

**OPERATOR**

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

Contact Geologist: TOM DENNING  
 Contact Phone Nbr: 785-28-2593  
 Well Name: BIELER # 2  
 Location: N2 NW SW SE SEC.9-T15S-R19W  
 API: 15-051-26,705-00-00  
 Pool:  
 State: KANSAS

Field: VIRGINIA  
 Country: USA



Scale 1:240 Imperial

Well Name: BIELER # 2  
 Surface Location: N2 NW SW SE SEC.9-T15S-R19W  
 Bottom Location:  
 API: 15-051-26,705-00-00  
 License Number: 4787  
 Spud Date: 8/15/2014 Time: 2:30 PM  
 Region: ELLIS COUNTY  
 Drilling Completed: 8/22/2014 Time: 8:23 AM  
 Surface Coordinates: 1160' FSL & 2310' FEL  
 Bottom Hole Coordinates:  
 Ground Elevation: 2025.00ft  
 K.B. Elevation: 2035.00ft  
 Logged Interval: 2900.00ft To: 3750.00ft  
 Total Depth: 3750.00ft  
 Formation: LANSING-KANSAS CITY  
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude: -99.4381417  
 Latitude: 38.7579948  
 N/S Co-ord: 1160' FSL  
 E/W Co-ord: 2310' 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: 8/15/2014 Time: 2:30 PM  
 TD Date: 8/22/2014 Time: 8:23 AM

**ELEVATIONS**

K.B. Elevation: 2035.00ft  
 K.B. to Ground: 10.00ft

Ground Elevation: 2025.00ft

**NOTES**

PRODUCTION CASING WAS RAN TO FURTHER TEST AND DEVELOP LANSING-KANSAS AND ARBUCKLE BASED ON FAVORABLE RESULTS OF DSTS

OPEN HOLE LOGGING BY PIONEER ENERGY SERVICES: DUAL INDUCTION LOG, DUAL COMPENSATED POROSITY LOG, MICRORESISTIVITY LOG

DRILL STEM TESTING BY TRILOBITE TESTING INC: THREE (3) CONVENTIONAL TESTS AND ONE (1) FAILED PACKER TEST

**FORMATION TOPS SUMMARY**


	<b>BIELER # 2</b>	<b>WILLIE # 1</b>	<b>VIRGINIA # 1</b>
	<b>N2 NW SW SE</b>	<b>NW SE SE SE</b>	<b>SW NE NW NE</b>
	<b>SEC.9-15S-19W</b>	<b>SEC.9-15-19W</b>	<b>SEC.16-15-19W</b>
	<b>2025'GL 2035'KB</b>	<b>KB 2043'</b>	<b>KB 2024'</b>
<u>FORMATION</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>
Anhydrite	1258 +777	+ 785	+784
B-Anhydrite	1293 +742	+ 749	+746
Topeka	3013 - 978	- 977	- 978
Heebner Sh.	3280-1245	-1246	-1254
Toronto	3310-1275	-1268	-1265
LKC	3331-1296	-1293	-1292
BKC	3572-1537	-1540	-1538
Marmaton	3616-1581	-1583	-1579
Arbuckle	3644-1609	-1620	-1627
RTD	3750-1715	-1710	-1726

**SUMMARY OF DAILY ACTIVITY**

8-15-14	RU, spud 2:30 PM, set 8 5/8" surface casing to 221' w/ 150 sxs Common 2%Gel 3% CC, slope 1 degree, plug down 11:00PM
8-16-14	222', WOC, drill plug 7:00 AM
8-17-14	1524', drilling
8-18-14	2529', drilling, displaced 2752' to 2781'
8-19-14	3225', CFS 3315', short trip, CFS 3365', DST # 1 3310' to 3365' "A"- "C" LKC-packer failure, DST # 2 3342'-3365' "C", slope 1 1/2 degree
8-20-14	3365', finish DST # 2, TIWB, CFS 3415', DST # 3 3364' to 3415' "D"- "G" LKC

8-21-14 3505', TIWB, CFS 3525', CFS 3648', DST # 4 3628' to 3648' Cg/Arb  
 8-22-14 3700', TIWB, RTD 3750' @8:23AM, CCH, TOWB, logs, TIWB, LDDP  
 8-23-14 3750', finish running production casing and cementing, RD

**DST # 2 TEST SUMMARY**

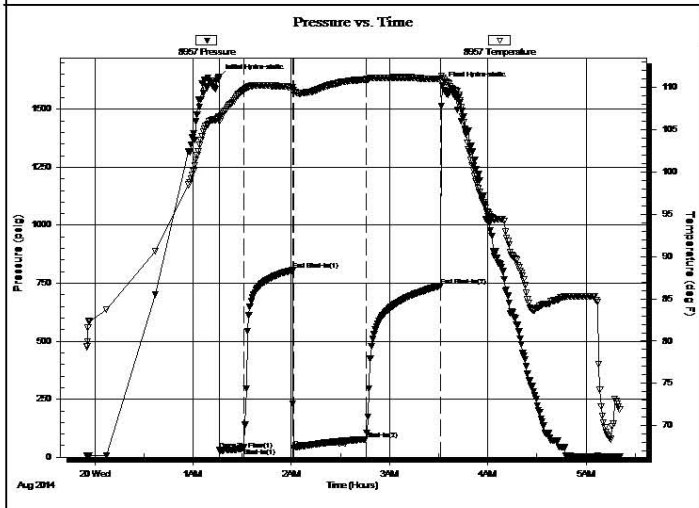
	<b>DRILL STEM TEST REPORT</b>	
	TDI Inc. 1310 Bison Rd Hays KS 67601 ATTN: Herb D	<b>9-15-19, Ellis, KS</b>  <b>Bieler #2</b> Job Ticket: 53964 <b>DST#: 2</b> Test Start: 2014.08.19 @ 23:55:00

**GENERAL INFORMATION:**

Formation: <b>KC "C"</b>	Test Type: Conventional Bottom Hole (Reset)
Deviated: No Whipstock: ft (KB)	Tester: Brett Dickinson
Time Tool Opened: 01:16:15	Unit No: 59
Time Test Ended: 05:21:00	
Interval: <b>3342.00 ft (KB) To 3365.00 ft (KB) (TVD)</b>	Reference Elevations: 2035.00 ft (KB)
Total Depth: 3365.00 ft (KB) (TVD)	2028.00 ft (CF)
Hole Diameter: 7.88 inches Hole Condition: Fair	KB to GR/CF: 7.00 ft

<b>Serial #: 8957</b>	<b>Inside</b>		
Press@RunDepth: 77.70 psig @ 3343.00 ft (KB)	Capacity: 8000.00 psig		
Start Date: 2014.08.19	End Date: 2014.08.20	Last Calib.: 2014.08.20	
Start Time: 23:55:05	End Time: 05:20:59	Time On Btm: 2014.08.20 @ 01:15:45	
		Time Off Btm: 2014.08.20 @ 03:32:30	

**TEST COMMENT:** IF-BOB in 6min  
 ISI-No blow  
 FF-BOB in 1/2min  
 FSI-2 1/2in blow



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1637.38	106.55	Initial Hydro-static
1	32.77	106.05	Open To Flow (1)
15	39.05	109.68	Shut-In(1)
45	805.46	110.02	End Shut-In(1)
46	40.78	109.74	Open To Flow (2)
90	77.70	110.95	Shut-In(2)
136	738.69	111.07	End Shut-In(2)
137	1604.57	111.16	Final Hydro-static

Recovery	

Gas Rates	

Length (ft)	Description	Volume (bbl)
60.00	GVSOCM 35%G 5%O 60%M	0.84
105.00	SGO 10%G 90%O	1.47
0.00	1240ft GIP	0.00

\* Recovery from multiple tests


Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

Trilobite Testing, Inc

Ref. No: 53964

Printed: 2014.08.20 @ 08:23:41

### DST # 3 TEST SUMMARY

 <b>TRILOBITE TESTING, INC</b>	<b>DRILL STEM TEST REPORT</b>	
	TDI Inc. 1310 Bison Rd Hays KS 67601  ATTN: Herb D	<b>9-15-19, Ellis, KS</b>  <b>Bieler #2</b> Job Ticket: 53965 <b>DST#: 3</b> Test Start: 2014.08.20 @ 15:15:00

**GENERAL INFORMATION:**

Formation: **KC "D-G"**  
 Deviated: No Whipstock:                      ft (KB)  
 Time Tool Opened: 18:58:15  
 Time Test Ended: 00:33:15

Interval: **3364.00 ft (KB) To 3415.00 ft (KB) (TVD)**  
 Total Depth: 3415.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair

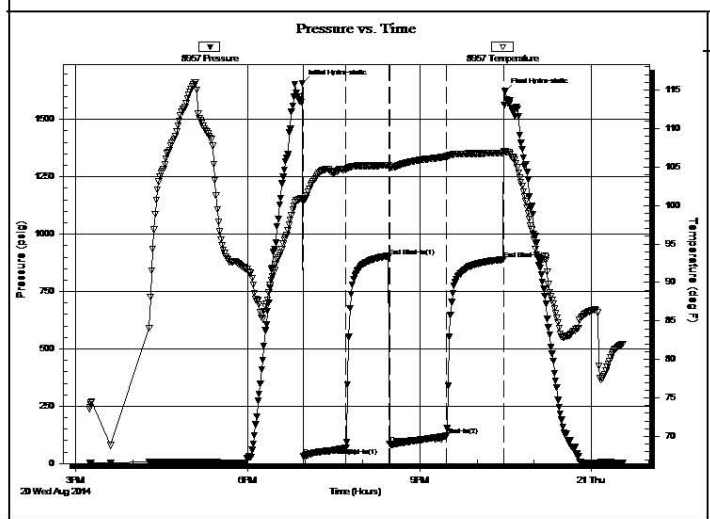
Test Type: Conventional Bottom Hole (Reset)  
 Tester: Brett Dickinson  
 Unit No: 59

Reference Elevations: 2035.00 ft (KB)  
 2025.00 ft (CF)  
 KB to GR/CF: 10.00 ft

**Serial #: 8957      Inside**

Press@RunDepth: 120.19 psig @ 3365.00 ft (KB)      Capacity: 8000.00 psig  
 Start Date: 2014.08.20      End Date: 2014.08.21      Last Calib.: 2014.08.21  
 Start Time: 15:15:05      End Time: 00:33:15      Time On Btm: 2014.08.20 @ 18:57:15  
 Time Off Btm: 2014.08.20 @ 22:29:00

**TEST COMMENT:** IF-BOB in 29min  
 IS- No blow  
 FF-BOB in 49min  
 FS- 1/2in blow



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1658.47	100.86	Initial Hydro-static
1	33.33	100.42	Open To Flow (1)
46	68.55	104.65	Shut-In(1)
91	901.18	105.24	End Shut-In(1)
92	84.37	105.00	Open To Flow (2)
151	120.19	106.35	Shut-In(2)
211	889.30	106.82	End Shut-In(2)
212	1622.16	107.03	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
120.00	GVSOCM 10%G 10%O 20%W 50%M	1.00

Gas Rates			
Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)	

120.00	SGOWCM 10%G 10%O 30%W 30%M	1.86
60.00	SGOWCM 10%G 10%O 10%W 70%M	0.84
45.00	GOCM 20%G 25%O 55%M	0.63
0.00	310ft GIP	0.00

\* Recovery from multiple tests

Trilobite Testing, Inc

Ref. No: 53965

Printed: 2014.08.21 @ 08:51:57

### DST # 4 TEST SUMMARY


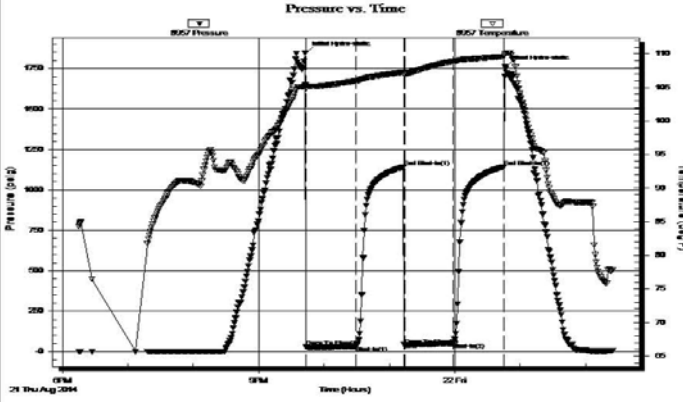
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<p>TDI Inc. 1310 Bison Rd Hays KS 67601 ATTN: Herb D</p>	<p><b>9-15-19, Ellis, KS</b> <b>Bieler #2</b> Job Ticket: 53966      <b>DST#: 4</b> Test Start: 2014.08.21 @ 18:15:00</p>																																										
<p><b>GENERAL INFORMATION:</b></p>																																											
<p>Formation: <b>Cong. Sd.</b> Deviated: No Whipstock:                      ft (KB) Time Tool Opened: 21:43:45 Time Test Ended: 02:25:30</p>		<p>Test Type: Conventional Bottom Hole (Reset) Tester: Brett Dickinson Unit No: 59</p>																																									
<p><b>Interval: 3628.00 ft (KB) To 3648.00 ft (KB) (TVD)</b> Total Depth: 3648.00 ft (KB) (TVD) Hole Diameter: 7.88 inches Hole Condition: Fair</p>		<p>Reference Elevations: 2035.00 ft (KB) 2025.00 ft (CF) KB to GR/CF: 10.00 ft</p>																																									
<p><b>Serial #: 8957      Inside</b></p>																																											
<p>Press@RunDepth: 53.67 psig @ 3629.00 ft (KB) Start Date: 2014.08.21      End Date: 2014.08.22 Start Time: 18:15:05      End Time: 02:25:29</p>		<p>Capacity: 8000.00 psig Last Calib.: 2014.08.22 Time On Btm: 2014.08.21 @ 21:43:00 Time Off Btm: 2014.08.22 @ 00:46:30</p>																																									
<p><b>TEST COMMENT:</b> IF-4in blow ISI-No blow FF-2in blow FSI-No blow</p>																																											
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<p>Trilobite Testing, Inc</p>		<p>Ref. No: 53966</p>																																									
<p>Printed: 2014.08.22 @ 06:41:42</p>																																											

Image Header 05

ROCK TYPES



ACCESSORIES

MINERAL

- ▲ Chert, dark
- ∩ Glauconite
- P Pyrite
- Sandy
- △ Chert White

OTHER SYMBOLS

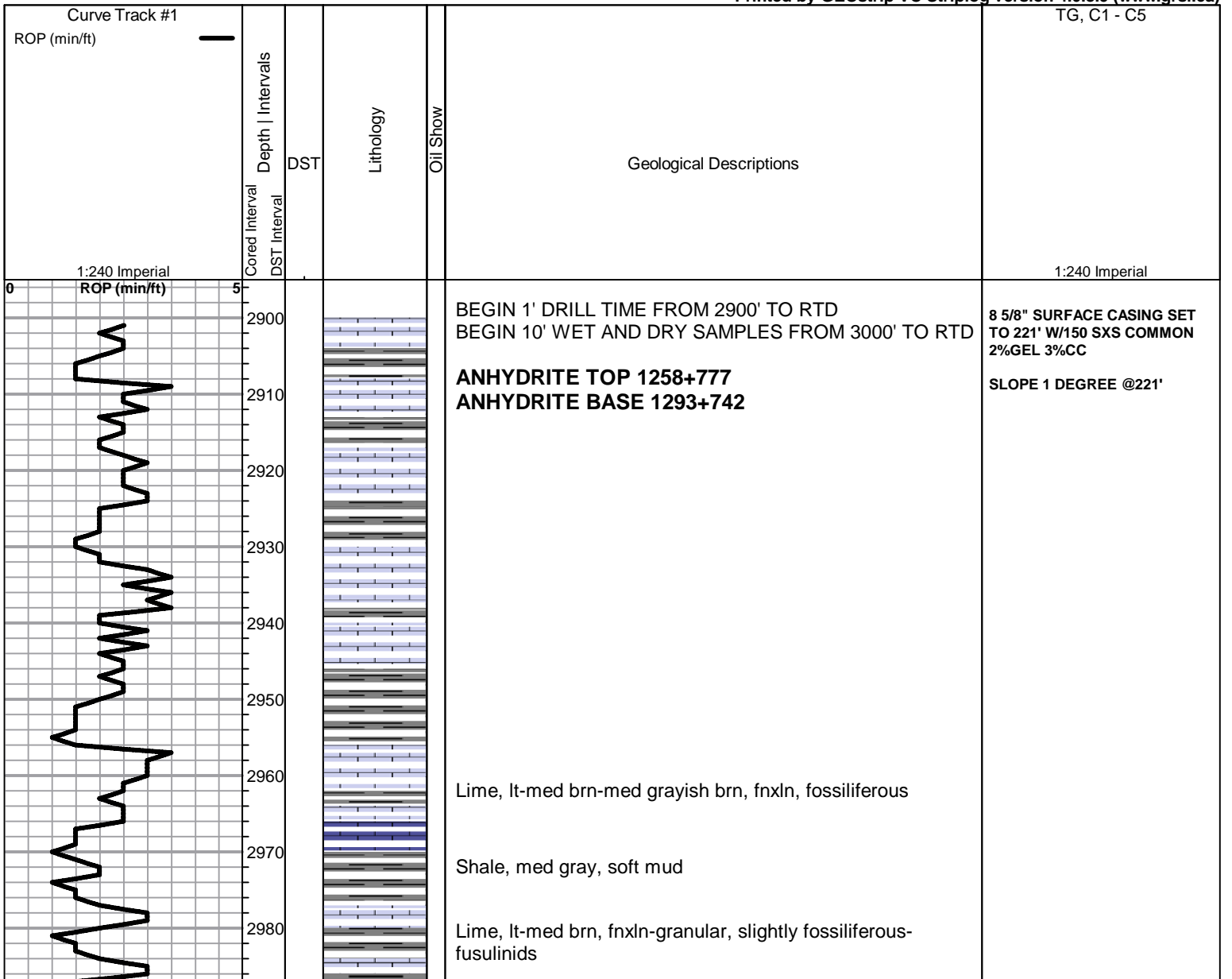
Oil Show

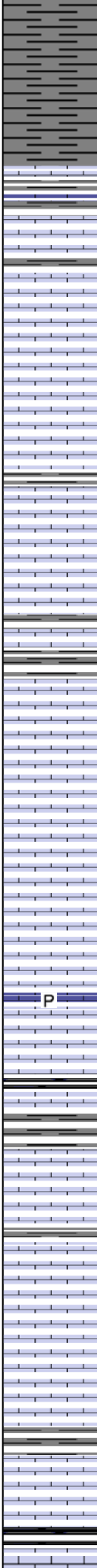
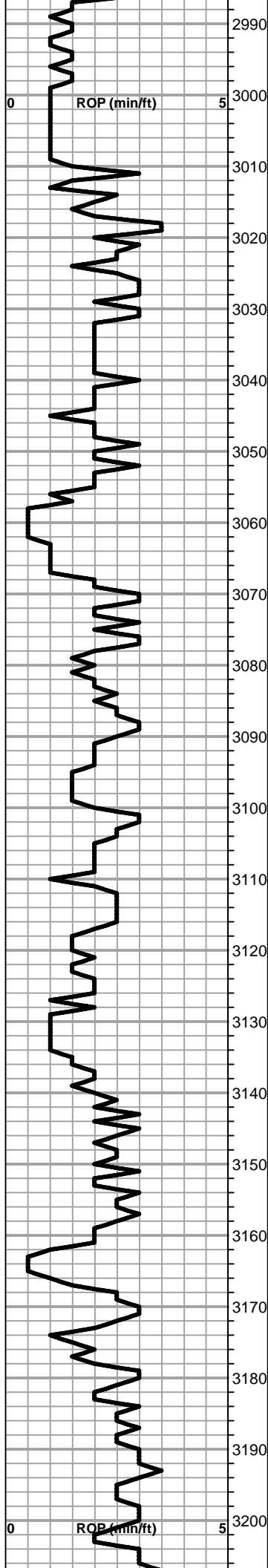
- Good Show
- Fair Show
- Poor Show
- Spotted or Trace
- Questionable Stn
- Dead Oil Stn
- Fluorescence
- \* Gas

DST

- DST Int
- DST alt
- Core
- tail pipe

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





Shale, med gray, soft mud to soft blocky

Lime, lt-med brn, fnxln, slightly fossiliferous

**TOPEKA SPL TOP 3017-982 ELog 3013-978**

Lime, med-dark brn, fnxln, slightly fossiliferous

Lime, lt brn-crm, fnxln, slightly fossiliferous

Lime, med brn, fn-vfxln

Lime, lt brn, fnxln, slight bedded chalk

Lime, offwhite-lt brn, fnxln. bedded chalk with sticky clumps

Lime, lt brn, granular, bedded chalk, NS, No Wet Cut

Lime, lt-med brn, fn-vfxln

Lime, lt-med brn-med grayish brn, fnxln to granular in part

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

Lime, lt-med brn, fn-vfxln

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

Lime, lt-med brn, fnxln-granular, slight bedded chalk, slightly fossiliferous

Lime, lt-med brn, fnxln-granular with lt chalk wash, bedded chalk with sticky clumps in part

Shale, black carbonaceous, blocky

Lime, lt-med brn, fnxln

Lime, crm-lt brn, fn-vfxln, slight bedded chalk

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

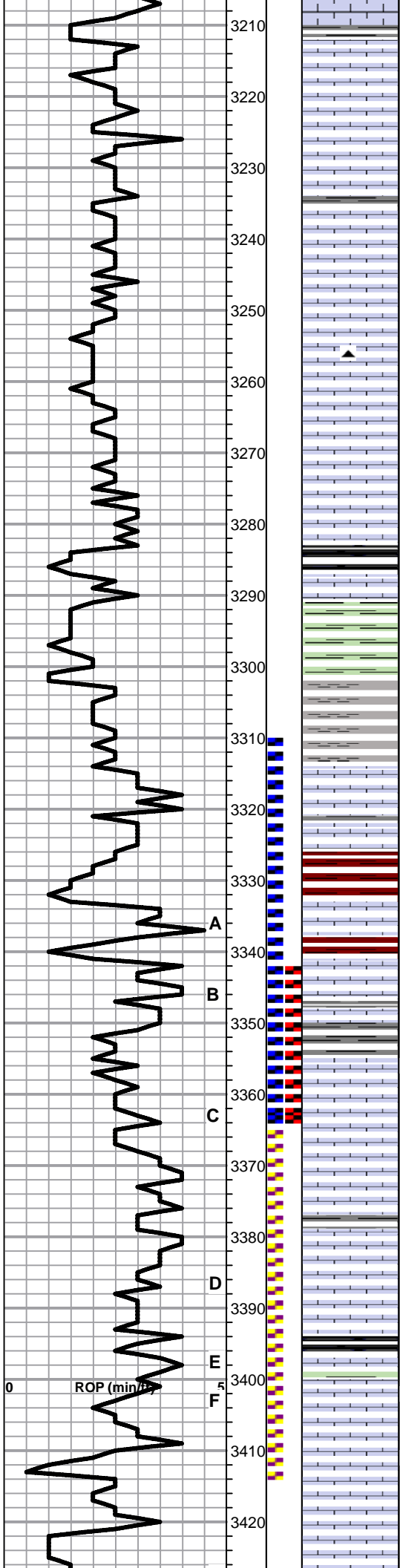
Lime, lt-med brn, fn-vfxln, slight bedded chalk

Lime, lt-med brn, fn-vfxln

Lime, lt-med brn, fn-vfxln, bedded chalk

Shale, black carbonaceous, fissile, blocky

Lime, lt-med brn, fn-vfxln



Lime, lt med brn, fn-xln

Lime, lt-med brn, fn-vfxln, slight bedded chalk

Lime, lt-med brn, fn-vfxln-slightly granular, slight bedded chalk, NS

Lime lt brn, fnxln-granular, bedded chalk with lt chalk wash and sticky clumps

Lime, lt brn, fn-vfxln, slight bedded chalk

Lime, lt-med brn, fnxln-granular, slight-med bedded chalk  
Chert, tan, fresh, sharp

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

Lime, lt brn, fnxln

**HEEBNER SHALE SPL 3283-1248 ELog 3280-1245**

Shale, black carbonaceous, fissile, blocky

Lime, med brn, vf-micro xln

Shale, lt green shale wash, soft mud

Clay, lt gray, soft, sticky

**TORONTO SPL 3302-1267 ELog 3310-1275**

Lime, lt-med brn, fn-micro xln

Lime, med brn-med gray, fn-vfxln

Shale, soft mud, lt red wash

**LKC SPL 3333-1298 ELog 3331-1296**

Lime, lt-dark brn, fn-vfxln, slightly fossiliferous

Shale, reddish brn-dark brn, soft-frn blocky

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

Lime, lt brn-lt grayish brn, fn-micro xln

Shale, dove gray, soft, mud

Lime, lt-med brn, fnxln, very lt odor, one chip oomoldic

Lime, crm-lt brn, fnxln, bedded chalk in part

Lime, lt brn, fnxln, bedded chalk, NS, No Odor

Lime, lt brn, fnxln, bedded chalk

Lime, lt brn, fnxln, bedded chalk, NS

Shale, black carbonaceous, blocky

Lime, lt gray, fn-vfxln, few chips, spotty staining, NFO, very lt odor, specks of organic staining

Lime, lt brn, fnxln, white chalk wash

Lime, lt-med brn, fnxln, few chips, oolitic-oomoldic, fossil fragments, very lt odor, potty stain, inter xln porosity+vugs

Lime, lt brn, fnxln

Lime, lt brn, fnxln-granular, bedded chalk, NS, No Odor

DST # 1 3310' TO 3365'  
PACKER FAILURE

DST # 2 3342' TO 3365' SEE  
HEADER FOR TEST SUMMARY

DST # 3 3364' TO 3415' SEE  
HEADER FOR TEST SUMMARY

ROP (min/ft)

A

B

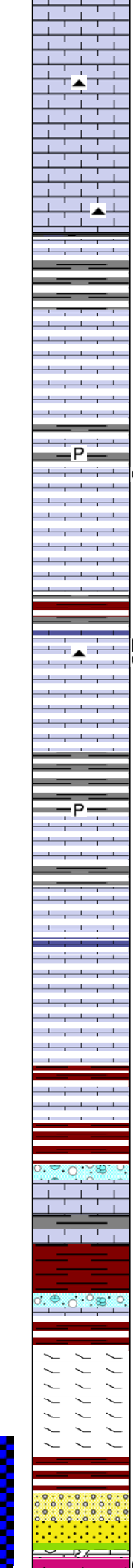
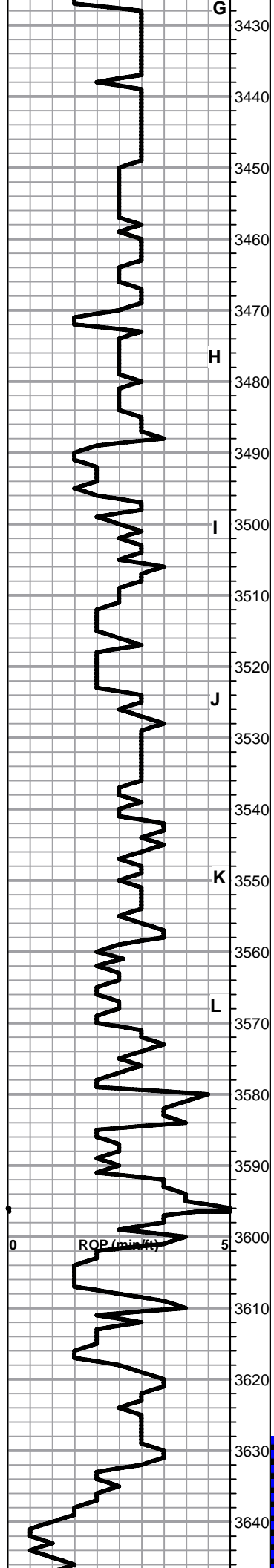
C

D

E

F





Lime, lt brn, fn-xln-granular, bedded chark, NS, No Odor

3430

3440 ▲ Lime, lt brn, fn-vfxln  
Chert, tan, fresh, sharp

3450 Lime, crm-lt brn, fn-vfxln

3460 ▲ Lime, lt gray-med brn, fn-micro xln

3470 Shale, grayish green, soft-firm blocky

3480 Lime, crm-tan, fnxln-vfxln in part, few chips  
oomoldic/granular, NS No Odor

3490 P ○ Lime, crm-lt-med brn, fn-vfxln, few granular with fine inter  
xln porosity, speckled fine staining, NFO, No Odor, Lt wet  
cut, good on crush

3500 I Lime, crm-lt brn, fnxln, slight bedded chalk

3510 Shale, red brn-lt tan, soft mud

3520 ▲ D ○ Lime, crm-lt brn, fnxln, scattered spotty organic stain in fine  
granular lime, NFO, No Odor, few gilsonitic chips

3530 J Lime, crm-buff, fn-vfxln, med bedded chalk

3540 Shale, med-dark gray with green tinting in part, soft blocky

3550 P Lime, crm-tan, fn-micro xln

3560 K Lime, crm-tan-lt brn, fn-micro xln, dark brn lime near shale  
boundary

3570 L Lime, me-lt brn, fn-vfxln

lime, crm-lt brn, fn-micro xln

**BKC SPL 3576-1541 ELog 3572-1537**

3580 Shale, lt red wash  
Lime, crm-med brn, fn-vfxln, no visible porosity

3590 Shale, red, soft mud-firm brown blocky

3600 Lime, lt gry-brn, fn-vfxln, clastic mix in part

3610 Shale, reds, brns, soft blocky

Lime, clastic mix

**MARMATON ELog 3616-1581**

3620 Lime, crm-lt brn, fn-vfxln, slightly dolomitic, orange chert  
fragments, NS

Lime, crm-lt brn, fnxln, increasing tan chert, fresh, sharp

**CONGLOMERATE SAND ELog 3636-1601**

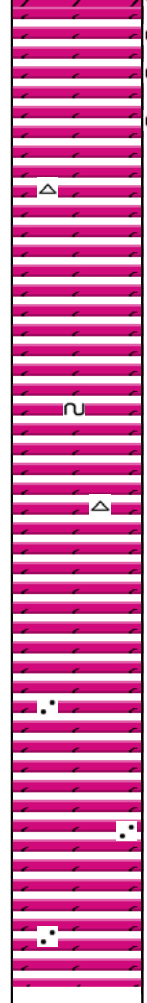
3640 Sandstone, quartz, white cementing, NS

**ARBUCKLE ELog 3644-1609**

CFS 3525'

DST # 4 3628' TO 3648' SEE  
HEADER FOR TEST SUMMARY

3650  
3660  
3670  
3680  
3690  
3700  
3710  
3720  
3730  
3740  
3750



Dolomite, fnxln-fine-med granular, lt odor, saturated staining increasing grain size with depth to coarse xln vugs in part.

Dolomite, fn-cxln granular, lt odor, saturated staining, inter xln porosity

Dolomite, crm, fnxln-granular, clean below o/w contact

Dolomite, crm, fnxln-granular, sucrosic in part

dolomite, crm, granular, few specks of glauconite

Dolomite, ivory, fnxln-granular, sucrosic in part

Dolomite, crm, fnxln-granular

Dolomite, crm, fnxln with clear quartz grain inclusions and fused quartz

**RTD 3750-1715    LTD 3748-1713**

**SLOPE 1 1/4 DEGREE**