

OPERATOR

Company: CARRIE EXPLORATION AND DEVELOPMENT
 Address: 210 W 22nd ST.
 HAYS, KS 67601

Contact Geologist: RON HEROLD
 Contact Phone Nbr: (913)961-2760
 Well Name: HAYES C #1
 Location: N2 N2 NW Sec. 8 - 21S - 11W
 Pool:
 State: KANSAS

API: 15-185-23813-00-00
 Field: KOWALSKY SOUTHWEST
 Country: USA

Scale 1:240 Imperial

Well Name: HAYES C #1
 Surface Location: N2 N2 NW Sec. 8 - 21S - 11W
 Bottom Location:
 API: 15-185-23813-00-00
 License Number: 6768
 Spud Date: 6/14/2013 Time: 3:30 PM
 Region: STAFFORD
 Drilling Completed: 6/20/2013 Time: 5:50 PM
 Surface Coordinates: 2111' FSL & 1857' FWL
 Bottom Hole Coordinates:
 Ground Elevation: 1798.00ft
 K.B. Elevation: 1803.00ft
 Logged Interval: 2300.00ft To: 3521.00ft
 Total Depth: 3520.00ft
 Formation: ARBUCKLE
 Drilling Fluid Type: FRESH WATER/CHEMICAL GEL

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -98.3744558 Latitude: 38.1502146
 N/S Co-ord: 2111' FSL
 E/W Co-ord: 1857' FWL

LOGGED BY

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

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

CONTRACTOR

Contractor: SOUTHWIND DRILLING, INC
 Rig #: 6
 Rig Type: MUD ROTARY
 Spud Date: 6/14/2013 Time: 3:30 PM
 TD Date: 6/20/2013 Time: 5:50 PM
 Rig Release: 6/22/2013 Time: 12:00 AM

ELEVATIONS

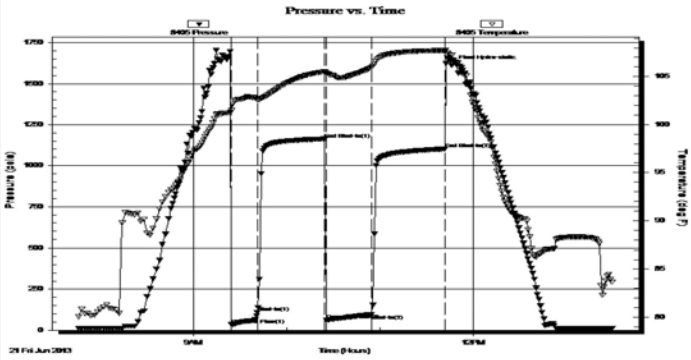
K.B. Elevation: 1803.00ft Ground Elevation: 1798.00ft
 K.B. to Ground: 5.00ft

NOTES

DUE TO FAVORABLE LOG ANALYSIS AND RECOVERY ON DRILL STEM TESTS DECISION WAS MADE TO RUN PRODUCTION CASING.

Serial #: 8405 **Inside**
 Press@RunDepth: 97.00 psia @ 3440.00 ft (KB) Capacity: 5000.00 psia
 Start Date: 2013.06.21 End Date: 2013.06.21 Last Calib.: 2013.06.21
 Start Time: 07:45:00 End Time: 13:30:00 Time On Btm:
 Time Off Btm: 2013.06.21 @ 11:46:30

TEST COMMENT: 1st Open/ 15 Minutes. Good blow built to bottom of 5 gallon bucket in 9 minutes and 15 seconds.
 1st Shut In/ 45 Minutes. No blow back.
 2nd Open/ 30 Minutes. Good blow built to bottom of 5 gallon bucket in 4 minutes and 40 seconds.
 2nd Shut In/ 45 Minutes. Good blow back built to bottom of bucket after bleeding pressure off 4 times.



Time (Min.)	Pressure (psia)	Temp (deg F)	Annotation
0	34.38	101.52	Open To Flow (1)
17	107.40	102.58	Shut-In(1)
60	1162.91	105.52	End Shut-In(1)
61	60.52	105.36	Open To Flow (2)
90	97.00	105.95	Shut-In(2)
138	1101.85	107.72	End Shut-In(2)
142	1611.28	107.20	Final Hydro-static

Length (ft)	Description	Volume (bbl)
0.00	1197 feet of gas.	0.00
100.00	Clean oil.	1.40
63.00	30% mud, 60% oil, 10% gas.	0.88
30.00	30% mud, 50% water, 15% oil, 5% gas.	0.42
0.00	Oil gravity was 47 corrected.	0.00

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

ROCK TYPES

Cht	Lmst fw7>	shale, gry	shale, red	Ss
Dolprim	shale, grn	Carbon Sh	Shcol	

ACCESSORIES

FOSSIL
 Oolite

STRINGER
 Sandstone

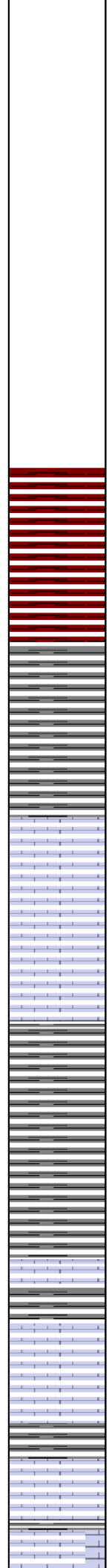
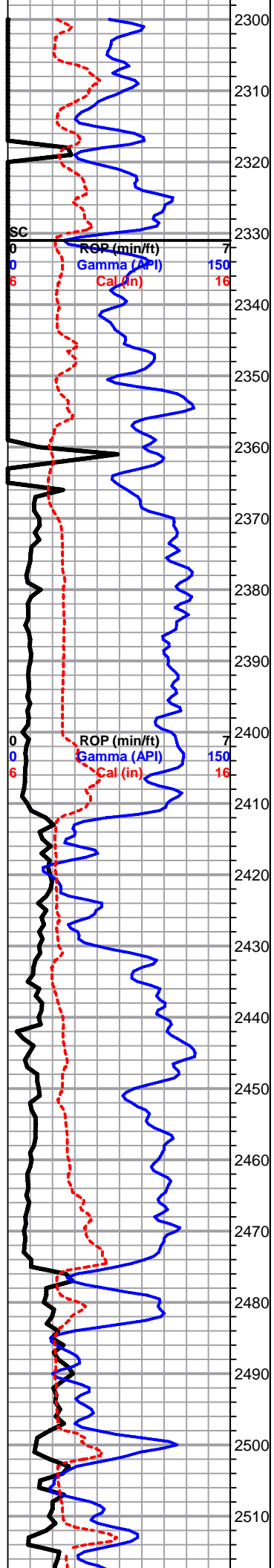
OTHER SYMBOLS

DST
 DST Int
 DST alt
 Core

Curve Track #1				Geological Descriptions				TG, C1 - C5				
ROP (min/ft)	Gamma (API)	Cal (in)	Depth Intervals	DST	Lithology	Oil Show	Geological Descriptions	Total Gas (units)	C1 (units)	C2 (units)	C3 (units)	C4 (units)
0	0	6	5 150 16									100
1:240 Imperial				1:240 Imperial				1:240 Imperial				
<p>0 ROP (min/ft) 5</p> <p>0 Gamma (API) 150</p> <p>6 Cal (in) 16</p>				<p>2290</p>				<p>0 Total Gas (units) 100</p> <p>0 C1 (units) 100</p> <p>0 C2 (units) 100</p> <p>0 C3 (units) 100</p> <p>0 C4 (units) 100</p>				
<p>1' DRILL TIME FROM 2300' - RTD</p> <p>10' WET/DRY SAMPLES FROM 2350' - RTD</p> <p>BLOODHOUND GAS DETECTOR DEPLOYED ON THIS</p>												

WELL

GEOLOGICAL SUPERVISION BY JEFF LAWLER FROM 2350' - RTD



Sh- Maroon, gritty & earthy

Sh- A/A w/ soft & silty gray shale

Lm- Cream Buff, FXLN, dense, well cemented, fsl, poorly dev. w/ sctrd micro XLN & XLN porosity, few pcs of gritty Vf Grn Ls w/o vis. porosity

Lm- Tan Cream, Vf Grn FXLN, fsl mix, poorly dev. mostly tight w/ minimal vis. porosity, some w/ sctrd XLN porosity & fsl fragments

Ss- Dove Gray, Fn Grn, sub-angular to sub-rounded, mod dev., micaceous, sl spkld w/ glauconite, loosley cemented, consistant fn ppt intergranular porosity, NS

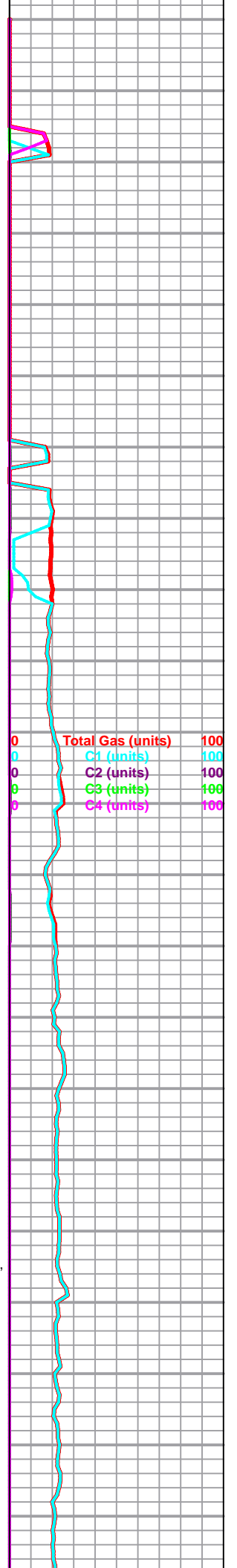
Sh- Lt Gray, soft & silty, calcareous, few gummy clumps

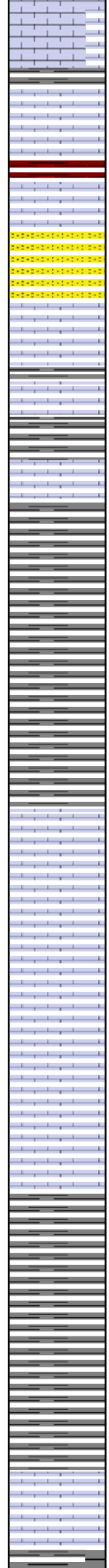
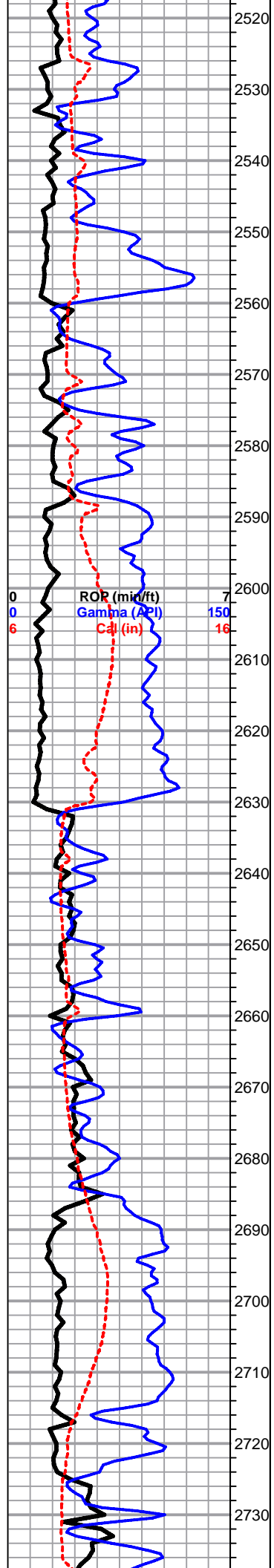
TARKIO LM 2476' (-673) E-LOG 2475' (-672) Lm- Cream Off White, VF-FXLN, dense, tight vry poorly dev., most lithographic w/ no vis. porosity, few w/ sctrd micro XLN, few pcs of dense algal ls, all w/ NS

Sh- Lt Gray, silty, sl calcareous

Lm- Tan, FXLN, dense, sl brittle, fsl w/ fragments

Lm- Buff Gray, Fn Grn, some sl chalky, mud supported matrix, well cemented, gritty minimal vis. porosity





grity, minimal vis. porosity

Lm- Lt Gray, Fn Grn, fsl, high-energy mix, trashy mix Sh- Lt & Drk lenses

Lm- Lt Gray, Vf Grn, dense, well cemented, mud supported matrix, sl fsl, no vis. porosity

Lm- Gray Buff, FXLN, dense & gritty, well cemented, sl fsl, tight w/o vis. porosity

Ss- Dove Gray Mustard Yellow, sl unconsolidated, fused, conglomeratic

Lm- White Off White, FXLN, dense, well cemented, fsl & poorly dev. sctrd micro XLN porosity

Lm- Buff, VFXLN, dense, tight, fsl, sl sandy, no vis. porosity

Lm- Lt Gray, VFXLN, dense, sl sandy & sl cherty, tight w/o vis. porosity, vry well cemented

Ss- Lt Gray, Fn Grn, sorted, consolidated, sub-angular, loosely cemented, consistant fn ppt intergranular porosity, NS

Ss- A/A, grading into micaceous, some sandy & shaley Ss

Sh- Gray, soft, vry silty, calcareous

HOWARD 2631' (-828) E-LOG 2631' (-828) Lm- Tan Buff, Vf Grn, dense, well cemented, most lithographic w/ no vis. to minimal vis. porosity

Lm- Cream Tan, FXLN, dense, sl fsl, poorly dev. w/ sctrd micro XLN porosity, clean & barren

Lm- Cream Off White, FXLN, dense, vry well cemented, sl sandy, apparent dense fenestral porosity, minimal effective porosity, barren

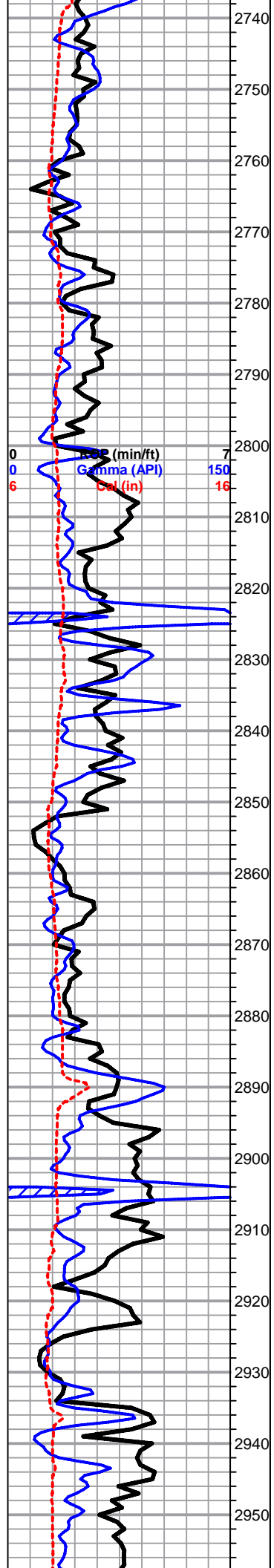
Lm- Gray, Vf - Fn Grn, chalky, soft & loosely cemented, fsl, poor intergranular vis. porosity

Ss- Dove Gray Semi-Frosted, Vry Fn - Fn Grn, angular, consolidated & sorted, micaceous, loosely cemented to semi-fused, consistant fn ppt porosity, barren

Sh- Lt Gray, vry silty & soft, calcareous, some gummy argillaceous clumps

TOPEKA 2725' (-922) E-LOG 2724' (-921) Lm- Cream Lt Gray, FXLN, dense, fsl, well cemented, sctrd micro XLN, barren

0	Total Gas (units)	100
0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100



Lm- Gray Tan, Vf-Fn Grn, soft, well cemented, fsl, massive, minimal intergranular porosity, few fsl fragments, barren, chalky in part

Lm- Cream Tan, VF-FXLN, mix of sub-sucrosic sl dolomitic ls, poorly developed w/ consistant micro XLN porosity, barren, & FXLN w/ fsl fragments, tight sl cherty ls, minimal vis. porosity, barren

Lm- Cream Off White, VF-FXLN, soft & loosely cemented, sl chalky in part, sl oolitic, sctrd sl development, sctrd micro XLN & rare fn ppt porosity, clean & barren

Lm- Cream Off White, FXLN, dense fsl cherty ls, sl dev. w/ sctrd micro XLN & XLN porosity, some w/ apparent fn ppt porosity & secondary recrystallization porosity, minimal effective porosity

Lm- Cream Off White, F-Med XLN, poorly dev. well cemented, interbedded fusulinids

Lm- White Cream, Vf Grn, soft, chalky, mud supported matrix, poor intergranular porosity

Sh- Black Drk & Lt Gray Maroon Lm Green, sl waxy, fissile, carbonaceous, soft & silty, calcareous

Lm- Cream Off White, FXLN, fsl, massive, dense, well cemented, sctrd XLN porosity

****SAMPLES W/ MUCH SHALE CARRYOVER****

Sh- Maroon Lm Green, sl waxy, gritty & earthy, sandy lm green lime

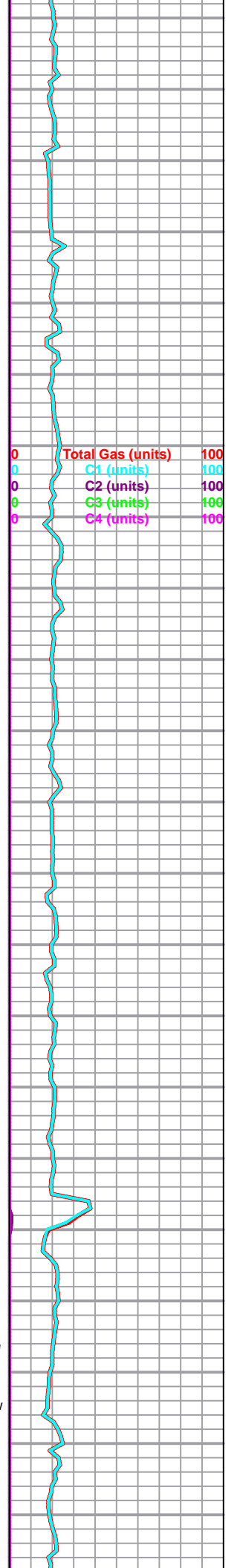
Sh- Black Drk Gray White, gritty, sl sandy, pyritic, sl fsl, highly rich in vis. micro organics, mottled white crumbley chalk

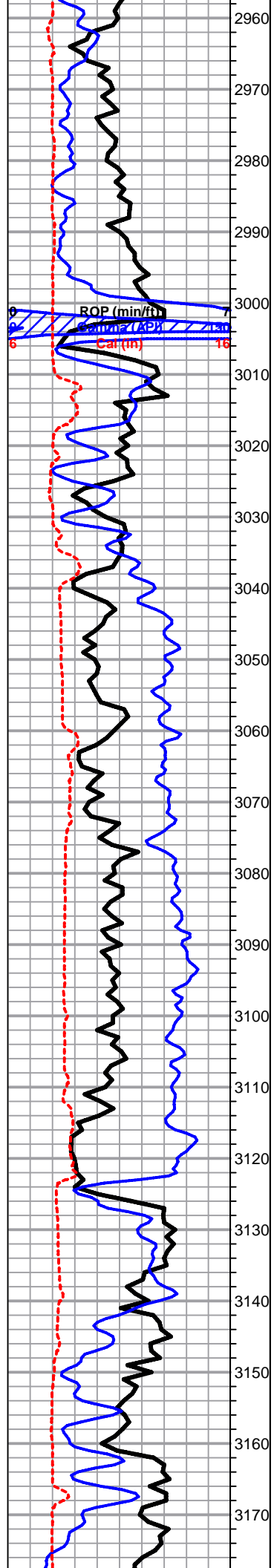
Chert- White, Crypto XLN, dense, gritty sl dolomitic chert, bone white & pristine

Sh- Lt Gray Maroon Lm Green, gummy argillaceous clumps, gritty & earthy, few sl waxy, some sl shaley lm green Ss

Lm- Cream Off White, VF-FXLN, dense, vry well cemented, sl fsl, tight w/ minimal vis. & rare micro XLN - XLN porosity

Lm- Cream Off White, FXLN, fsl, dense, loosely-well cemented, poorly devel. w/ sctrd XLN porosity, barren





Lm- Cream Buff, Fn Grn, dense, well cemented, gritty & granular, sl fsl, tight w/ minimal vis. intergranular porosity

Lm- Ivory, VFXLN, dense, sl cherty ls, vry well cemented w/o vis. porosity

Lm- Tan, Crypto XLN, vry dense & well cemented cherty ls, no vis. porosity

HEEBNER 3003' (-1200) E-LOG 3000' (-1197) Sh- Black Maroon Gray, fissile, carbonaceous, silty, gritty & earthy

TORONTO 3020' (-1217) E-LOG 3017' (-1214) Lm- White Off White, F-Med XLN, fsl & oolitic, mod. dev. w/ sctrd ppt interoolite porosity, SCTRD TO RARE DRK BLK STN, NO SFO, SL TARRY, NO ODR

DOUGLAS SHALE 3037' (-1234) E-LOG 3034' (-1231) Sh- Gray Maroon, mostly sl waxy & crumbley, some argillaceous clumps

Sh- Lt Gray, sl silty, vry soft, calcareous, some sl sandy lime

Sh- A/A w/ silty soft brown pcs, some lm green & dove gray shaley Ss, fused & poorly dev. w/ vry fn ppt intergranular porosity, NS

D Sh/Ss- Sh A/A, Ss- Clear to Semi-frosted, Fn Grn, angular, loosely cemented to fused, poorly dev. sorted & consolidated, SAT BLK DEAD STN, NO SFO, NO GSY SHEEN, NO ODR

Sh- Lt Gray, soft, silty, & calcareous

Sh- A/A

BROWN LIME 3125' (-1322) E-LOG 3123' (-1320) Lm- Brown Tan, VF-FXLN, dense, vry well cemented, tight w/ minimal vis. porosity, lithographic

Sh- Lt Gray, many gummy argillaceous clumps

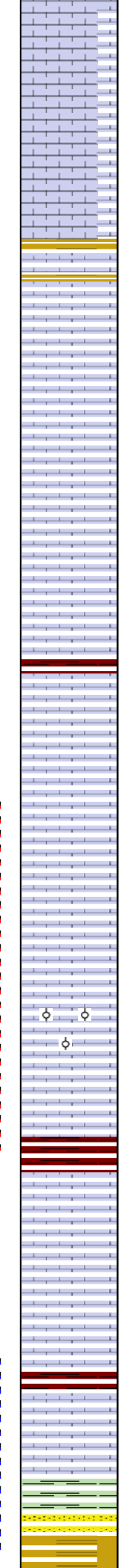
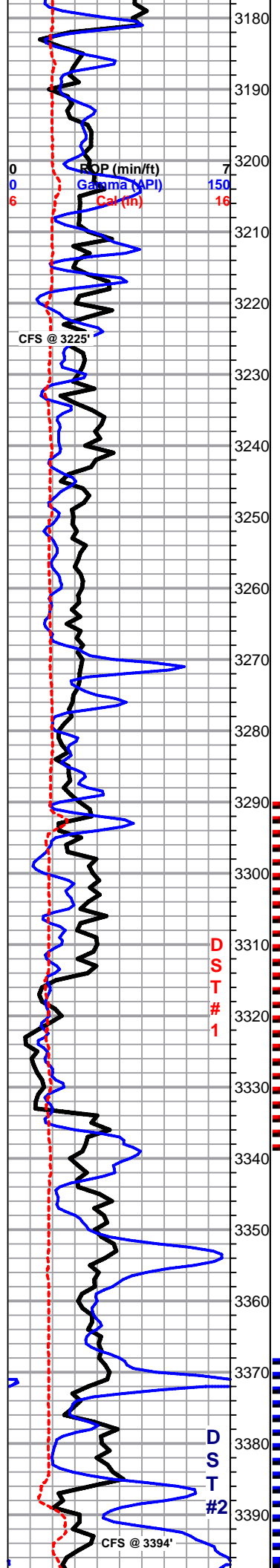
LKC 3141' (-1338) E-LOG 3140' Lm- Cream Off White, FXLN, sl fsl, mostly tight & vry well cemented, sctrd micro XLN porosity, barren

O Lm- Ivory Buff, VF-FXLN, dense, mostly well cemented, sl - sctrd dev. some w/ minimal vis. - micro XLN porosity, some w/ mostly consistant fn ppt - ppt porosity, SCTRD LT BROWN STN, SOME W/ RECRYSTALLIZATION W/IN POROSITY, NO SFO, FNT-WK ODR

O Lm- Cream Off White, VF-FXLN, dense, vry well cemented, sctrd dev. w/ vry fn ppt porosity, sl dolomitic ls, 2-3 PCS W/ SCTRD WK BLK STN, DEAD OIL, NO SFO, FNT ODR

Total Gas (units) 100
 C1 (units) 100
 C2 (units) 100
 C3 (units) 100
 C4 (units) 100

@ 3180'
BIT TRIP
SURVEY 1 dgr.
STRAP +1.74'



○ Lm- Tan, VF-FXLN, dense, vry well cemented, fsl & oolitic, few pcs of oolitic biomicrite, sl dev. w/ sctrd XLN & ppt porosity, SCTRD LT BRWN STN, NO SFO, FNT ODR

Lm- Cream Tan, FXLN, dense, poorly dev. well cemented, mostly tight w/ sctrd XLN porosity, barren

○ Lm- Lt Gray Buff, VF-FXLN, dense, vry well cemented, poorly dev. oolitic / oolitic biomicrite, sctrd micro XLN & XLN porosity, FEW PCS W/ WK SPOTTY STN, 1-2 W/ SL SFO UPON CRUSH, WK ODR

○ Lm- Cream Tan, Vf-Fn Grn, dense, most loosely cemented & crumbly, sl chalky in part, poor intergranular vis. porosity, few FXLN pcs w/ XLN porosity & secondary recrystallization porosity, mostly all barren w/ FEW PCS W/ VRY WK STN, NO SFO, FNT ODR

○ Lm- Tan Cream, FXLN, oolitic mix, some biomicrite w/ micro XLN porosity, few pcs w/ sctrd fn ppt porosity, tight & poorly dev., SCTRD LT STN, 1 PC W/ WK SFO, SL GSY BBLs UPON CRUSH, WK ODR & cream FXLN, sl oomoldic, partial skeletal dissolution w/ sl vuggy porosity, poor intervugular connectivity, well cemented w/ micro XLN matrix porosity, barren

Lm- Tan, Crypto-FXLN, dense, most well cemented & tight, no vis. - sctrd XLN porosity, barren

Lm- Cream Buff, Vf-Fn Grn, dense, sl chalky in part, loosely cemented to well cemented, most all w/ poor intergranular porosity

Lm- Cream Off White, FXLN, loosely to well cemented, some sl chalky, sl oolitic, poorly dev. w/ sctrd XLN porosity, barren

Lm- Tan, VF-FXLN, dense, well cemented, sl cherty ls, some massive, clean, minimal vis. porosity, barren

○ Lm- Tan, VFXLN, dense, vry well cemented cherty ls, mod. dev. w/ sctrd ppt to sub-vuggy porosity, sctrd recrystallization w/in porosity, LT SCTRD STN, NO SFO, SL GSY SHEEN, WK ODR

○ Lm- White Off White, oolitic, few small pcs of oolitic clusters, well dev. w/ constant ppt interoolitic porosity, oomoldic w/ vuggy porosity, mostly dissolved oolite nuclei, SCTRD DRK STN, NO SFO, WK ODR

Lm- Tan Cream, VF-FXLN, dense, well cemented, tight w/ minimal vis. porosity, lighographic, some gummy white chalk

Sh- Maroon Gray, soft, blocky

Lm- Cream Tan, FXLN

Lm- Cream, FXLN, sl oolitic, tight w/ no vis. porosity

Lm- Bright Off White, friable

BKC 3370' (-1567) E-LOG 3370' (-1567) Sh- Maroon soft gummy red wash

Sh- Lm Green, blocky, sticky

○ Sh- Yellow, blocky, Ss- Green, few pcs clear, BLK STN, NO SFO, NO FLOR. NO ODR

Total Gas (units) 100
 C1 (units) 100
 C2 (units) 100
 C3 (units) 100
 C4 (units) 100

36 UNITS

DST #1
LKC I-J
3290' - 3340'

DST #2
ARBUCKLE
3369' - 3432'

