

OPERATOR

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

Contact Geologist: TOM DENNING
 Contact Phone Nbr: 785-628-2593
 Well Name: CHARLIE # 1
 Location: W2 NW NE NW SEC. 29-T8S-R19W
 API: 15-163-24,296-00-00
 Pool: INFIELD
 State: KANSAS
 Field: BRAY
 Country: USA



Scale 1:240 Imperial

Well Name: CHARLIE # 1
 Surface Location: W2 NW NE NW SEC. 29-T8S-R19W
 Bottom Location:
 API: 15-163-24,296-00-00
 License Number: 4787
 Spud Date: 7/13/2015 Time: 5:00 PM
 Region: ROOKS COUNTY
 Drilling Completed: 7/19/2015 Time: 2:00 AM
 Surface Coordinates: 330' FNL & 1475' FWL
 Bottom Hole Coordinates:
 Ground Elevation: 2005.00ft
 K.B. Elevation: 2015.00ft
 Logged Interval: 2400.00ft To: 3550.00ft
 Total Depth: 3550.00ft
 Formation: ARBUCKLE
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -99.4688852
 Latitude: 39.3351323
 N/S Co-ord: 330' FNL
 E/W Co-ord: 1475' FWL

LOGGED BY

Company: SOLUTIONS CONSULTING, INC.
 Address: 108 W 35TH
 HAYS, KS 67601

Phone Nbr: (785) 639-1337
 Logged By: GEOLOGIST Name: HERB DEINES

CONTRACTOR

Contractor: SOUTHWIND DRILLING, INC.
 Rig #: 1
 Rig Type: MUD ROTARY
 Spud Date: 7/13/2015 Time: 5:00 PM
 TD Date: 7/19/2015 Time: 2:00 AM

ELEVATIONS

K.B. Elevation: 2015.00ft
K.B. to Ground: 10.00ft

Ground Elevation: 2005.00ft

NOTES

RECOMMENDATION TO RUN PRODUCTION CASING BASED ON POSITIVE RESULTS OF DST # 3

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

DRILL STEM TESTING BY TRILOBITE TESTING INC: ONE FAILED TEST, TWO (2) CONVENTIONAL TESTS

CHARLIE # 1	LOWRY B-3	DON # 1
W2 NW NE NW	S2 NE NW	E2 SE SW SW
SEC.29-8S-19W	SEC.29-8-19W	SEC.20-8-19W
2005'GL 2015'KB	KB 2012'	KB 2013'

<u>FORMATION</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>
Anhydrite	1458 +557	+ 554	+ 553
B-Anhydrite	1490 +525	+ 520	+ 521
Topeka	2968 - 953	- 952	- 950
Heebner Sh.	3170-1155	-1157	-1153
Toronto	3191-1176	-1178	-1174
LKC	3207-1192	-1194	-1191
BKC	3426-1411	-1412	-1411
Arbuckle	3462-1447	-1447	-1449
RTD	3550-1535	-1483	

SUMMARY OF DAILY ACTIVITY

7-13-15 Spud 4:00 PM, set 8 5/8" surface casing to 229.76' w/150 sxs
Common 2%Gel 3%CC, , slope 1 degree

7-14-15 231', plug down 12:30 AM, WOC, drill plug 8:30AM

7-15-15 1920', drilling

7-16-15 2670', drilling, start 1' drill time and samples @ 2400'

7-17-15 3265', drilling, CFS 3225', short trip, CFS 3285', DST #1 Misrun,
recondition hole, DST # 2 3225'-3285' "C" and "D" LKC

7-18-15 3405', CFS 3466', CFS 3468', DST # 3 3410' to 3468' Arbuckle

7-19-15 3550', RTD 3550' @2:20 AM, CCH, TOWB, logs, TIWB, LDDP, run
production casing and cement, rain overnight



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

TDI
1310 Bison Rd.
Hays, KS 67601
ATTN: Herb Deines

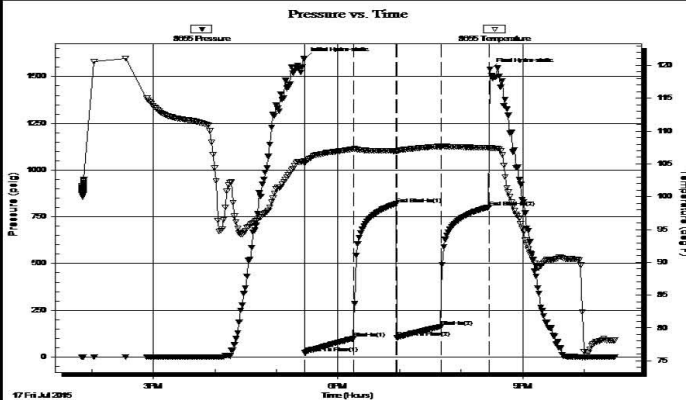
29-8S-19W Rooks, KS
Charlie #1
Job Ticket: 34531 **DST#: 2**
Test Start: 2015.07.17 @ 13:50:13

GENERAL INFORMATION:

Formation: **LKC "C&D"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 17:27:43
Time Test Ended: 22:29:43
Interval: **3225.00 ft (KB) To 3285.00 ft (KB) (TVD)**
Total Depth: 3285.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Reference Elevations: 2015.00 ft (KB)
2007.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8655 Outside
Press@RunDepth: 161.94 psig @ 3249.00 ft (KB)
Start Date: 2015.07.17 End Date: 2015.07.17
Start Time: 13:50:14 End Time: 22:29:43
Capacity: 8000.00 psig
Last Calib.: 2015.07.17
Time On Btm: 2015.07.17 @ 17:27:13
Time Off Btm: 2015.07.17 @ 20:28:13

TEST COMMENT: 45- IF- BOB 23mins
45- IS- No blow
45- FF- BOB 39mins
45- FS- No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1597.75	105.46	Initial Hydro-static
1	21.99	105.11	Open To Flow (1)
48	98.60	107.22	Shut-In(1)
90	819.07	106.95	End Shut-In(1)
91	104.17	106.88	Open To Flow (2)
133	161.94	107.66	Shut-In(2)
180	801.76	107.43	End Shut-In(2)
181	1540.64	107.48	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
315.00	WM, 45%W 55%M	4.47
1.00	∞	0.01

* Recovery from multiple tests

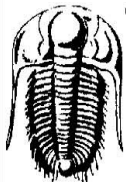
Gas Rates

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

Trilobite Testing, Inc

Ref. No: 34531

Printed: 2015.07.17 @ 23:21:39



TRILOBITE TESTING, INC.

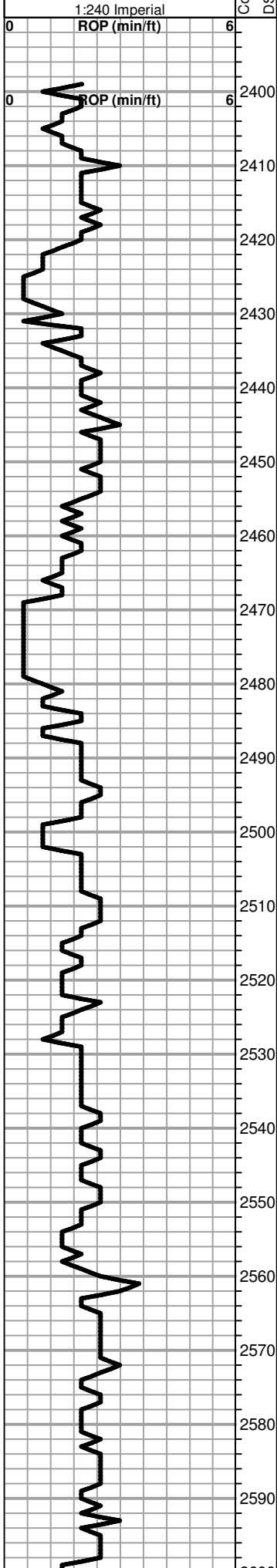
DRILL STEM TEST REPORT

TDI
1310 Bison Rd.
Hays, KS 67601
ATTN: Herb Deines

29-8S-19W Rooks, KS
Charlie #1
Job Ticket: 34532 **DST#: 3**
Test Start: 2015.07.18 @ 13:55:09

GENERAL INFORMATION:

Formation: **Arbuckle**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 15:43:09
Test Type: Conventional Bottom Hole (Reset)
Tester: Brannan Lonsdale



BEGIN 1' DRILL TIME FROM 2400' TO RTD
 BEGIN 10' WET AND DRY SAMPLES FROM 2400' TO RTD

ANHYDRITE TOP 1458+557
ANHYDRITE BASE 1490+525

1:240 Imperial

8 5/8" SURFACE CASING SET TO 229.76' W/ 150 SXS
 COMMON 2%GEL 3%CC

SLOPE 1 DEGREE @ 232'

Lime, white, med-coarse grained granular, slight fossil fragment content, no wet cut, NS

Shale, red wash, soft sticky clumps

Shale, reddish brn, soft sticky clumping with lt red wash

Lime, lt brn, oolitic/oomoldic, honeycomb appearance, NS, no wet cut

Lime, white-lt brn, fnxln with oomoldic/fossil fragment chips, NS

Shale, reddish brn, soft sticky clumping

Lime, white-frm-lt brn, fnxln-oomoldic in part, NS

Lime, lt brn, fnxln-oomoldic in part, NS

Shale, med-dark brn, slightly waxy, med-firm blocky

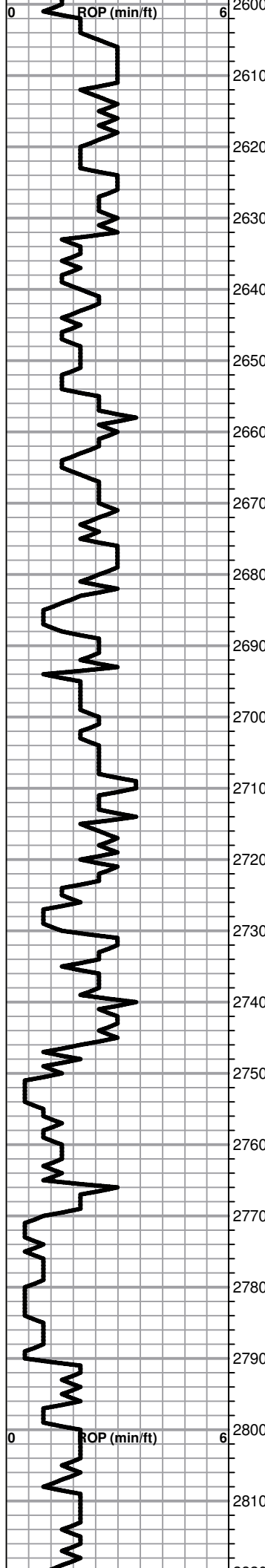
Shale, red-reddish brn-med gray, soft-firm blocky

Lime, offwhite, soft granular, NS

Shale, reddish brn, soft sticky

Lime, frm-lt brn-lt gray, fnxln, lt green shades in part

Lime, frm, fnxln-granular, soft on crush



Lime, white-crm, soft granular with chalk, NS

Lime, crm, fnxln-granular

Lime, crm, fnxln

Lime, lt brn, slightly oomoldic, NS

P

Shale, gray, pyritic clusters

Lime, white-lt brn, fnxln

Shale, reddish brn, firm blocky

Lime,crm-lt brn, fnxln

Shale, lt-med gray, soft sticky clumps-soft blocky

Lime, lt brn, fnxln

Shale, decreasing reds and browns, increasing grays

Lime, crm, fnxln, thin beds of micro fossils well cemented

○

Lime, crm-lt brn, fnxln, thin fossil beds near shale boundaries

P

Lime, offwhite-lt brn-lt gray, fnxln, xln pyrite

Lime, offwhite-lt gray-lt grayish brn, fnxln

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

○

Few sandstone clusters, fnxln grained, poorly sorted, NS

Lime, lt-med gray, soft

Shale, lt-med gray, soft blocky

Lime, lt brn, fnxln

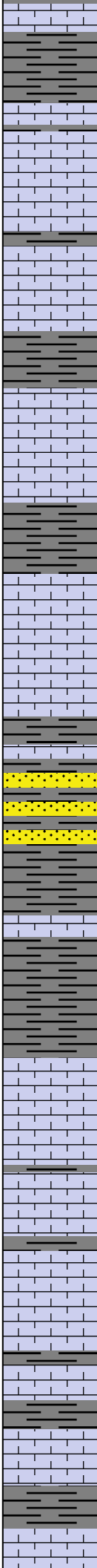
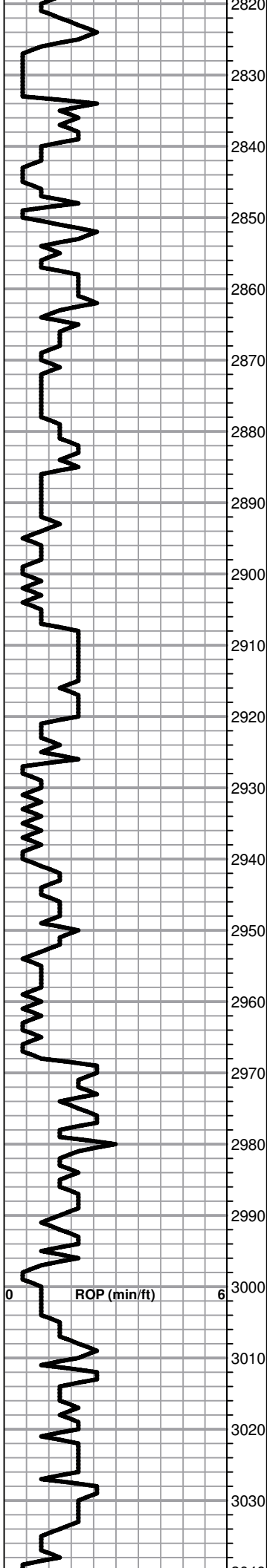
Shale, lt gray, soft blocky

Shale, lt-med gray, soft blocky

Lime, crm-lt grayish brn, fnxln

Lime, lt brn, fnxln, slightly fossiliferous

Lime, lt brn-lt grayish brn, fnxln



Lime, lt brn-lt grayish brn, fnxln

Lime, crm-tan, fnxln-granular, fossil fragments, NS

Lime, crm-tan-med gray near shale boundaries, fnxln-granular, slightly fossiliferous

Lime, lt brn, fnxln

Shale, lt-med gray, soft

Lime, gray on boundary, fnxln, slightly fossiliferous

Lime, lt brn-lt gray, fnxln

Lime, lt brn, fnxln, fossiliferous

Shale, lt-med gray, soft blocky

Lime, lt-med brn-med grayish brn, fnxln-granular, gray mottling near shale boundary

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

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

Shale, med gray, soft sticky clumps

Sandstone, fine grained, poorly sorted, micaceous, NS

Shale, lt gray, soft mud

Shale, lt-med gray, soft mud-soft blocky

TOPEKA ELog 2968-953

Lime, lt brn-lt gray, fnxln

Lime, lt brn, fn-vfxln

Lime, crm-lt brn, fnxln

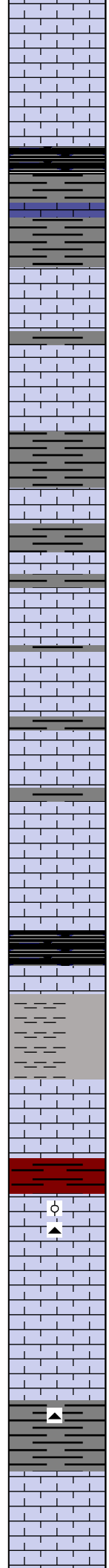
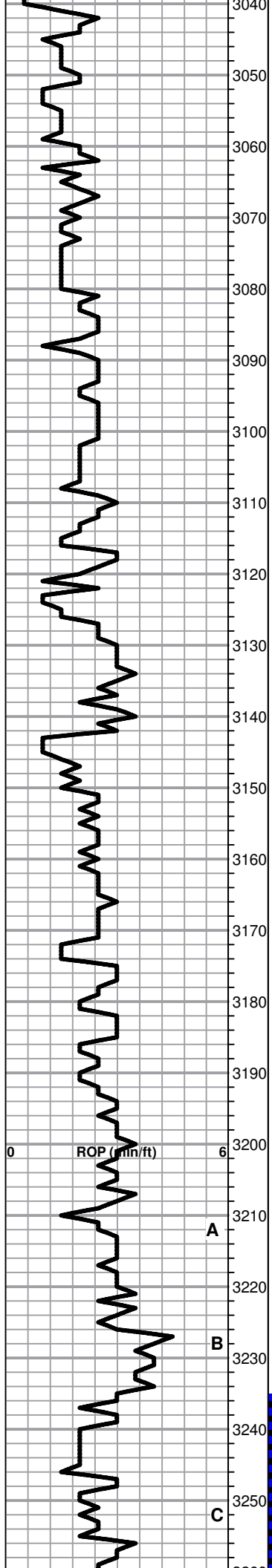
Lime, lt brn-lt grayish brn, fine granular, shaley in part, NS

Lime, lt brn-lt grayish brn, fnxln, soft on crush

Lime, lt brn, fnxln, slightly granular in part

Lime, lt-med brn, fn-vfxln, thin cemented fossil beds

Lime, crm-lt brn, fnxln-granular with sticky chalk clumps



Lime, crm-lt brn, fnxln-granular, some sticky chalk clumps

Shale, black carbonaceous

Lime, med brn, fn-vfxln

Lime, crm-lt gray, fnxln, sub lithographic

Lime, crm-tan, fn-vfxln

Lime, crm-lt brn, fnxln

Shale, red-gray, soft sticky

Lime, lt-med gray, fnxln, gray mottling in part

Shale, gray-black, soft blocky

Lime,lt brn, fnxln-granular in part

Lime, lt brn-lt gray, fn-vfxln

Lime, lt brn, fn-vfxln

● Lime, crm-tan, fine oolitic with fossil fragments, dark stain in interoolitic porosity, scattered to saturated staining,lt odor, NFO

Lime, lt brn, fnxln

Lime, crm-tan, fnxln, slight bedded chalk

HEEBNER SHALE ELog 3170-1155

Shale, black carbonaceous, fissile, blocky

Lime, lt brn, vfxln

Shale, dove gray, soft sticky

TORONTO ELog 3191-1176

Lime, crm-tan, fn-vfxln, NS

Lime, crm-lt brn, fn-vfxln

LKC ELog 3207-1192

○ Lime, crm-tan, mostly fn-vfxln, thin oolitic zone with scattered pin point vugs, spotty stain, very lt odor, NFO, not well developed

Lime, crm, fn-micro xln

Lime, crm, fn-micro xln, tint of lt gray near shale boundary

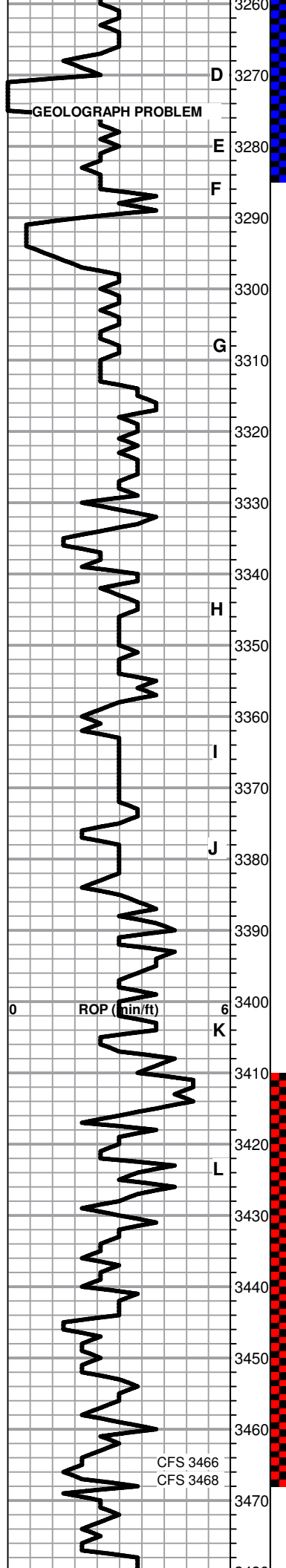
▲ Shale, med-dark gray, soft blocky , black chert, fresh, sharp

○ Lime, white-crm, mostly fnxln with slightly oolitic/granular with spotty lt staining, NFO, poorly developed

Shale, red gray, soft blocky

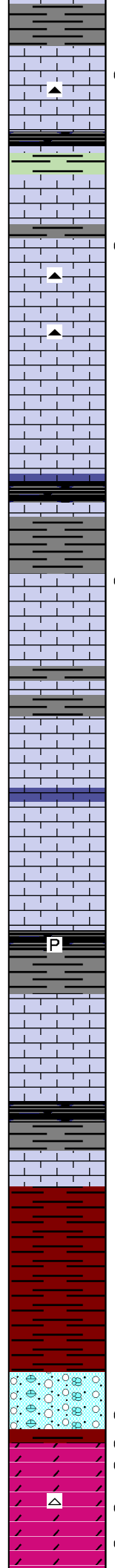
DST # 1 3225' TO 3285' HIT SAND BRIDGE IN CEDAR HILL SAND. PULLED TOOL, RECONDITIONED HOLE AND RAN DST # 2 OVER SAME INTERVAL

DST # 2 3225' TO 3285' SEE HEADER FOR TEST



GEOLOGRAPH PROBLEM

D 3270
 E 3280
 F 3290
 G 3310
 H 3350
 I 3370
 J 3380
 K 3410
 L 3420



Shale, red-gray, soft blocky

○ Lime, white-cream, mostly fnxn, thin zone of oolitic/oomoldic with scattered lt staining, NFO

Shale, gray-black carbonaceous
 Lime, lt gray, fnxn

Lime, cream, fn-vfxln

○ Lime, cream, oolitic/oomoldic, spotty stain, NFO, No Odor

Lime, cream-tan, fnxn, bedded chalk
 Chert, tan-lt gray, fresh, sharp

▲

Lime, white-cream, fn-micro xln, lithographic

Lime, cream, fn-micro xln, bedded chalk

Lime, cream-med grayish brn, mottled
 Shale, gray-black carbonaceous, slightly fossiliferous

Shale, lt gray, soft sticky clumps

○ Lime, cream-tan, mostly fnxn, trace of spotty stain in poorly developed fine grained section with inter xln porosity

Lime, offwhite-cream, fn-micro xln

Lime, cream-lt brn, fn-micro xln

Lime, cream-lt brn, fn-vfxln

Lime, lt brn, fn-micro xln, slight bedded chalk

Lime, lt gray, fn-micro xln, pyrite inclusions
 Shale, black carbonaceous, pyritic

P

Lime, cream-micro xln

Lime, white-cream, fn-micro xln

Shale, gray-black carbonaceous

Lime, cream-lt brn, fnxn-coarse granular, cemented, NS
BKC ELog 3426-1411

Shale, red, soft with red wash, weathered chert residue in part

Shale, red, soft-firm grainy with clastic mix of cherts

Lime, white, fnxn with mix of clastic material including dolomite, lt scattered staining and bleeding chips
ARBUCKLE ELog 3462-1447

● Dolomite,fnxn, spotty stain, improving with depth to xln with vuggy porosity, stain becoming dark indicating low gravity oil, very lt odor

● Dolomite, tan-lt brn, fnxn with vuggy development, dark contact staining, very lt odor

DST # 3 3410' TO 3468' SEE HEADER FOR TEST SUMMARY

CFS 3466
CFS 3468

