

OPERATOR

Company: TDI, INC.
 Address: 1310 BISON ROAD
 HAYS, KANSAS 67601

Contact Geologist: TOM DENNING
 Contact Phone Nbr: 785-628-2593
 Well Name: ZIMMERMAN UNIT # 2
 Location: NW NE SE NE Sec.22-15s-18w
 API: 15-051-26,729-00-00
 Pool: IN FIELD
 State: KANSAS

Field: SCHOENCHEN
 Country: USA



Scale 1:240 Imperial

Well Name: ZIMMERMAN UNIT # 2
 Surface Location: NW NE SE NE Sec.22-15s-18w
 Bottom Location:
 API: 15-051-26,729-00-00
 License Number: 4787
 Spud Date: 9/9/2014 Time: 1:30 PM
 Region: ELLIS COUNTY
 Drilling Completed: 9/14/2014 Time: 8:36 AM
 Surface Coordinates: 1480' FNL & 430' FEL
 Bottom Hole Coordinates:
 Ground Elevation: 2008.00ft
 K.B. Elevation: 2018.00ft
 Logged Interval: 2900.00ft To: 3760.00ft
 Total Depth: 3760.00ft
 Formation: ARBUCKLE
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -99.3023774
 Latitude: 38.7363788
 N/S Co-ord: 1480' FNL
 E/W Co-ord: 430' FEL

LOGGED BY

Company: SOLUTIONS CONSULTING, INC.
 Address: 108 WEST 35TH STREET
 HAYS, KANSAS 67601

Phone Nbr: 785-625-3380
 Logged By: GEOLOGIST Name: HERB DEINES

CONTRACTOR

Contractor: SOUTHWIND DRILLING, INC.
 Rig #: 1
 Rig Type: MUD ROTARY
 Spud Date: 9/9/2014 Time: 1:30 PM
 TD Date: 9/14/2014 Time: 8:36 AM

ELEVATIONS

K.B. Elevation: 2018.00ft
 K.B. to Ground: 10.00ft

Ground Elevation: 2008.00ft

NOTES

RECOMMENDATION TO RUN PRODUCTION CASING BASED ON FAVORABLE RESULTS OF DST # 1.

OPEN HOLE LOGGING BY PIONEER ENERGY SERVICES: DUAL INDUCTION LOG, DUAL COMPENSATED POROSITY LOG. ATTEMPTED TO RUN MICRORESISTIVITY LOG BUT COULDN'T GET THROUGH SALT SECTION. RAN DST # 1 BEHIND LOG WITH NO DOWNHOLE PROBLEMS

DRILL STEM TESTING BY TRILOBITE TESTING INC: ONE (1) STRADDLE TEST


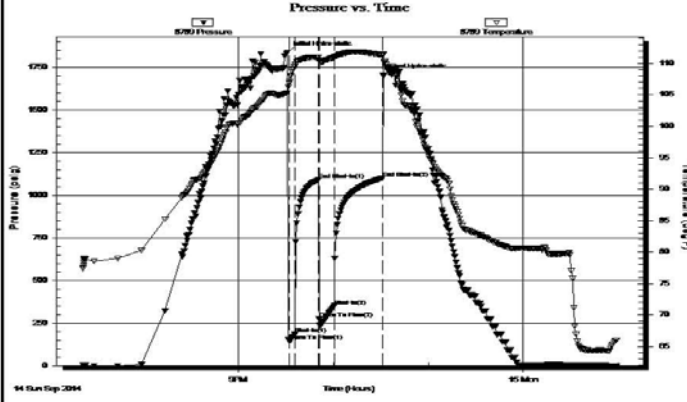
FORMATION TOPS SUMMARY

	ZIMMERMAN UNIT # 2	RONALD # 1	ZIMMERMAN UNIT # 1
	NW NE SE NE	S2 N2 SW NW	NW NE SW NE
	SEC.22-15S-18W	SEC.23-15-18W	SEC.22-15-18W
	2008'GL 2018'KB	KB 2004'	KB 1965'
<u>FORMATION</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>
Anhydrite	1171+ 847	+ 845	+ 849
B-Anhydrite	1207+ 811	+ 809	+ 813
Topeka	2991 - 973	- 965	- 964
Heebner Sh.	3253-1235	-1226	-1230
Toronto	3273-1255	-1246	-1250
LKC	3302-1284	-1276	-1280
BKC	3526-1508	-1504	-1503
Arbuckle	3574-1556	-1545	-1582
RTD	3760-1742	-1744	-1712

SUMMARY OF DAILY ACTIVITY

9-09-14	RU, spud 1:30 PM
9-10-14	1080', set 8 5/8" surface casing to 1181' w/ 375 sxs SMD, slope 3/4 degree, plug down 4:30PM, WOC 12 hrs
9-11-14	1207', drill plug 4:30 AM
9-12-14	2390', drilling, displaced 2876'-2892'
9-13-14	3170', drilling
9-14-14	3715', drilling, RTD 3760' @ 8:36AM, short trip, TOWB, logs, straddle DST # 1 3569'-3586'
9-15-14	3760', finish DST # 1, TIWB, LDDP, run production casing, RD

DST # 1 TEST SUMMARY

 TRILOBITE TESTING, INC.		DRILL STEM TEST REPORT																																																	
Formation: Arbuckle Deviated: No Whipstock: ft (KB) Time Tool Opened: 21:32:15 Time Test Ended: 01:00:00 Interval: 3569.00 ft (KB) To 3586.00 ft (KB) (TVD) Total Depth: 3756.00 ft (KB) (TVD) Hole Diameter: 7.88 inches Hole Condition: Fair		TDI Inc 1310 Bison Rd Hays KS 67601-9696 ATTN: Herb Dienes 22 15s 18w Ellis Zimmerman Unit 2 Job Ticket: 56139 DST#: 1 Test Start: 2014.09.14 @ 19:22:00 Reference Elevations: 2018.00 ft (KB) 2008.00 ft (CF) KB to GR/CF: 10.00 ft																																																	
Serial #: 8789 Inside Press@RunDepth: 350.99 psig @ 3572.00 ft (KB) Start Date: 2014.09.14 End Date: 2014.09.15 Start Time: 19:22:02 End Time: 00:59:00		Capacity: 8000.00 psig Last Calib.: 2014.09.15 Time On Btm: 2014.09.14 @ 21:31:00 Time Off Btm: 2014.09.14 @ 22:31:30																																																	
TEST COMMENT: 5-IFP- BOB in 50 sec. 15-ISIP- Surface Blow 10-FFP- BOB in 1 min. 30-FSP- 5 in. Blow Back																																																			
Pressure vs. Time		PRESSURE SUMMARY																																																	
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Time (Min.)</th> <th style="text-align: center;">Pressure (psig)</th> <th style="text-align: center;">Temp (deg F)</th> <th style="text-align: left;">Annotation</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">0</td><td style="text-align: center;">1838.40</td><td style="text-align: center;">105.31</td><td>Initial Hydro-static</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">142.84</td><td style="text-align: center;">106.84</td><td>Open To Flow (1)</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">186.52</td><td style="text-align: center;">109.51</td><td>Shut-In(1)</td></tr> <tr><td style="text-align: center;">20</td><td style="text-align: center;">1091.68</td><td style="text-align: center;">110.90</td><td>End Shut-In(1)</td></tr> <tr><td style="text-align: center;">20</td><td style="text-align: center;">274.41</td><td style="text-align: center;">110.39</td><td>Open To Flow (2)</td></tr> <tr><td style="text-align: center;">30</td><td style="text-align: center;">350.99</td><td style="text-align: center;">110.92</td><td>Shut-In(2)</td></tr> <tr><td style="text-align: center;">60</td><td style="text-align: center;">1100.81</td><td style="text-align: center;">111.34</td><td>End Shut-In(2)</td></tr> <tr><td style="text-align: center;">61</td><td style="text-align: center;">1705.00</td><td style="text-align: center;">111.49</td><td>Final Hydro-static</td></tr> </tbody> </table>		Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation	0	1838.40	105.31	Initial Hydro-static	2	142.84	106.84	Open To Flow (1)	5	186.52	109.51	Shut-In(1)	20	1091.68	110.90	End Shut-In(1)	20	274.41	110.39	Open To Flow (2)	30	350.99	110.92	Shut-In(2)	60	1100.81	111.34	End Shut-In(2)	61	1705.00	111.49	Final Hydro-static												
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation																																																
0	1838.40	105.31	Initial Hydro-static																																																
2	142.84	106.84	Open To Flow (1)																																																
5	186.52	109.51	Shut-In(1)																																																
20	1091.68	110.90	End Shut-In(1)																																																
20	274.41	110.39	Open To Flow (2)																																																
30	350.99	110.92	Shut-In(2)																																																
60	1100.81	111.34	End Shut-In(2)																																																
61	1705.00	111.49	Final Hydro-static																																																
Recovery		Gas Rates																																																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Length (ft)</th> <th style="text-align: left;">Description</th> <th style="text-align: center;">Volume (bbl)</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">63.00</td><td>MCO 30%_m 70%_o</td><td style="text-align: center;">0.88</td></tr> <tr><td style="text-align: center;">819.00</td><td>CO 100%</td><td style="text-align: center;">11.49</td></tr> <tr><td style="text-align: center;">0.00</td><td>252 GIP</td><td style="text-align: center;">0.00</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		Length (ft)	Description	Volume (bbl)	63.00	MCO 30% _m 70% _o	0.88	819.00	CO 100%	11.49	0.00	252 GIP	0.00													<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="text-align: center;">Choke (inches)</th> <th style="text-align: center;">Pressure (psig)</th> <th style="text-align: center;">Gas Rate (Mcf/d)</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)																				
Length (ft)	Description	Volume (bbl)																																																	
63.00	MCO 30% _m 70% _o	0.88																																																	
819.00	CO 100%	11.49																																																	
0.00	252 GIP	0.00																																																	
	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)																																																

ROCK TYPES

Dolprim	shale, grn	shale, red	Dol Lime
Lmst fw<7	shale, gry	Shcol	
Lmst fw>7	Carbon Sh	Lscongl	

ACCESSORIES

MINERAL

- ▲ Chert, dark
- Sandy

FOSSIL

- ◊ Oomoldic

TEXTURE

- C Chalky

OTHER SYMBOLS

Oil Show

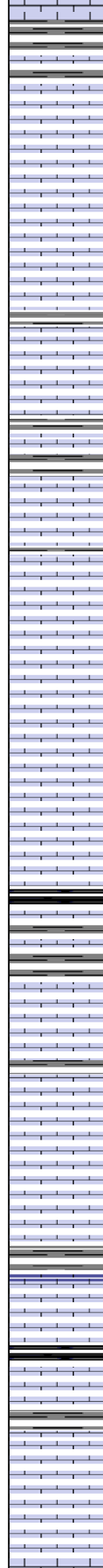
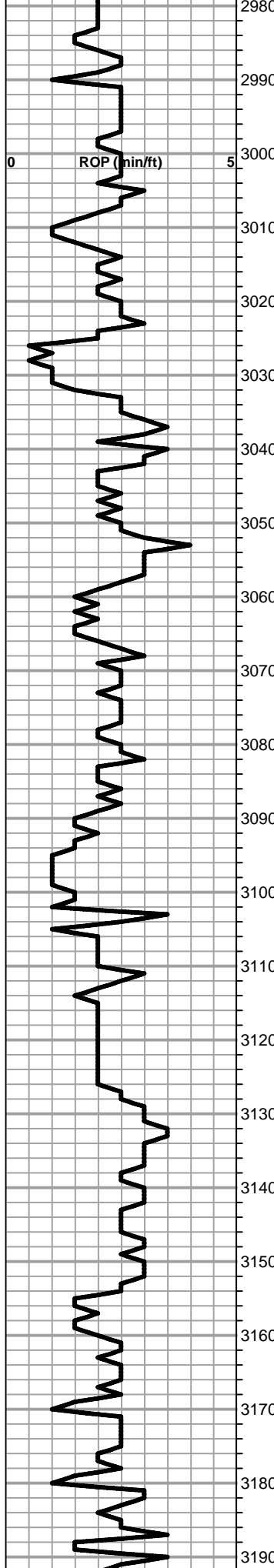
- Good Show
- ◐ Fair Show
- ◑ Poor Show
- Spotted or Trace
- Questionable Strn
- D Dead Oil Strn
- Fluorescence
- * Gas

DST

- DST Int
- DST alt
- Core
- tail pipe

Printed by GEOstrip VC Striplog version 4.0.8.9 (www.grsi.ca)

Curve Track #1 ROP (min/ft)	Depth Intervals Cored Interval DST Interval	Lithology	Oil Show	Geological Descriptions
<p>1:240 Imperial</p>	<p>2900</p> <p>2910</p> <p>2920</p> <p>2930</p> <p>2940</p> <p>2950</p> <p>2960</p> <p>2970</p>	<p>Lime, med grayish brn, fnxln, fossiliferous</p> <p>Shale, med gray, soft blocky Lime, lt-med brn, fnxln, fossiliferous</p> <p>Lime, med-dark brn, fnxln, slightly fossiliferous</p> <p>Shale, lt-med gray, soft blocky with slightly sticky clumps in part</p> <p>Lime, lt-dark brn, fnxln</p>	<p>BEGIN 1' DRILL TIME FROM 2900' TO RTD BEGIN 10' WET AND DRY SAMPLES FROM 2950' TO RTD</p> <p>ANHYDRITE TOP 1171 +847 ANHYDRITE BASE 1207-811</p>	<p>TG, C1 - C5</p> <p>1:240 Imperial</p> <p>8 5/8" SURFACE CASING SET TO 1181' W/ 375 SXS SMD, WOC 12 HRS</p> <p>SLOPE 3/4 DEGREE @1181'</p>



Lime, lt-med brn, fnxln, slight bedded chalk

TOPEKA ELog 2991-973

Lime, lt-med brn, fnxln, slightly fossiliferous

Lime, lt-med brn, fnxln, slightly fossiliferous

Lime, lt-med brn-med grayish brn, fnxln-granular, slight bedded chalk

Lime, lt-med brn, fnxln, slightly fossiliferous-fusulinids

Lime, lt brn, granular, bedded chalk, NS

Lime, lt-med brn, fnxln

Lime, lt-med brn-med grayish brn, fnxln, slightly fossiliferous

Lime, lt brn-lt grayish brn, fnxln

Lime, lt brn, fnxln-granular, slightly fossiliferous, soft on crush

Lime, lt-med brn, fnxln, slightly fossiliferous

Lime, lt brn, fnxln-granular, bedded chalk with lt chalky wash, slightly fossiliferous

Lime, lt brn, granular, slight bedded chalk

Shale, black carbonaceous, blocky

Lime, lt brn, fn-vfxln

Lime, crm, fn-vfxln, lithographic, slight bedded chalk

Lime, crm, fnxln, lithographic in part

Lime, crm-lt brn, fnxln, slight bedded chalk

Lime, lt brn, fnxln-granular in part, slight bedded chalk

Lime, granular with increasing bedded chalk

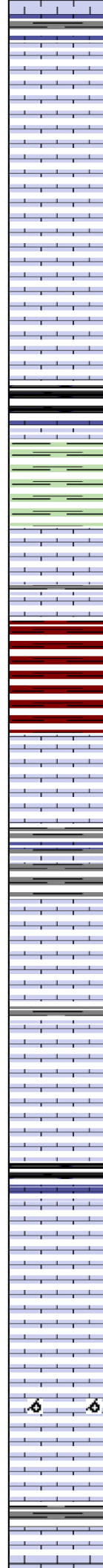
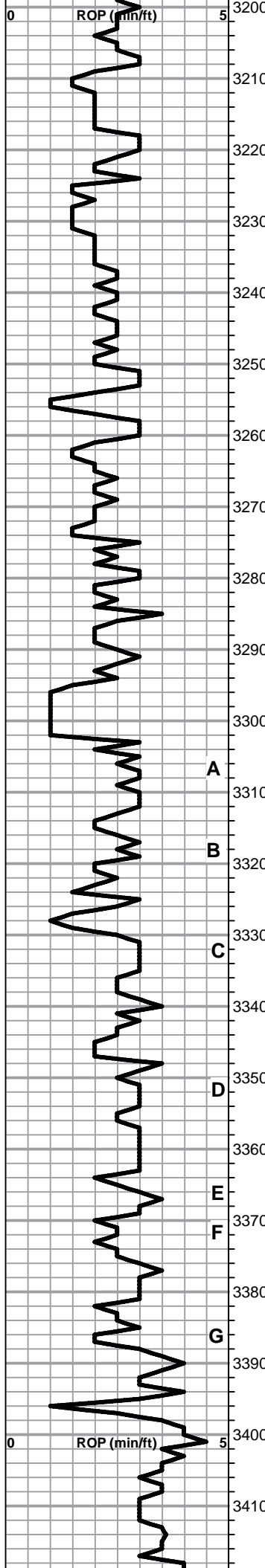
Lime, crm-lt brn, granular

Shale, black carbonaceous, blocky

Lime, lt brn, fnxln-granular, scattered micro xln, NS

Lime, lt brn, fn-vfxln-granular in part

Lime, lt brn with lt gray tinting in part, fnxln



Lime, lt brn, fnxln-granular with chalky matrix in part

Lime, lt brn, fnxln-granular, chalky matrix, NS

Lime, lt brn, fnxln-granular, slight bedded chalk

Lime, lt brn, fnxln-granular

Lime, lt brn, fnxln

HEEBNER SHALE ELog 3253-1235

Shale, black carbonaceous, fissile, blocky
Lime, lt brn-lt gray, fn-vfxln

Shale, grayish green-lime green, soft blocky-soft mud

TORONTO ELog 3273-1255

Lime, crm, fnxln-granular, slight bedded chalk, NS

Lime, lt-med brn-grayish brn, fn-vfxln

Shale, red-reddish brn, soft blocky

LKC ELog 3302-1284

Lime, crm-lt brn, fn-vfxln, slight fossiliferous, NS

Lime, med brn-med gray, fn-vfxln

Lime, crm, fnxln-oomoldic, spotty stain with trace of free oil, very lt odor, bedded chalk in part

Lime, crm-tan-lt brn, fn-vfxln

Lime, crm-tan, fnxln, lot of bedded chalk in part, NS

Lime, crm-tan, fn-vfxln, bedded chalk

Shale, black carbonaceous, blocky
Lime, lt gray, fnxln

Lime, crm-tan, fnxln with scattered oomoldic chips. It spotty stain, does not appear well developed

Lime, crm-lt brn, fn-micro xln, bedded chalk, NS

Lime, tan-lt brn, fnxln, moderate bedded chalk, NS

Lime, crm-tan, fnxln with barren oomoldic chips in part, NS

Lime, crm-tan, fn-micro xln, slight bedded chalk

Lime, crm, fn-vfxln

A

B

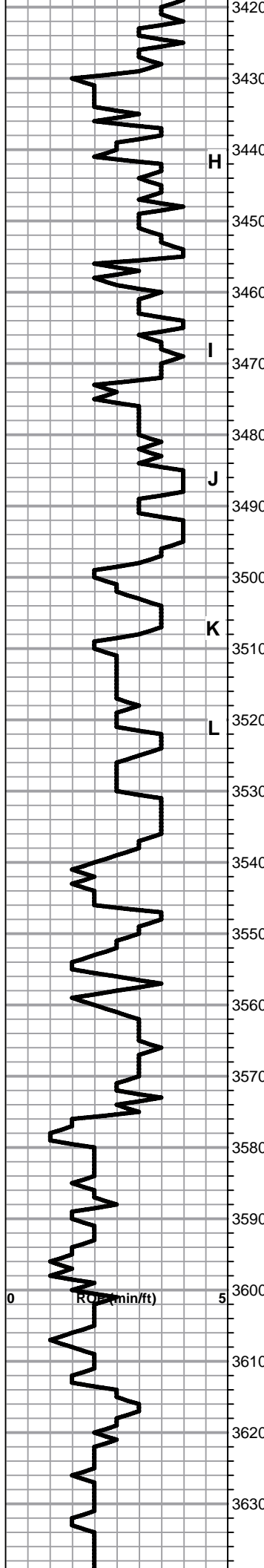
C

D

E

F

G



Shale, gray-black carbonaceous, firm blocky

Lime, lt-med brn, fnxn

Lime, crm-lt brn, fnxn-granular in part, slight bedded chalk, dark fossiliferous chert, fresh, sharp, NS

Lime, crm-tan, fn-vfxln, moderate bedded chalk

Lime, lt-med brn-grayish brn, fnxn

Lime, crm-tan, fn-micro xln, slight bedded chalk, NS

Lime, crm-tan, fn-micro xln

Shale, med gray, calcareous, soft-firm blocky

D Lime, crm-tan, fnxn, few chips with flaky gilsonite, NFO, No Odor, No Staining

Lime, crm, fn-micro xln, slight bedded chalk

Lime, crm-tan, fn-vfxln, slight bedded chalk, NS

Lime, crm-tan, fn-micro xln

Lime, crm, fn-vfxln

BKC ELog 3526-1508

Shale, red-reddish brn, soft-soft blocky with lt red wash
Lime, clastic mix

Lime, lt brn, fnxn

Shale, soft with dark red wash with clastic lime mix in part

Lime, lt brn, fnxn, slightly dolomitic, orange chert fragments

Lime, tan-lt brn, fnxn, dolomitic

ARBUCKLE ELog 3574-1556

● Dolomite, lt brn, granular, sucrosic, good odor

● Dolomite, tan, granular, med grain, good odor, saturated stain

● Dolomite, tan-lt brn, fnxn-granular, sucrosic, lt odor

Dolomite, tan-lt brn, fnxn-granular, scattered sucrosic, very lt odor

Dolomite, ivory-tan, fnxn-granular

C Dolomite, ivory-lt brn, fnxn-granular, chalky white wash

Dolomite, ivory-tan, fnxn-granular

DST # 1 STRADDLE TEST
3569' TO 3586', ARBUCKLE
SEE HEADER FOR TEST
SUMMARY

