

The Fayetteville Shale Play of North-Central Arkansas – A Project Update*

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Abstract

The Fayetteville Shale is a Mississippian-aged unconventional gas reservoir present in the subsurface over much of the northern Arkansas portion of the Arkoma Basin. It is approximately age equivalent to the Barnett Shale in the Ft. Worth Basin of North-Central Texas. Southwestern Energy initiated drilling in the Fayetteville in the summer of 2004. Currently, over 500 wells are producing from the Fayetteville with approximately 460 of these horizontals. Total production to date from the shale has reached 52 Bcf and daily production averaged in excess of 230 MMcf in July, 2007. Southwestern Energy's gross Fayetteville production alone rose from 10 MMcf/D in January of 2006 to an estimated 200 MMcf/D at the end of July.

In addition, production from overlying Pennsylvanian-aged conventional sands has also been established within the play. Daily production from these conventional reservoirs is currently in excess of 16 MMcf with rates from individual intervals as high as 6 MMcf/D.

Overall, drilling activity within the Fayetteville Shale Play has been ramping up at a rapid pace as Southwestern Energy now has 19 rigs active in the play, Chesapeake has increased their rig count to 13, and other operators continue to move into the area (+/-10 rigs). Currently, a core area has been established in the play consisting of southern Van Buren, Cleburne, northern Conway, northern Faulkner, and northern White Counties in north-central Arkansas.

The Fayetteville Shale Play of North-Central Arkansas- A Project Update

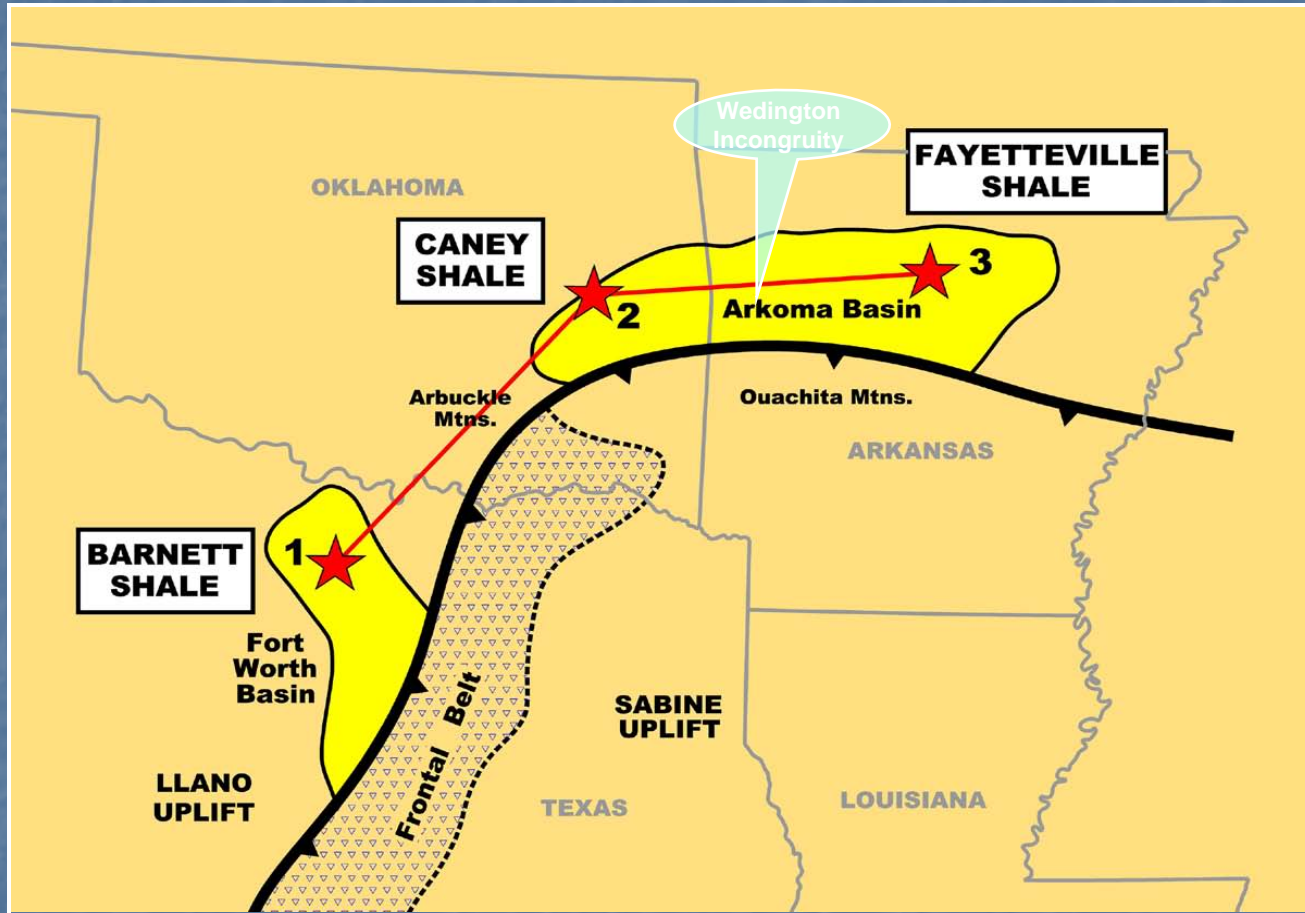
AAPG 2008 Annual Convention
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- *Introduction*
- Major Players
- Fayetteville Production
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Mississippian Shale Deposition



- The Fayetteville Shale is a Mississippian-age shale that is the geologic equivalent of the Caney Shale in Oklahoma and the Barnett Shale in north Texas.

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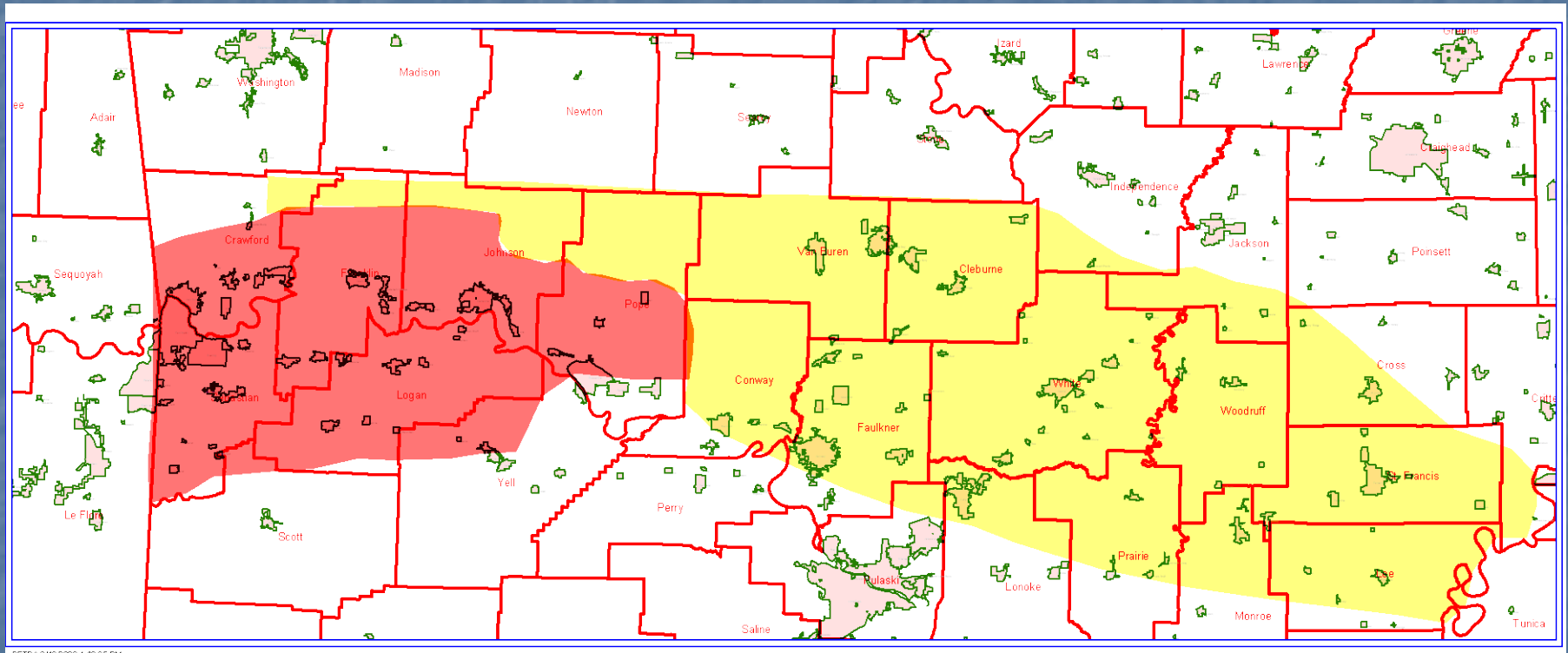
- The Fayetteville Shale is approximately age equivalent to the Barnett Shale in the Fort Worth Basin of north-central Texas.
- The Barnett Shale Play is currently the largest producing gas field in Texas.
- The Fayetteville Shale will soon become the largest gas-producing interval in Arkansas. The play is still evolving and expanding and like most resource plays it is highly commodity price sensitive.

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- The Moorefield (eastern exploration area) and Chattanooga Shales (western HBP area) are also prospective in several Arkansas counties and have the potential to add significant reserves.
- SW Energy initiated the play and started leasing activity in early 2003.
- Initial lease terms were \$25-50/acre bonus w/ a one-eighth royalty and a 10 yr primary term. Currently, lease terms are much higher w/ \$500-1500/acre bonuses and up to one-fifth royalty for a 5 yr term due to the early success of the play and competition for leases.

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Map showing Traditional Fairway w/ Fay Shale Leasing Outline



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- SWN discovered the play and currently has the largest core leasehold position w/ +/-850,000 acres. SWN has drilled and completed some 60-70% of the wells and currently has 19 rigs drilling in the play.
- Chesapeake has approx. 600,000 acres, is 2nd in terms of number of producing wells, and has 19 rigs drilling in the play w/ plans to ramp up to 25 by year end.
- XTO owns +/-300,000 acres, is ramping up to 4 rigs in the Fayetteville (up from 1) and has announced plans to ramp up to 9 by year end.
- Petrohawk has leased approx. 160,000 acres and expects to have 7 rigs active in the play by year end.

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Consolidation

- XTO has been the most aggressive buyer of Fayetteville properties w/in the last 6 months (leased majority of Anadarko minerals, Alta-East, Crestar, SWN SE acreage)
- Petrohawk was very active early on acquiring KCS, One Tec, Adexco, Alta-West, and Aspect Energy.
- Chesapeake also actively bought properties early in the life of the play acquiring leases from Weiser Brown, Stephens Production, and CDX.
- SWN due to their strong land position early in the play has not actively pursued Fayetteville properties and just recently divested of +/-55,000 acres to XTO.

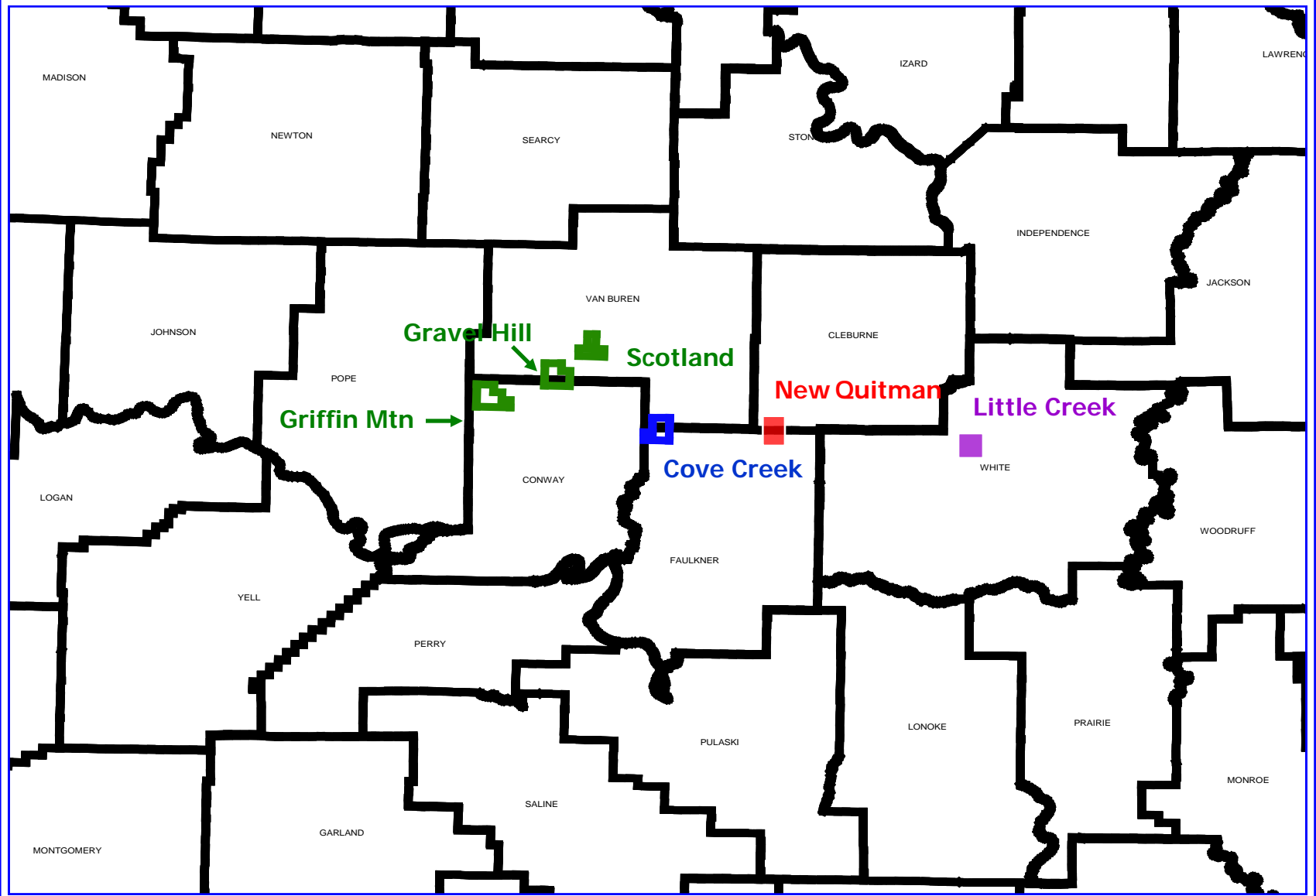
Fayetteville Shale Eastern Exploration Area Activity Map



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Arkansas County Map Showing Field Locations



*from SW Energy's Cove Creek Field Rules

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- SW Energy (Seeco) initiated drilling in the play in July of 2004 w/ the Thomas #1-9 (vertical well; IP 532 Mcf/D), Sect. 9-T9N-R17W, in northern Conway County. The first horizontal well was the Seeco-Vaughan #4-22H, Sect. 22-T9N-R17W, which was drilled in February of 2005 (IP 582 Mcf/D).
- 1st production began in September of 2004 with the the first horizontal well going on-line in May of 2005.
- As of February, 2008, Fayetteville Shale production totaled 134 BCF and daily production averaged approx. 600 MMcf/D.
- SWN accounted for some 350 MMcf/D (Gross) of that total w/ Chesapeake producing approx. 150 MMcf/D, and Petrohawk w/ +/-70 MMcf/D.

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Production Results

Initial Rates

- Verticals 300-1000 Mcfpd
- Horizontals 0.5-5.0 MMcfpd

EUR's

- Verticals 100-300 MMcf/well
- Horizontals 0.6-3.0+ (?) Bcf/well (avg +/-2.0 Bcf)

Drainage

- Verticals approx. 5-20 acres
- Horizontals approx. 18-62 acres

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Initially

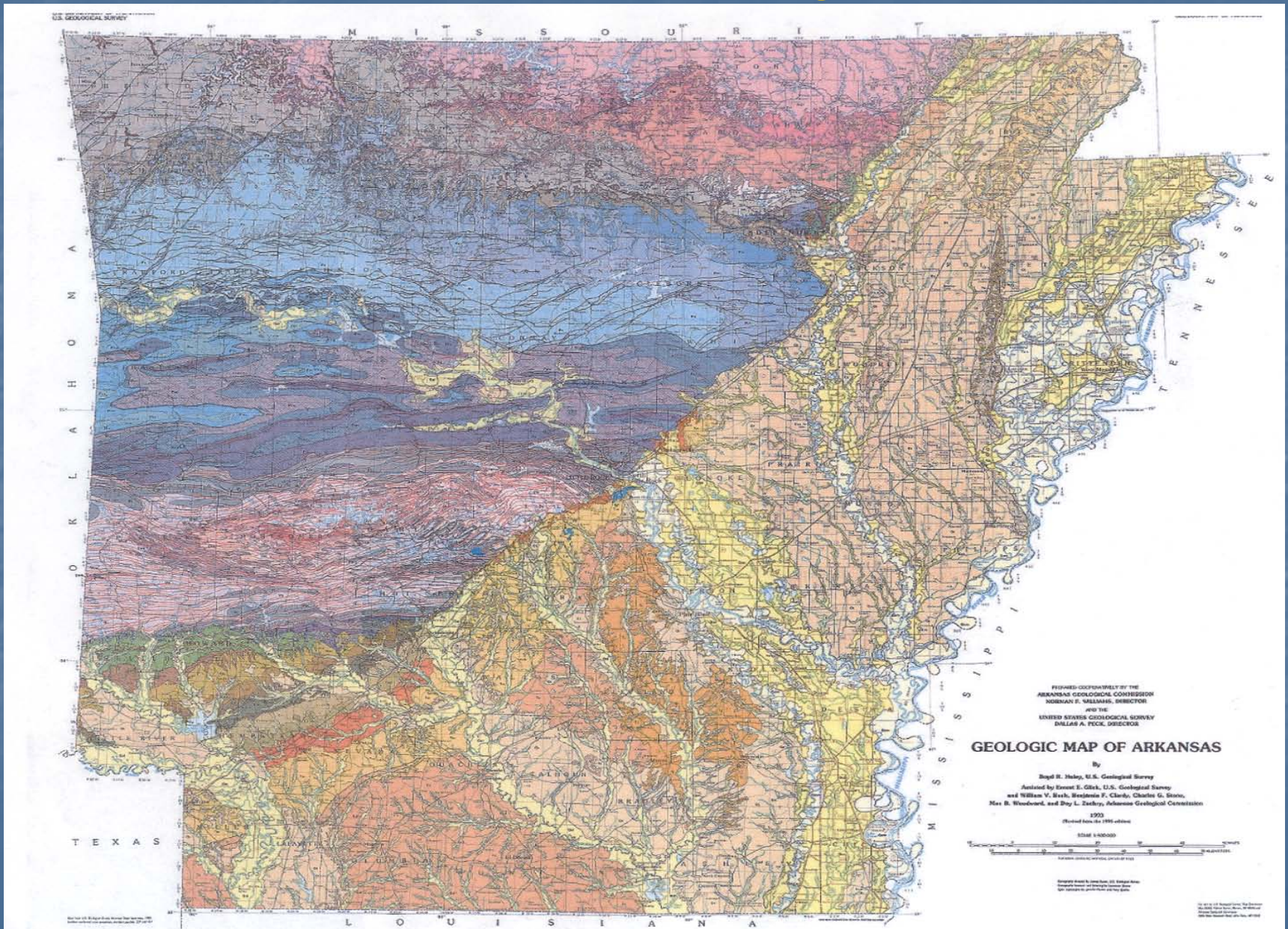
- Wells were all vertical.
- Early horizontal wells lateral length averaged 1200'-2000'.
- Nearly all laterals oriented NW-SE.
- Nitrogen Foam Fracs.
- No 3-D Seismic.
- Virtually no conventional production.
- Area lacked infrastructure.

Currently

- All Fayetteville wells are horizontal.
- Avg lateral length has increased to 3000'-4000' through most of the play.
- Varied lateral orientation (N-S, E-W, NW-SE, etc.)
- Nearly all Fayetteville fracs are slickwater.
- Seeco and Chesapeake have active 3-D programs.
- Several good conventional wells are producing.
- Infrastructure greatly improved.

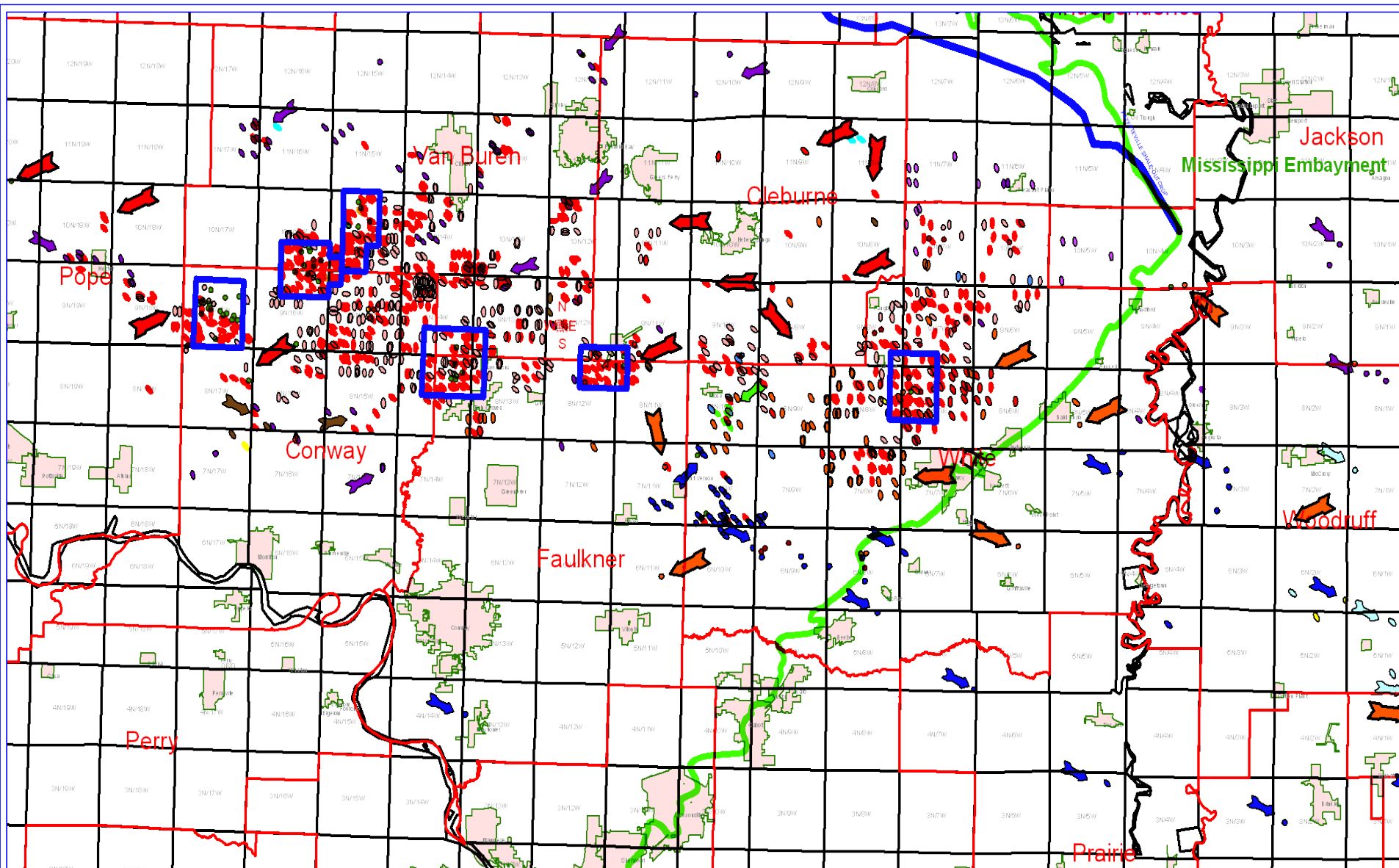
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Arkansas State Geologic Map



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- The Fayetteville Shale has the potential to be the largest gas producing interval on the Arkansas side of the Arkoma Basin.
- Production results have continued to improve as more slickwater fracs have been performed and lateral lengths have increased.
- A core area within the play has been established and currently consists of southern Van Buren, Cleburne, northern Conway, northern Faulkner, and northern White Counties.
- The Moorefield and Chattanooga Shales are also prospective but more analysis and testing needs to be done before we know if these intervals will be viable as "stand alone" targets.
- Conventional Reservoirs are present in the eastern exploration area. Additional conventional potential exists throughout the play with perhaps the greatest potential in Morrowan sands present to the south along the frontal Ouachita fold and thrust belt.

Acknowledgements

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- TerraTek – Salt Lake City, UT
- Mitchell Energy – Pioneers of the Barnett Play
- Commodity Prices

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