Applying Fundamentals “101” of Unconventional Shale Production to the Exploration and Development of the Wolfcamp “A”, Wolfcamp “B”, and Lower Spraberry Shale – A Case Study*

Keith Skaar¹

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Abstract

This presentation provides a brief review of the fundamentals of hydrocarbon production from unconventional reservoirs; i.e., how does a shale produce with no conventional permeability(?) We will also review the three factors of rock mechanics necessary for commercial production in unconventional reservoirs using a recent 20,000 acre case study to identify a reservoir target for exploration and development.
Applying Fundamentals “101” of Unconventional Shale Production to the Exploration and Development of the Wolfcamp “A”, Wolfcamp “B”, and Lower Spraberry Shale – A Case Study

Keith Skaar
Acknowledgments

1. Arc Light Capital/Element Petroleum, LP

2. Lee Sanders

3. George Mitchell, Dan Steward, and All Previous Published Authors on Unconventional Resource Plays – Barnett et al.
Midland Basin - ‘Wolfberry’ Play

(JV, Midland Basin, Petroleum, Play, Midland Basin, West Texas)

Historical unconventional Upper WFPM* Wolfberry Produces

Leonard Shale Horizontal Activity

Most Recent Upper WFPM Horizontal Activity

(Spraberry Shale/WFPM “A” & “B”
20,000+ Gross Acres
10 wells on line
ave. projected EUR of 66,000 BOE/well

Most Recent Classic Horizontal Activity (5x wells)

Element Petroleum Horizontal Project

“Wolfberry” Play
Midland Basin, West Texas

´Spraberry Trend’ (to 2007): Cumulative Production to Date:
1,864,213,245 BO
2,385,054,382 MCFG

´Spraberry Trend’ (Jan 2008 to Jan 2010): 756 New Wells
1,782,303,605 BO
2,291,543,981 MCFG

Potential and Proven Upper Wolfcamp: Includes the
37,500 to 105,000 BOE Well Potential Recoveries

Potential and Proven Lower Wolfcamp: “Britton Trend”
23,000 to 56,000 BOE Well Potential Recoveries

Potential Productivity Enhancements: NO CLAMP’ OR STORED UNIT
20,000 to 250,000 BOE Well Potential Recoveries

Potential Productivity Enhancements: Bringing a Shale Trend
250,000 BOE Well Potential Recoveries
q. What Are the Fundamentals of Unconventional Shale Production?

- i.e., How Does a Shale with No Permeability Produce?
## Quick-Desorption™ and Shale Evaluation

**Company:** Element Petroleum  
**County:** Howard County  
**Desorption Temperature:** 174 °F  
**State:** Texas  
**Confining Pressure:** 2,535 psi

### Sample Quick-Desorption Plug (microfracture) Data

### Crushed Sample Data

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**Notations:**  
- D: Diffusion coefficient [cm²/sec]  
- r: Sphere Radius [cm]  
- D/r²: Diffusion parameter [1/sec]  
- ton*: US Short ton equal to 2,000 lbs
$6 \times 0 = 0$
$10 \times 0 = 0$
$15 \times 0 = 0$
9050-60' 'Cline’ slabbed core showing brittle highly organic productive turbiditic shale deposits
9050-60' ‘Cline’ slabbed core showing brittle highly organic productive turbiditic shale deposits (UV light)
Examples of horizontal partings connected by discontinuous vertical fractures to form a reticulate network emphasized during drying of slab after initial spraying with water.

These partings may or may not be open in subsurface (more likely in overpressured settings—no longer the case for Howard County, but perhaps the case at onset of generation), but certainly demonstrate planes of weakness for hydraulic stimulation to take advantage of with appropriate proppant program and with inhibition of proppant embedment.

Cobra/(Manhattan) Guitar 1 # 3h - Cline Pay slabbed core photo
Vertically-linked horizontal natural microfractures in an organic-rich shale. Pygmatic folding of the fractures indicates that fracturing occurred early in the burial history, prior to significant compaction—similar features observed in Bakken Shales (Sonnenberg/Cander). Rare microporosity is present within the microfracture network (arrow). Note rare open vugs and/or molds in the matrix.

Cobra/(Manhattan) Guitar 1 # 3h - Cline Pay thin section
Cobra/(Manhattan) Guitar 1 # 3h - Cline Pay thin section
Marcellus Shale Outcrop – West Virginia
Q. So With No Conventional Permeability, How Does a Shale Produce?

A. Hydrocarbon Expulsion across the Micro-Fracture Face in Response to $\Delta P$
Productive Capacity of Shales

- Organic Richness (TOC)
- Oil/Gas in Place (SCF/ton)
- Mineralogy
- Brittleness
- Pore Pressure
- Permeability
- Thickness (Net Pay)
- Organic Maturation
1. Mature Hydrocarbons – TOC, etc.

2. Brittle “Homogenous” Rock Mechanics

3. Commercial OOIP/OGIP Volume – i.e. Gross Thickness of Porous Reservoir
1. Mature Hydrocarbons

1. TOC > 2\% plus

2. Maturity \geq\ Type II/III oil-prone marine

3. Strong S1/S2 \%
### TOTAL ORGANIC CARBON, PROGRAMMED PYROLYSIS DATA

**Well Name:** Rogers #3804E  
**Operator:** Element Petroleum  
**State:** Texas  
**County:** Howard  
**Project No.:** BH-68251 / BH-68252

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**Notes:**
- "*" = not measured or invalid value
- TOC - Total Organic Carbon, wt. %
- S1 = volatile hydrocarbon (HC) content, mg HC/g rock
- S2 = remaining HC generation potential, mg HC/g rock
- S3 = carbon dioxide content, mg CO2/g rock
- * = Sample contaminated
- ** = low S2, Tmax unreliable
- Meas. %Ro = measured vitrinite reflectance
- HI - Hydrogen index = S2 x 100 / TOC, mg HC/g TOC
- OI - Oxygen index = S3 x 100 / TOC, mg CO2/g TOC
- PI - Production index = S1 / (S1+S2)
- Program:
  - f = fat S2 peak
  - n = normal
  - SRA = Scanning Rock Analysis
  - LE CO = TOC on LEC O Instrument
  - SRA = Scanning Rock Analysis

**Lab ID:** 3403281073 / 3403281075 / 3403281077 / 3403281079 / 3403381081 / 3403381083 / 3403381085 / 3403381087 / 3403281089 / 3403281091 / 3403281093 / 3403281095
kerogen type and maturity (Tmax) - Rogers #3804E

- Type I: oil-prone usually lacustrine
- Type II: oil-prone usually marine
- Type II-III: oil-gas-prone
- Type III: gas-prone
- Type IV: inert

Project #: BH-68251 / BH-68251

Company: SCAL INC.
KEROGEN CONVERSION AND MATURITY (Tmax) - Rogers #3804E

Company: SCAL INC.
Project #: BH-68251 / BH-68251

Diagram showing the relationship between production index (PI) and maturity (based on Tmax, °C) for different stages of hydrocarbon generation and expulsion:

- **Immature**
- **Oil Window**
- **Dry Gas Window**
- **Stained or Contaminated**
- **Intensive Generation, Expulsion**

The diagram includes points indicating high level conversion and low level conversion.
2. Brittle “Homogenous” Rock Mechanics

1. Contiguous ‘Brittle’ Rock of 60’ – 200’ - with No Frac Barriers, etc.
"Wolfberry" Project
Eastern Midland Basin

🌟 = Unconventional Resource Pay
🌟 = (Potential) Conventional Reservoir

('Wolfberry' Type Log)

Middle Clearfork

(Upper Spraberry)

Leonard
Dean

(400' Gross Interval)

(Upper Wolfcamp)

Lower Wolfcamp

Cline

Strown
Atoka Shale
Atoka Lime

Mississippian Lime

Woodford Shale
Stratigraphic Cross-Section
Upper Wolfcamp (“A” & “B”)
North Midland Basin
North Central Howard Co. Upper Wolfcamp Type Log

Dean

WFMP “A”

(Horizontal Target)

WFMP “B”
North Central Howard Co. Upper Wolfcamp Type Log

Dean

WFMP “A”

(Horizontal Target)

Upper WEMP

WFMP “B”

Lower WEMP
# TABLE 1. Semi-quantitative X-ray Diffraction Analysis

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<tr>
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<td>43</td>
<td>5</td>
<td></td>
<td>4</td>
<td>3</td>
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</tbody>
</table>

*Attention: organic and amorphous matters are not included in these estimates!*
3. Commercial OOIP/OGIP in Place

1. Gross Thickness of Section

2. Effective Porosity of Section
### Quick-Desorption™ and Shale Evaluation

**Company:** Element Petroleum  
**County:** Howard County  
**Desorption Temperature:** 174 °F  
**Well:** Rogers #3804E  
**State:** Texas  
**Confining Pressure:** 2,535 psi

#### Sample Quick-Desorption Plug (microfracture) Data

| No. | Depth (ft) | Measured Gas (scf/ton) | Lost Gas (scf/ton) | Residual Gas (scf/ton) | TOTAL Gas (scf/ton) | Matrix Perm (mD) | Plug Perm (mD) | Plug Porosity (%) | Bulk Density (g/cc) | Gas Filled Porosity (%) | Total Porosity (%) | Saturations | Grain Density (g/cc) | Diffusion Parameter |
|-----|------------|-------------------------|--------------------|------------------------|---------------------|------------------|----------------|------------------|---------------------|-----------------------|---------------------|-------------|---------------------|-------------------|------------------|
| 1   | 7,503.00   | 44.1                    | 113.0              | 20.7                   | 177.8               | 0.0004           | 0.01           | 2.467            | 1.53                | 4.75                  | 36.8                | 4.3          | 2.663               | 1.86E-04           |
| 2   | 7,505.00   | 34.1                    | 49.1               | 16.0                   | 99.2                | 0.0007           | 0.07           | 2.411            | 1.48                | 4.43                  | 31.5                | 3.1          | 2.636               | 6.36E-05           |
| 3   | 7,514.00   | 29.1                    | 85.3               | 9.7                    | 124.1               | 0.0006           | 0.01           | 2.429            | 1.20                | 5.47                  | 28.4                | 2.7          | 2.611               | 3.24E-04           |
| 4   | 7,517.00   | 19.0                    | 36.1               | 21.0                   | 76.1                | 0.0009           | 1.46           | 2.495            | 1.94                | 6.25                  | 37.5                | 3.5          | 2.611               | 1.61E-03           |
| 5   | 7,665.00   | 12.1                    | 51.9               | 11.5                   | 75.5                | 0.0006           | 0.01           | 2.455            | 2.71                | 6.76                  | 33.3                | 1.6          | 2.689               | 6.86E-04           |
| 6   | 7,744.00   | 22.9                    | 167.5              | 4.0                    | 194.4               | 0.0003           | 0.02           | 2.488            | 0.50                | 5.25                  | 32.5                | 1.2          | 2.661               | 3.44E-04           |
| 7   | 7,787.00   | 28.1                    | 86.2               | 12.7                   | 127.0               | 0.0000           | 0.01           | 2.542            | 1.02                | 4.73                  | 31.8                | 1.8          | 2.658               | 2.09E-03           |
| 8   | 7,791.00   | 25.6                    | 86.8               | 12.6                   | 124.9               | 0.0000           | 0.04           | 2.496            | 1.85                | 6.12                  | 28.2                | 1.7          | 2.629               | 4.23E-04           |
| 9   | 7,808.00   | 10.9                    | 38.4               | 14.9                   | 64.2                | 1411.0           | 0.26           | 2.624            | 1.29                | 3.12                  | 31.9                | 1.0          | 2.693               | 9.09E-04           |
| 10  | 7,816.00   | 13.1                    | 52.8               | 14.7                   | 80.6                | 1463.0           | 0.11           | 2.617            | 0.76                | 2.44                  | 30.7                | 0.8          | 2.688               | 4.75E-04           |
| 11  | 7,820.00   | 24.4                    | 75.5               | 16.9                   | 116.9               | 1197.0           | 1.20           | 2.444            | 1.53                | 5.37                  | 38.4                | 2.1          | 2.599               | 2.94E-04           |
| 12  | 7,856.00   | 29.8                    | 136.5              | 11.3                   | 177.6               | 1798.0           | 0.14           | 2.469            | 0.90                | 5.13                  | 38.2                | 0.7          | 2.619               | 5.03E-04           |

**Average:** 24.4  81.6  13.8  119.9  1305.8  0.0011  0.28  2.495  1.39  4.99  32.6  2.0  2.651  4.44E-04  2.22E-03  0.21

**Notations:**  
- D: Diffusion coefficient [cm²/sec]  
- r: Sphere Radius [cm]  
- D/r²: Diffusion parameter [1/sec]  
- ton*: US Short ton equal to 2,000 lbs
## TOTAL ORGANIC CARBON, PROGRAMMED PYROLYSIS DATA

**Operator**: Element Petroleum  
**State**: Texas  
**County**: Howard  
**Project No.**: BH-68151 / BH-68351

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Depth (ft)</th>
<th>Top Type</th>
<th>Prep</th>
<th>TOC</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Tmax (°C)</th>
<th>Ro (%)</th>
<th>HI</th>
<th>OI</th>
<th>S2/S3</th>
<th>S1/TOC *100</th>
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</tbody>
</table>

### Notes

- **S1** - volatile hydrocarbon (HC) content, mg HC/g rock
- **S2** - remaining HC generation potential, mg HC/g rock
- **S3** - carbon dioxide content, mg CO2/g rock
- **TOC** - Total Organic Carbon, wt %
- **Ro** - measured vitrinite reflectance
- **HI** - Hydrogen Index = S2 x 100 / TOC, mg HC/g TOC
- **OI** - Oxygen Index = S3 x 100 / TOC, mg CO2/g TOC
- **PI** - Production Index = S1 / (S1+S2)
- **LECO** - TOC on LECO Instrument
- **SRA** - Programmed Pyrolysis on SRA instrument
- **EP** - Programmed Pyrolysis on Rock-Eval Instrument
- **EXT** - Extracted Rock
- **NOPR** - Normal Preparation

* - Sample contaminated
* - low S2, Tnax unreliable
** - not measured or invalid value
Q. What do you do if you don’t have access to modern core data?
1. Historical Well Logs
2. Historical Production
3. Historical Core/Cuttings Data
Dean

Wolfcamp “A”

Perf Interval: frac w/45,000 #’s sand

Pan American Slaughter # 1
Martin County Historical ‘Wolfberry’ Producer
cum prod: 271,878 BO 349, 972 MCFG
(Completed 1966)
<table>
<thead>
<tr>
<th>County</th>
<th>MARTIN, TEXAS Fld: WILDCAT (LENORAH NO. DEAN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opr.</td>
<td>PAN AMERICAN PETROLEUM CORPORATION</td>
</tr>
<tr>
<td>Lge:</td>
<td>ELMA L. SLAUGHTER</td>
</tr>
<tr>
<td>Sec:</td>
<td>Sec 77, Blk B, Bauer &amp; Cockrell, 1980 FSL &amp; 660 FEL</td>
</tr>
<tr>
<td>OWWO - Orig Shell</td>
<td></td>
</tr>
<tr>
<td>11 mi N/LENORAH</td>
<td></td>
</tr>
<tr>
<td>Maps</td>
<td>1-20-66 OBJ. 11,000' Method: RT Spud: 1-20-66</td>
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<tr>
<td>CTR</td>
<td>C.R. ELEV D.F.</td>
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<tr>
<td>Logs</td>
<td>12,075'Lmpbd 10,475'Lbd Loc. P&amp;A</td>
</tr>
<tr>
<td>Pay Zone</td>
<td>Top Pay: Producing Interval: IP: BO: W: BS&amp;W: Hrs: Test Basis:</td>
</tr>
<tr>
<td>Dean &amp; Wifc</td>
<td>8790</td>
</tr>
<tr>
<td>Choke</td>
<td>22/64</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>CSG: TBE: PKR RECORD</td>
<td>Reached T.D.</td>
</tr>
<tr>
<td></td>
<td>13 3/8 - 341 - 350</td>
</tr>
<tr>
<td></td>
<td>8 5/8 - 3960 - 3975</td>
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<td>County: MARTIN, TEXAS Fld: WILDCAT (LENORAH NO. DEAN)</td>
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<tr>
<td>Well:</td>
<td>PAN AMERICAN #1 ELMA L. SLAUGHTER</td>
</tr>
<tr>
<td>Date</td>
<td>TD 12,075'Lime, Pbd 10,475'L</td>
</tr>
<tr>
<td></td>
<td>TO to 10,510', good gas kick @ 6439, Ran logs: PB 10,475'L</td>
</tr>
<tr>
<td></td>
<td>Perm 9106, 9119, 9173, 9196, 9229, 9244</td>
</tr>
<tr>
<td></td>
<td>9279, 9318, 9360, 9442</td>
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<tr>
<td></td>
<td>Pkr @ 8901, A/10,500, Swbd &amp; flwd 51</td>
</tr>
<tr>
<td></td>
<td>BIW no oil or gas, 10 hrs.</td>
</tr>
<tr>
<td></td>
<td>Swbd 9 BNO + 23 BIW, 32 hrs., gd sho gas</td>
</tr>
<tr>
<td></td>
<td>Fluid build up 100'-200' per hr between runs. Swbd 2 BNO + 1% wtr, 6 hrs.</td>
</tr>
<tr>
<td></td>
<td>gd sho gas, Pulled tbg &amp; Pkr.</td>
</tr>
<tr>
<td></td>
<td>SF/30,000 + 45,000#/ (9106-9442)</td>
</tr>
<tr>
<td></td>
<td>Flwd 689 BLO + 12 BIW, 15 hrs, 16/64&quot; ch.</td>
</tr>
<tr>
<td></td>
<td>FTP 250, Flwd 382 BLO, 3 BIW, 24 hrs.</td>
</tr>
<tr>
<td></td>
<td>FCP 300#, 16/64&quot; ch. Flwd 134 BLO + 150 BNO,</td>
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<tr>
<td></td>
<td>24 hrs., 16/64&quot; ch. FCP 200, 2% BS&amp;W.</td>
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<tr>
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<td>Flwd 324 BNO, 24 hrs, FCP 215, 16/64&quot; ch, 1%</td>
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<tr>
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<td>BS&amp;W, Flwd 313 BNO, no wtr + 2% BS&amp;W, 24 hrs, 16/64&quot; ch, FCP 250, Flwd 352 BNO, 24 hrs.</td>
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<tr>
<td></td>
<td>FCP 250-200, 16/64&quot; ch, 9 hrs, on 20/64&quot; ch.</td>
</tr>
</tbody>
</table>

The Subsurface Library
P. O. Box 942
Midland, Texas
Gulf P.E. Little # 1 - Conventional Logs
Howard County Historical ‘Wolfberry’ Producer
cum prod: 94,784 BO 93,284 MCFG
(Completed 1981)
**COUNTY** HOWARD, TEXAS  
**FIELD** WILDCAT  

**ORP**  
GULF OIL CORP.  

**LSE**  
P.E. LITTLE  

**LOC**  
Sec 18, Blk 33, T-2-N, T&P  
660 FNL & 1980 FWL of Sec. 15 mi NW/Big Spring  

**UNIQUE NO.**  
42-227-32243  

**MAPS**  

<table>
<thead>
<tr>
<th>FG</th>
<th>OBJ</th>
<th>RE SPUD</th>
<th>LAHEE CLASS</th>
<th>ELEV D.F.</th>
<th>GL</th>
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</thead>
<tbody>
<tr>
<td>4-29-81</td>
<td>9400'RT</td>
<td>4-6-81</td>
<td>2625'x</td>
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**PAY ZONE** Dean  
**PROD INTERVAL** 8086-8415  
**IP** 138  
**BO** 12  
**W HRS** 24  
**CHK**  
**TEST BASIS**  

<table>
<thead>
<tr>
<th>GOR</th>
<th>GTY</th>
<th>CP</th>
<th>TP</th>
<th>BHP</th>
<th>POT DATE</th>
<th>TREATMENT</th>
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<tbody>
<tr>
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<td>5-13-81</td>
<td>A/15000</td>
<td>SF/20,000 x</td>
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<tr>
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**PAY ZONE** Dean  
**PROD INTERVAL** 8086-8415  
**IP** 138  
**BO** 12  
**W HRS** 24  
**CHK**  
**TEST BASIS**  

---

**COUNTY** HOWARD, TEXAS  
**FIELD** WILDCAT  

**WELL NO.** 1  

**ORP**  
GULF OIL CORP.  

**LSE**  
P.E. LITTLE  

**LOC**  

| Sec 18, Blk 33, T-2-N, T&P | 660 FNL & 1980 FWL of Sec. 15 mi NW/Big Spring  

**UNIQUE NO.**  
42-227-32243  

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**PAY ZONE** Dean  
**PROD INTERVAL** 8086-8415  
**IP** 138  
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**CHK**  
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**PAY ZONE** Dean  
**PROD INTERVAL** 8086-8415  
**IP** 138  
**BO** 12  
**W HRS** 24  
**CHK**  
**TEST BASIS**  

---

**NEW WORK:**  

| OTD 9395' Orig. Comp. 2-27-81 | Old Penn Pfs/ 9211-60' |  

| PF/ 6/9084-87; 4/9106-08; 4/9117-19; 6/9129-32; 12/9148-54; 12/9168-74; A/2350' |

| BP @ 8500' |

| PF/ 2/8301-03; 8/8308-16; 2/8319-21; 2/8328-30; 2/8336-38; 2/8347-49; 2/8357-59; 4/8368-72; 4/8378-82; 2/8388-90; 2/8407-09; A/15000 |

| (8301-8415) |


| RPB @ 8461 A/10,500 Swb 30 BW/5' trace oil (5-27-81) |
Gulf P.E. Little #1
Howard County Historical ‘Wolfberry’ Producer
cum prod: 94,784 BO 94,284 MCFG

Note: Casing Leaks
Wolfcamp “A”
SFH Unit 23 # 1H Production Summary

WFMP “A” Horizontal
608 days gross
Cum: 139,441 BO
148,944 MCFG
Hamlin Unit 1522 # 3H
WFMP “A” Horizontal
477 days gross
Cum: 94,842 BO
61,086 MCFG
Gardner Unit 1510 # 2H Production Summary

334 days gross
Cum: 107,523 BO
67,431 MCFG
Garrett-Reed Unit 37-48 # 4H Production Summary

WFMP “A” Horizontal
257 days gross
Cum: 122,624 BO
106,231 MCFG
Clark Unit 24-13 # 1H Production Summary

Clark Unit 2413 # 1H
WFMP “A” Horizontal
170 days net
Cum: 51,072 BO
34,338 MCFG
Wolfe-McCann Unit 10-15 # 2H Production Summary

Wolfe-McCann Unit 1015 # 2H
Wolfcamp “A” Horizontal
117 days gross
Cum: 64,860 BO
37,658 MCFG
Garrett-Snell B Unit 36-25 # 4H Production Summary

(Note: 2 mile horizontal)

Garrett-Snell B Unit 3625 # 4H
Wolfcamp “A” Horizontal
51 days net
Cum: 25,795 BO
17,429 MCFG
Wright Unit 4132 # 2H
Wolfcamp “A” Horizontal
28 days net
Cum: 31,063 BO
15,997 MCFG
Clark Unit 24-13 B # 6H Production Summary

Clark Unit B 2413 # 6H
Wolfcamp “A” Horizontal
21 days net
Cum: 8,832 BO
5,569 MCFG
Wolfcamp “B”
Stratigraphic Cross-Section
Upper Wolfcamp (“A” & “B”)
North Midland Basin
Gulf P.E. Little # 1 - Conventional Logs
Howard County Historical ‘Wolfberry’ Producer
cum prod: 94,784 BO 94, 284 MCFG (Completed 1981)

Dean
Wolfcamp

porous organics w/ commercial reservoir capacity(?)

Clean(?) detritus limes > 4 % porosity

Perf Interval: frac w/ 30,000 #’s sand

Clean(?) detritus limes > 4 % porosity
Gulf P.E. Little #1
Howard County Historical ‘Wolfberry’ Producer
cum prod: 94,784 BO 94,284 MCFG

Note: Casing Leaks
Lower Spraberry Shale
Offset Well to the Pioneer-Flanagan 14 Lloyd (lower Spraberry Shale/Leonard Shale Horizontal) 24hr IP: 1,101 BOE/D 7212’ lateral length

(lower Spraberry Shale) (“Leonard” Shale)
Conclusions

1. Understand The Production Mechanics of Unconventional Shale Reservoirs – *there is no way to evaluate your rock without understanding how these reservoirs produce.*

2. From Modern Core data, create petrophysical log templates not only to identify and isolate pay, but to be able to utilize standard log data to evaluate acreage on a large scale.

3. On every new project, always utilize every bit of data available, historical or modern, to evaluate any specific acreage block.
Q. Any Suggestions on What to Do During This Low Oil Price Environment?
1. Evaluate Distressed Properties for Acquisition
2. Generate Prospects