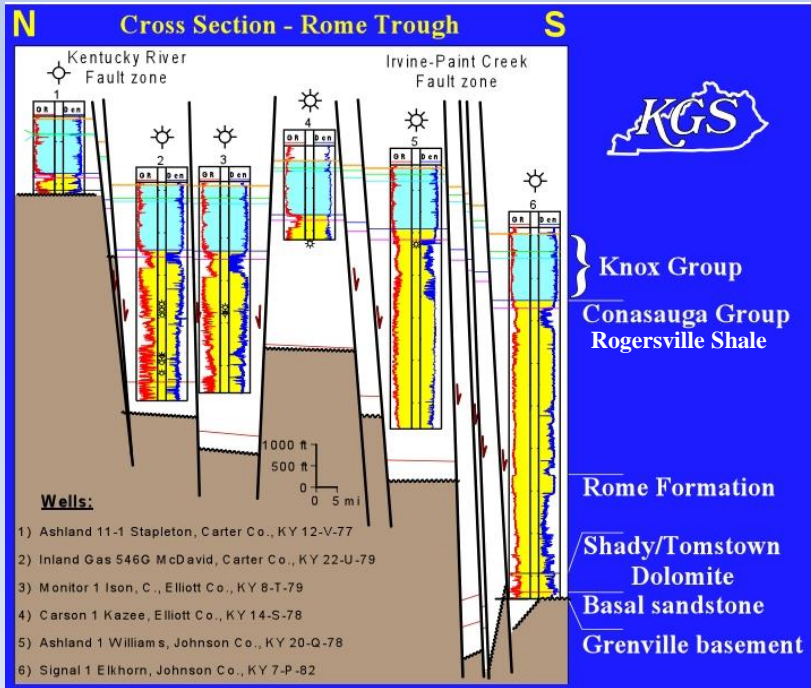


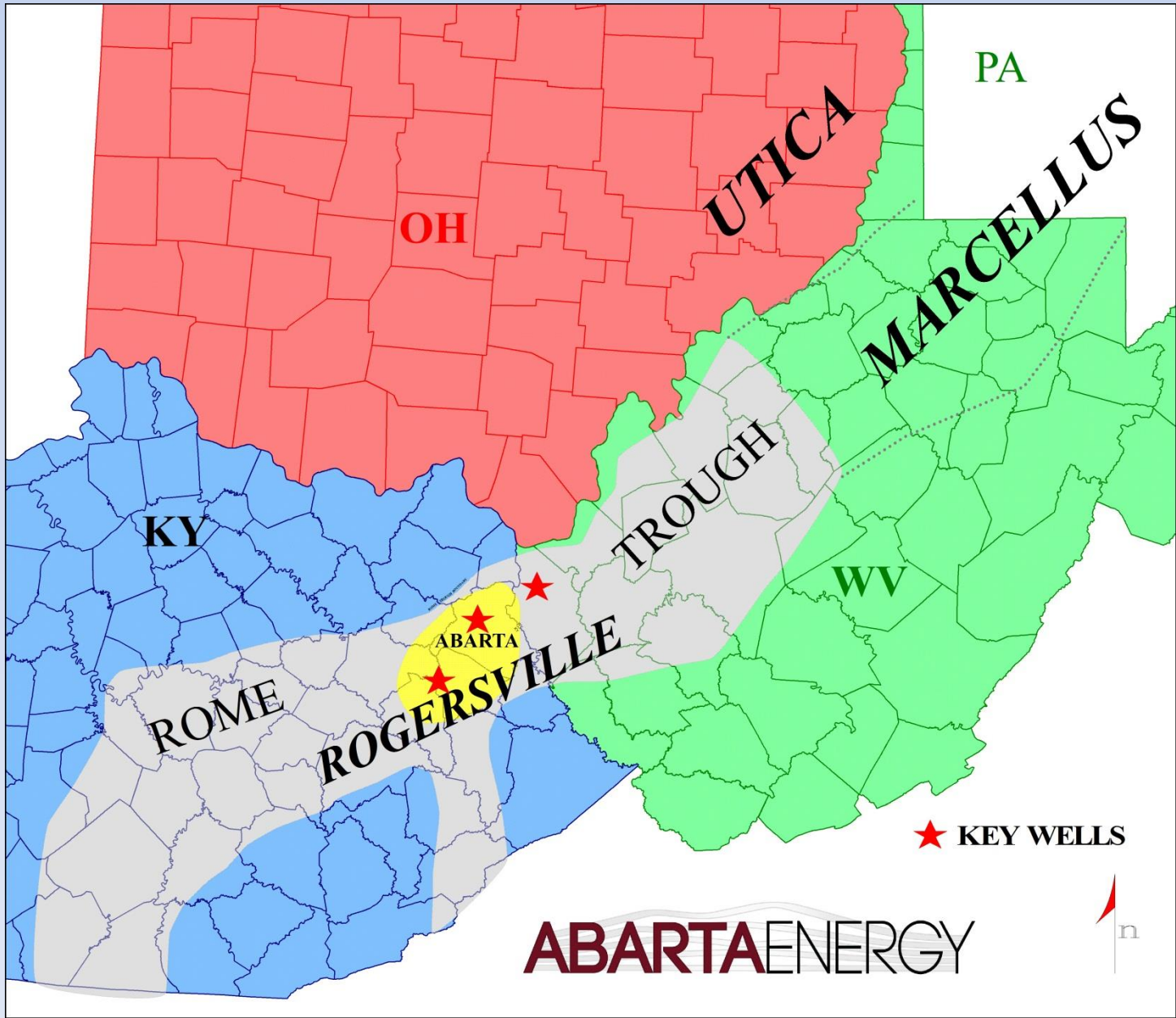
# ROGERSVILLE SHALE – A BRIEF LOOK AT THE HISTORY OF A NEW DEEP PLAY

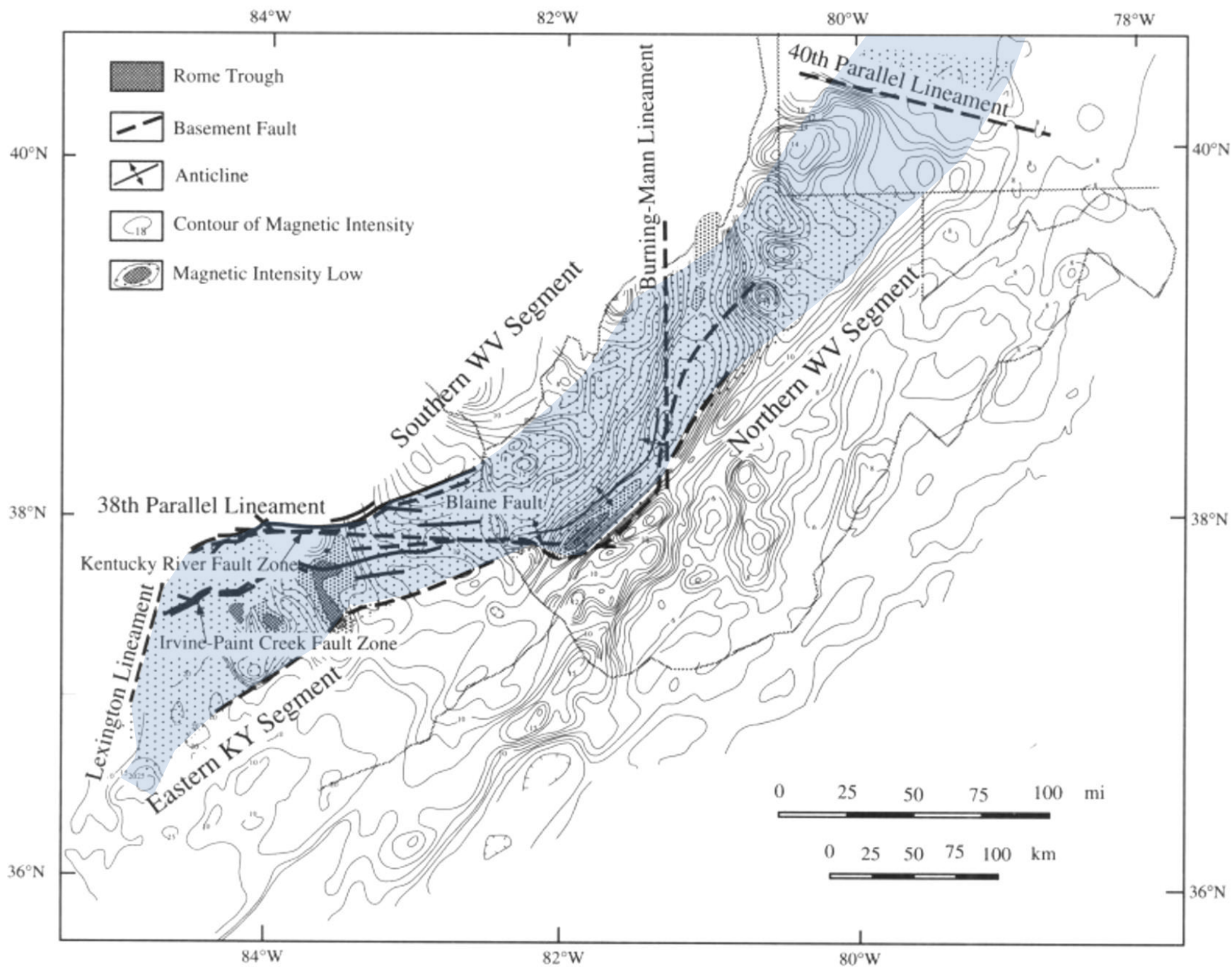


Junior Jenkins

**ABARTA**ENERGY

10/14/2014  
AGS MEETING

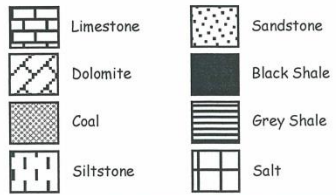
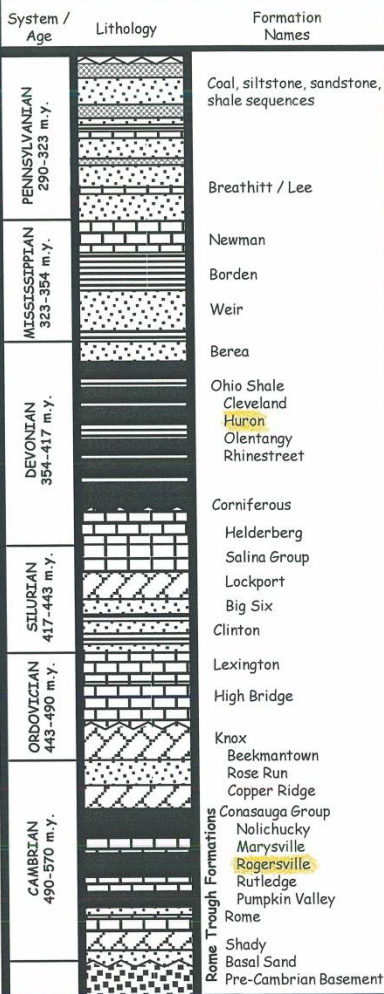


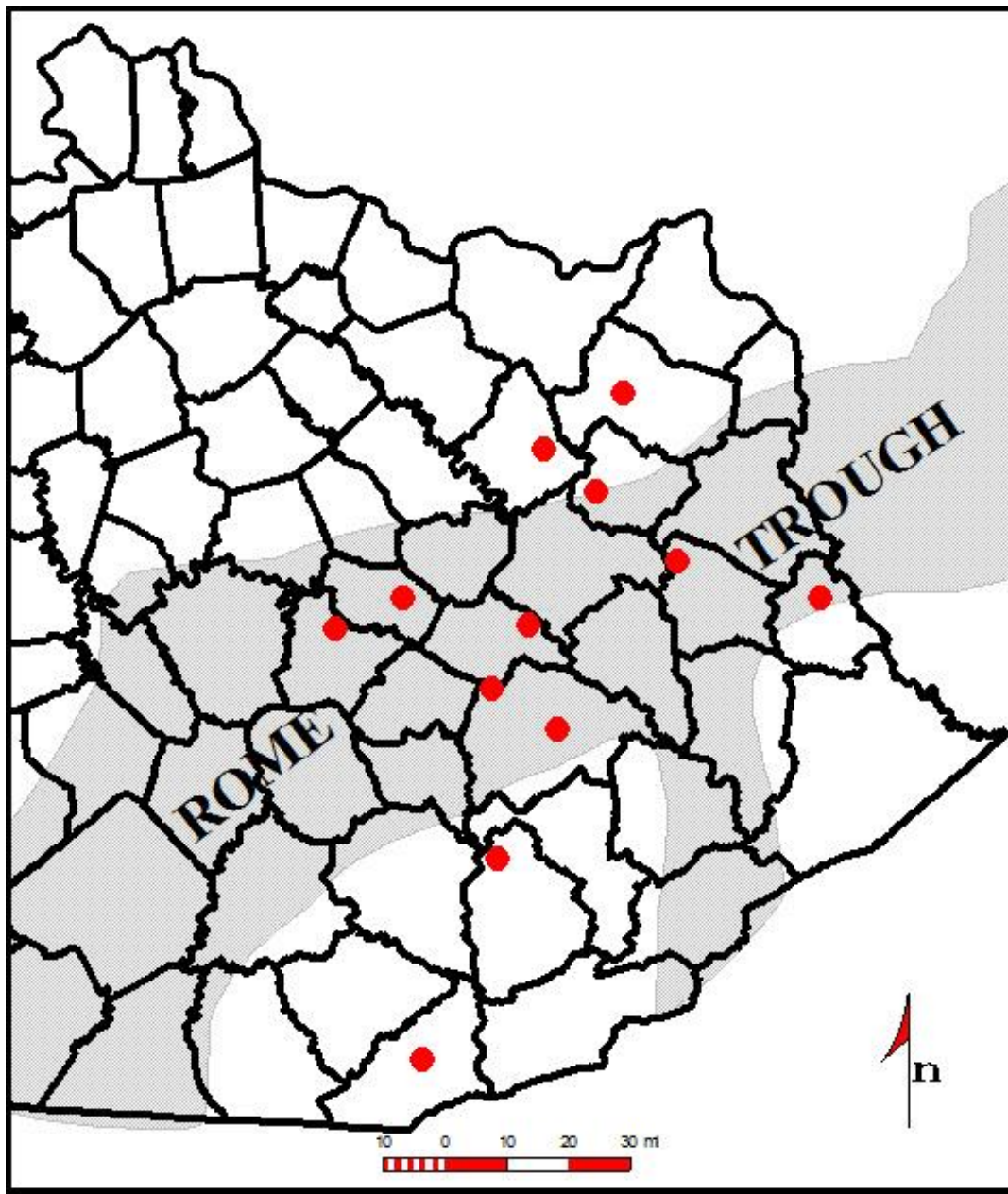


KY



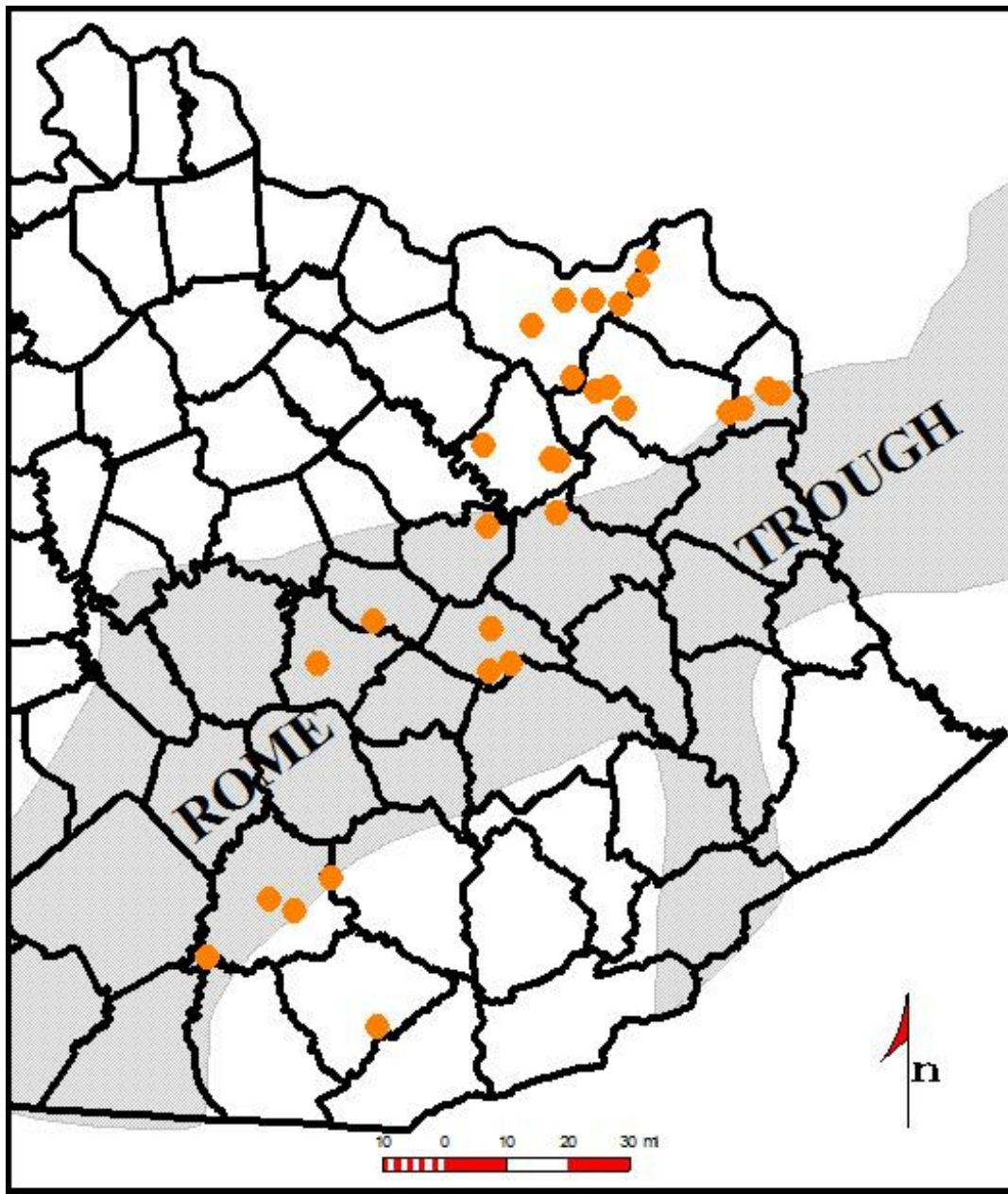
### General Kentucky Stratigraphy





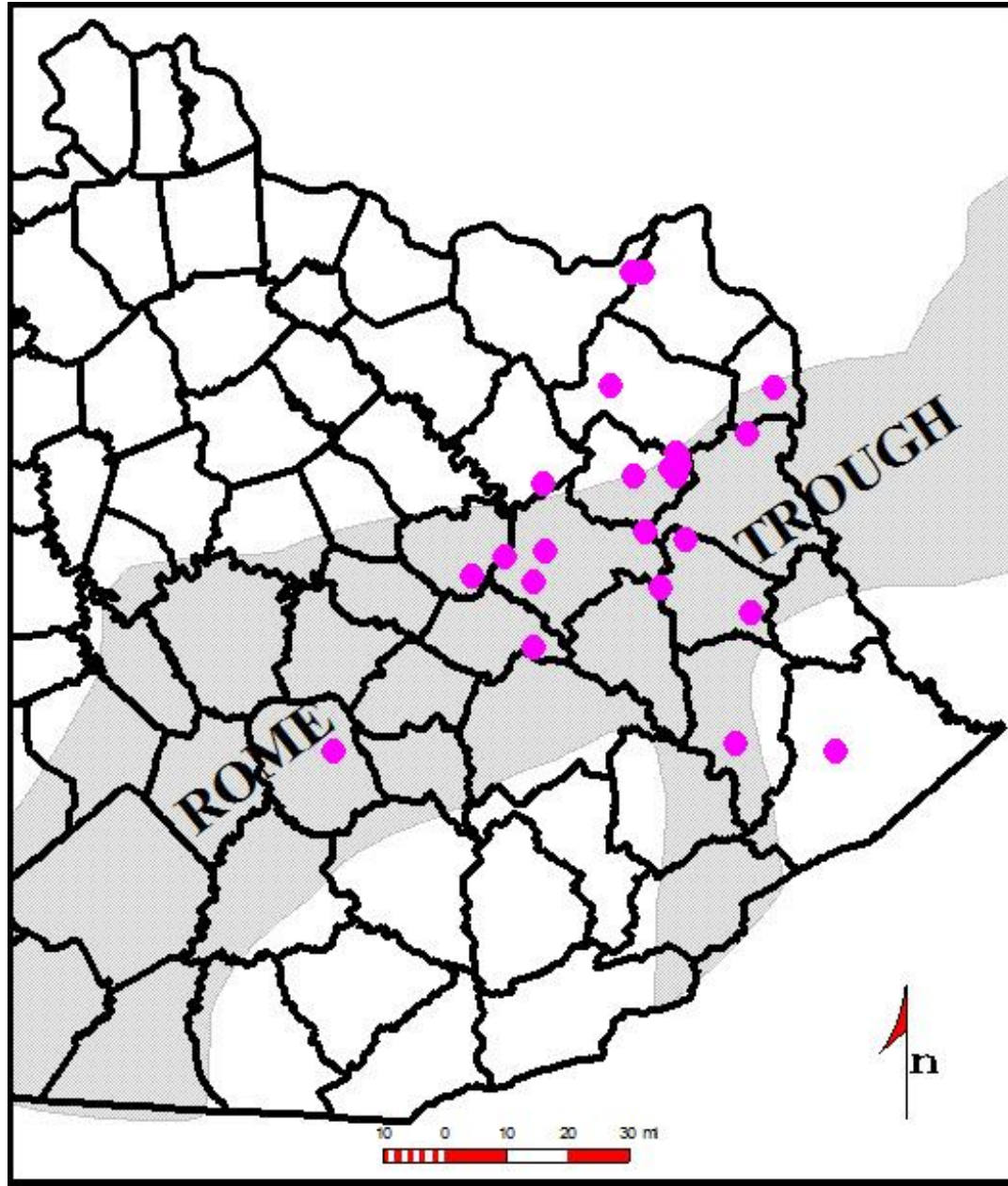
**ABARTA**ENERGY

**CAMBRIAN WELLS DRILLED  
PRE 1961**



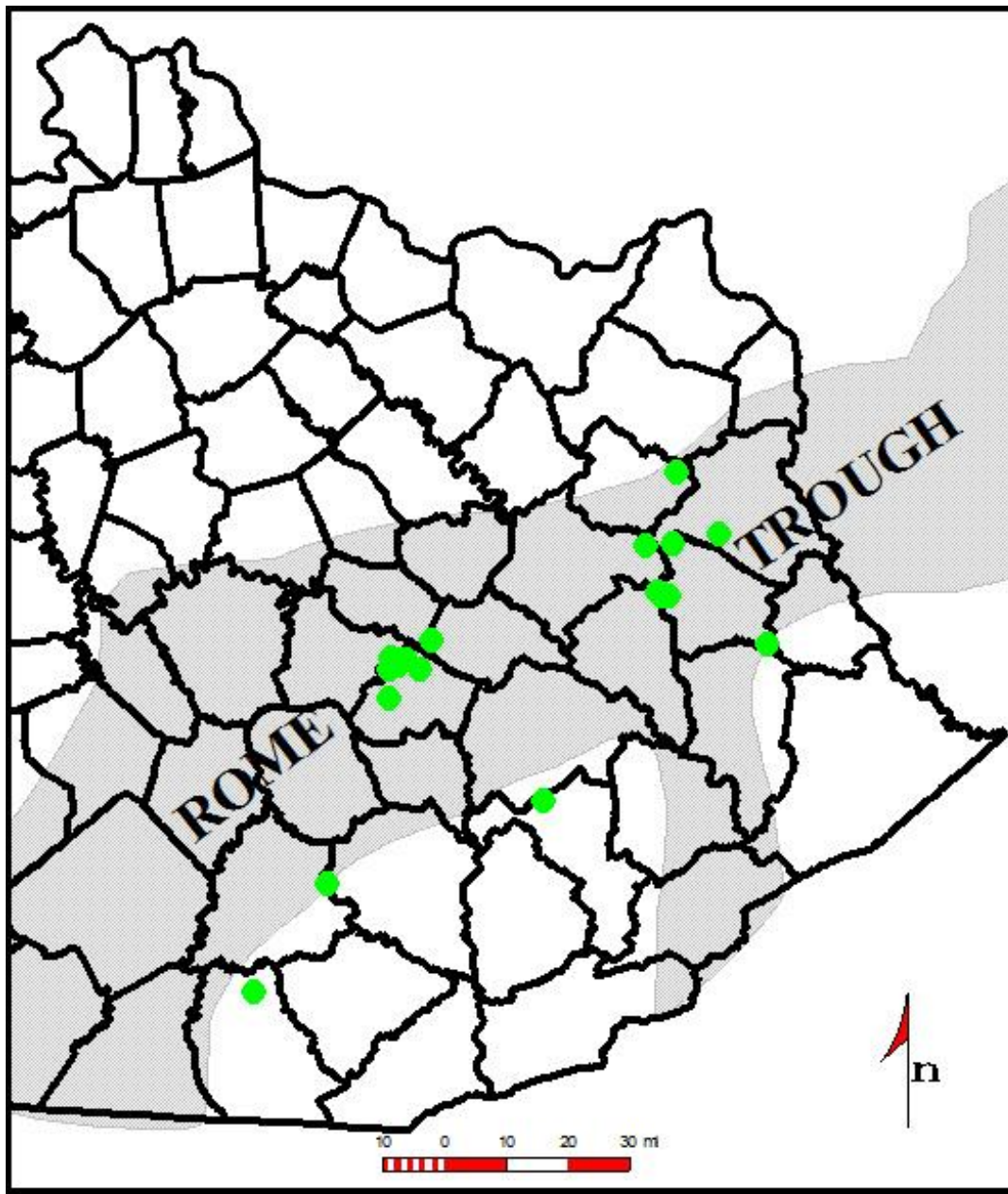
**ABARTA**ENERGY

**CAMBRIAN WELLS DRILLED  
1960'S**



**ABARTA**ENERGY

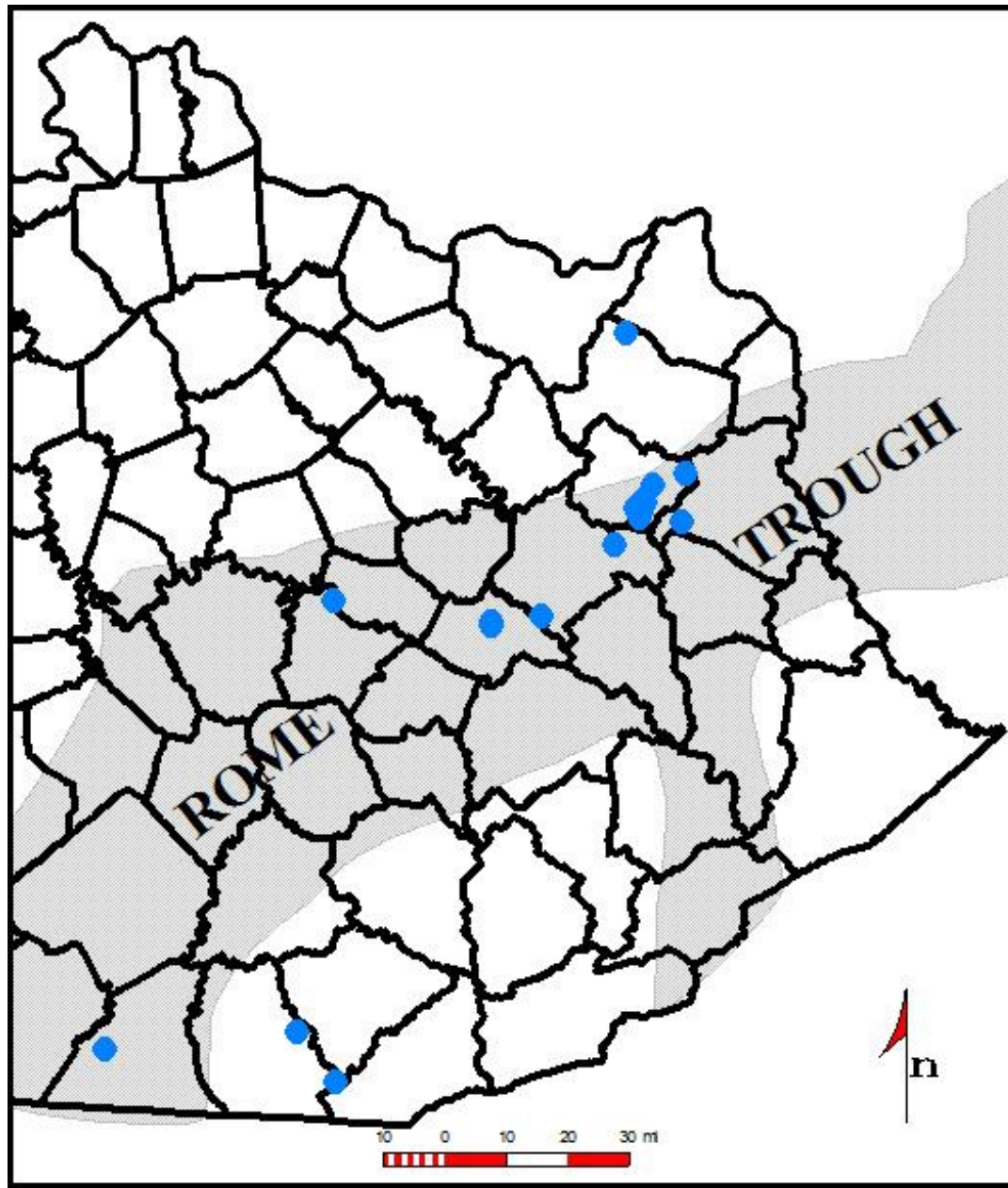
**CAMBRIAN WELLS DRILLED  
1970'S**



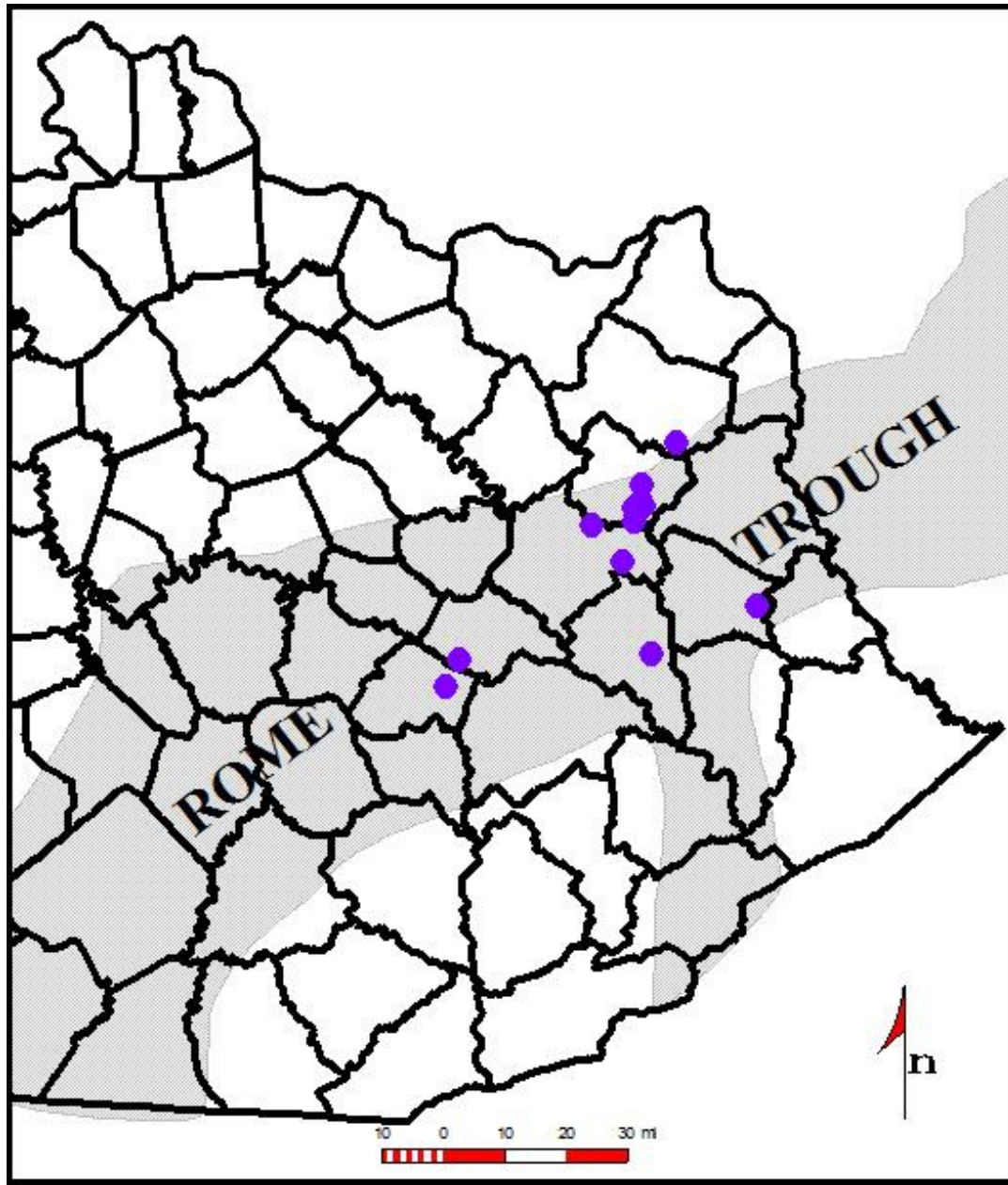
**ABARTA**ENERGY

**CAMBRIAN WELLS DRILLED  
1980'S**

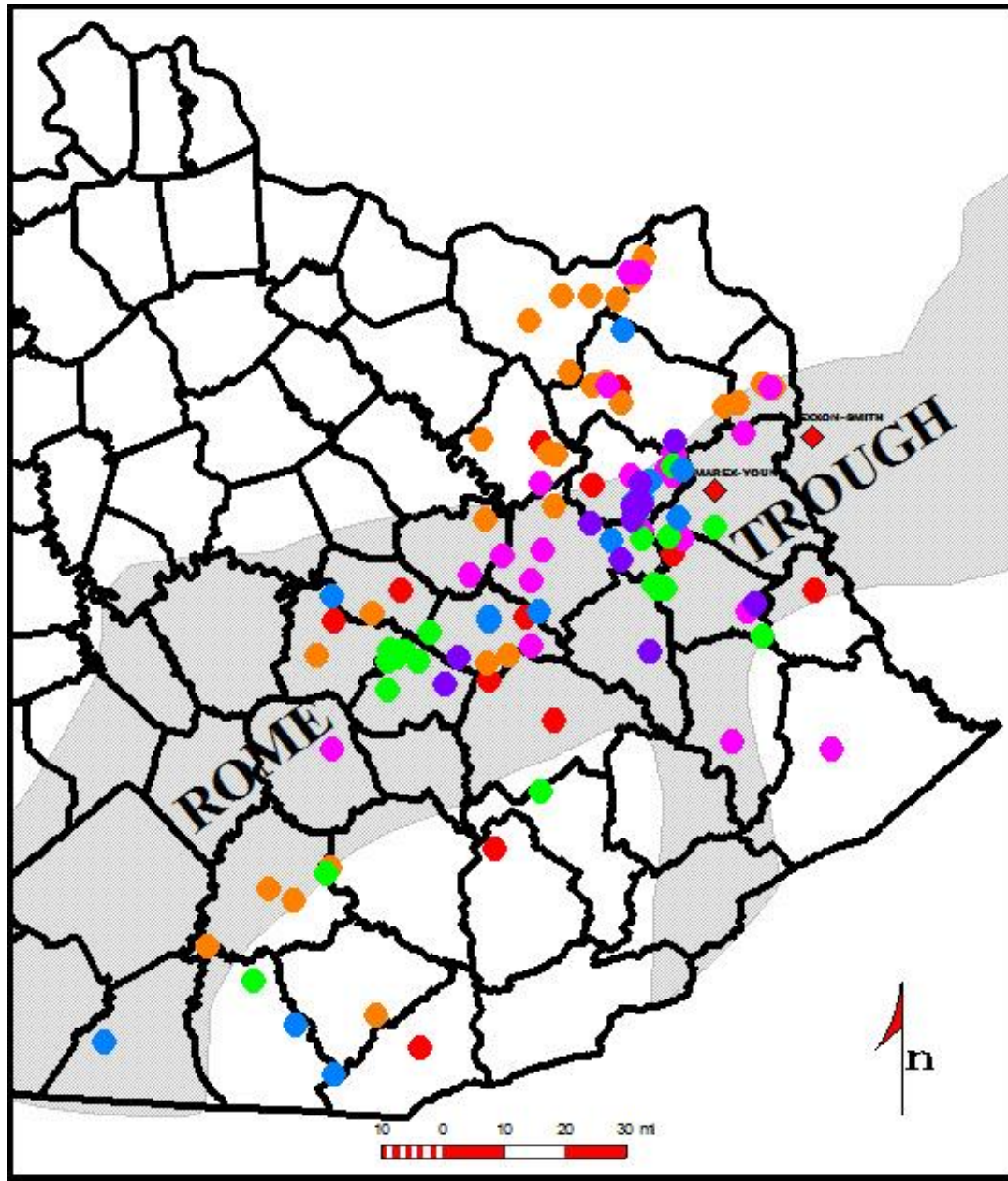




CAMBRIAN WELLS DRILLED  
1990'S



CAMBRIAN WELLS DRILLED  
AFTER 2000



**ABARTA**ENERGY

**CAMBRIAN WELLS DRILLED  
TO DATE - 2014**

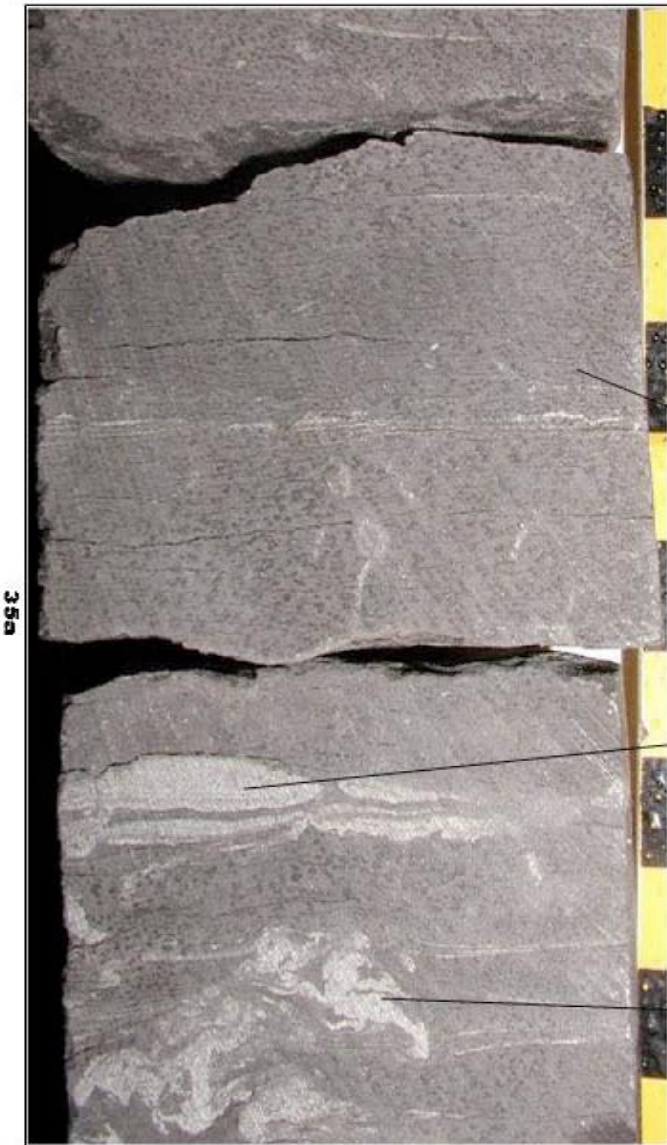
# MOST DEEP WELLS HAVE HYDROCARBON SHOWS (SOME VERY GOOD)

GOOD AND NUMEROUS SHOWS ARE A POSITIVE...  
BUT ALSO A CURSE!

IN GENERAL, REPUTATION OF DEEP SHOWS IN KENTUCKY:

- SHOWS (FLOWS) NOT SUSTAINABLE
- SHOWS (FLOWS) NOT REPEATABLE.

BUT THAT IS LOOKING AT IF FROM A CONVENTIONAL  
RESERVOIR VIEWPOINT



**Exxon #1 Smith  
Rogersville Shale  
11,150.5 ft**

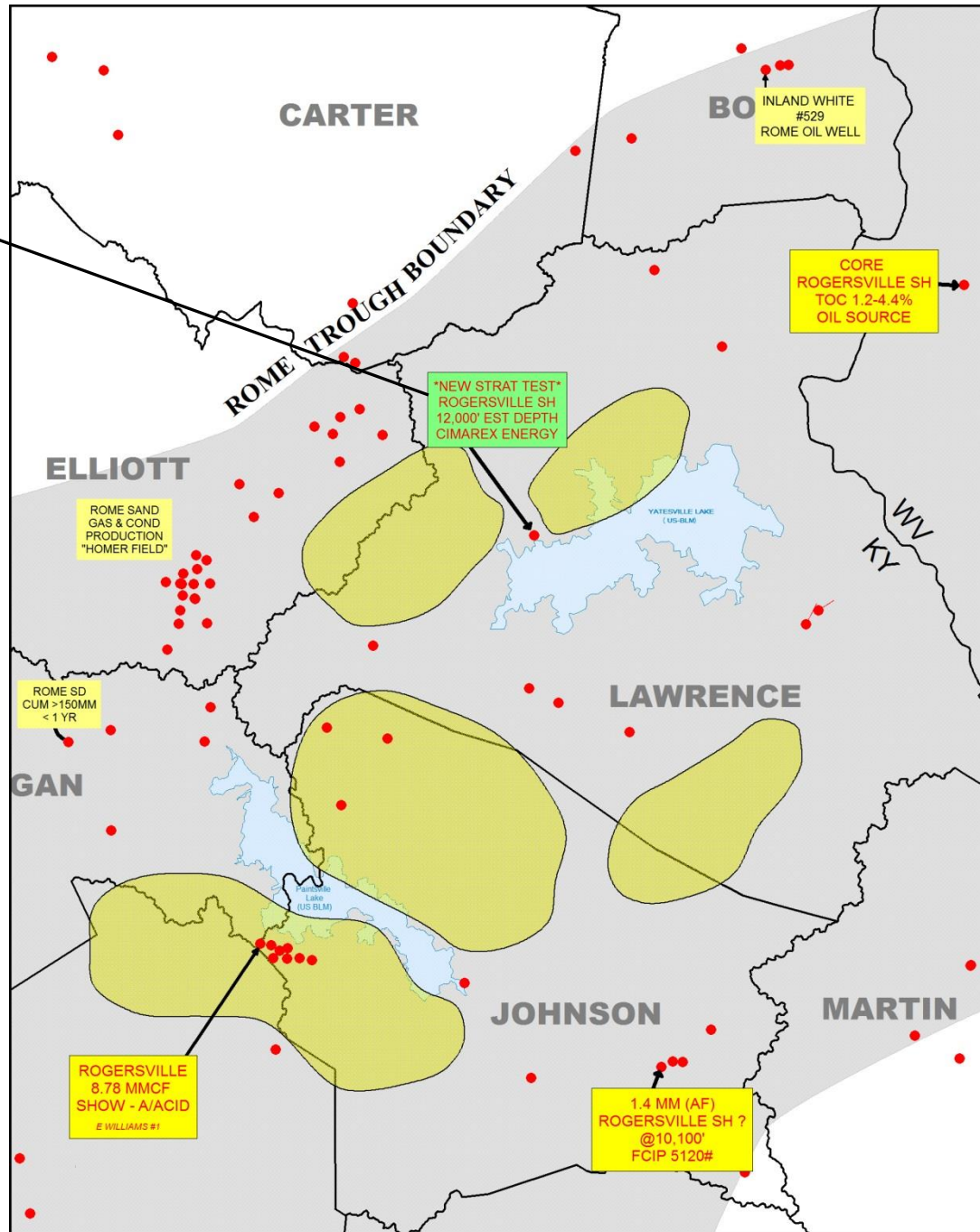
**Shale**

**Very fine grained  
sandstone laminae**

**Burrows filled with  
very fine grained sandstone**

**"RUMORS"**

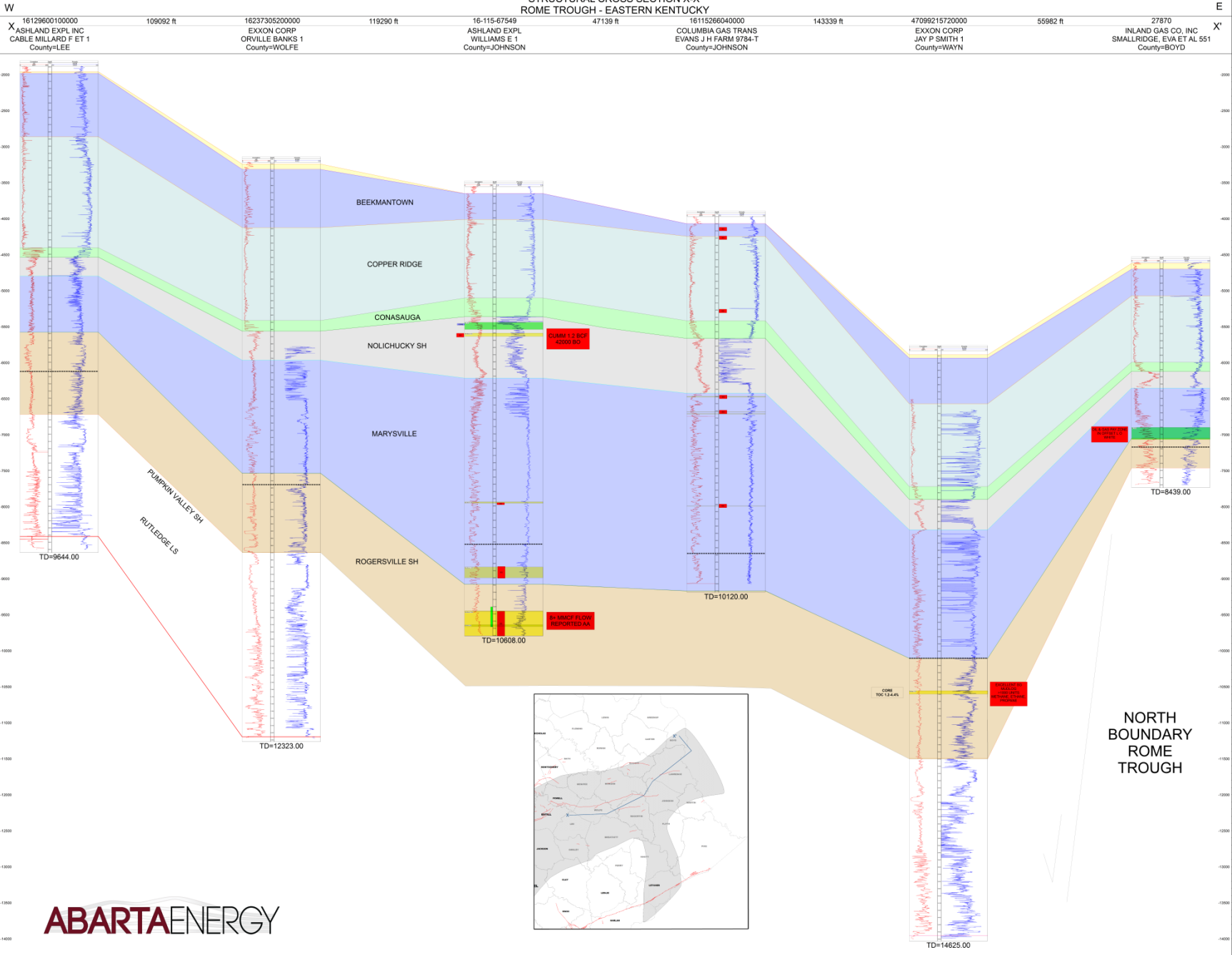
- RAN CASING TO TD
- 2 STAGE MASSIVE FRAC IN VERTICAL ROGERSVILLE SECTION
- FLARING GAS



**ABARTA  
ACREAGE**  
65,000 Acres +/-

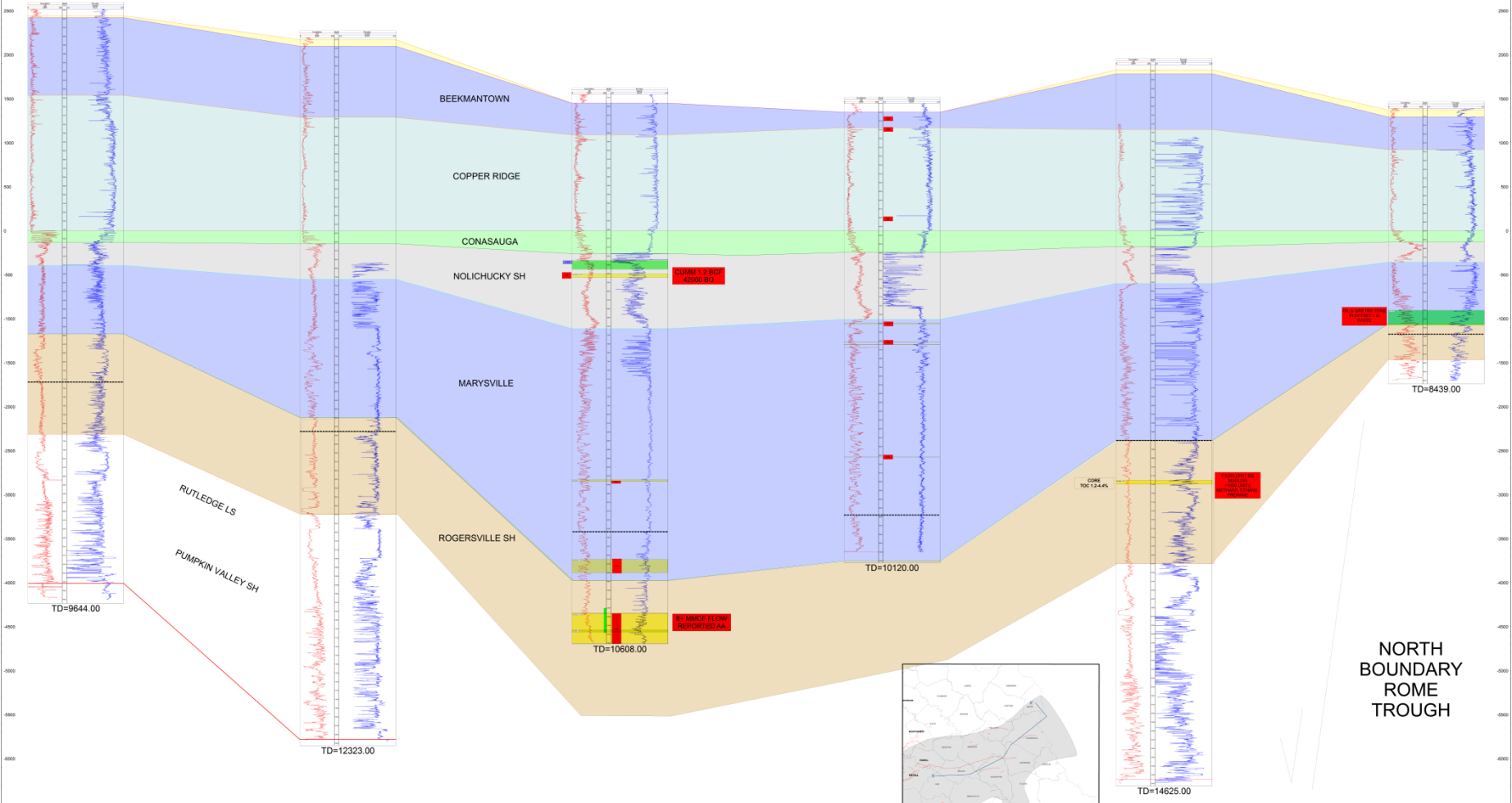
**DEEP WELL  
> 5,000 FEET**

STRUCTURAL CROSS SECTION X-X'  
ROME TROUGH - EASTERN KENTUCKY



W E  
**STRATIGRAPHIC CROSS SECTION X-X'**  
**ROME TROUGH - EASTERN KENTUCKY**

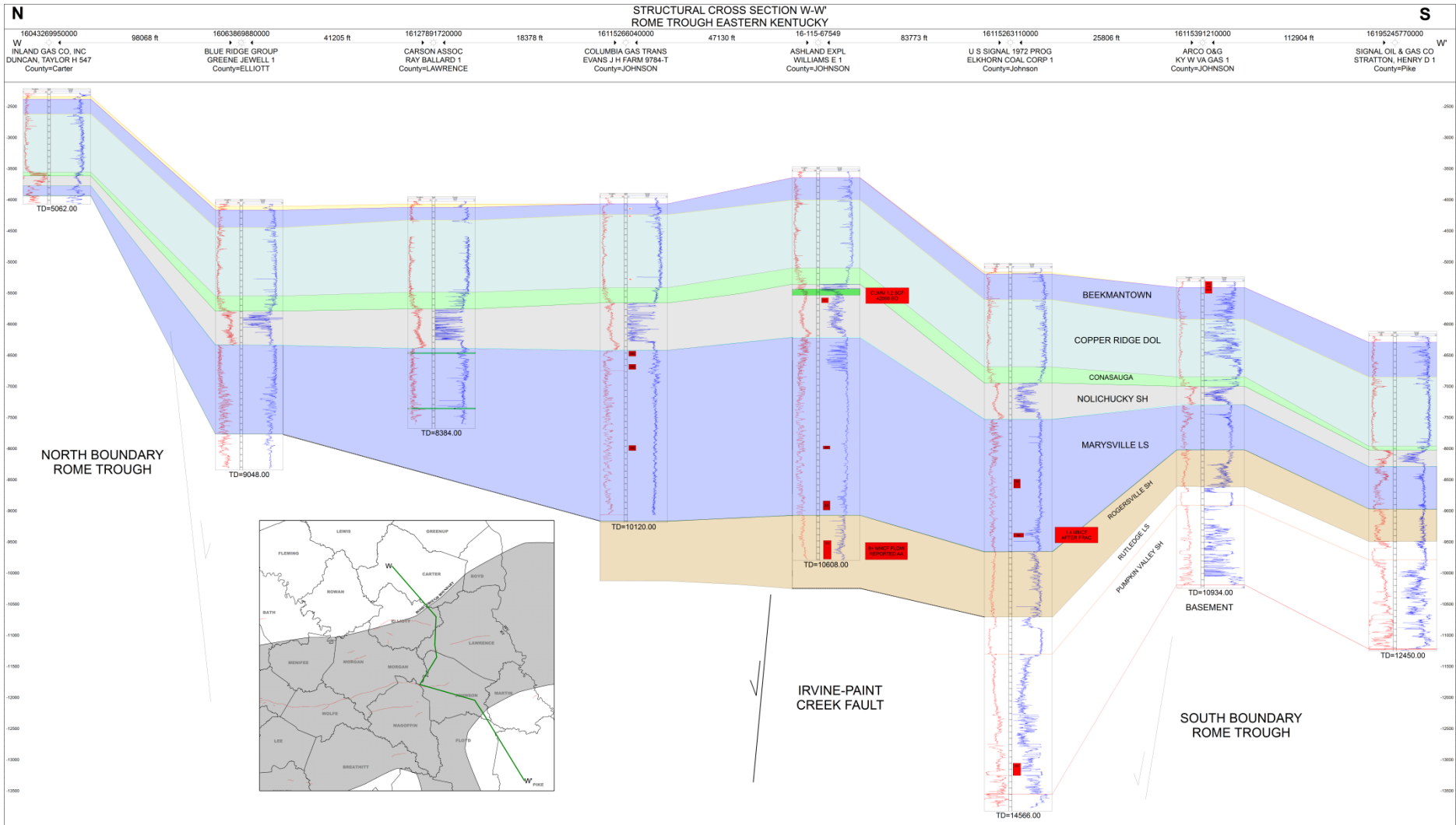
16129600100000	109092 ft	16237305200000	119290 ft	16-115-67549	47139 ft	16115266040000	143339 ft	47099215720000	55982 ft	27870
X		X		X		X		X		X'
ASHLAND EXPL INC CABLE MILLARD F ET 1 County=LEE		EXXON CORP ORVILLE BANKS 1 County=WOLFE		ASHLAND EXPL WILLIAMS E 1 County=JOHNSON		COLUMBIA GAS TRANS EVANS J H FARM 9784-T County=JOHNSON		EXXON CORP JAY P SMITH 1 County=WAYN		INLAND GAS CO, INC SMALLRIDGE, EVA ET AL 551 County=BOYD



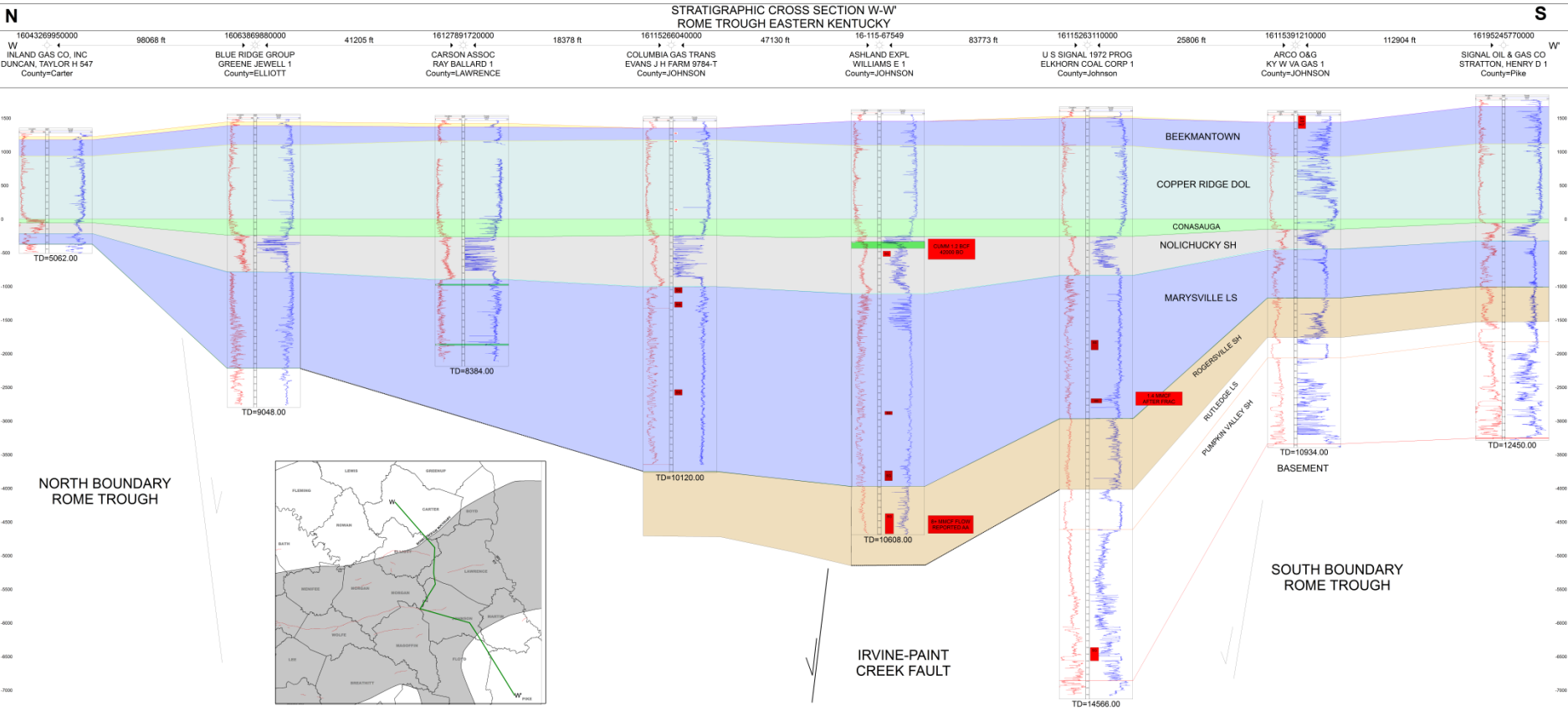
NORTH  
 BOUNDARY  
 ROME  
 TROUGH

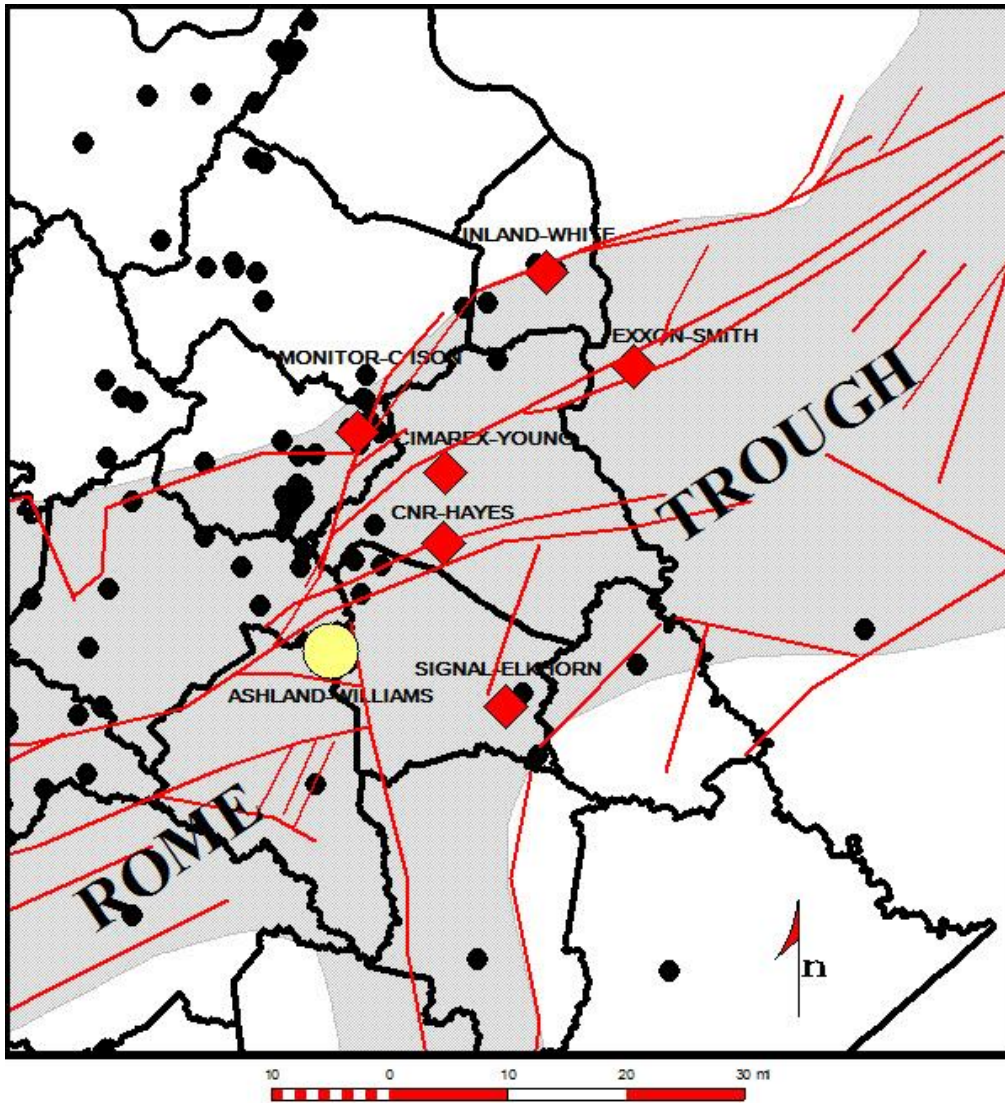






STRATIGRAPHIC CROSS SECTION W-W'  
ROME TROUGH EASTERN KENTUCKY



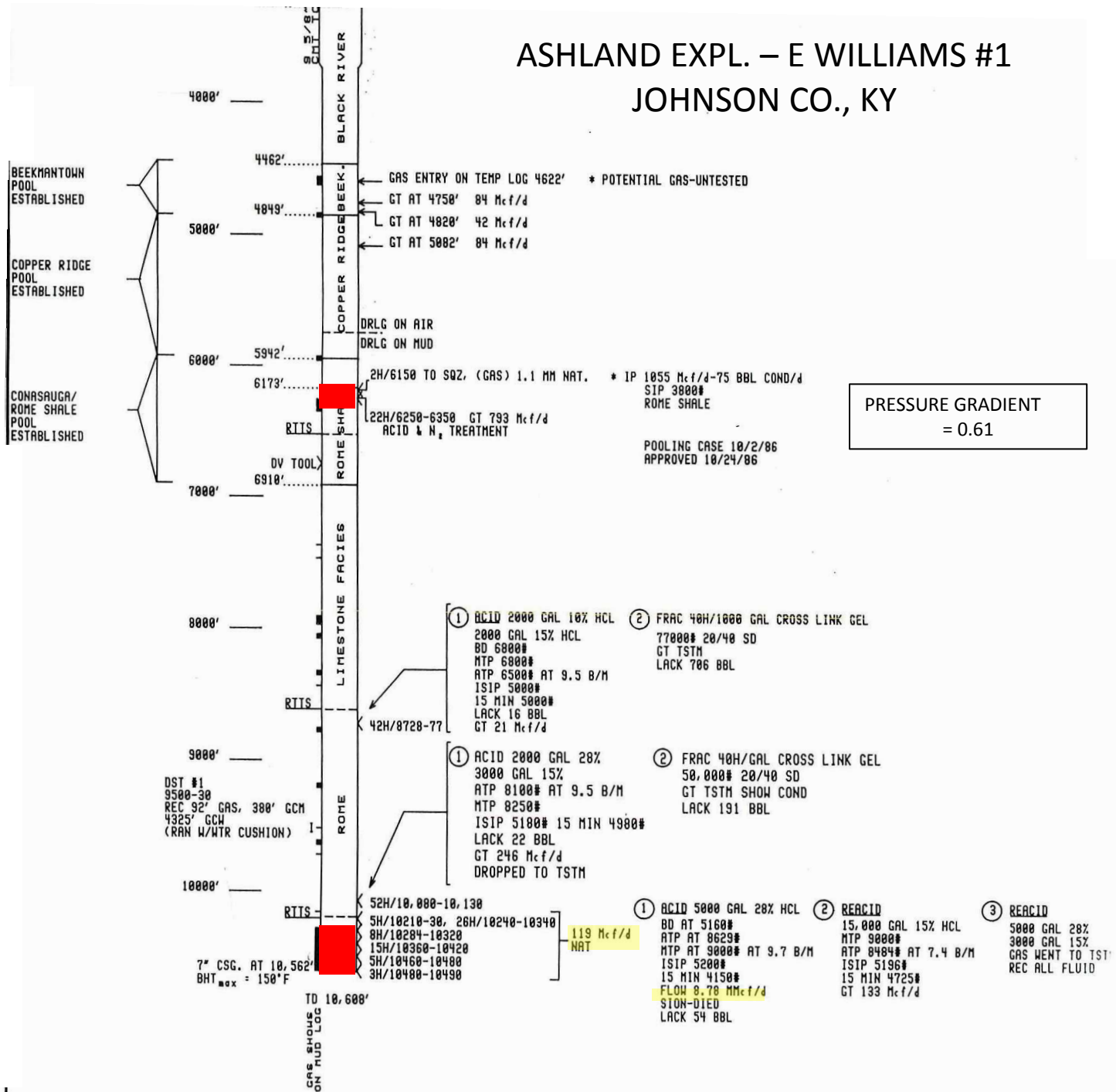


**KEY WELL**  
**ASHLAND - E WILLIAMS #1**

- > DRILLED: 1985
- >TD: 10,608'
- >8.8 MMCF/D SHOW  
NEAR ROGERSVILLE
- >PAY @ 6,250-6,350'
- >1055 MCF 75 BCPD
- >SIP 3800#

SUSTAINABLE & SEMI-REPEATABLE

# ASHLAND EXPL. – E WILLIAMS #1 JOHNSON CO., KY



DAILY REPORT

LOGGING SUPT

COMPANY ASHLAND EXPLORATION, INC.

WELL # 1, E. WILLIAMS P 67549

LOCATION WILDCAT, JOHNSON CO., KY. SEC. 20-0

DATE \_\_\_\_\_ THRU \_\_\_\_\_

SAND  ANHYDRITE

LIME  SALT

SHALE

OIL SHOWS HAVE FOLLOWING SIGNIFICANCE:  OIL  GAS

2 - VERY POOR SHOW  
 5 - FAIR SHOW, PROBABLY NOT PRODUCTIVE  
 10 - FAIR SHOW, POSSIBLY PRODUCTIVE  
 15 - GOOD SHOW, PROBABLY PRODUCTIVE

\*\*\*\*\* TOTAL GAS IN DRLG. MUD \*\*\*\*\*

..... METHANE 1% PER DIV.      \*\*\* TOTAL GAS SHOW VALUE

..... ETHANE 5% PER DIV.      ..... METHANE ION LOG

..... PROPANE 25% PER DIV.      ..... ETHANE

..... BUTANE 25% PER DIV.      ..... PROPANE

DRLG. FLUID ANALYSIS      CUTTINGS GAS

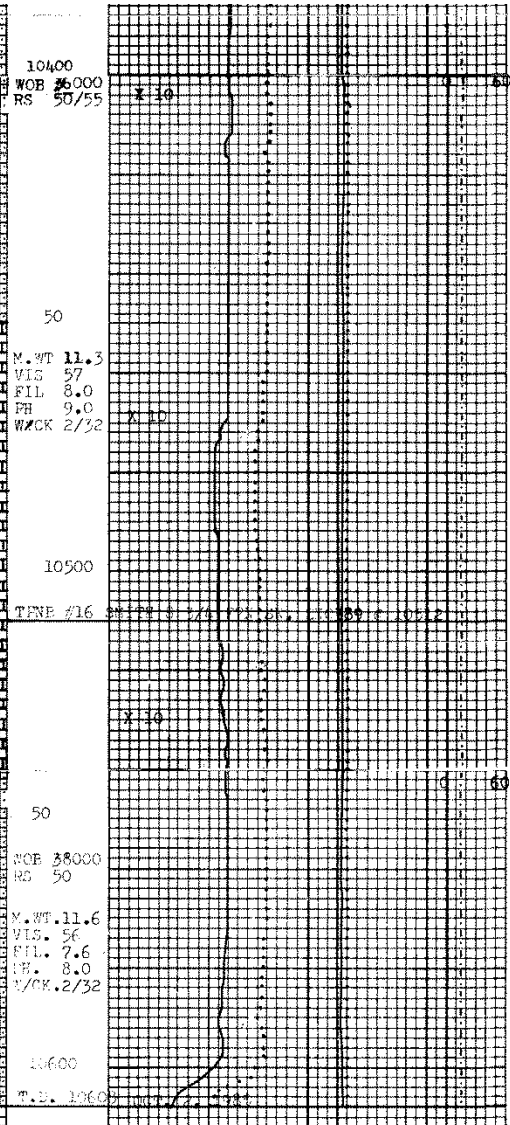
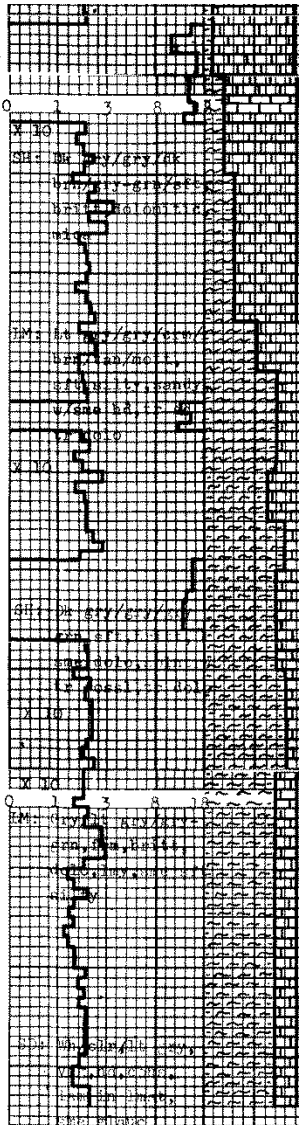
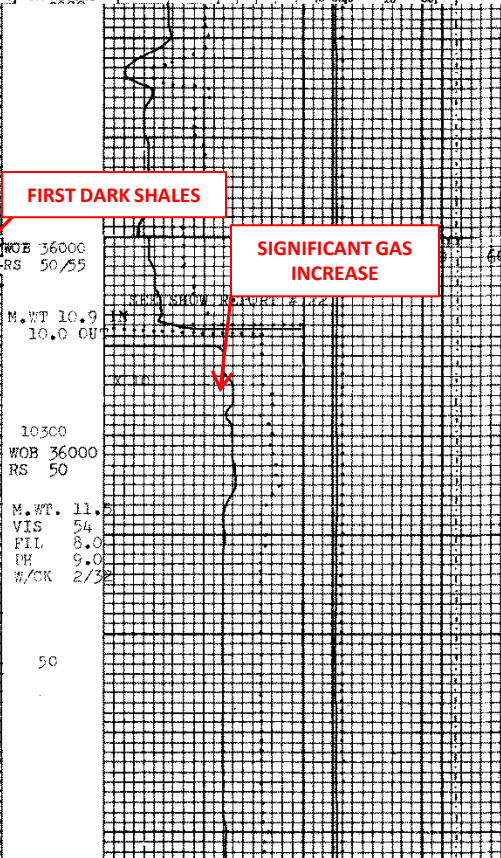
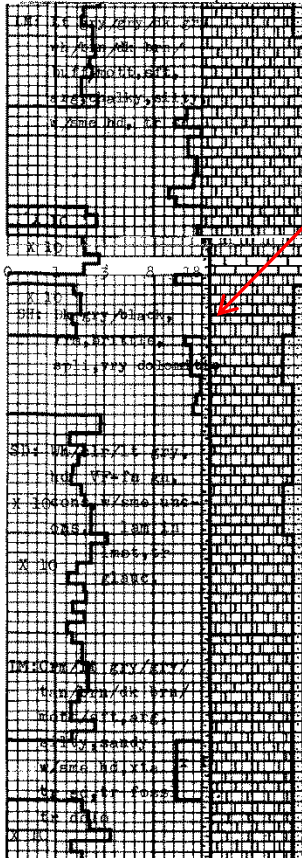
10 20 30 40 50 10 20 30 40 50

DRILLING RATE      LITHOLOGY      DEPTH

MIN PER/FT      FT PER/HR      DATE

100 50 0      MUD DATA

BIT RECORD



10400  
WOB 36000  
RS 50/55

50  
M.W.T. 11.3  
VIS 57  
FIL 8.0  
PH 9.0  
W/CK 2/32

10500

50  
WOB 38000  
RS 50

M.W.T. 11.6  
VIS 56  
FIL 7.6  
PH 8.0  
W/CK 2/32

10600



**Southern  
Hydrocarbon  
Corporation**

SERVICES & PRODUCTS

934 Little Coal River, Suite B  
Alum Creek, West Virginia 25003  
Phone: (304) 756-3171 • Fax (304) 756-1364

Chandler Engineering Co.  
Model 292/2920 BTU Analyzer

Test time: Oct.31 11 10:55  
Test #:12104

Calibration #: 96  
Location No. :1

	Standard/Dry Analysis				Saturated/Wet Analysis		
	Mole%	BTU*	R.Den.*	GPM**	Mole%	BTU*	R.Den.
Methane	83.816	848.52	0.4642	--	82.357	833.76	0.456
Ethane	8.212	145.66	0.0853	2.1946	8.069	143.12	0.083
Propane	3.537	89.20	0.0539	0.9738	3.475	87.65	0.052
i-Butane	0.484	15.79	0.0097	0.1584	0.476	15.51	0.009
n-Butane	0.969	31.70	0.0195	0.3056	0.952	31.14	0.019
i-Pentane	0.233	9.36	0.0058	0.0854	0.229	9.19	0.005
n-Pentane	0.245	9.85	0.0061	0.0888	0.241	9.68	0.006
( C6+ )	0.331	16.80	0.0105	0.1425	0.325	16.51	0.010
Moisture	0.000	0.00	0.0000	--	1.740	0.88	0.010
Nitrogen	2.072	0.00	0.0200	--	2.036	0.00	0.019
( CO2 )	0.101	0.00	0.0015	--	0.099	0.00	0.001

Ideal 100.00 1166.9 0.6765 3.9491  
\* : Uncorrected for compressibility at 60.0F & 14.730PSIA.  
\*\*: Liquid Volume reported at 60.0F.

	Standard/Dry Analysis	Saturated/Wet Analysis
Molar Mass	= 19.594	19.566
Relative Density	= 0.6783	0.6774
Compressibility Factor	= 0.9970	0.9969
Gross Heating Value	= 22547. Btu/lb	22203. Btu/lb
Gross Heating Value	= 1170.4 Btu/CF	1151.0 Btu/CF
Absolute Gas Density	= 51.9091 lbm/1000CF	51.8411 lbm/1000CF
Wobbe Index	= 1397.57	
Unnormalized Total :	100.812	
Last Calibrated with Calgas of	1056.4 Btu/CF	Oct.31 11 08:59
C6+ Last Update: Aug.23 10 07:44		
C6+ BTU/CF	5065.8, C6+ lbm/Gal 5.64250, and C6+ Mol.Wt. 92.00.	

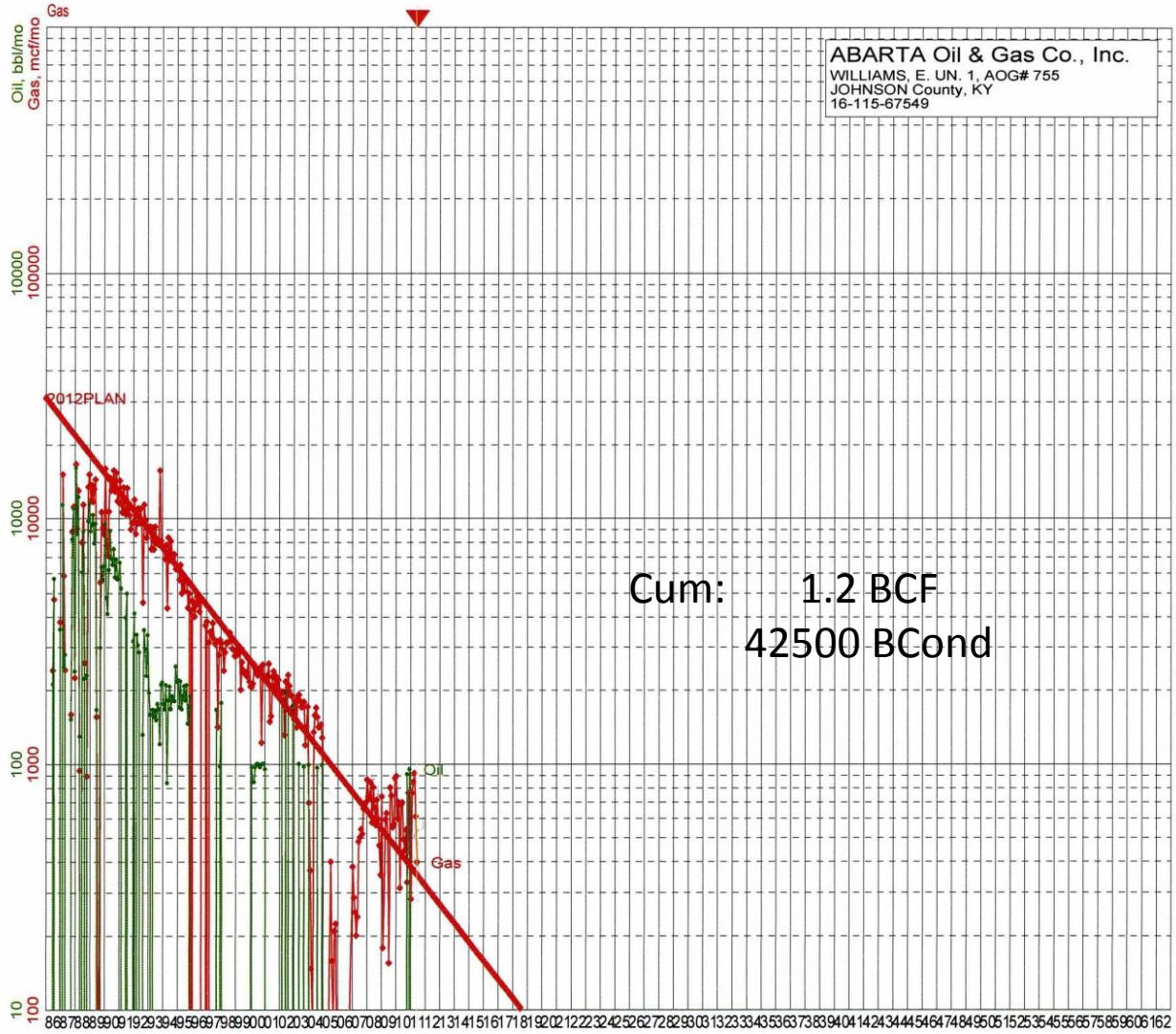
BBL LIQUID PER 1 MMCFG

35 BBL (LIFE OF WELL)  
75 BBL (INITIAL PROD)

**DISCLAIMER**

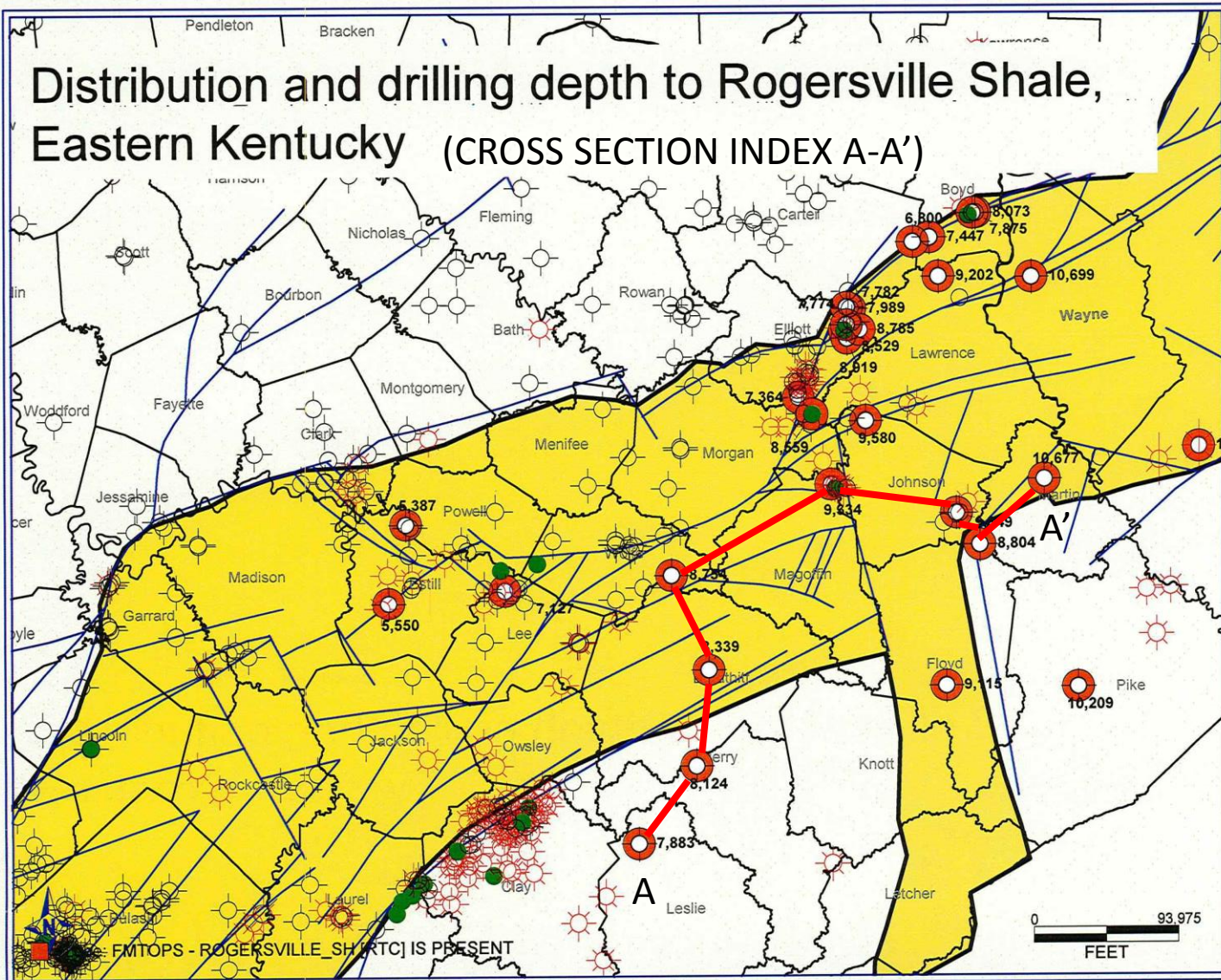
All analysis are based solely on samples and materials supplied to Southern Hydrocarbon Corporation by the client. Southern Hydrocarbon Corporation, it's officers and employees assume no responsibility for and make no warranty as to the productivity, proper operations, or profitability of any gas well or well or other operations or facilities in connection with which these analysis are relied upon. Southern Hydrocarbon Corporation makes no warranty as to the accuracy of these analysis. These analysis reflect the best judgement by Southern Hydrocarbon Corporation.

**Client:** Abarta Oil & Gas  
**Well/Site:** E. Williams No. 1  
**Measuring Station:** \_\_\_\_\_  
**District:** Martha, KY **Pressure:** 120#  
**Date:** 10/24/2011 **Time:** 1000  
**Remarks:** Rome (NOLICHUCKY) SHALE



Gas, mcf/mo	◆◆◆
Qual=	2012PLAN
Ref=	6/2011
Cum=	1181220
Rem=	23830
EUR=	1205050
Yrs=	24.249
Qref=	354.2
De=	16.125077
Dmin=	0.000
b=	0.000000
Qab=	5.0
Oil, bbl/mo	●●●
Ref=	6/2011
Cum=	42052

# Distribution and drilling depth to Rogersville Shale, Eastern Kentucky (CROSS SECTION INDEX A-A')





A

A'

UFG  
Fordson  
(Leslie)

ARCO  
Duff  
(Perry)

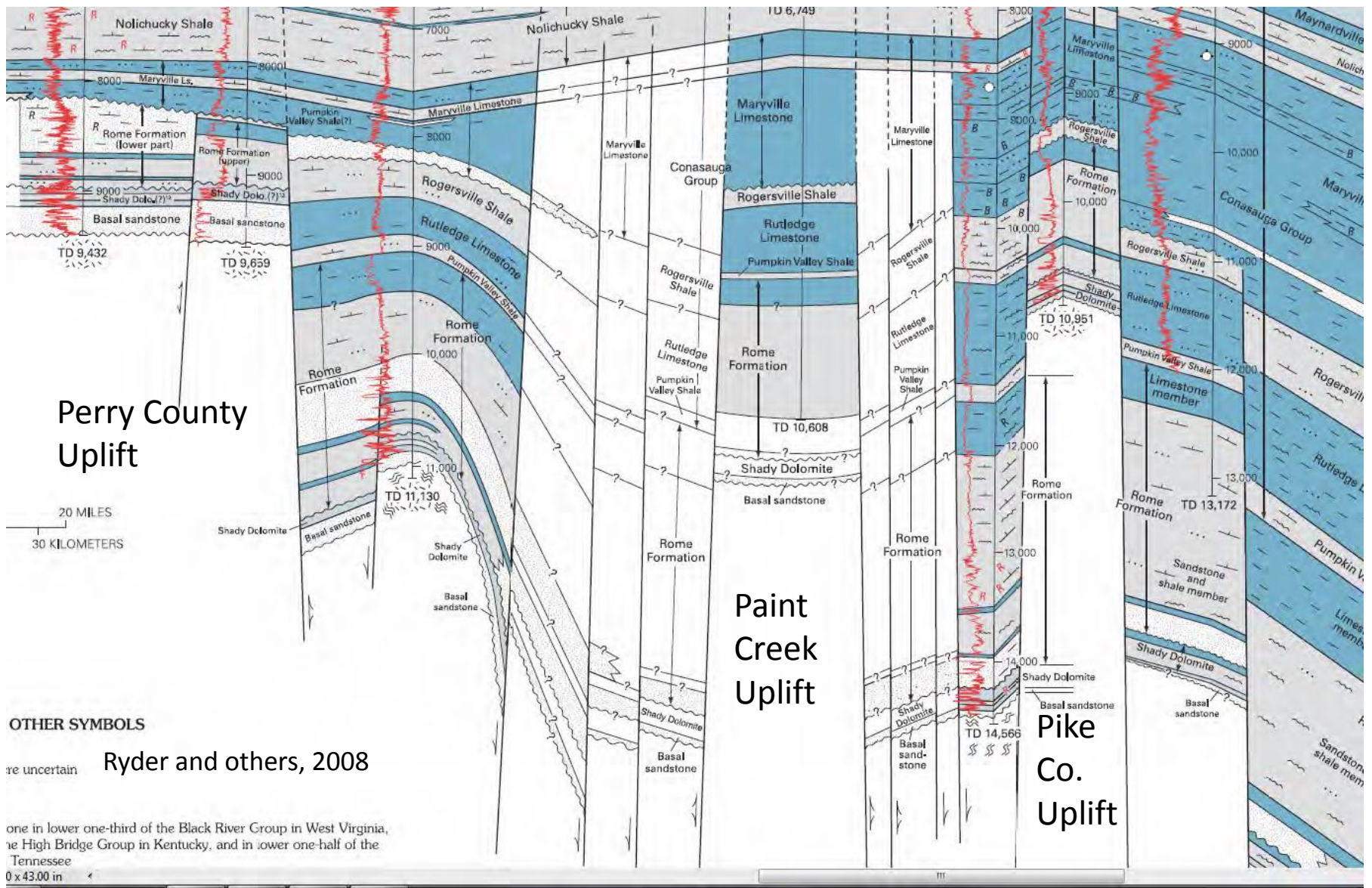
UFG  
Williams  
(Breathitt)

Ashland  
Williams  
(Johnson)

Signal  
Elkhorn  
(Johnson)

ARCO  
KyWVa  
(Johnson)

UFG  
James  
(Martin)



Perry County  
Uplift

Paint  
Creek  
Uplift

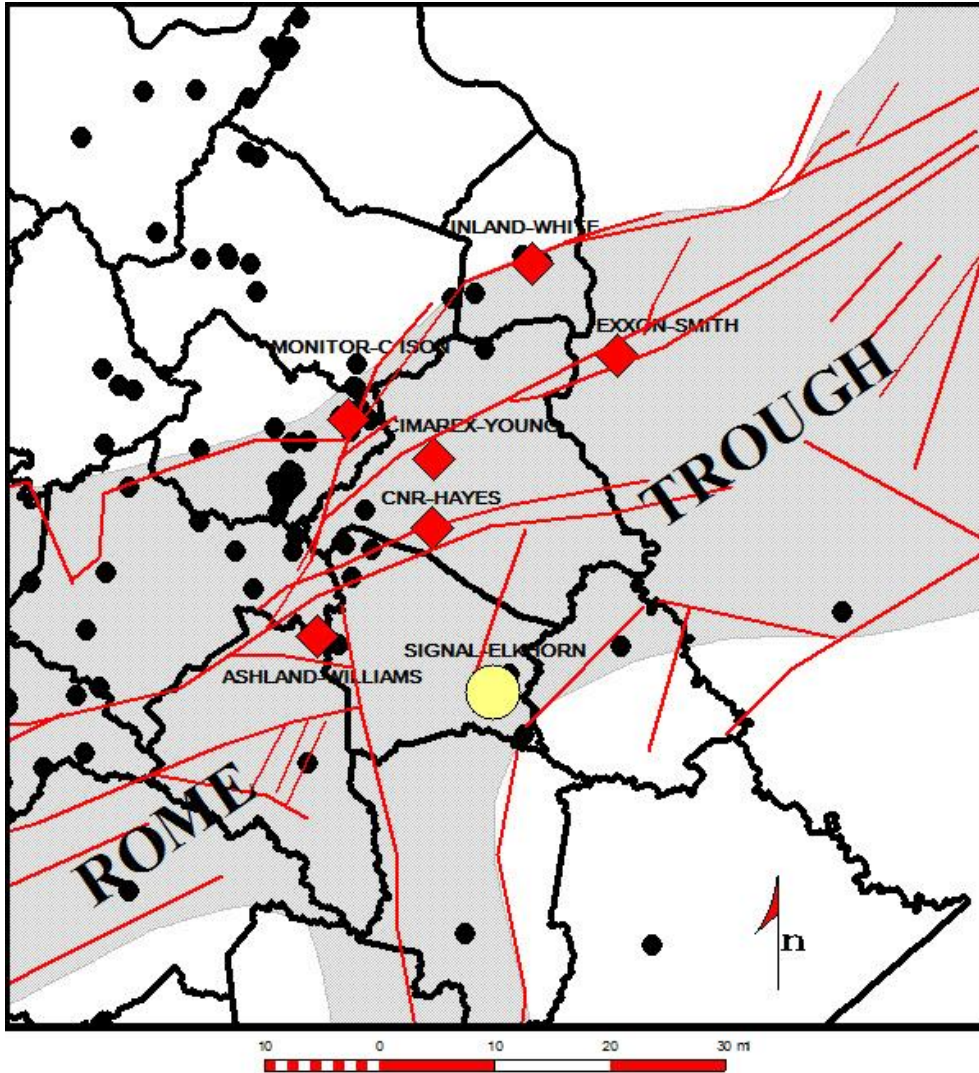
Pike  
Co.  
Uplift

OTHER SYMBOLS

uncertain

Ryder and others, 2008

one in lower one-third of the Black River Group in West Virginia,  
the High Bridge Group in Kentucky, and in lower one-half of the  
Tennessee  
0 x 43.00 in



KEY WELL  
SIGNAL-ELKHORN WELL

- > DRILLED: 1973
- > TD: 14,566'
- > 1.4 MMCF/D JUST ABOVE ROGERSVILLE
- > PAY @ 10,100'
- > SIP 5120#
- > WET GAS

NOT SUSTAINABLE &  
UNKNOWN IF REPEATABLE

2001

GAS ANALYSIS

WELL: Signal Oil & Gas - No.1 Elkhorn Coal  
 LOCATION: Johnson County, Kentucky, 7-P-82, 900 FSL 1600.FEL

FORMATION: Rome  
 DEPTH: Perforated interval: 10,053 - 10,154'  
 DATE SAMPLED: 4/20/73  
 POINT OF COLLECTION: Separator  
 ANALYSIS BY: Weatherly Laboratories, Inc.  
 LAB. NO.: N-141  
 SAMPLED AT: 60 psig, 54 °F.  
 TYPE OF ANALYSIS:  
 HEATING VALUE (BTU/Cu.Ft.): 1115.1 Dry, 1095.6 Wet.  
 CALCULATED SPECIFIC GRAVITY (Air=1.00): 0.6431  
 SULFUR (grains/100 cu.ft.): none H<sub>2</sub>S, Mercaptans

COMPONENT	MOL %	GAL./Mcf
Helium		
Hydrogen		
Nitrogen	1.84	
Methane	88.08	
Ethane	6.34	
Propane	2.02	0.555
Iso-Butane	0.32	0.105
N-Butane	0.53	0.166
Iso-Pentane	0.20	0.073
N-Pentane	0.19	0.068
Hexane +	0.36	0.164
Heptane +		1.131
Carbon Dioxide	0.12	

REMARKS:

\* BTU calculated @ 14.7 psia, 60°F.

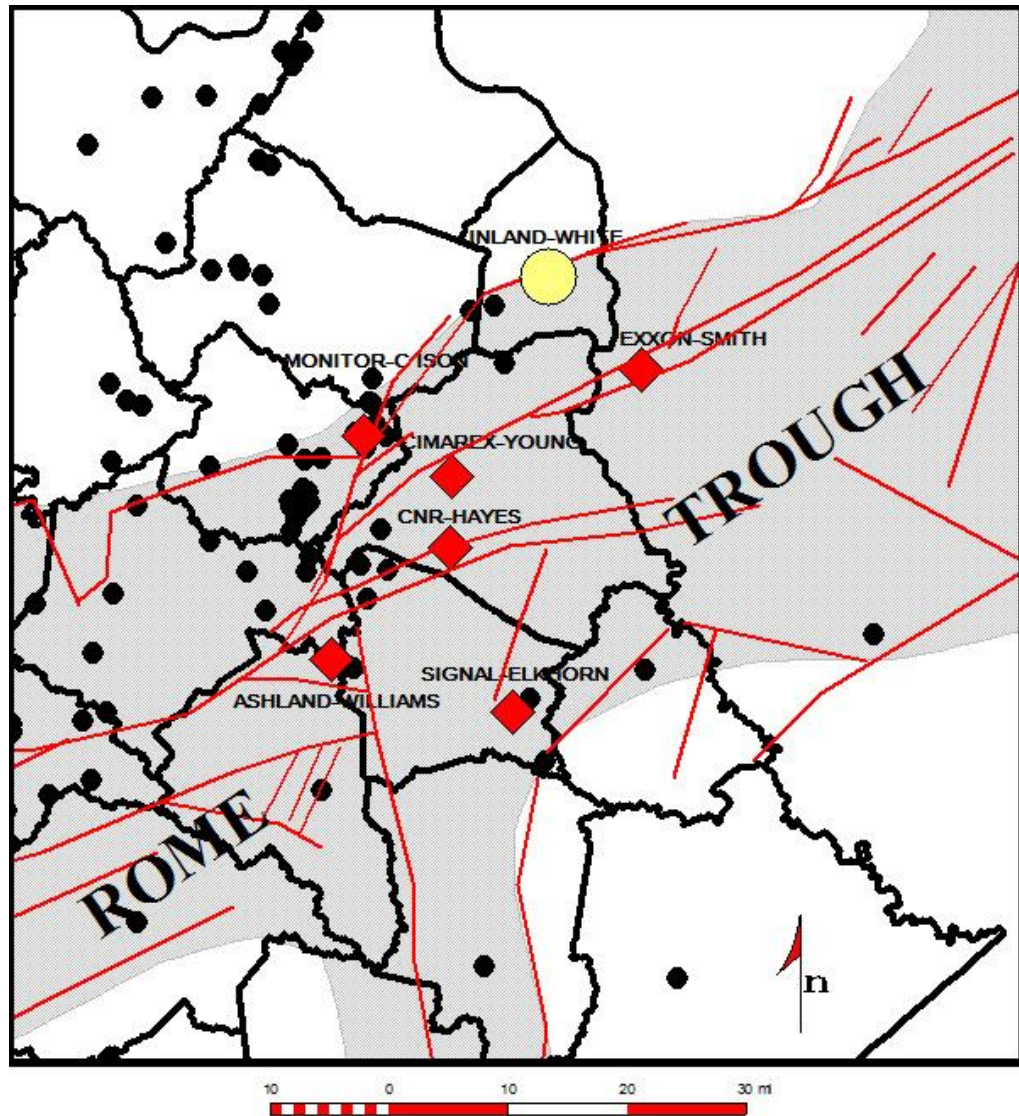
Acidized w/5500 gal 15% acid. BDP 10,500#. While cleaning up well flowed 960 MCFD @ 820 FTP thru 16/64" choke.

After flowing 16 hours, well gauged 800 Mcfd @ 667 FTP thru 16/64" choke.

2-hour test thru 24/64" choke, after being open 21 hours, gauged 700 Mcfd decreasing to 570 Mcfd @ 215# FTP decreasing to 163# FTP.

Fract well w/575 bbls of 5% acid and 15% alcohol, spearheaded w/1000 gal 28% acid. Gelled frac fluid w/1/4 ppg sand. Injected total of 6000# sand.

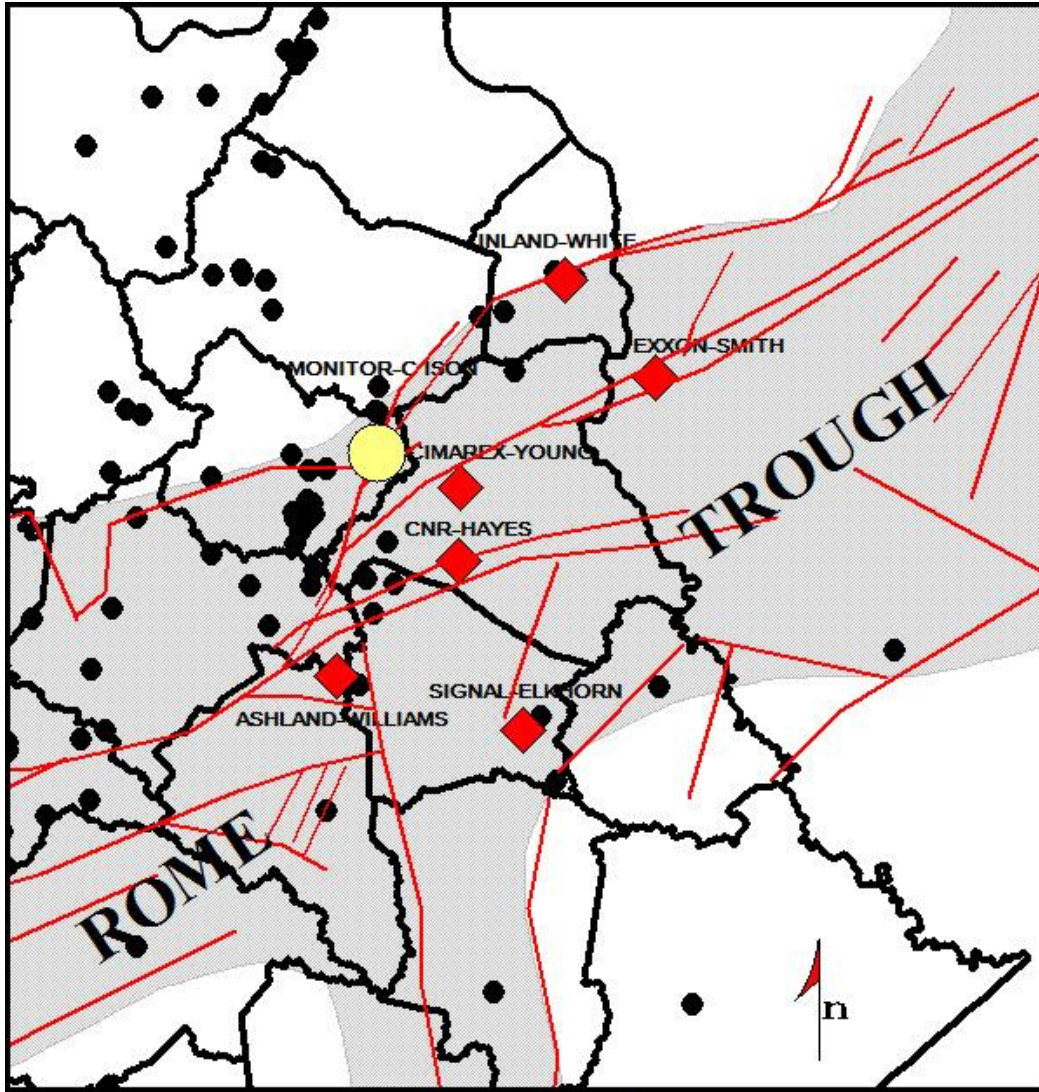
After open 9 hours well reached maximum flow of 1,400 Mcfd + 40 bwph @ 1760# FTP thru 16/64" choke. Changed choke to 24/64" after 1 1/2 hours. After open 29 hours, well had decreased to 305 Mcfd @ 102# FTP thru 24/64" choke.



KEY WELL  
INLAND-L O WHITE

- > DRILLED: 1967
- > TD: 7,676'
- > 32 BOPD 90 MCF/D
- > PAY @ 7,574-7,598'
- > MARYSVILLE SAND
- > FRAC 35,000#SD 851 BW  
124,000 SCFN2
- > 1972 CUM 17,000 BO
- > RYDER TYPED OIL TO  
ROGERSVILLE SOURCE  
IN SMITH WELL

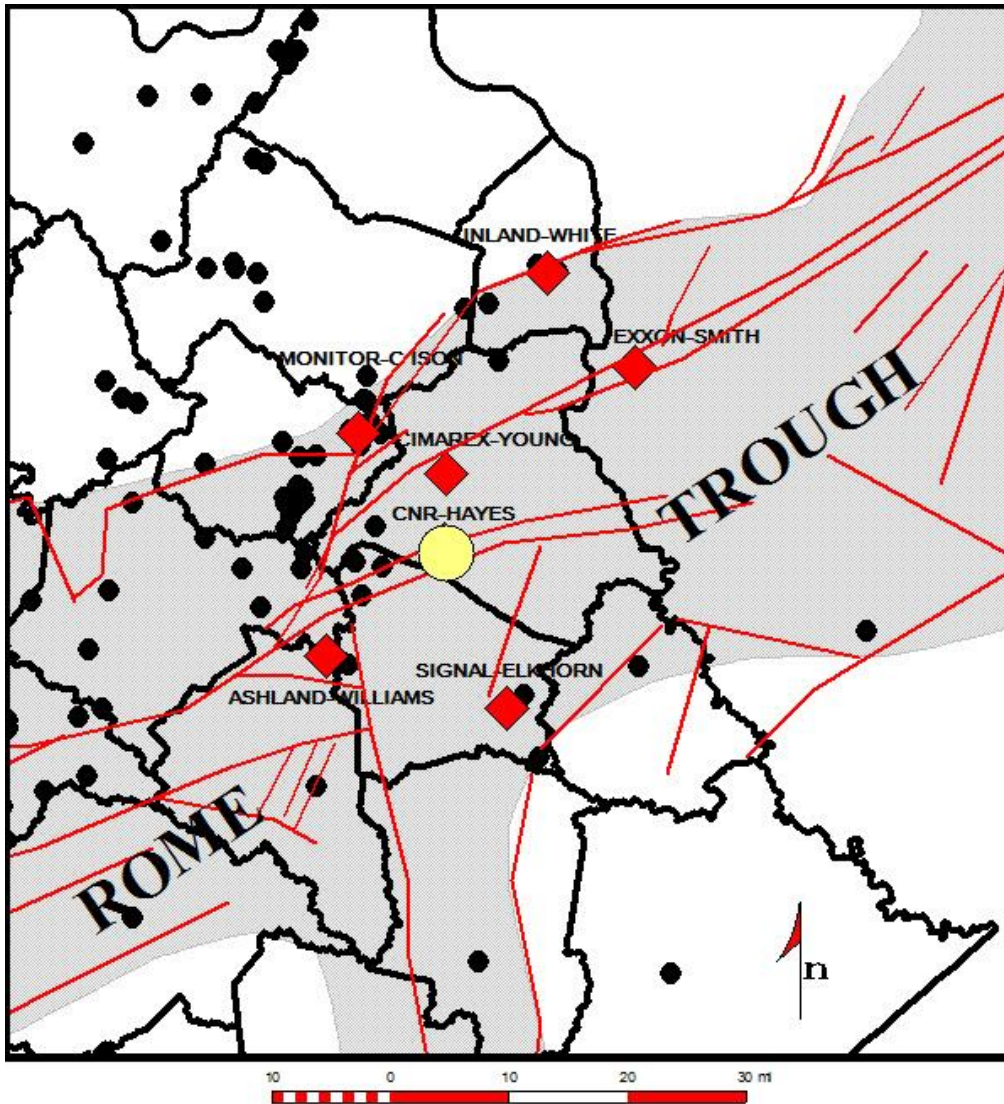
SUSTAINABLE & NOT REPEATABLE



KEY WELL  
MONITOR-C ISON

- > DRILLED: 1970
- > TD: 9,665'
- > SO&G @ 4,496'?
- > ST PETER SAND
- > GEOCHEM REPORT  
8,650-60' TOC=5.8%

NOT SUSTAINABLE OR REPEATABLE

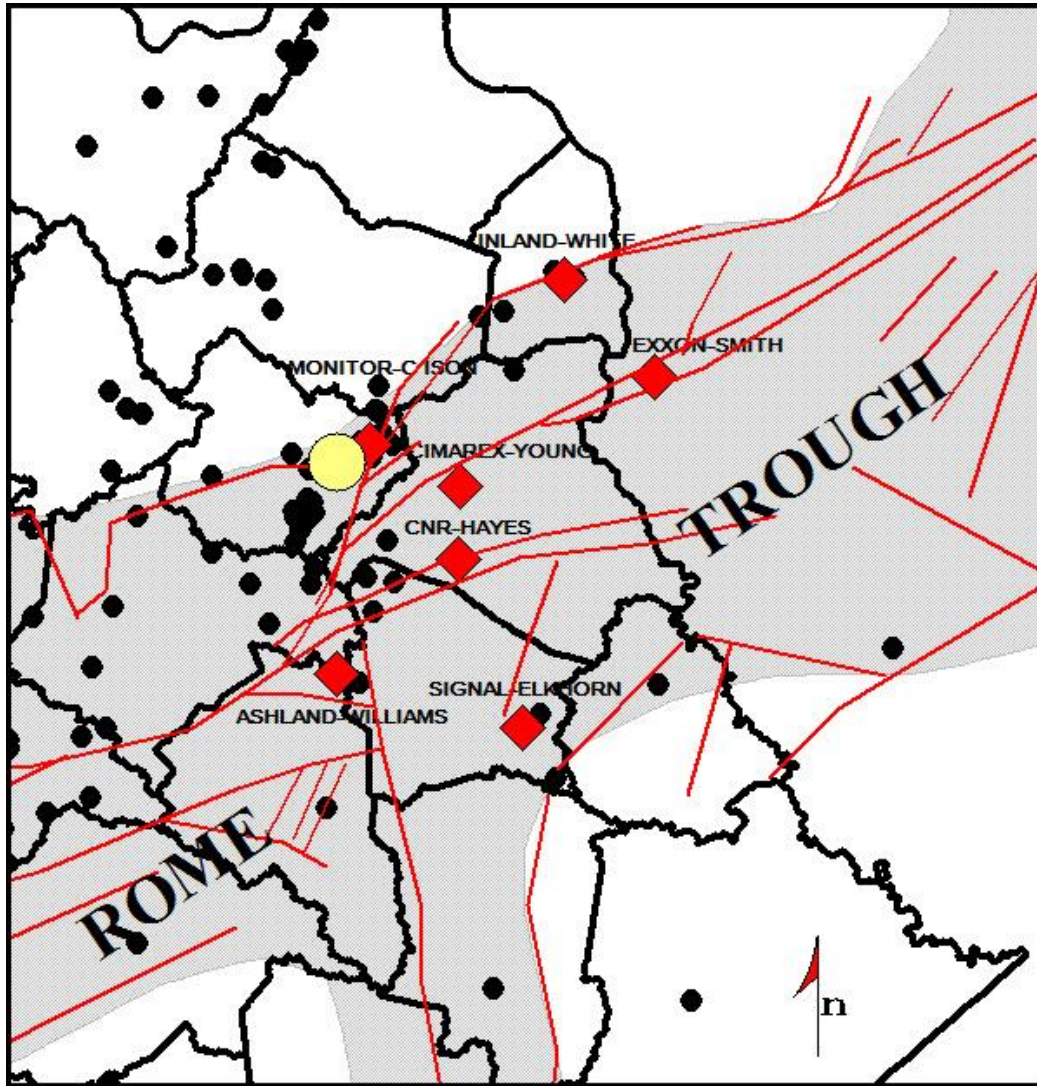


KEY WELL  
COLUMBIA-ESTER HAYES

- > DRILLED: 1979
- > TD: 5,511'
- > 611 MCF/D (NAT)
- > PAY @ 5,337-5,511'
- > BEEKMANTOWN
- > SIP ?
- > 2007 STILL MAKING 100 MCF/D
- > CUM OVER 1 BCF
- > SOURCE??

SUSTAINABLE & NOT REPEATABLE

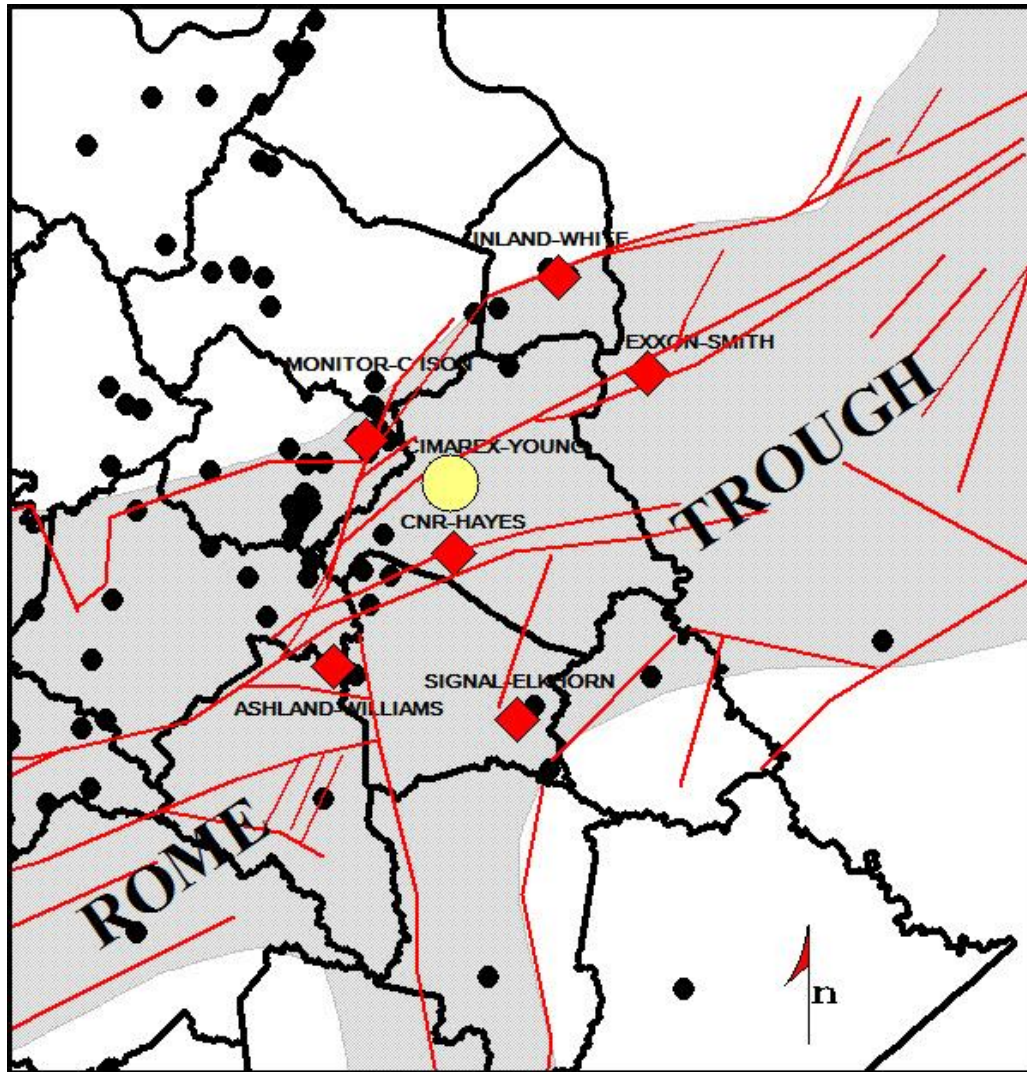
ABARTAENERGY



KEY WELL  
HAY EXPL-SIMPSON

- > DRILLED: 2009
- > TD: 8,842'
- > PERF ROGERSVILLE
- > 8535-8690'
- > FIRST TARGETED  
ROGERSVILLE WELL
- > NOT STIMULATED
- > SHOW OF GAS

SUSTAINABLE - UNKNOWN  
REPEATABLE - UNKNOWN



STAR KEY WELL  
BRUIN-YOUNG WELL

> DRILLED: 2013

RUMORS:

>TD: 15,000' +/- ???

>PERF & FRAC  
ROGERSVILLE ???

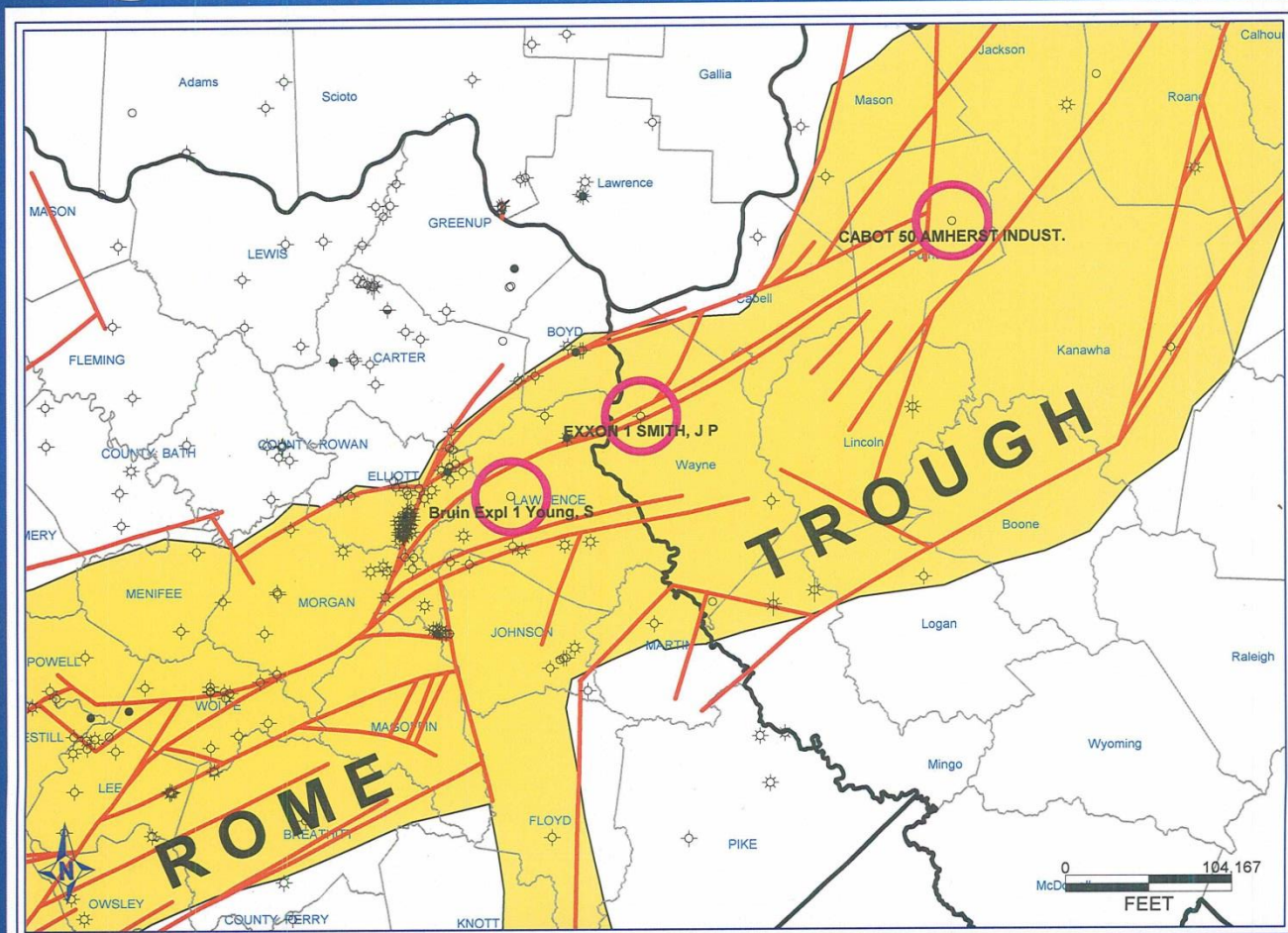
>FLARE SEEN

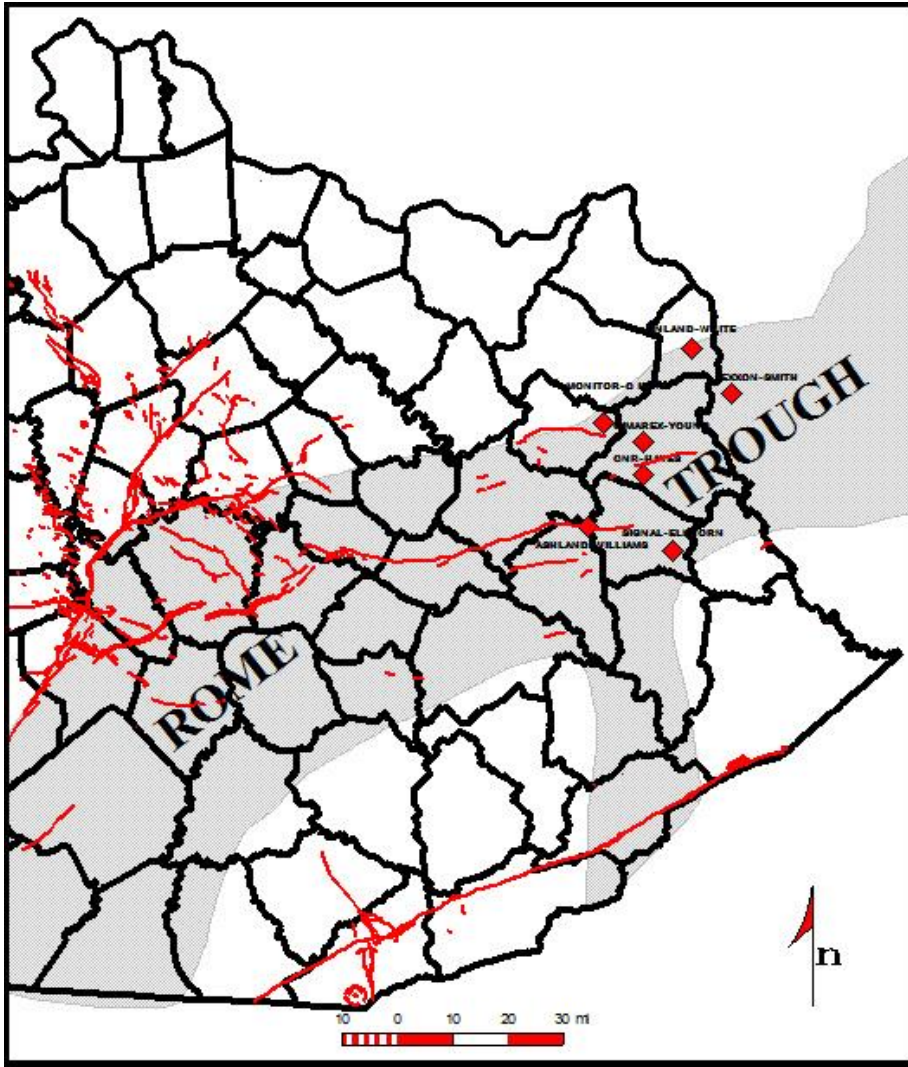
>POSSIBLE LIQUIDS ???

>CONTINUING TO  
LEASE AGRESSIVLY

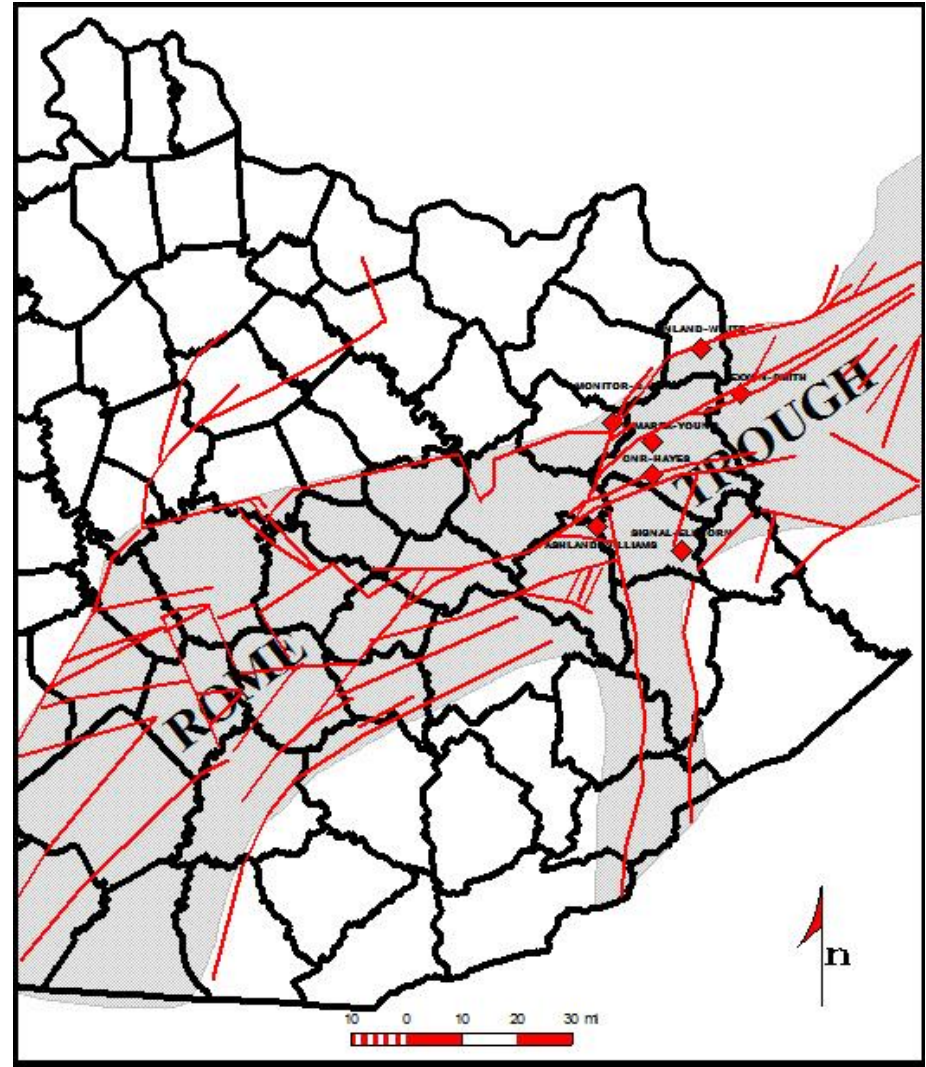


# Emerging Cambrian Rogersville Shale Play 2014



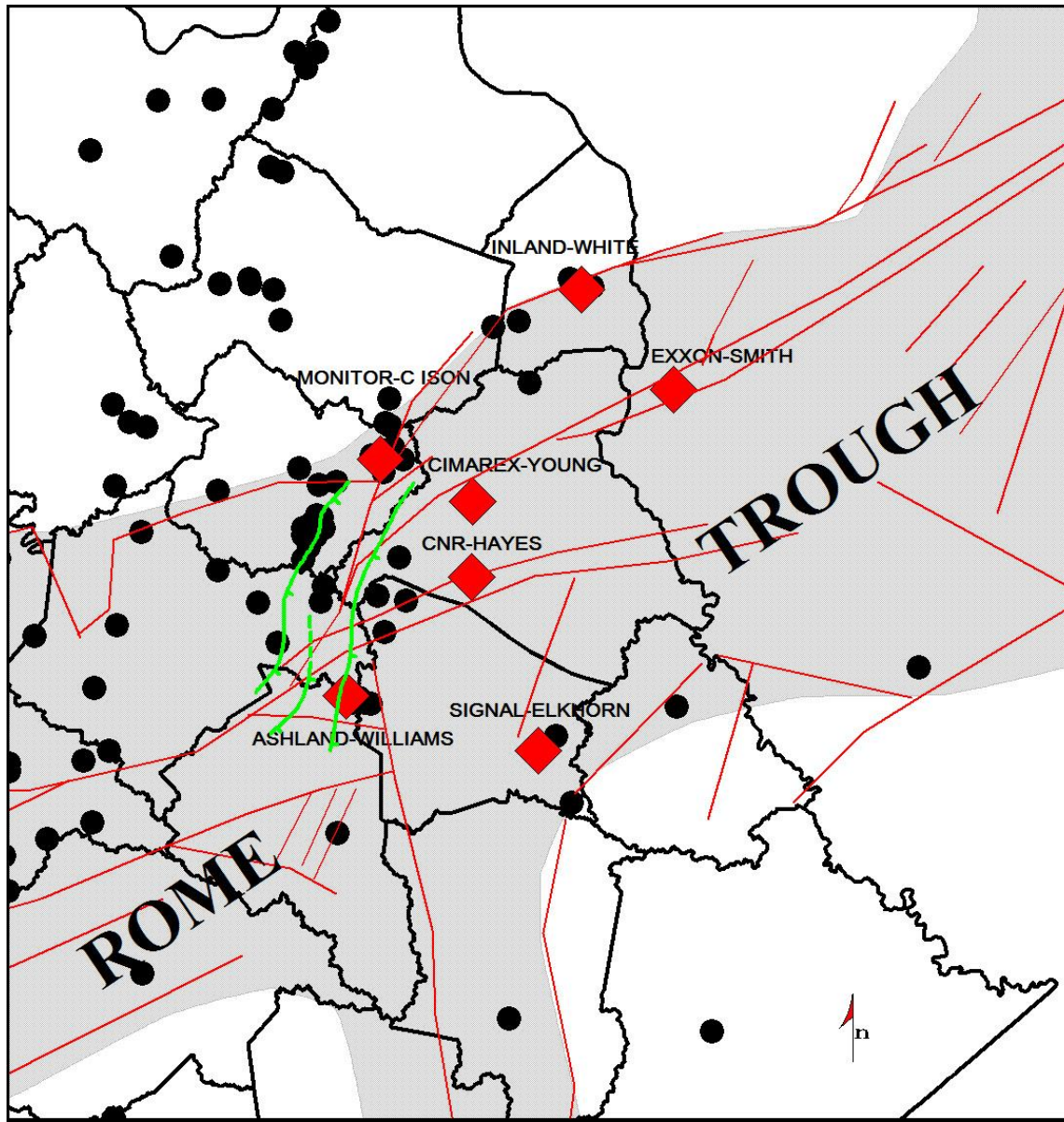


**SURFACE FAULTS IN KY**



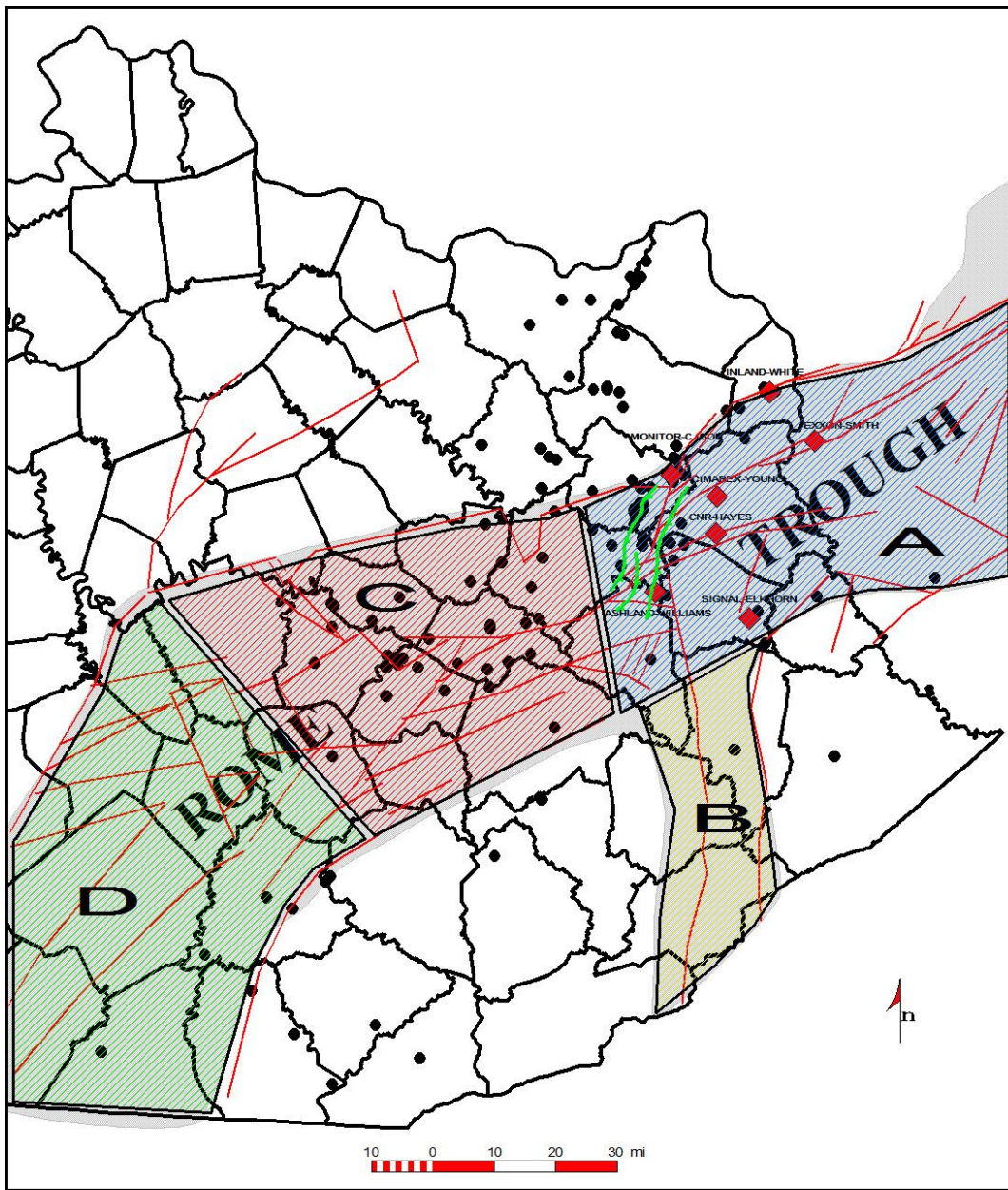
**BASEMENT FAULTS IN KY**

*WHAT DIRECTION IS DEEP EXPLORATION HEADING IN KENTUCKY?*



0 6 12 18 mi

**ISONVILLE FAULT COMPLEX**  
**THICKER CAMBRIAN - THICKER ROGERSVILLE SHALE?**  
**6,000' + THICKENING**



VARIATION IN ROME TROUGH CHARACTERISTICS  
DIFFERENT TARGETS FOR DIFFERENT ZONES?

**COMPANIES CURRENTLY RUMORED**  
**TO BE ACTIVE IN KY DEEP PLAY :**

- > CIMAREX**
- > EQT**
- > CONTINENTAL**
- > SOUTHWEST ENERGY**
- > CHESAPEAKE**
- > SM ENERGY**
- > AEP**



*THANK YOU!*