficient recovery of natural gas or maximum production from the entire unit.
- 640 acre unit - 4 wells can produce natural gas worth \$100 million.
- Each well will cost \$8 million.
- Majority interest owner -80%; minority owner has 3%.
- With maximum recovery from 4 wells at a cost of \$32 million, the 3% owner would put up almost \$1 million to get back \$3 million before paying any severance tax or royalties, thus perhaps clearing \$1.5 million.
- If the 3% owner could propose a 2nd unit well with the majority owner going non-consent under the joint operating agreement, the 3% owner could put up the full \$8 million for a well and produce \$25 million from it and keep all \$25 million as risk penalty. The 3% owner could make perhaps 10 times the money from one well as he could have if all 4 wells had been drilled.

Order No. 361-L-122

February 14, 2014 - Elm Grove Field, Bossier Parish, Louisiana

- 2. That the applicant's request for approval of three (3) alternate unit wells for HA RA SUMM, HA RA SUNN and HA RA SUOO is opposed by the majority of the owners having the right to drill in said units, including the operators of each of said units.
- 3. That the available geological, engineering or other appropriate information indicates that approval of the applicant's request is not in the interests of conservation, nor is it necessary to prevent waste, to avoid the drilling of unnecessary wells, to allow for orderly development, or to protect the correlative rights of the owners of the tracts in said units.
- 4. For the reasons set forth in Findings No. 2 and 3 hereof it would be reasonable and in the interests of conservation to deny the application, reserving to the unit operator the ability to propose alternate unit wells for said units at a later time.
- To the same effect: Order No. 691-C-29 Swan Lake Field.

House Bill No. 1204

- (2) The commissioner shall approve an increased well density within a unit's current boundaries established for stratigraphic zones which comprise the Haynesville Shale upon application by any working interest owner and the commissioner finding, after notice and a public hearing, that the geological, engineering, and other relevant evidence establishes that the developed area cannot be efficiently and economically drained by the current unit well or wells. The commissioner shall issue a permit to drill an alternate unit well to a successful applicant, upon the election of the current unit operator not to participate pursuant to R.S. 30:10 or otherwise, and in compliance with R.S. 30:28 and applicable rules and regulations.
- Current Status: Pending House Natural Resources - Considered 4/16/14.

Cross-unit Wells

- Because a field rule may limit a well from being drilled or completed within say 330 feet of another unit boundary, the result is a gap of at least 660 feet which cannot be produced.
- A borehole that might be most efficiently extended to 8,000 feet must be limited to about 4,500 feet for a 640 acre square unit.
- That means the unit and rules based on the Standard Model result in an inefficient well and an unproduced gap, neither of which benefits anyone; adherence to the Standard Model causes a loss of money and hydrocarbons.
- Instead of revising units, one solution is to permit wells to cross unit boundaries. This leads to allocation issues for the adjacent units.

Cross-unit Well Allocation - Louisiana

Order No. 191-H-176

- That unit production from said cross unit horizontal alternate unit wells should be allocated to each unit in the same proportion as the perforated length of the lateral, as defined in the DEFINITIONS section herein, in that each unit bears to the total length of the perforated lateral, as determined by an "as drilled" survey performed after the cross unit wells are drilled and completed; and that unit production should continue to be shared on a surface acreage basis.
- 'perforated length of lateral' shall mean and is hereby defined as the length of horizontal lateral wellbore wherein perforations have been made, regardless of the number of perforated stages or individual perforations, which is measured from the lesser measured depth perforation or 'top of perforations' to the greater measured depth perforation or 'base of perforations'

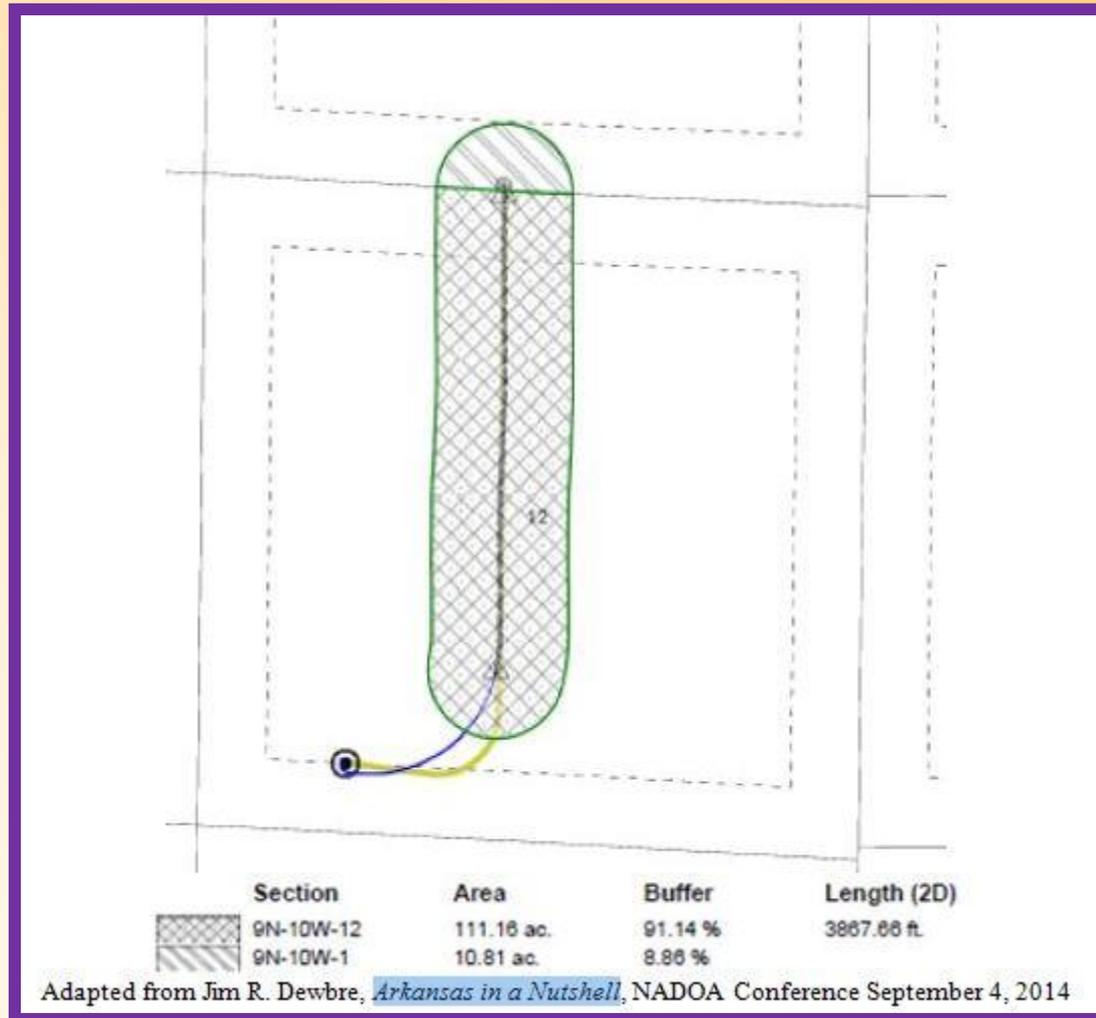
Cross-unit Well Allocation - Arkansas

Rule B-43(o)(2)(E)

- E. The method for sharing the costs of and the proceeds of production from one or more separately metered wells shall be based on acreage allocation as follows:
 - i) An area measured 560 feet along and on both sides of the entire length of the horizontal perforated section of the well, and including an area formed by a 560 feet radius from the beginning point of the perforated interval, and a 560 feet radius from the ending point of the perforated interval shall be calculated for each such separately metered well (the “calculated area”).
 - ii) Each calculated area shall be allocated and assigned to each drilling unit according to that portion of the calculated area occurring within each drilling unit.

Cross-unit Well Allocation - Arkansas

The Band-aid

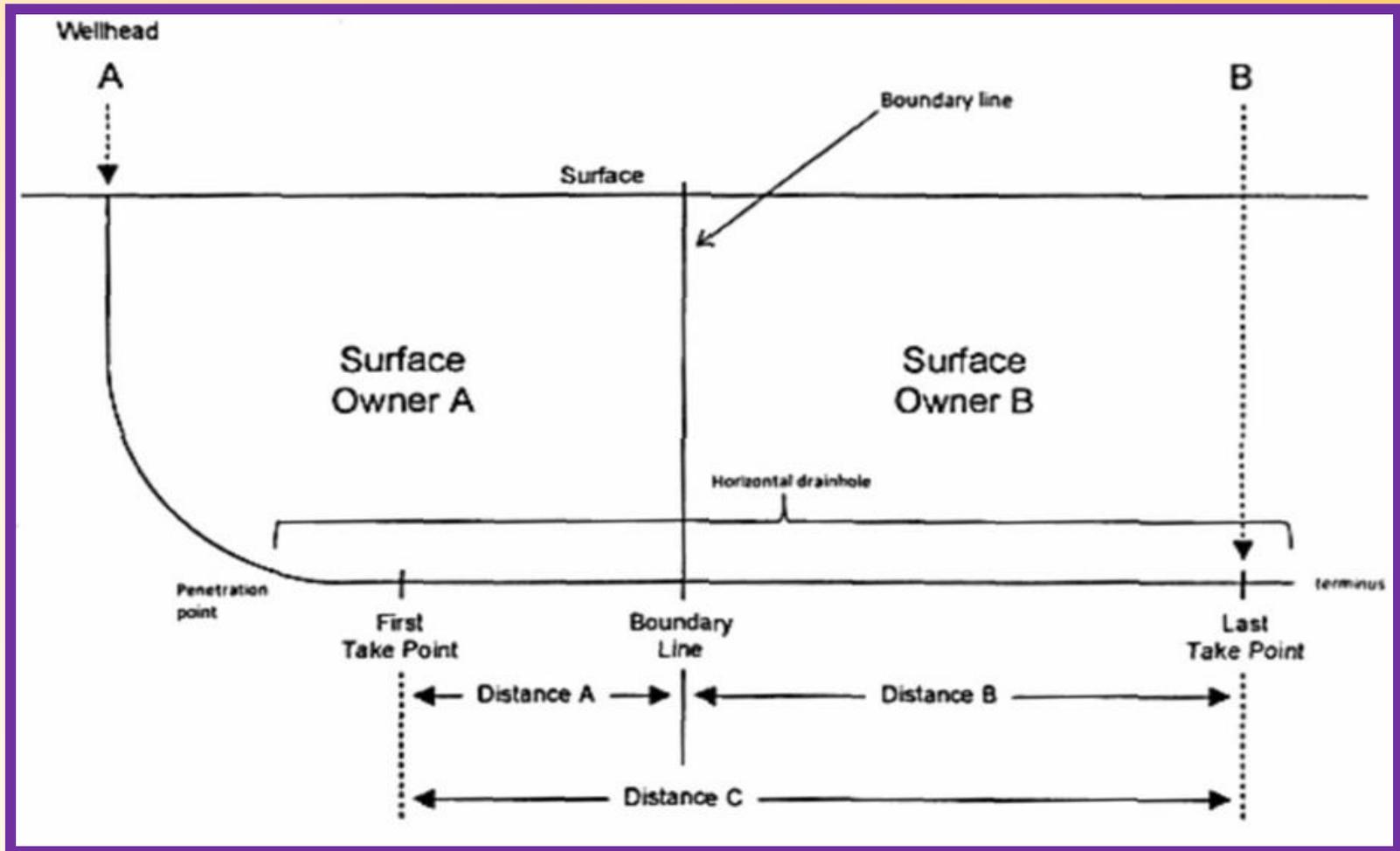


Cross-lease Wells

Non-Units; Non-Pooling

- **Springer Ranch, Ltd. v. Jones, 421 S.W.3d 273 (Tex. App.--San Antonio 2013).**
- **1956 lease on 8545 acres. Later division into 3 tracts. 1993 contract:**
 - [the parties] contract and agree with each of the other parties, that all royalties payable under the above described Oil and Gas Lease from any well or wells on said 8,545.02 acre tract, shall be paid to the owner of the surface estate on which such well or wells are situated, without reference to any production unit on which such well or wells are located. . . .
- **Worked well for several vertical wells, but for horizontal well the wellhead was located on one tract while the terminus was on another tract. Who was entitled to royalties?**
- **The court rejects the claim that the division between the two owners should be based on the total length of the wellbore, including the vertical segment since there is no production from that vertical segment. Instead, the court allocates production based on the length of the lateral between the first takepoint in the correlative interval to the last takepoint at the terminus of the horizontal wellbore.**
- **The court looked to *Browning v. Luecke*.**

Springer Ranch, Ltd. v. Jones



With respect to the SR2 well, Springer Ranch is in the position of "Surface Owner A," and Sullivan is in the position of "Surface Owner B."

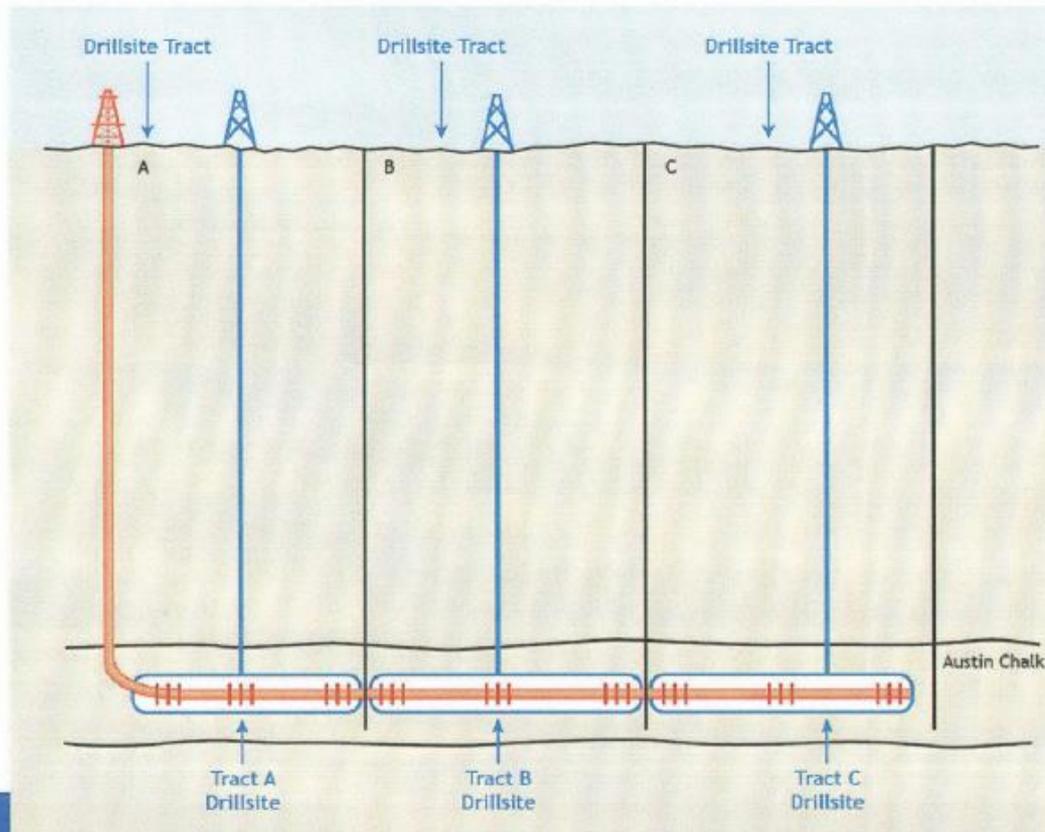
Browning Oil Co. v. Luecke,
38 S.W.3d 625 (Tex. App.—Austin 2000, rev. denied).

- The *Browning* court was faced with a jury verdict that had given a royalty owner the full value of all minerals produced from a horizontal wellbore that traversed over a portion of the lease, after the lessee had improperly pooled the royalty owner's interest into a unit. The royalty owners had a portion of both horizontal drainholes and the vertical drillsite on their acreage.
 - “We decline to apply legal principles appropriate to vertical wells that are so blatantly inappropriate to horizontal wells and would discourage the use of this promising technology. The better remedy is to allow the offended lessors to recover royalties as specified in the lease, compelling a determination of what production can be attributed to their tracts with reasonably probability. ...”
- The court remanded for a determination of damages.

Browning depicted

Blue = The Browning Court's description of the legal characteristics of the Browning well; the wellbore as it exists under each lease is a "drillsite," and each lease traversed is a "drillsite tract."

Red = The Browning Oil Company Well, As Drilled



"Oil and Gas Lease Act," SB 259

58 Pa. Stat. § 34.1

- **The Legislature enacted the following statute that allows a lessee of adjoining lands to drill a horizontal well that traverses the property line between the two separate leases.**
 - **“Where an operator has the right to develop multiple contiguous leases separately, the operator may develop those leases jointly by horizontal drilling unless expressly prohibited by a lease. In determining the royalty where multiple contiguous leases are developed, in the absence of an agreement by all affected royalty owners, the production shall be allocated to each lease in such proportion as the operator reasonably determines to be attributable to each lease.”**
- **Allocation of production between the two or more separate, but contiguous, leases is left to the discretion of the operator. To date, the predominant method of allocation for horizontal wells, be they allocation wells or pooled unit wells appears to be the length of the lateral in the productive horizon under the owner's land as compared to the total length of the lateral in the productive horizon.**

THE END