

**5 1/2" Production Casing Set**

**Contractor:** Discovery Drilling Company (Rig #2)  
**Commenced:** April 5, 2003  
**Completed:** April 13, 2003  
**Elevation:** 1900' K.B.; 1898' D.F.; 1892' G. L.  
**Casing Program:** Surface; 8 5/8" @ 824'  
 Production; 5 1/2" @ 3591'  
**Samples:** Samples saved and examined 1600' to the Rotary Total Depth.  
**Drilling Time:** One (1) foot drilling time recorded and kept 1600' to the Rotary Total Depth.  
**Measurements:** All depths measured from the Kelly Bushing.  
**Formation Testing:** There were three (3) Drill Stem Tests ran by Superior Testing.  
**Electric Log:** By Eli; Dual Induction, Compensated Density/Neutron Log and Micro Log.  
**Gas Detector:** By MBC Well Logging.

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	811	+1089
Herington	1734	+166
Winfield	1784	+116
Towanda	1853	+47
Ft. Riley	1885	+15
Base Florence	2001	-101
Council Grove	2083	-83
Neva	2241	-341
Red Eagle	2298	-398
Tarkio	2595	-695
Howard	2731	-831
Topeka	2794	-894
Heebner	3121	-1221
Toronto	3138	-1238
Douglas	3155	-1255
Brown Lime	3211	-1311
Lansing	3221	-1321
Base Kansas City	3452	-1552
Conglomerate Sand	3478	-1578
2 <sup>nd</sup> Conglomerate Sand	3500	-1600
Arbuckle	3544	-1644
Rotary Total Depth	3595	-1695
Log Total Depth	3595	-1695

(All tops and zones are corrected to Electric Log measurements.)

**SAMPLE ANALYSIS, SHOWS OF OIL, TESTING DATA, ETC.**

**HERINGTON SECTION**

1734-1744' Dolomite; gray, finely crystalline, slightly sucrosic in part, scattered porosity, shaley, 12 unit gas kick.

**KRIDER SECTION**

1746-1750' Dolomite; gray and white, finely crystalline, sucrosic, scattered vugular type porosity, trace gas bubbles.

1760-1770' Dolomite; as above, fair pinpoint porosity, show gas bubbles.

**WINFIELD SECTION**

1784-1800' Dolomite; gray and white, finely crystalline, scattered porosity, plus trace dolomitic limestone, 10 unit gas kick.

**TOWANDA SECTION**

1853-1880' Dolomite; gray and tan, fair to good porosity, sucrosic, 30 unit gas kick.

**FT RILEY SECTION**

1885-1893' Dolomite; tan and gray, finely crystalline, good pinpoint to vugular type porosity, 111 unit gas kick.

1898-1904' Dolomite; as above.

1920-1940' Limestone; tan, slightly dolomitic, oolitic, oocastic, good porosity, no shows.

**NEVA SECTION**

2241-2250' Limestone; white, fossiliferous, fair interfossiliferous porosity, trace spotty fluorescence, show of gas bubbles, 13 unit gas kick.

**RED EAGLE SECTION**

2298-2330' Limestone; tan, fossiliferous in part, poor visible porosity, trace fair yellow fluorescence.

**TOPEKA SECTION**

3046-3062' Limestone; gray, fossiliferous, finely crystalline in part, scattered porosity, dark brown to black stain, show of free oil (heavy) and no odor in fresh samples.

3068-3080' Limestone; tan, few sub-oocastic, fair porosity, trace dark brown stain, show of free oil and questionable odor in fresh samples.

**TORONTO SECTION**

3141-3153' Limestone; white and gray, chalky, poor visible porosity, no shows.

**LANSING SECTION**

3226-3232' Limestone; tan and brown to white, finely crystalline, sucrosic in part, few fossiliferous and chalky, good golden brown to dark brown stain and saturation, show of free oil (gassy) and good odor in fresh samples.

**Drill Stem Test #1** **3228-3245'**

**Times:** 45-45-60-60  
**Blow:** Fair increasing to strong  
**Recovery:** 1700' gas in pipe  
30' slightly muddy oil  
15' clean gassy oil

**Pressures:** ISIP 995 psi  
FSIP 983 psi  
IFP 39-35 psi  
FFP 43-42 psi  
HSH 1583-1520 psi

3251-3260' Limestone; tan, fossiliferous/oolitic, black stain and saturation, show of free oil (heavy black) and no odor in fresh samples.

3263-3273' Limestone; gray, fossiliferous, scattered fossil cast porosity, dark black to gray stain, no show of free oil and faint odor in fresh samples.

3280-3283' Limestone; cream and white, oolitic, slightly chalky, good interoolitic porosity, golden brown stain and saturation, show of free oil and fair odor in fresh samples.

**Drill Stem Test #2** **3247-3286'**

**Times:** 30-30-45-45  
**Blow:** Strong, gas to surface in 23 minutes  
Gas gauged as follows:  
Initial Flow  
23 minutes gas to surface  
25 minutes 5,050 cfgpd  
30 minutes 6,930 cfgpd  
Final Flow  
10 minutes 5,860 cfgpd  
20 minutes 5,050 cfgpd  
30 minutes 6,330 cfgpd  
40 minutes 5,860 cfgpd  
45 minutes 5,600 cfgpd

**Recovery:** 125' slightly oil cut mud  
200' muddy gassy oil  
1230' clean gassy oil  
120' water

**Pressures:** ISIP 1014 psi  
FSIP 997 psi  
IFP 222-367 psi  
FFP 401-613 psi

*HSH 1627-1518 psi*

- 3296-3300' Limestone; tan and gray, oocastic, good oocastic, porosity, trace brown and black stain, weak show of free oil and faint odor in fresh samples.
- 3300-3320' Limestone; as above, trace tan chert.
- 3320-3334' Limestone; tan and gray, oocastic, fair to good oocastic porosity, (barren).
- 3360-3365' Limestone; gray and white, sub-oocastic, chalky, poor visible porosity, no shows.
- 3365-3383' Limestone; white and cream, oolitic, chalky, black stain, no show of free oil and fair odor in fresh samples.
- 3393-3400' Limestone; white and cream, fossiliferous, chalky, trace poor stain, no show of free oil or odor in fresh samples.
- 3421-3431' Limestone; tan to white, fossiliferous/oolitic, chalky in part, questionable discoloration, trace white and tan, cherty, dense, limestone.

### CONGLOMERATE SECTION

- 3478-3489' Sand; very fine grained, sub-rounded, sub-angular, well sorted, friable, fair intergranular porosity, good golden brown stain, trace of free oil and questionable odor in fresh sample.
- 3500-3504' Sand; medium grained, sub rounded, quartzitic, feldspar and chert inclusions, dull gray and black stain, plus abundant varied colored boney to opaque chert, black spotty stain.

#### Drill Stem Test #3 3448-3514'

**Times: 30-45-45-60**

**Blow: Strong, gas to surface 30 seconds**

**Gas gauged as follows:**

**5 minutes 445,000 cfgpd**

**10 minutes 754,000 cfgpd**

**20 minutes 802,000 cfgpd**

**30 minutes 828,000 cfgpd**

**Final Flow**

**Gas stabilized at 847,000 cfgpd**

**Recovery: 180' gassy mud**

**30' gassy slightly watery mud**

**120' gassy muddy water**

**Pressures: ISIP 587 psi**

**FSIP 553 psi**

**IFP 397-283 psi**

**FFP 298-294 psi**

**HSH 1711-1648 psi**

- 3511-3544' Varied colored weathered chert, trace black stain, trace white and yellow oolitic opaque chert all in matrix of blood red soft to sub-waxy shale.

## ARBUCKLE SECTION

3544-3550'	Dolomite; cream to white, coarse crystalline, fair to good porosity, chalky luster, no shows.
3550-3560'	Dolomite; gray and white to cream, medium and coarse crystalline, fair to good porosity, trace iron pyrite, no shows.
3560-3570'	Dolomite; white and cream, coarse crystalline, good intercrystalline to vugular type porosity.
3570-3590'	Dolomite; white and cream, sucrosic, sandy, scattered porosity, trace white and tan chert.
3590-3595'	Dolomite; cream and white, medium to coarse crystalline, large sub rounded quartz grained inclusions, no shows.

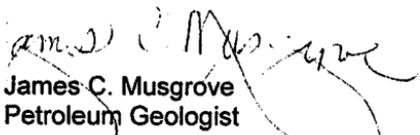
### **Rotary Total Depth 3595 (-1695)**

#### **Recommendations:**

On the basis of the favorable structural position and the positive Drill Stem Tests, it was recommended by all parties involved to set and cement 5 ½" production casing at 3591' and the following zones be perforated in the Conner 'A' #1:

- |                      |           |
|----------------------|-----------|
| 1. Conglomerate Sand | 3500-3504 |
| 2. Conglomerate Sand | 3478-3489 |
| 3. Lansing           | 3280-3283 |
| 4. Lansing           | 3226-3231 |
| 5. Red Eagle         | 2298-2303 |
| 6. Neva              | 2241-2243 |
| 7. Ft. Riley         | 1898-1903 |
| 8. Winfield          | 1788-1790 |
| 9. Krider            | 1757-1768 |
| 10. Herington        | 1734-1750 |

Respectfully submitted;

  
James C. Musgrove  
Petroleum Geologist