

OPERATOR

Company: HERTEL OIL COMPANY, LLC
 Address: 704 E 12TH ST.
 HAYS, KANSAS 67601

Contact Geologist: MIKE HERTEL
 Contact Phone Nbr: 785-628-2445
 Well Name: WERTH-PFANNENSTIEL UNIT # 2
 Location: N2 NW SW SE Sec.14-15s-19w
 Pool: INFIELD
 State: KANSAS

API: 15-051-26,572-00-00
 Field: MARTINA NORTH
 Country: USA



Scale 1:240 Imperial

Well Name: WERTH-PFANNENSTIEL UNIT # 2
 Surface Location: N2 NW SW SE Sec.14-15s-19w
 Bottom Location:
 API: 15-051-26,572-00-00
 License Number: 33625
 Spud Date: 8/1/2013 Time: 3:30 PM
 Region: ELLIS COUNTY
 Drilling Completed: 8/7/2013 Time: 7:34 AM
 Surface Coordinates: 1150' FSL & 2310' FEL
 Bottom Hole Coordinates:
 Ground Elevation: 2002.00ft
 K.B. Elevation: 2010.00ft
 Logged Interval: 2900.00ft To: 3616.00ft
 Total Depth: 3616.00ft
 Formation: LANSING-KANSAS CITY
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -99.4014258 Latitude: 38.7434431
 N/S Co-ord: 1150' FSL
 E/W Co-ord: 2310' FEL

LOGGED BY

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

Phone Nbr: (785) 639-1337
 Logged By: Geologist Name: HERB DEINES/CHRIS NEELY

CONTRACTOR

Contractor: DISCOVERY DRILLING INC.
 Rig #: 3
 Rig Type: MUD ROTARY
 Spud Date: 8/1/2013 Time: 3:30 PM
 TD Date: 8/7/2013 Time: 7:34 AM
 Rig Release: 8/8/2013 Time: 12:45 AM

ELEVATIONS

NOTES

RECOMMENDATION TO PLUG AND ABANDON WELL BASED ON NEGATIVE RESULTS OF TWO DSTS AND LACK OF RESERVOIR DEVELOPMENT. THE # 2 WELL WAS VERY SIMILIAR TO THE # 1 WELL IN STRUCTURE AND RESERVOIR DEVELOPMENT.

OPEN HOLE LOGS BY GEMINI WIRELINE: DUAL INDUCTION LOG, COMPENSATED DENSITY NEUTRON LOG, MICRO RESISTIVITY LOG.

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

FORMATION TOPS SUMMARY AND CHRONOLOGY OF DAILY ACTIVITY

	WERTH-PFANNENSTIEL # 2 1150' FSL & 2310' FWL, SW/4 Sec. 14-15s-19w 2002' GL 2010' KB		WERTH-PFANNENSTIEL # 1 1150'FSL & 1505'FEL Sec 14-15s-19w Reference Well
<u>FORMATION</u>	<u>SAMPLE TOPS</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>
Anhydrite	1192+ 818	1200+ 810	+ 809
B-Anhydrite	1240+ 770	1238+ 772	+ 774
Topeka	2996- 986	2994- 984	- 988
Heebner Shale	3261-1251	3259-1249	-1250
Toronto	3280-1270	3279-1269	-1269
LKC	3306-1296	3304-1294	-1294
BKC	3550-1540	3550-1540	-1542
Marmaton	3601-1591		-1593
Congl. Sand	3614-1604		-1607
RTD	3616-1606		
LTD		3616-1606	

SUMMARY OF DAILY ACTIVITY

- 8-01-13 RU, spud 5:30 PM,
- 8-02-13 545', drilling 12 ¼" surface casing hole
- 8-03-13 1200', set 8 5/8" surface pipe to 1199' w/ 450 sxs common 2% gel, 3% CC, plug down 3:00 AM, slope ¾ degree, WOC 12 hrs
- 8-04-13 2125', drilling
- 8-05-13 2880', drilling
- 8-06-13 3410', drilling, short trip in Toronto, start DST # 1 3608' to 3616' Conglomerate sand @11:15PM

8-07-13

3616', finished DST # 1 at 6:41AM, logged down DST # 1, straddle test # 2 3314' to 3386' A-F benches LKC, finished DST #2 at 5:00PM, decision to P&A due to negative results. Plug down 11:30PM

DST # 1 CONGLOMERATE SAND 3608' TO 3616'

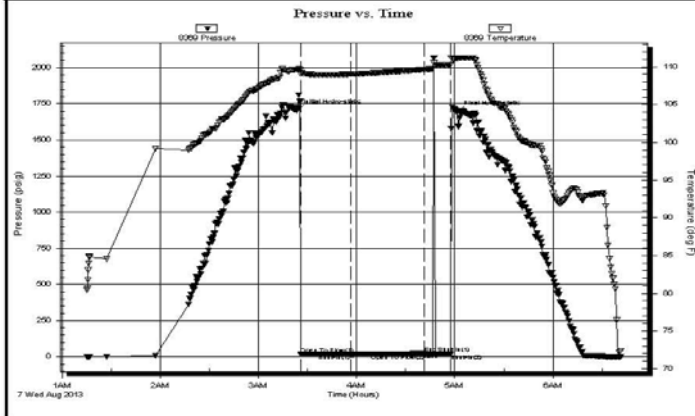
	DRILL STEM TEST REPORT	
	Hertel Oil Company LLC 704 E 12th st Hays Ks 67601-3440 ATTN: Mike Hertel	14-15s-19w Ellis Werth-Pfannestiel#1 Job Ticket: 54265 DST#: 1 Test Start: 2013.08.07 @ 01:15:06

GENERAL INFORMATION:

Formation: Congl Sd Deviated: No Whipstock ft (KB) Time Tool Opened: 03:26:01 Time Test Ended: 06:41:30 Interval: 3608.00 ft (KB) To 3616.00 ft (KB) (TVD) Total Depth: 3616.00 ft (KB) (TVD) Hole Diameter: 7.85 inches Hole Condition: Fair	Test Type: Conventional Bottom Hole (Initial) Tester: Ray Schwager Unit No: 70 Reference Elevations: 2010.00 ft (KB) 2002.00 ft (CF) KB to GR/CF: 8.00 ft
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Serial #: 8369 Inside Press@RunDepth: 16.40 psig @ 3609.00 ft (KB) Start Date: 2013.08.07 End Date: 2013.08.07 Start Time: 01:15:06 End Time: 06:41:30	Capacity: 8000.00 psig Last Calib.: 2013.08.07 Time On Btm: 2013.08.07 @ 03:23:16 Time Off Btm: 2013.08.07 @ 05:01:31
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TEST COMMENT: 30-IFP-vy w k surface bl died in 4min
 45-ISIP-no bl
 15-FFP-no bl , flushed tool no help



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1703.60	109.64	Initial Hydro-static
3	18.58	109.05	Open To Flow (1)
33	16.40	109.03	Shut-In(1)
78	21.92	109.67	End Shut-In(1)
79	16.69	109.67	Open To Flow (2)
95	17.23	110.29	Shut-In(2)
99	1694.56	111.15	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
3.00	Mud	0.01

Gas Rates

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

DST # 2 STRADDLE TEST 3314' TO 3386' "C" TO "F" LKC BOTTOM PACKER HELD

	DRILL STEM TEST REPORT	
	Hertel Oil Company LLC 704 E 12th st Hays Ks 67601-3440 ATTN: Mike Hertel	14-15s-19w Ellis Werth-Pfannestiel#1 Job Ticket: 54266 DST#: 2 Test Start: 2013.08.07 @ 10:25:15

GENERAL INFORMATION:

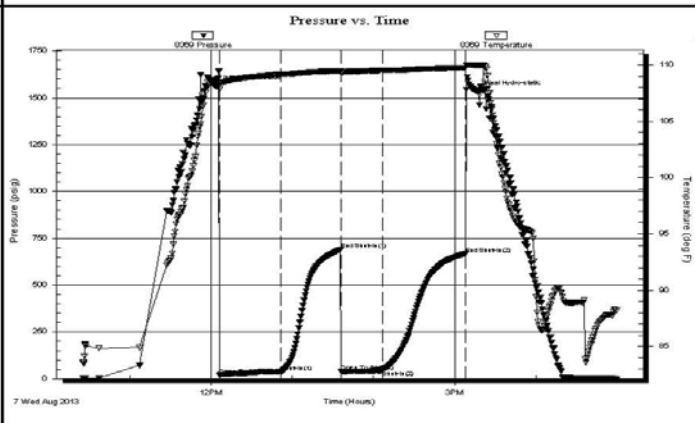
Formation: **LKC C-F**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 12:06:10
 Time Test Ended: 17:00:09
Interval: 3314.00 ft (KB) To 3386.00 ft (KB) (TVD)
 Total Depth: 3616.00 ft (KB) (TVD)
 Hole Diameter: 7.85 inches Hole Condition: Fair

Test Type: Conventional Straddle (Reset)
 Tester: Ray Schwager
 Unit No: 70
 Reference Elevations: 2010.00 ft (KB)
 2002.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 8369 Inside

Press@RunDepth: 43.46 psig @ 3325.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2013.08.07 End Date: 2013.08.07	Last Calib.: 2013.08.07
Start Time: 10:25:15 End Time: 17:00:09	Time On Btm: 2013.08.07 @ 12:03:55
	Time Off Btm: 2013.08.07 @ 15:16:54

TEST COMMENT: 45-IFP-w k bl thru-out 1/4"to 1/2"bl
 45-ISIP-no bl
 30-FFP-surface bl thru-out
 60-FSP-no bl



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1559.60	108.71	Initial Hydro-static
3	18.18	107.83	Open To Flow (1)
48	37.31	109.16	Shut-In(1)
92	690.70	109.47	End Shut-In(1)
93	39.68	109.29	Open To Flow (2)
123	43.46	109.51	Shut-In(2)
185	666.69	109.74	End Shut-In(2)
193	1531.31	109.97	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
45.00	SOCM 1%O99%M	0.36

* Recovery from multiple tests

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

Clystgy	shale, grn	shale, red	Dol Lime
Lmst fw<7	shale, gry	Shcol	Lscong1
Lmst fw>7	Carbon Sh	Ss	CglSandy

ACCESSORIES

MINERAL

- ▲ Chert, dark
- P Pyrite
- Varicolored chert

FOSSIL

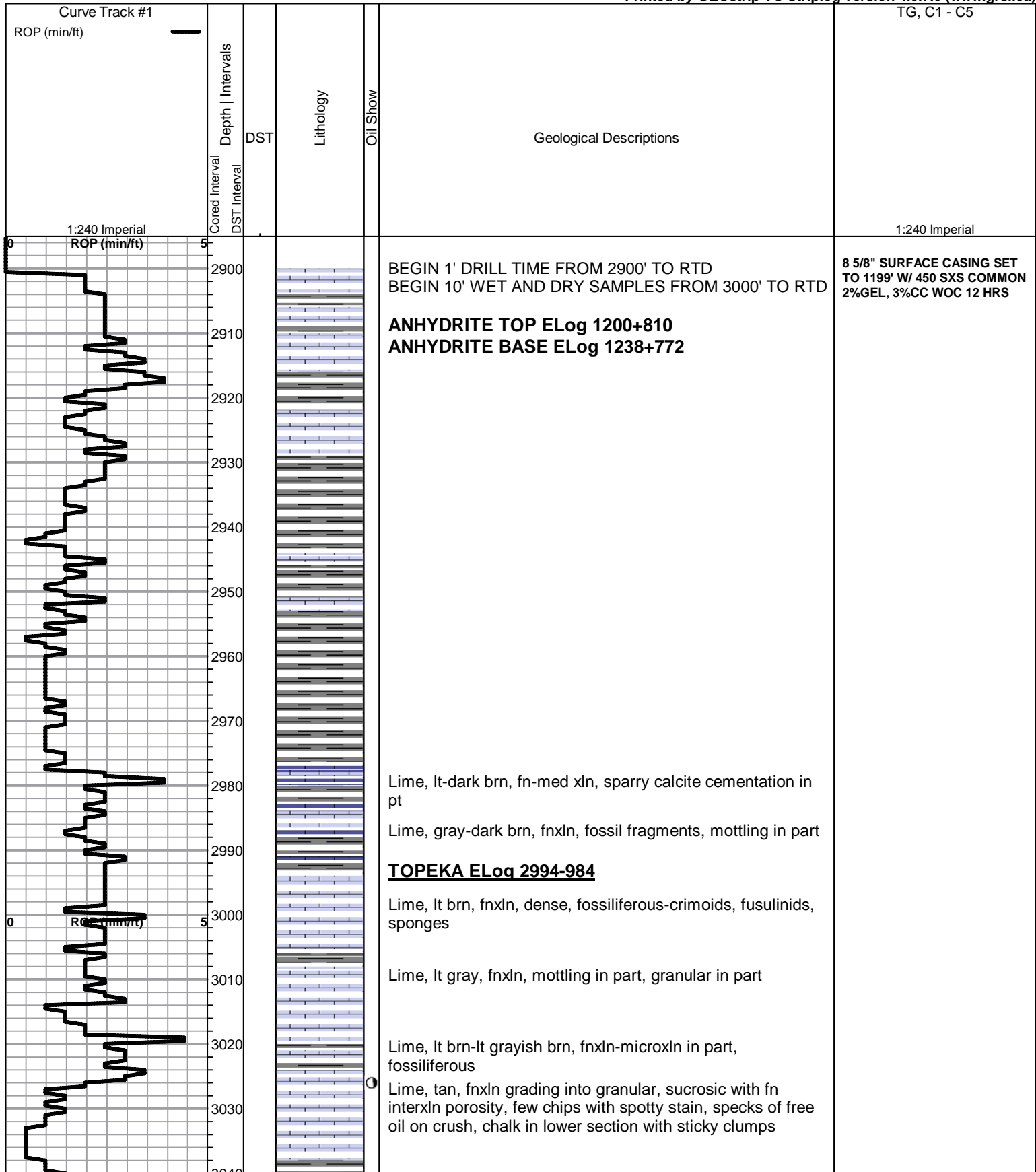
- Oolite
- ⊗ Oomoldic

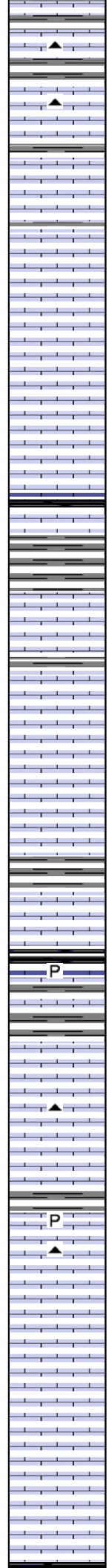
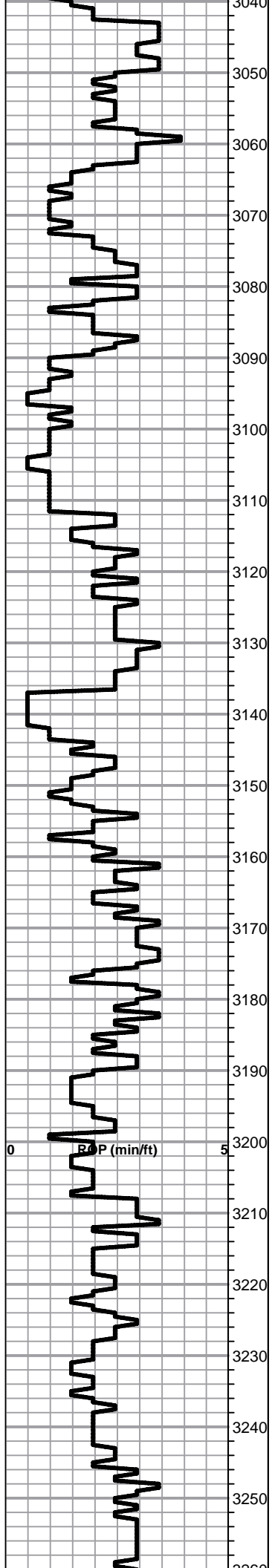
OTHER SYMBOLS

DST

- DST Int
- DST alt
- Core

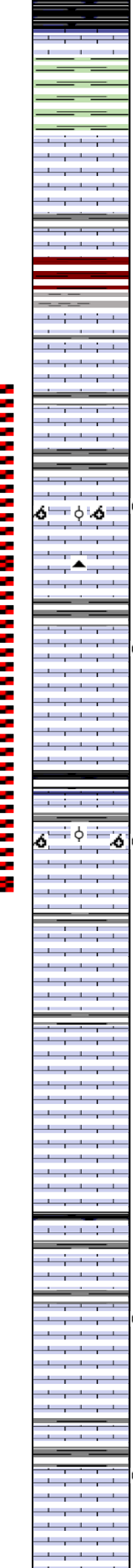
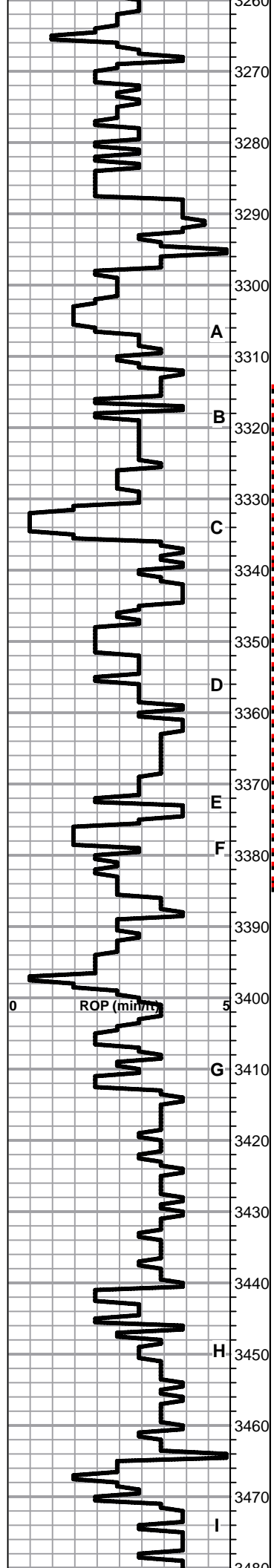
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- 3040 Lime, brn, fn-vfxln, fossiliferous in part
- 3050 Lime, tan-gray, fnxln-granular in part, fossiliferous, traces of sparry calcite in part
- 3060 Lime, tan, fnxln grading into granular, slightly fossiliferous, NS
- 3070 Lime, lt brn, fnxln, slight chalk in part
- 3080 Lime, lt brn, fnxln-granular in part, bedded chalk with scattered lt mottling in part
- 3090
- 3100 Lime, tan-lt gray, granular, chalk in part with lt mottling
- 3110 Shale, black carbonaceous
- 3120 Shale, grayish green, soft sticky clumps in part
- 3130 Lime, tan-brn, fn-vfxln, lithographic and very clean
- 3140 Lime, tan-lt brn, fn-vfxln grading into granular, NS,
- 3150 Lime, tan-lt brn, fnxln
- 3160 Lime, tan-lt brn, fnxln
- 3170 Lime, tan, fnxln, fossiliferous in part
- 3180 Shale, black carbonaceous
Lime, dark gray, vfxln
- 3185 Shale, gray, soft blocky
- 3190 Lime, tan-brn, fnxln-granular in part, bedded chalk in part
- 3200 Lime, tan, fn-vfxl, fossiliferous in part
- 3210 Lime, lt-grayish brn, fnxln, dense, slightly fossiliferous
- 3220 Lime, tan, fn-vfxln, NS
- 3230 Lime, crm-tan, fnxln-granular
- 3240 Lime, tan, fnxln-granular, fossilifeorus
- 3250 Lime, brn, fn-vfxln

HEEBNER SHALE ELog 3259-1249



Shale, black carbonaceous, fissile, blocky

Shale, lime green, soft blocky to soft mud

TORONTO ELog 3279-1269

Lime, crm, fnxln, NS

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

Shale, reddish brn, soft with lt red wash

LKC ELog 3304-1294

Lime, crm-tan, fnxln-granular in part, slight chalk, NS

Lime, tan, fnxln, hard on crush

Lime, tan, fnxln

○ Lime, tan, oolitic/oomoldic, few chips with spotty stain, SFO on crush

▲ Lime, tan-grayish lt brn, fn-vfxln

○ Lime, tan, fnxln-granular, spotty staining, No Odor, NFO

Lime, tan, fn-vfxln

Shale, gray-black carbonaceous

△ ○ Lime, tan-lt brn, oolitic/oomoldic, spotting staining

Lime, tan-lt brn, fn-vfxln

Lime, tan-lt gray, fn-vfxln,

Lime, tan, fnxln-granular in part, NS

Lime, tan, fn-vfxln

Lime, crm-tan, fn-vfxln, clean appearance

Lime, crm, fnxln grading to gray trashy near shale boundary

Shale, black carbonaceous

Lime, tan-lt brn, fn-vfxln, hard on crush

○ Lime, tan, fnxln, spotty stain, NFO, appears poorly developed

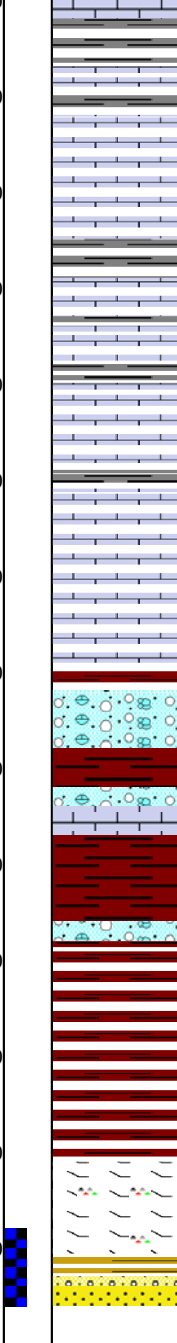
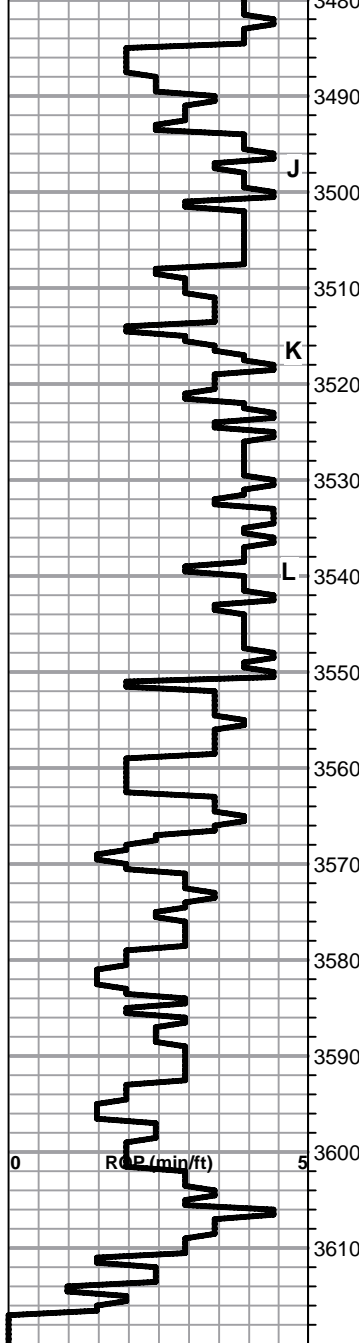
Lime, tan, fn-vfxln

○ Lime, tan-lt brn, oolitic/oomoldic in part, spotty stain

Lime, tan-lt brn, fn-vfxln

DST # 2 STRADDLE TEST
3214'-3386' SEE HEADER FOR
TEST SUMMARY

The microlog shows no
permeability thru this interval



Shale,lt-med gray, soft blocky

Lime, crm, fnxln, granular in part, bedded chalk, NS

Lime, off white-tan, fn-vfxln, NS

Lime, crm, fn-vfxln, bedded chalk with chalky matrix in part

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

Lime, crm-lt grayish brn, fn-vfxln, hard on crush

Lime, tan, fn-vfxln, bedded chalk in part

Lime, tan, fn-vfxln, bedded chalk, hard on crush

BKC ELog 3550-1540

Shale, dark reddish brn, sandy, firm-hard on crush
Lime, clastic mix in part grading to tan, fnxln

Shale, varicolored, firm, blocky

Shale, reddish brn-deep brn, soft blocky

Shale, reddish brn-deep brn, soft blocky

Shale, reddish brn-deep brn, soft blocky

MARMATON SPL 3601-1591

Lime, crm-lt brn, fnxln, dolomitic in part, orange chert

CONGLOMERATE SAND SPL 3614-1604

SS, quartz-recrystallized dolomite, poor sort, sat stain, lt odor, specks of free oil

1st plug @ 1250' w/ 40sxs
2nd plug @ 450' w/ 80 sxs
3rd plug @ 40' w/ 10 sxs
Rathole w/ 30 sxs
Mousehole w/ 15 sxs
Used 175 sxs 60/40 poz 4%gel,
1/4 # flocele per sx

**DST # 1 3608' TO 3616' SEE
HEADER FOR TEST SUMMARY**

Zone similar to # 1 well which
was tested and recovered oil
and a lot of salt water. Top of
zone not a clean sand with
permeability