

# HERTEL

## OIL

*Company, L.L.C.*  
*Hays, Kansas*

Scale 1:240 Imperial

Well Name: PAIGE #1  
Surface Location: E2 SW NE NE 27 - 14S - 18W  
Bottom Location:  
API: 15-051-26477-00-00  
License Number: 33625  
Spud Date: 2/28/2013 Time: 11:00 PM  
Region: ELLIS COUNTY  
Drilling Completed: 3/5/2013 Time: 5:15 AM  
Surface Coordinates: 990' FNL & 870' FEL  
Bottom Hole Coordinates:  
Ground Elevation: 2009.00ft  
K.B. Elevation: 2017.00ft  
Logged Interval: 2800.00ft To: 3700.00ft  
Total Depth: 3700.00ft  
Formation: LANSING-KANSAS CITY  
Drilling Fluid Type: FRESH WATER / CHEMICAL GEL

### OPERATOR

Company: HERTEL OIL COMPANY, LLC  
Address: 704 E 12TH STREET  
HAYS, KS 67601

Contact Geologist: DAVE HERTEL  
Contact Phone Nbr: (785) 628-2445  
Well Name: PAIGE #1  
Location: E2 SW NE NE 27 - 14S - 18W  
Pool: API: 15-051-26477-00-00  
State: KANSAS Field: UNNAMED  
Country: USA

### SURFACE CO-ORDINATES

Well Type: Vertical  
Longitude: -99.3026701 Latitude: 38.8103247  
N/S Co-ord: 990' FNL  
E/W Co-ord: 870' FEL

### LOGGED BY



Company: SOLUTIONS CONSULTING, INC.

Address: 108 W 351H  
HAYS, KS 67601

Phone Nbr: (785)259-3737  
Logged By: Geologist

Name: JEFF LAWLER

**CONTRACTOR**

Contractor: DISCOVERY DRILLING  
Rig #: 1  
Rig Type: MUD ROTARY  
Spud Date: 2/28/2013  
TD Date: 3/5/2013  
Rig Release: 3/6/2013  
Time: 11:00 PM  
Time: 5:15 AM  
Time: 5:00 PM

**ELEVATIONS**

K.B. Elevation: 2017.00ft  
K.B. to Ground: 8.00ft  
Ground Elevation: 2009.00ft

**NOTES**


DUE TO LACK OF RECOVERY ON DRILL STEM TEST AND RESERVIOR DEVELOPMENT DECISION WAS MADE TO PLUG & ABANDON THE PAIGE #1.

RESPECTFULLY SUBMITTED,  
JEFF LAWLER

**WELL COMPARISON SHEET**

FORMATION	PAIGE #1				NENE NE 24-14-18				NW NW SW 26-14-18				S2 SW SW 27-14-18				SE SE NW 27-14-18									
	2017		2008		2008		2031		2073		2055															
	LOGTOPS	SAMPLETOPS	COMP. CARD	LOG	SMPL.	COMP. CARD	LOG	SMPL.	COMP. CARD	LOG	SMPL.	COMP. CARD	LOG	SMPL.												
	DEPTH	DATUM	DEPTH	DATUM	DEPTH	DATUM	DEPTH	DATUM	DEPTH	DATUM	DEPTH	DATUM	DEPTH	DATUM												
ANHYDRITE TOP	1218	799	1218	799					1226	805	-	6	-	6	1257	816	-	17	-	17						
BASE	1254	763	1254	763					1267	764	-	1	-	1	1293	780	-	17	-	17						
TOPEKA	2993	-976	2994	-977	3001	-993	+ 17	+ 16	2997	-966	-	10	-	11	3040	-967	-	9	-	10						
HEEBNER SHALE	3260	-1243	3264	-1247	3250	-1242	-	1	-	5	3271	-1240	-	3	-	7	3297	-1224	-	19	-	23	3305	-1250	+ 7	+ 3
TORONTO	3279	-1262	3284	-1267	3270	-1262	+ 0	-	5	3291	-1260	-	2	-	7	3318	-1245	-	17	-	22	3326	-1271	+ 9	+ 4	
LKC	3306	-1289	3308	-1291	3296	-1288	-	1	-	3	3317	-1286	-	3	-	5	3343	-1270	-	19	-	21	3351	-1296	+ 7	+ 5
BKC	3539	-1522	3552	-1535	3538	-1530	+ 8	-	5	3556	-1525	+ 3	-	10	3582	-1509	-	13	-	26						
CHERTY CONGL.					3583	-1575																				
ARBUCKLE	3628	-1611	3638	-1621	3654	-1646	+ 35	+ 25	3654	-1623	+ 12	+ 2	3668	-1595	-	16	-	26	3684	-1629	+ 18	+ 8				
RTD			3700	-1683	3690	-1682		-	1	3865	-1834		+ 151	3780	-1707		+ 24									
LTD	3700	-1683												3779	-1706	+ 23			3760	-1705	+ 22					

**DST #1 LKC J-K 3468' - 3515' (STRADDLE)**



**TRILOBITE TESTING, INC.**

**DRILL STEM TEST REPORT**

Hertal Oil Company LLC **27-14s-18w**

704 E 12 th St  
Hays Ks 67601 + 3440

ATTN: Dave Hertal

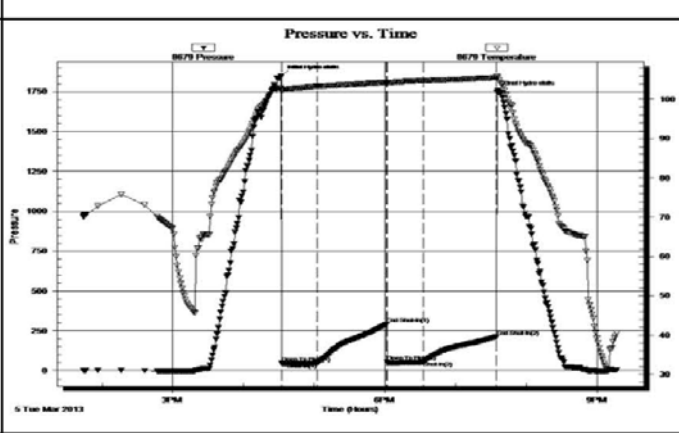
**Paige #1**  
Job Ticket: 50400 **DST# 1**  
Test Start: 2013.03.05 @ 13:44:19

**GENERAL INFORMATION:**

Formation: LKC J - K  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 16:32:19  
Time Test Ended: 21:21:49  
Interval: 3468.00 ft (KB) To 3515.00 ft (KB) (TVD)  
Total Depth: 3700.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Good  
Reference Elevations: 2019.00 ft (KB)  
2011.00 ft (CF)  
KB to GR/CF: 8.00 ft

**Serial #: 8679** Inside  
Press@RunDepth: 57.65 psig @ 3506.00 ft (KB) Capacity: 8000.00 psig  
Start Date: 2013.03.05 End Date: 2013.03.05 Last Calib.: 2013.03.05  
Start Time: 13:44:20 End Time: 21:16:49 Time On Btm: 2013.03.05 @ 16:31:49  
Time Off Btm: 2013.03.05 @ 19:35:19

**TEST COMMENT:** IFP=Fair blow built to 9 in  
ISI=Weak surface blow back died out in 2 min  
FFP=Fair blow built to 5 3/4 in  
FSI=Dead no blow back



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1845.06	102.85	Initial Hydro-static
1	48.34	102.30	Open To Flow(1)
31	48.32	103.27	Shut-In(1)
90	291.10	104.31	End Shut-In(1)
90	55.29	104.20	Open To Flow(2)
121	57.65	104.71	Shut-In(2)
183	213.52	105.48	End Shut-In(2)
184	1746.18	105.80	Final Hydro-static

Recovery		
Length(ft)	Description	Volume(bbl)
55.00	MCGO 10%G 55%O 35%M	0.51
0.00	100-Glp	0.00

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

Trilobite Testing, Inc

Ref. No: 50400

Printed: 2013.03.06 @ 04:24:41

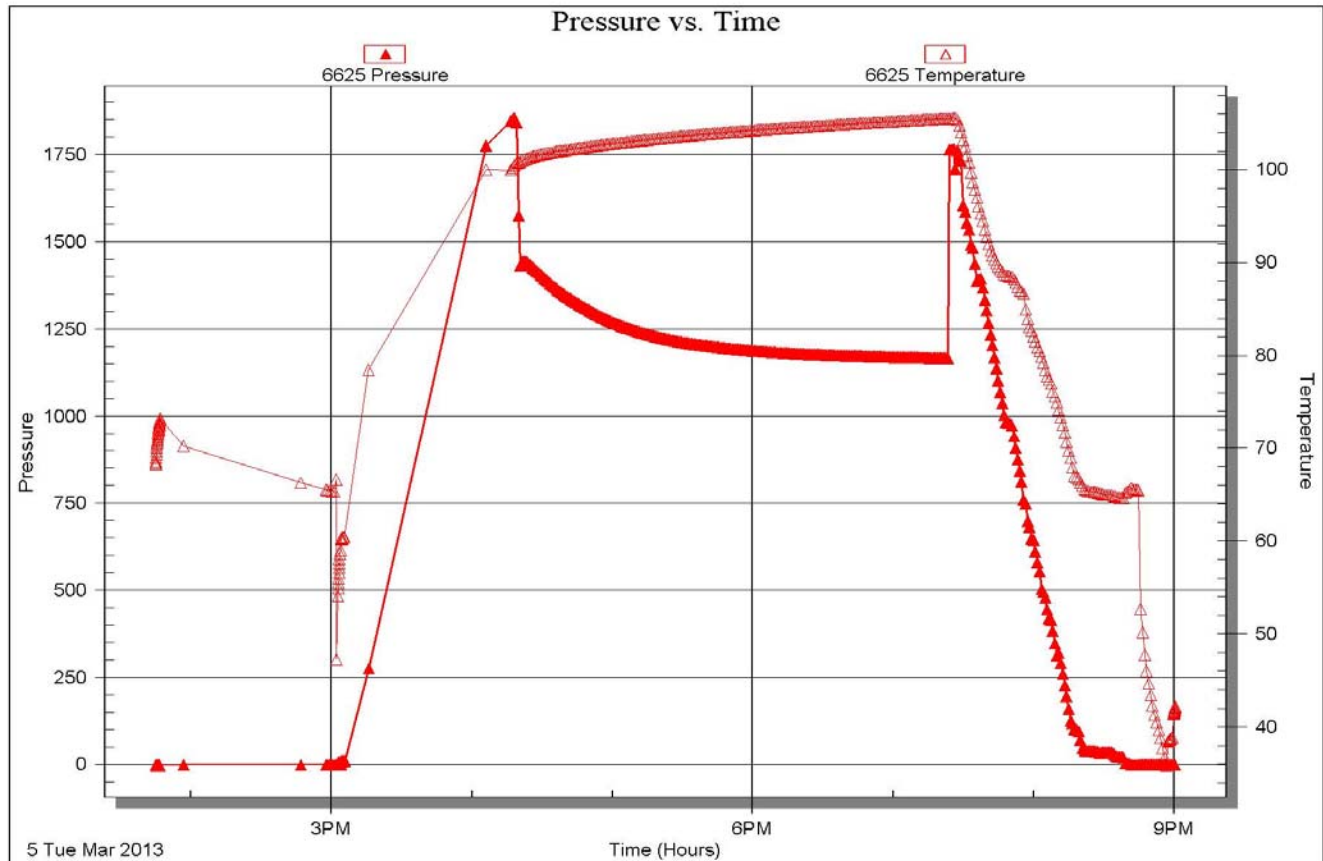
### DST #1 LKC J-K 3468' - 3515' (STRADDLE) BOTTOM PACKER CHART

Serial #: 6625

Below (Straddle) Oil Company LLC

Page #1

DST Test Number: 1

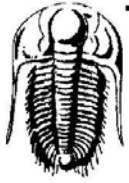


Trilobite Testing, Inc

Ref. No: 50400

Printed: 2013.03.06 @ 08:18:33

## DST #2 LKC CD 3313' - 3364' (STRADDLE)



**TRILOBITE  
TESTING, INC.**

### DRILL STEM TEST REPORT

Hertal Oil Company LLC  
704 E 12 th St  
Hays Ks 67601 + 3440  
ATTN: Dave Hertal

**27-14s-18w**

**Paige #1**

Job Ticket: 48501

**DST#: 2**

Test Start: 2013.03.05 @ 21:58:11

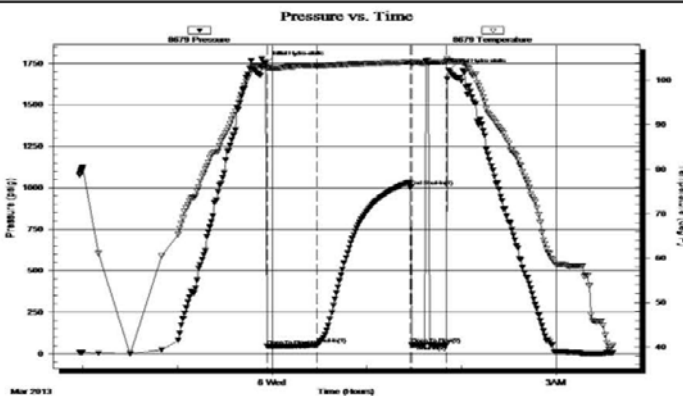
**GENERAL INFORMATION:**

Formation: <b>LKC- C &amp; D</b>	Test Type: <b>Conventional Straddle (Reset)</b>
Deviated: <b>No Whipstock:</b> ft (KB)	Tester: <b>Jeff Brown</b>
Time Tool Opened: <b>23:56:41</b>	Unit No: <b>67</b>
Time Test Ended: <b>03:45:11</b>	Reference Elevations: <b>2019.00 ft (KB)</b>
Interval: <b>3313.00 ft (KB) To 3364.00 ft (KB) (TVD)</b>	<b>2011.00 ft (CF)</b>
Total Depth: <b>3700.00 ft (KB) (TVD)</b>	KB to GR/CF: <b>8.00 ft</b>
Hole Diameter: <b>7.88 inches</b> Hole Condition: <b>Good</b>	

**Serial #: 8679** Inside

Press@RunDepth: <b>53.92 psig @ 3355.00 ft (KB)</b>	Capacity: <b>8000.00 psig</b>
Start Date: <b>2013.03.05</b> End Date: <b>2013.03.06</b>	Last Calib.: <b>2013.03.06</b>
Start Time: <b>21:58:12</b> End Time: <b>03:36:11</b>	Time On Btm: <b>2013.03.05 @ 23:56:11</b>
	Time Off Btm: <b>2013.03.06 @ 01:51:41</b>

**TEST COMMENT:** IFP=Weak blow built to 1/2 in died out in 15 min  
ISI=Dead no blow back  
FFP=Surged then died -Flush tool surged then died



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1753.00	102.98	Initial Hydro-static
1	45.65	102.76	Open To Flow(1)
32	53.92	103.28	Shut-In(1)
92	1003.72	104.05	End Shut-in(1)
92	53.66	103.79	Open To Flow(2)
114	53.27	104.20	Shut-In(2)
116	1710.63	104.44	Final Hydro-static

**Recovery**

Length(ft)	Description	Volume(bbl)
10.00	Mud with a scum of oil	0.05

**Gas Rates**

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

\* Recovery from multiple tests

Trilobite Testing, Inc

Ref. No: 48501

Printed: 2013.03.06 @ 04:16:56

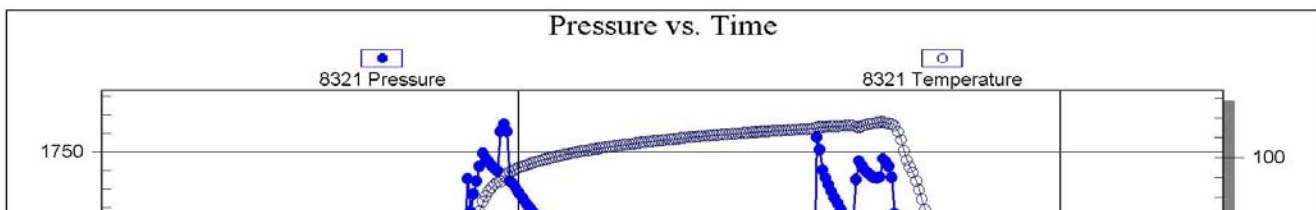
## DST #2 LKC CD 3313' - 3364' (STRADDLE) BOTTOM PACKER CHART

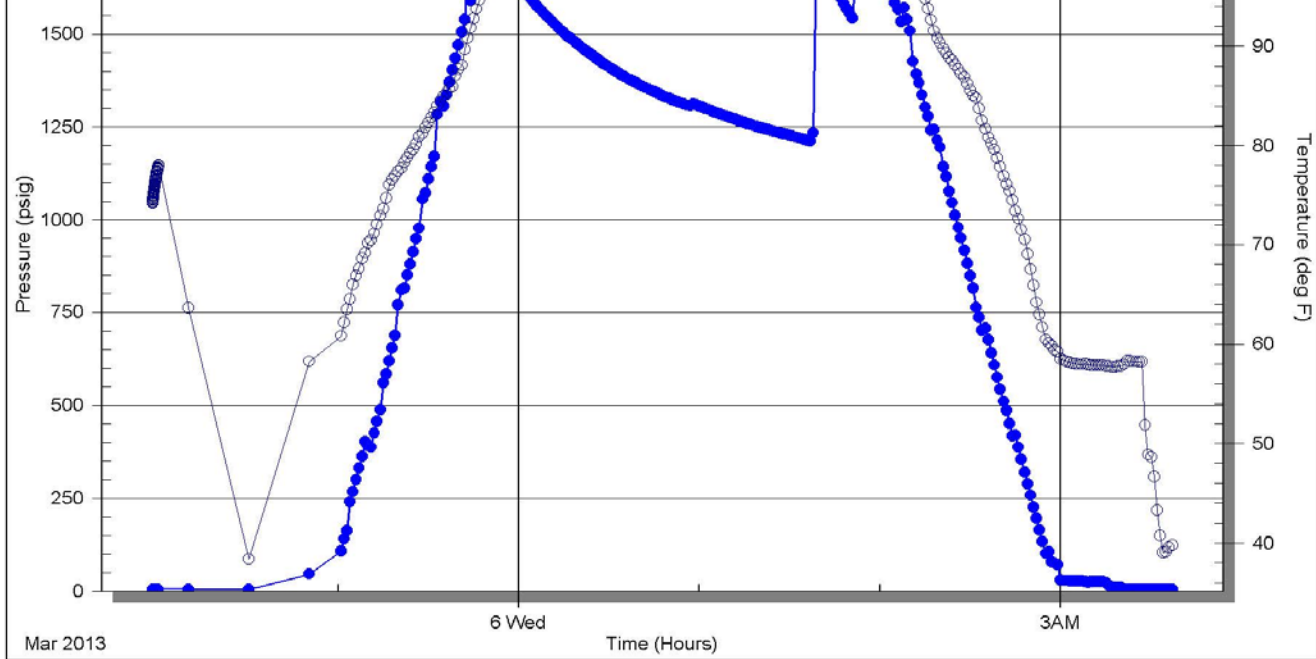
Serial #: 8321

Below (Straddle) Oil Company LLC

Paige #1

DST Test Number: 2



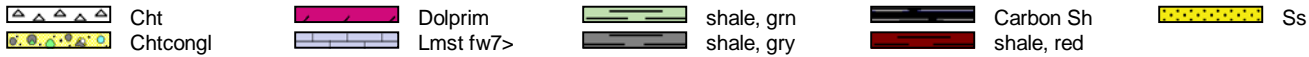


Trilobite Testing, Inc

Ref. No: 48501

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**ROCK TYPES**



**ACCESSORIES**

**MINERAL**  
.\* Sandy

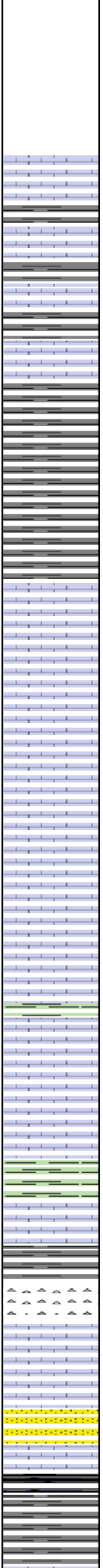
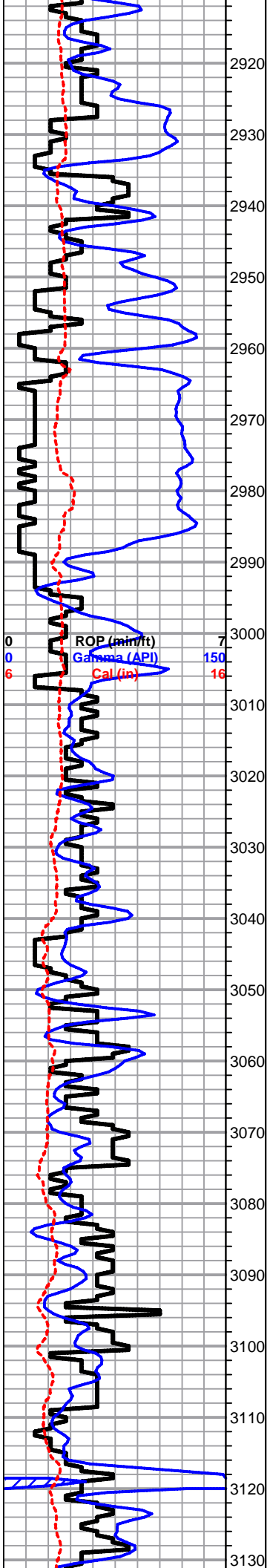
**STRINGER**  
~~~~ Chert

**OTHER SYMBOLS**

**DST**  
■ DST Int  
■ DST alt

Printed by GEOstrip VC Striplog version 4.0.7.0 (www.grsi.ca)

| Curve Track #1 |                |                | Curve Track #3    |              |           |          |                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------|----------------|----------------|-------------------|--------------|-----------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ROP (min/ft)   | Gamma (API)    | Cal (in)       | Depth   Intervals | DST          | Lithology | Oil Show | Geological Descriptions                                                                                                                                                                                                                                                                                                                                                               |
| 1:240 Imperial | 1:240 Imperial | 1:240 Imperial | Cored Interval    | DST Interval |           |          |                                                                                                                                                                                                                                                                                                                                                                                       |
| 0              | 150            | 16             | 2880              |              |           |          | <p><b>1' DRILL TIME THROUGH ANHYDRITE FROM 1200' - 1275'</b><br/> <b>1' DRILL TIME FROM 2900' - RTD</b><br/> <b>10' WET/DRY SAMPLES FROM 2950' - RTD</b><br/> <b>GEOLOGICAL SUPERVISION BY JEFF LAWLER FROM 2950' - RTD</b></p> <p><b>8 5/8" SURFACE PIPE @ 221'</b></p> <p><b>ANHYDRITE TOP 1218' (+801) E-LOG 1218' (+801)</b><br/> <b>BASE 1254' (+765) E-LOG 1254' (+763)</b></p> |
|                |                |                | 2890              |              |           |          |                                                                                                                                                                                                                                                                                                                                                                                       |
|                |                |                | 2900              |              |           |          |                                                                                                                                                                                                                                                                                                                                                                                       |
|                |                |                | 2910              |              |           |          |                                                                                                                                                                                                                                                                                                                                                                                       |



Lm- Tan, FXLN, dense, well cemented, fsl, tight w/ minimal vis. porosity

Sh- Gray Lm Green, gummy argillaceous clumps, sl waxy thin chips, some soft white chalk,  
 Ss- Lt Gray, vf grn, calcareous & shaley

Sh- A/A w/ more white wash chalk & sandy shale

Sh- Gray Lm Green, soft, silty, sandy, calcareous

**TOPEKA 2994' (-975) E-LOG 2993' (-976)** Lm- Cream Off White, Vf Grn & FXLN, dense, massive, mix of lithofied mud matrix w/o vis. porosity & sl fsl, well cemented, tight w/ sctrd micro XLN porosity

Lm- Tan Buff, Crypto XLN, dense, well cemented w/o vis. grains/porosity

Lm- Tan Gray, A/A, sl fsl, tight w/ no vis. porosity

Lm- Tan Cream, FXLn, sl fsl, dense, well cemented, minimal vis. porosity, sctrd interbedded recrystallization

Sh- Lm Green Brick Red Yellow, soft, silty, some sl sandy, gummy white chalk

Lm- Tan, VFXLN, dense, sl fsl, sctrd micro XLN porosity, tight

Lm- Tan, VFXLN, sub-sucrosic dolomitic Ls, gritty, well cemented, mostly consistant XLN porosity, NS

Sh- Mint Green White, soft, sl sandy

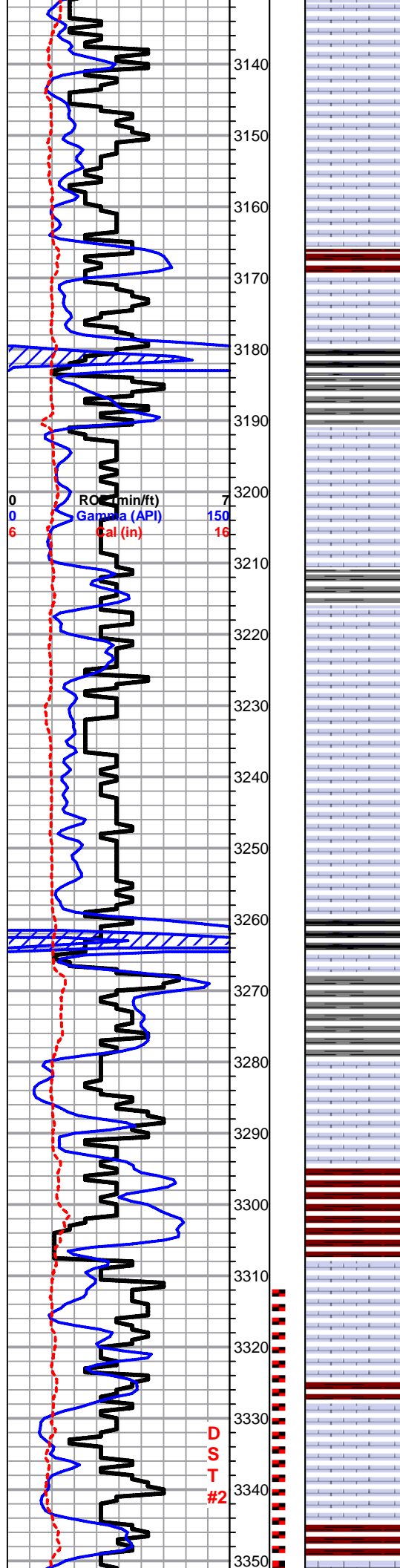
Sh- Gray, soft silty & calcareous

Chert- Lt Gray White, fresh bedded angular sharp chert

Lm- Fn-Med Grn, mud supported matrix, sl sandy, loosely cemented, chalky

Ss- Dove Gray, Fn Grn, well cemented, sl unconsolidated, shaley

Sh- Black Gray, fissile, well compacted, gritty & grainy, carbonaceous, soft & silty, calcareous



Lm- Cream Off White, Crypto XLN, dense, well cemented & brittle, cherty Ls w/o vis. grains/porosity

Lm- White Off White, Crypto XLN, A/A

Lm- Buff Cream, FXLN, fsl, sl developed, dense, fenestral & XLN porosity, clean & barren

Sh- Black Gray, fissile, carbonaceous, soft & sl silty

Sh- Gray Maroon, soft, silty, gritty & earthy

Lm- Cream Off White, VF-FXLN, dense, some sl fsl, sctrd XLN & secondary recrystallization porosity, vry clean

Lm- Cream Lt Gray, FXLN, dense, fsl, high-energy trashy mix, sctrd XLN porosity

Sh- Lt Gray White, silty, soft, gummy white chalk

Lm/Chert- Buff Smokey Gray, dense, well cemented, sctrd mottling, few chips of fsl bedded chert

Lm- Lt Gray, Fn Grn, gritty sl sandy Ls, sl chalky in part, minimal vis. porosity, soft

Lm- Cream Off White, FXLN, dense, well cemented, sl cherty Ls, minimal vis. porosity, vry clean & barren

**HEEBNER 3264' (-1247) E-LOG 3260' (-1243)** Sh- Black Gray White, fissile, carbonaceous, soft & silty, sl unconsolidated, gummy white clumps

Sh- Lt Gray Lm Green, gummy argillaceous clumps & lm grn wash

**TORONTO 3284' (-1267) E-LOG 3279' (-1262)** Lm- White Off White, Crypto - VFXLN, dense, vry well cemented, tight, vry clean, barren

Sh- Maroon Lt Gray Lm Green, soft, gummy sandy lime, few clumps of white chalk

**LKC 3308' (-1291) E-LOG 3306' (-1289)** Lm- Cream Off White, FXLN, dense, well cemented, some sl fsl, poorly developed w/ micro XLN & sctrd XLN porosity, vry clean

Lm- A/A, sl chalky in part w/ sctrd light mottling

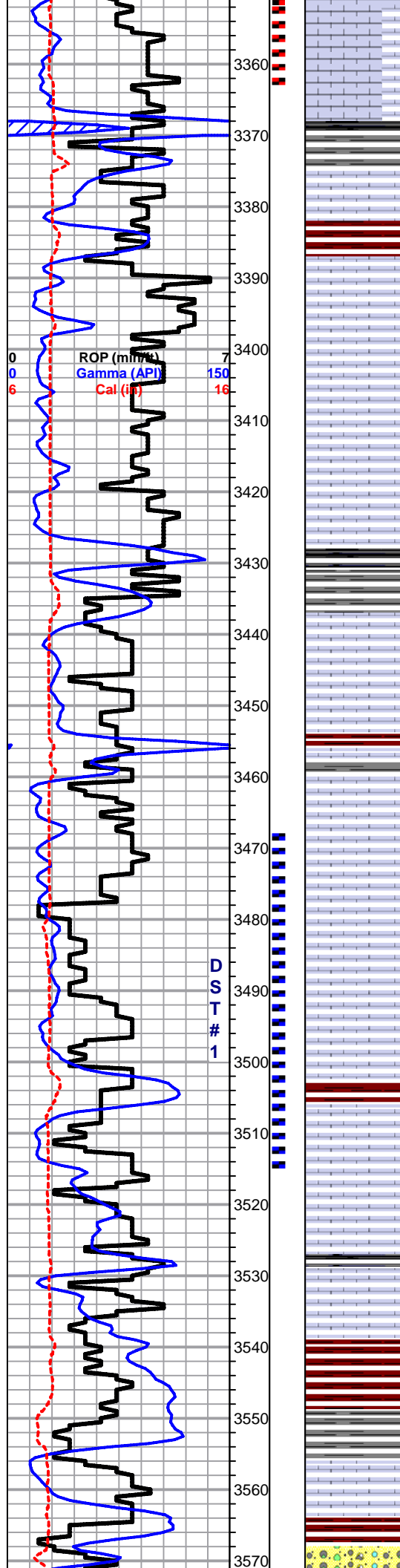
Sh- Maroon Purple, gritty & earthy, few clumps of red wash

Lm- Buff Tan, VFXLN, dense, well cemented cherty Ls, no vis. porosity

Lm- Cream Off White, FXLN, few chips sl oolitic, moderately well developed w/ sctrd ppt porosity, massive, well cemented, SCTRD DRK BRWN STN, GD SFO, GD GSY SHN IN CUP & FLOATING FREE OIL, PR-FR ODR

**DST #2  
STRADDLE**

**LKC C&D  
3313' - 3364'  
CHARTS  
ABOVE  
CONFIRM  
VALID  
STRADDLE**

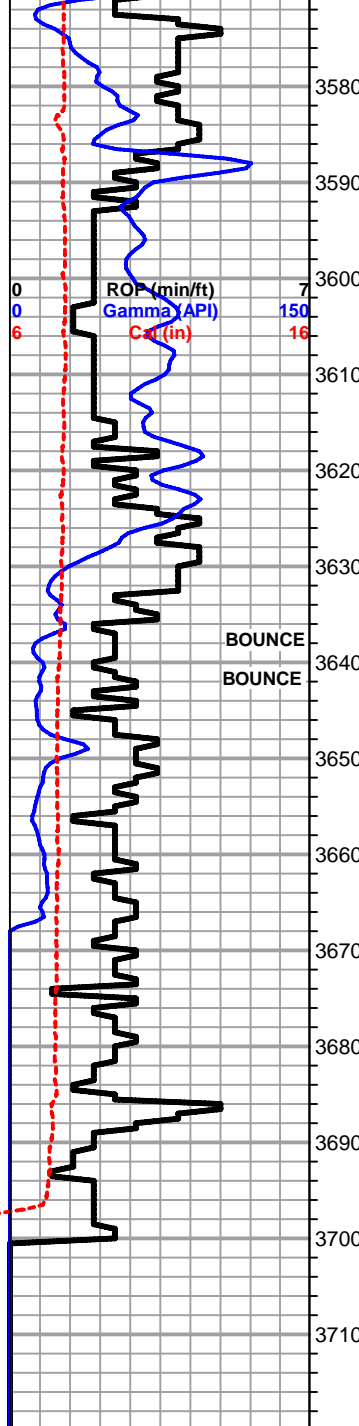


- Lm- White Off White, FXLN, fsl & oolitic, moderately developed, loosely cemented, mostly sctrd ppt interoolite porosity, SCTRDR STN, FR SFO, FNT ODR, GD GSY SHN IN CUP & FLOATING FREE OIL
- Lm- White Off White, VF-FXLN, dense, some loosely cemented & crumbly, most well cemented w/ minimal vis. porosity
- Lm- Tan Off White, VFXLN, densely packed oolitic biomicrite w/ clear siliceous cementation, tight & vry well cemented, no porosity
- Lm- White Off White, Crypto XLN, lithographic, no vis. grains/porosity
- Lm- White Off White, A/A, VFXLN, tight w/ no vis. porosity, vry clean
- Lm- Tan, VFXLN, dense, cherty Ls w/ rare micro XLN porosity
- Sh- Black Gray Lm Green, slick, vry well compacted, slaty, carbonaceous, silty & calcareous
- Lm- Cream Off White, VF-FXLN, dense, poorly developed, well cemented, tight w/ minimal vis. porosity
- Lm- A/A w/ few chips of dark gray fresh bedded chert
- Lm- White Off White, VF-FXLN, dense, well cemented, sctrd XLN porosity, clean
- Lm- White Off White, F-Med XLN, fsl & sl oolitic, moderately developed, some w/ consistant vry fn ppt porosity throughout, few have sctrd ppt interoolitic porosity, LT SCTRDR STN, NO SFO, FNT ODR
- Lm- Tan Semi-Translucent, FXLN, dense, fsl, oolitic & sl oomoldic, sctrd partial skeletal dissolution w/ associated sctrd vuggy porosity, DRK BRWN STN, FR SFO, FR ODR, GD OIL SCUM ON TOP OF WET CUP
- Sh- Maroon White, gummy argillaceous clumps
- Lm- White Off White, FXLN, dense, some sl chalky in part, poorly developed, minimal vis. porosity, vry clean
- Lm- Cream Off White Tan, VF-FXLN, mostly dense & poorly developed w/ minimal vis. porosity, few tan VFXLN, massive, vry well cemented, sctrd development w/ sctrd ppt porosity, SCTRDR DRK BRWN STN, NO SFO, NO ODR
- Lm- White Off White Cream, mix of sl chalky, mud supported, crumbly, sctrd vry fn interstitial porosity, WK SPOTTY STN, NO SFO, NO ODR, & FXLN, sl fsl, sctrd XLN porosity, WK SPOTTY STN A/A
- BKC 3552' (-1535) E-LOG 3539' (-1522)** Sh- Maroon White Gray, much gummy white chalk & argillaceous clumps
- Sh- Gray Maroon, fissile, gritty & earthy
- Lm- Tan, VFXLN, dense, vry well cemented, sl lithographic, no vis. porosity
- Sh-Red, many gummy argillaceous clumps
- Cherty Conglomerate, White, graded & BW cherty conglomerate, some w/ clear dr

BIT TRIP @  
3400'  
SURVEY 1 1/4  
STRAP -0.27'

DST #1  
(STRADDLE)  
LKC J-K  
3468' - 3515'  
CHARTS  
ABOVE  
CONFIRM  
VALID  
STRADDLE





Cherty Conglomerate- white, eroded & R/W cherty conglomerate, some w/ clear qtz. inclusions, soft white chalky matrix in some

D

Ss- Clear to Frosted, mature, sl unconsolidated, sub-rounded to sub-angular, friable to loosely cemented clusters, some w/ lt sctrd white siliceous cementation, DRK SAT STN, SOME BLEEDING FO, FNT ODR, GD SCUM ON TOP OF WET CUP

Shale/Chert- abundant gummy red argillaceous clumps & red wash, various colors of sl conglomerate chert, some fresh bedded

Chert- Semi-Translucent Clear Salmon, fresh bedded sharp angular chert, some oolitic, no vis. porosity

**ARBUCKLE 3638' (-1621) E-LOG 3628' (-1611)** Dolomite- White, Med XLN, mostly vry loosely cemented, some euhedral rhombs, mostly consistant fn ppt porosity, SCTRD DRK BRWN STN, FR SFO, GOOD SCUM ON TOP OF WET CUP

D

Dolomite- Snow White, VF-Med XLN, some massive & vry well cemented, sctrd development, some w/ ppt porosity, much barren porosity, SCTRD BLK GILSONITE, NO SFO, NO ODR

D

Dolomite- Snow White, Crs XLN, well developed euhedral rhombs, GD ppt porosity, BLK GILSONITE, few chips of white oolitic fresh bedded chert

Dolomite- A/A w/ gummy white chalk

Dolomite- Snow White, F-Med XLN, A/A, barren

Dolomite- Snow White, A/A w/ various colored chert, cherty dolomite, & red shale

Dolomite- Cream Off White, eroded & R/W, qtz inclusions w/ dolomite cementation, fused w/ micro XLN porosity, barren

**RTD 3700' (-1683) LTD 3700' (-1683) @ 05:15 3/5/2013**

**MINI TRIP  
CTCH  
TOH LOG**