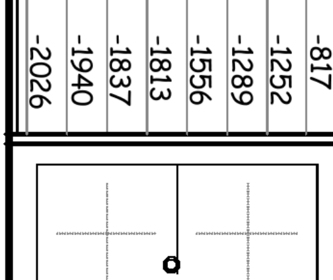
Robert L. Milford
PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

OPERATOR Raymond Oil Company, Inc.
LEASE W & H Unit #1
LOC SPOT 145'S & 137'W of CE2 W2
LOC FOOTAGE 2,495' FSL & 1,843' FWL
SEC. 9 TWSP 19S RNG 27W
COUNTY Lane STATE Kansas
API 15-101-22583-00-00
CONTRACTOR Murfin Drilling Co., Inc. RIG NO. 22
DRILLING STARTED 12-20-2016 COMPLETED 1-4-2017
MUD DISPLACED 3,482' MUD TYPE Chemical
DRILLING TIME KEPT FROM 3,400' TO RTD
SAMPLES SAVED FROM 3,400' TO RTD
SAMPLES EXAMINED FROM 3,400' TO RTD
GEOLOGICAL SUPERVISION FROM 3,697' TO RTD

ELEVATIONS
KB 2,724'
GL 2,713'
MEASUREMENTS FROM KB

CASING RECORD
Conductor
Surface 8-5/8" @ 263' w/ 175 sacks cement
Production none.



ELECTRICAL SURVEYS:
ELT Wireline Services
Dual Induction Log
Compensated Density - Neutron Log
Micro Log

FORMATION NAME	LOG TOP	LOG DATUM	SAMPLE TOP	SAMPLE DATUM
Stone Corral	2,066'	+658	2,061'	+663
Base Stone Corral	2,096'	+628	2,091'	+633
Wabaunsee	3,548'	-824	3,541'	-817
Heebner	3,984'	-1260	3,976'	-1252
Lansing	4,021'	-1297	4,013'	-1289
Stark	4,288'	-1564	4,280'	-1556
Fort Scott	4,545'	-1821	4,537'	-1813
Cherokee	4,569'	-1845	4,561'	-1837
Mississippian	4,672'	-1948	4,664'	-1940
Total Depth	4,760'	-2036	4,750'	-2026

DATE	7:00 AM DEPTH	REMARKS
12-20-16	0'	Spud @ 8:30 pm. Plug down @ 2:15 am on 12-21-16. Dev.: 0.2° @ 272'
12-21-16	272'	Cut 272' in last 24 hrs. Shut down for Christmas
12-22-16	272'	Cut 0' in last 24 hrs. Shut down for Christmas
12-23-16	272'	Cut 0' in last 24 hrs. Shut down for Christmas
12-24-16	272'	Cut 0' in last 24 hrs. Shut down for Christmas
12-25-16	272'	Cut 0' in last 24 hrs. Shut down for Christmas
12-26-16	272'	Cut 0' in last 24 hrs. Drilled out plug @ 2:15 pm. Dev.: 1.2° @ 1290'
12-27-16	1,325'	Cut 1,053' in last 24 hrs; 15.5 hrs drlg. Dev.: 0.4° @ 1602' & 0.4° @ 1978'
12-28-16	2,255'	Cut 930' in last 24 hrs; 22.25 hrs drlg. Dev.: 0.8° @ 2481' & 1.3° @ 2981'
12-29-16	2,981'	Cut 726' in last 24 hrs; 21 hrs drlg. Dev.: 1.1° @ 3200' & 1.6° @ 3420'
12-30-16	3,482'	Cut 501' in last 24 hrs; 22 hrs drlg. Dev.: 1.3° @ 3639'
12-31-16	3,987'	Cut 505' in last 24 hrs; 22.5 hrs drlg.
1-1-17	4,272'	Cut 285' in last 24 hrs; 16.5 hrs drlg. DST #1' @ 4308'
1-2-17	4,353'	Cut 81' in last 24 hrs; 5 hrs drlg. DST #2' @ 4353'
1-3-17	4,471'	Cut 118' in last 24 hrs; 9.75 hrs drlg. DST #3' @ 4636'
1-4-17	4,636'	Cut 165' in last 24 hrs; 12.75 hrs drlg. RTD 4750' @ 10:00 pm
1-5-17	4,750'	Cut 114' in last 24 hrs; 6.75 hrs drlg. Plugged and abandoned

Remarks

Samples are not lagged, per request of the operator.

The electric log measurements correlate from 5' to 8' lower to the drilling measurements.

Formation tops and lithology on this report have been corrected to the electric log.

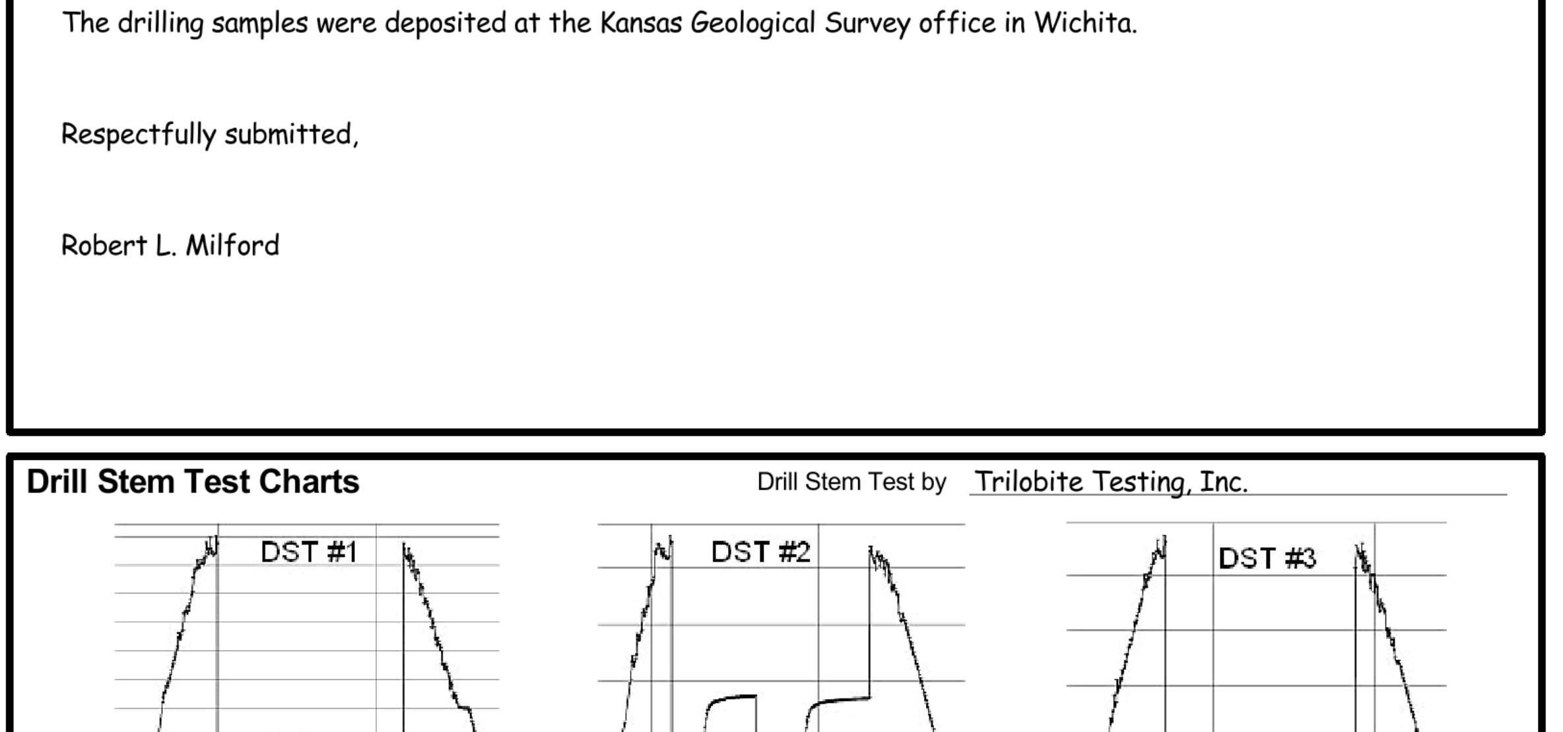
The drilling samples were deposited at the Kansas Geological Survey office in Wichita.

Respectfully submitted,

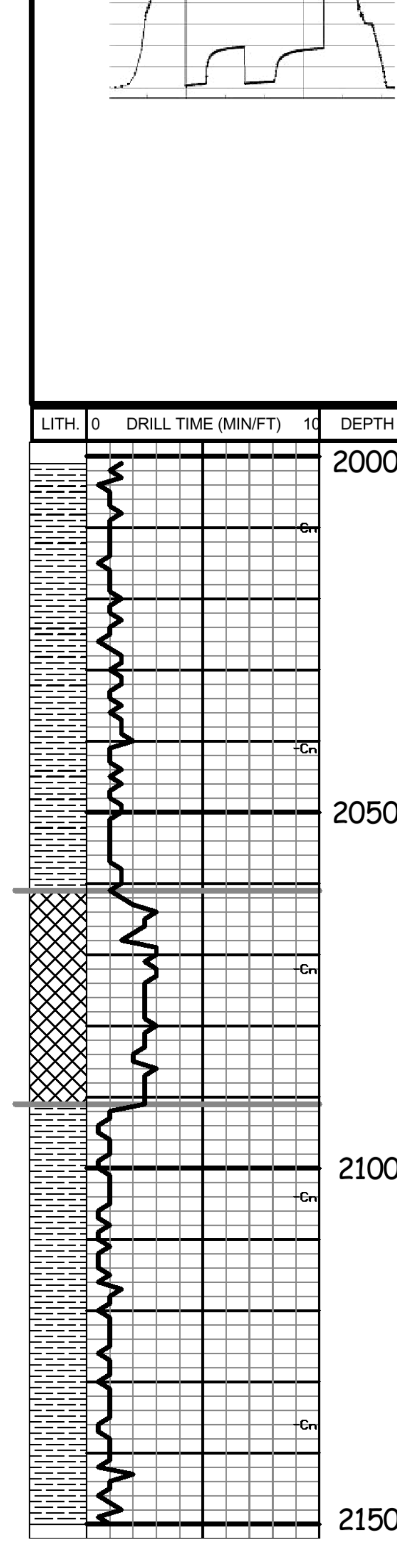
Robert L. Milford

Drill Stem Test Charts

Drill Stem Test by Trilobite Testing, Inc.



LITH. | 0 DRILL TIME (MIN/FT) 10 | DEPTH | SHOWS | SAMPLE DESCRIPTIONS | REMARKS



No sample caught from 2000'-10'

Sh: red-brn (95%)
LS: wh-gry, fxln, chky-sub chky, pr por, NS

A.A.

A.A.

A.A.

Sh: red-brn (95%)
LS: crm-gry, fxln, sub chky, pr por, NS

Sh: mstly red-brn, w/ some gry-grn
Anhy: crm-gry (20%)

Sh: A.A.
Anhy: A.A., incrs amnt (35%)

A.A., (no incrs Anhy)

A.A.

Sh: red-brn, w/ some gry-grn (90%)
Anhy: crm-gry

Sh: red-brn, w/ some gry-grn (85%)
Anhy: crm-gry

A.A.

Sh: red-brn, w/ some gry-grn (90%)
Anhy: crm-gry

Stone Corral 2066' (+658) EL

B/Stone Corral 2096' (+628) EL

Sh: red-brn & gry, w/ scat Anhy: crm-gry & Sd: lt gry, fn-vry fn grain, pr vis por, NS, & 30% LS: crm-gry, fxln, fos in prt, pr por, NS

A.A.

A.A.

A.A.

A.A.

A.A.

Sh: red-brn & gry (80%)
LS: crm-gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS, w/ tr Anhy & Sd: A.A.

A.A.

A.A.

A.A.

Sh: red-brn, some sdy (80%)
LS: crm-gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS

A.A.

A.A.

Sh: red-brn & gry ((85%)
LS: A.A.

Sh: mstly gry, some red-brn (90%)
LS: crm-gry, fxln, sub chky-prtly dns, pr por, NS

LS: crm-gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: mstly gry, scat red-brn (50%)
A.A. (pr sample)

A.A. (pr sample)

A.A. (pr sample)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS
Sh: mstly gry (25%)
A.A. (pr sample)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: gry (25%)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS
Sh: gry (25%)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns, pr-fr fos por, NS
Sh: gry, some grn (40%).

A.A. w/ some LS: gry, fxln, fos, prtly dns, pr por, NS

LS: crm-gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: gry-grn (30%)

LS: A.A. w/ some chky, pr fos por, NS
Sh: A.A. (30%)

LS: A.A., (dcrs amnt)
Sh: gry, calc (60%)

Sh: gry, calc (85%)
LS: A.A. pr por, NS

LS: tan-drk gry, fxln, fos in prt, sub chky-prtly dns, pr-fr fos por, NS
Sh: gry, some calc. (70%)

LS: crm-drk gry, fxln, fos in prt, sub chky-prtly dns, pr-fr fos por, NS
Sh: gry-grn (50%)

A.A.

LS: crm-drk gry, fxln, fos in prt, sub chky-prtly dns, pr fos por, NS
Sh: gry-grn (30%)

LS: crm-brn, fxln, fos in prt, sub chky-prtly dns, pr fos por, NS
Sh: A.A. (20%)

LS: A.A., some chky, some pr-fr fos por, NS
Sh: gry-grn (30%)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr-fr fos & small vug por, NS
Sh: A.A. (15%)

LS: crm-gry, fxln, fos in prt, sli chty (gry), sub chky-prtly dns, pr fos por, NS
Sh: gry-grn (30%)

LS: crm-drk gry, fxln, fos in prt, sub chky-prtly dns, pr fos por, NS
Sh: gry, some grn (50%)

LS: crm-brn, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: gry-grn (20%)

LS: crm-tan, fxln, fos-ool in prt, chky-prtly dns, fr-gd intrprtical & moldic por, NS (90%)

LS: crm-brn, fxln, fos-ool (small) in prt, sub chky-prtly dns, pr-fr intrprtical por, NS
Sh: gry-grn (30%)

LS: A.A., pr por, NS
Sh: gry, some grn (60%)

LS: crm-drk gry, fxln, fos in prt, sub chky-prtly dns, fr-gd fos por, NS
Sh: gry-grn (25%)

LS: A.A., NS
Sh: A.A. (incrs to 40%)

LS: A.A., NS
Sh: trace Blk Carb w/ gry-grn (60%)

LS: crm-brn, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: gry-grn (50%)

LS: crm-gry, fxln, fos in prt, sub chky-prtly dns, pr por, NS (mstly small pcs)
Sh: gry-grn (25%)

LS: crm-gry, fxln, ool (vry small), sub chky-prtly dns, fr-gd moldic por, NS (bigger pcs than above)
Sh: A.A. (25%)

LS: crm-gry, fxln, fos-ool (vry small) in prt, sub chky-prtly dns, fr-gd intrprtical-moldic por, NS
Sh: gry-grn w/ some red-brn (50%)

A.A.

Sh: tr Blk Carb w/ drk gry & gry-grn
LS: crm-brn, fxln, fos in prt, sub chky-prtly dns, pr por, NS

LS: crm-gry, fxln, fos in prt, sub chky-prtly dns, pr-fr fos por, NS
Sh: gry-grn w/ some red-brn (60%)

LS: crm-brn, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: A.A. (60%)

LS: A.A. w/ pr-fr fos por, NS
Sh: A.A. (60%)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns, pr w/ some fr fos por, NS
Sh: A.A. (40%)

LS: A.A. but vry small pcs, NS
Sh: gry-grn, some red-brn (35%)

LS: crm-brn, fxln, fos in prt, sub chky-prtly dns, pr w/ some fr fos por, NS
Sh: A.A. (60%)

Sh: Blk Carb (scat pcs), mstly gry-grn (65%)
LS: A.A., NS, vry small pcs

LS: crm-brn, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: tr Blk Carb, mstly gry-grn, some rd-brn (50%)

LS: crm, fxln, fos in prt, chty (wh), sub chky-prtly dns, fr-gd fos por, NS (small pcs)
Sh: gry-grn, some red-brn (20%)

LS: A.A., some chky, pr-fr por, NS (mstly small but some larger pcs)
Sh: gry-grn (20%)

LS: crm, fxln, ool (sm-med, crs), sub chky-prtly dns, some fr-gd introol-vug por, NS
Sh: gry-grn, some red-brn (50%)

LS: crm-tan, fxln, fos w/ some ool A.A., sub chky-prtly dns, some fr-gd introol-vug por, NS
Sh: A.A. (50%). See Remarks for 4040' Circ.

LS: crm-brn, fxln, sli fos, sub chky-prtly dns, pr por, NS
Sh: gry, grn, some red-brn (20%)

LS: A.A. w/ LS: drk gry, fxln, shly, prtly dns, pr por, NS
Sh: gry (10%)

LS: crm-brn w/ some drk gry, fxln, sli fos, sub chky-prtly dns w/ some dns, pr por, NS
Sh: gry & grn (15%). See Remarks for 4068' Circ.

LS: crm-brn, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS
Sh: gry & grn (20%)

LS: wh-tan, fxln, fos in prt, chty (crm-org), sub chk-prt dns w/ some chky, fr fos por, NS (85%)

LS: A.A., incrs gry-brn, pr por, NS (4087'-90')

LS: crm-gry, fxln, sli fos, chty (crm-tan), sub chky-prtly dns, pr por, NS
Sh: gry-grn (10%)

LS: crm-lt brn, fxln, sli fos, sli chty (crm-tan), sub chky-prtly dns w/ some dns, pr por, NS
Sh: A.A. (5%)

LS: A.A. w/ some LS: crm-tan, fxln, fos, sub chky-prtly dns w/ some chky, fr-gd fos por, NS

LS: A.A., NS (4116'-20')

LS: crm-tan, fxln, fos in prt, sli chty (crm-tan), sub chky-prtly dns w/ some chky, pr fos por, NS

LS: A.A., chty (crm-lt gry), pr por, NS

LS: crm-tan, fxln, some dolomitic, fos in prt, chty (wh-tan), sub chky-prtly dns w/ some chky, fr-gd fos por, NS

LS: crm-tan, fxln, some dolomitic, fos in prt, chty (wh-lt gry), sub chky-prtly dns w/ some chky-vry chky, fr-gd fos por, NS

LS: crm-tan w/ some wh, fxln, ool (small) in prt, chty (wh-lt gry), sub chky-prtly dns w/ some chky-vry chky, fr-gd moldic-vug por, NS

LS: crm-tan, fxln, sli fos, sli chty (crm-tan), chky-prtly dns w/ some vry chky, pr por, NS

LS: crm-tan, fxln, ool (small) in prt, sli chty (wh-tan), chky-prtly dns w/ some vry chky, fr-gd moldic por, NS

Sh: tr Blk Carb w/ drk gry & grn (15%)
LS: crm-tan, fxln, fos in prt, sli chty (wh-tan), sub chky-prtly dns, pr por, NS

LS: crm-tan, fxln, fos in prt, sli chty (wh-lt gry), sub chky-prtly dns w/ some chky, pr por, NS
Sh: med-drk gry, red-brn, grn, tr Blk Carb (20%)

LS: crm-tan, fxln, fos-ool (small) in prt, chty (tan), sub chky-prtly dns w/ some chky, fr-gd pin point-moldic por, NS. Sh: gry, grn, red-brn (35%)

LS: crm-tan, fxln, sli fos-ool, sub chky-prtly dns, trace pin point-moldic por, NS
Sh: gry, grn, some red-brn (30%)

LS: crm-tan, fxln, fos-ool in prt, sli chty (tan), sub chky-prtly dns, some fr-gd intrprtical-vug-moldic por, NS. Sh: gry, grn, some red-brn (30%)

LS: crm-tan, fxln, fos-ool in prt, sli chty (crm-lt gry), sub chky-prtly dns, pr-fr intrprtical por, NS
Sh: gry, grn, some red-brn (50%)

no sample caught for 4250'-55'

A.A., No new cuttings up (4255'-60')

A.A., No new cuttings up (4260'-70')
4272' 30" Circ: LS: crm-tan, fxln, ool, sub chky-prtly dns w/ some chky-vry chky, gd ooc por, NS, dull yell fluor, no cut, no odor
4272' 60" Circ: LS: A.A., sli chty (wh-lt gry), NS
A.A., No new cuttings up (4272'-80')

LS: crm-tan, fxln, fos-ool in prt, sub chky-prtly dns w/ some chky, gd ooc por, NS

Sh: Blk Carb w/ some gry & grn (15%)
LS: A.A. w/ some LS: med-drk brn, fxln, sli fos, prtly dns, pr por, NS

● LS: wh-tan, fxln, ool in prt, vry chky-prtly dns, fr-gd introol por w/ vry scat lt-vry lt brn sub sat-sat stn, SSFO w/ cps pcs FS, sli odor (ooc por is barren and may be from uphole). See Remarks

4308'-10': LS: crm-tan, fxln, fos in prt, sub chky-prtly dns, mstly pr w/ vry scat pcs gd ooc por, NS
Sh: gry-grn & red-brn (15%)

LS: A.A. w/ incrs tan, sli chty (wh-lt gry), pr w/ tr ooc por A.A., NS
Sh: Blk Carb (scat pcs) w/ gry-grn (10%).

● LS: crm-tan, fxln, fos-ool in prt, sli chty (lt-med gry), sub chky-prtly dns, pr intrprtical por w/ 1 pc lt brn sub sat stn & SSFO, tr barren ooc por A.A., no odor. (See Remarks)

LS: crm-tan, fxln, fos-ool in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, NS (See Remarks)

LS: A.A., incrs tan-lt brn, sli fos, pr por, NS

4353'-60': LS: crm-brn-gry, fxln, fos in prt, sub chk-prt dns, pr por, NS. Sh: gry & rd-brn (15%)

LS: crm-brn, fxln, fos in prt, sli chty (gry-tan), sub chky-prtly dns, pr por, NS
Sh: gry-grn (15%)

LS: A.A., pr por, NS
Sh: gry (15%)

LS: crm-tan, fxln, sli fos, sub chky-prtly dns w/ some dns, pr por, NS
Sh: gry (10%)

LS: A.A., pr por, NS
Sh: gry (20%) w/ vry scat Shly Sd: lt gry-lt grn, fn-vry fn grain, calc, pr por, NS

LS: crm-tan, fxln, sli fos, sub chky-prtly dns, pr por, NS
Sh: gry (5%)

LS: A.A.
Sh: gry & grn, tr sdy Sh: grn (25%)

LS: crm-lt brn, fxln, sli fos, some shly (red-brn, mottled), sub chky-prtly dns, pr por, NS
Sh: A.A. w/ some red-brn (20%)

LS: crm-tan, fxln, ool-fos in prt, sub chky-prtly dns w/ some chky, mstly pr w/ some fr intrprtical-small vug por, NS. Sh: A.A. (10%)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns, pr por, NS
Sh: gry, some silty (30%)

LS: crm-tan, fxln, fos-ool in prt, sub chky-dns w/ some chky, pr por, NS
Sh: gry (5%)

LS: crm-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS
Sh: red-brn & gry-grn (20%)

LS: A.A., w/ sub chky-dns w/ some chky, pr por, NS
Sh: gry-grn (10%)

LS: A.A., pr por, NS
Sh: grn, red-brn, gry (15%)

LS: crm-tan, fxln, fos in prt, sub chky-dns w/ some chky, pr por, NS
Sh: gry, red-brn, grn (10%)

LS: A.A. in the 4500' 30" Circ. sample
Sh: Blk Carb, lt-med gry & grn (30%)

LS: crm-tan w/ some brn, fxln, sli fos, sub chky-dns, pr por, NS
Sh: lt gry (some soft & gummy)-med gry (40%)

LS: crm-tan, fxln, sli fos, sub chky-prtly dns, pr por, NS
Sh: gry (5%)

LS: tan-brn, fxln, sli fos, sub chky-prtly dns, pr por, NS
Sh: drk gry, some gry-grn, tr Blk Carb (25%)

● LS: crm-brn, fxln, some ool, sub chky-prtly dns, pr w/ tr small vug por, tr lt brn sptd stn, NSFO, no odor (stn & por in brn ool, rock)
Sh: Sh: Blk Carb w/ some med gry-grn (70%)

● LS: A.A., incrs crm-tan, dcrs brn ool rock, 1 pc w/ SSFO, no odor
Sh: gry, grn, red-brn (10%)

● See Remarks for Circ. No smpl caught 4560-63'

● 63-70': LS: tan-brn, sli fos, mstly prtly dns, pr por, NS w/ tr LS: A.A. w/ stn & cpl pcs SFO (may be cavings), no odor, Sh: A.A. (30%)

● LS: crm-tan, fxln, fos-ool in prt, sub chky-prtly dns, pr por, NS, w/ cpl pcs por & stn that look like cavings from Ft Scott. Sh: A.A. (10%)

● LS: crm-brn, fxln, sli fos, sub chky-dns, pr w/ tr fr fos-small vug por, SSFO, cpl pcs w/ odor on brk. Sh: gry-grn (5%)

LS: crm-tan, fxln, fos in prt, sub chky-dns, pr por, NS
Sh: gry-grn, some sdy (10%)

4600'-10': LS: crm-brn, fxln, fos in prt, sub chky-dns, pr por, NS. Sh: lt-drk gry (15%)
4611' 30" Circ: LS: A.A. w/ tr cht (tan-brn), pr por, NS. Sh: gry-grn (15%)

● LS: A.A. w/ tr med brn patchy stn, NSFO

● Sh: gry-grn (15%) w/ trace Sd: clr, fn-med grain, semi fri, pr vis por, SSFO, sli odor

● LS: crm-tan, fxln, some sdy, sub chky-prtly dns, tr vug por, tr brn stn, NSFO. Sh: gry-grn (15%). scat Sd: clr, fn-med grain, sil, mstly brittle, pr vis por, med brn sub sat-sat stn, S-FSFO, fr odor

● Sd: wh, fn-vry fn grain, sil, soft-semi brittle, pr por, NS w/ tr Sd: A.A. w/ SSFO, fr odor

4636'-40': Junk from trip. Mix of LS, Sh & Sd

Sd: white A.A., NS (10%). Scat Cht: mstly white, fresh & weathered, NS. Time lag indicates about 4' new cuttings, the rest of smpl trip Junk A.A.

Cht: mstly wh, some crm, some wh-tan semi transl, fresh & weathered (50/50), fr-gd por in weathered cht, NS. Sh: mstly gry (10%).
LS: crm-tan, mstly prtly dns, pr por, NS (10%)

Cht: A.A., NS (70%). Sd: clr-wh, vry fn-med grain, sil, semi fri-brtl, pr vis por, NS (10%). Sh: gry-grn, some red-brn (10%). LS: crm-tan, fxln, fos-ool in prt, sub chky-prtly dns, pr por, NS (10%)

LS: mstly tan w/ some crm, fxln, fos-ool in prt, sub chky-prtly dns, pr por, NS.
Sh: gry & grn (10%). Cht & Sd: A.A. (10%)

Dol: crm-brn, fxln, fos in prt, mstly prtly dns w/ some sub chky, pr-fr pin point-small vug por, NS, w/ some LS A.A. Small amnt of Cht, Sd & Sh A.A.

A.A.

Dol: crm-tan w/ some brn, fxln, fos in prt, mstly prtly dns w/ some sub chky, sli chty (wh-tan), some pr-fr & some gd pin point-small vug por, NS

Dol: A.A.

Dol: crm-tan, fxln, fos in prt, sli chty (wh-tan), sub chky-prtly dns, fr-gd pin point-small vug por, NS

Dol: A.A. w/ incrs amnt of rock w/ fr-gd por, NS

Dol: A.A. w/ dcrs amnt of rock w/ fr-gd por, NS

4750' 30" & 60" Circ: A.A.

REMARKS

Samples start 3400' @ 3:04 am on 12-30-16
10' dry samples (no wet samples)

Samples are not lagged. Descriptions written in the interval they were taken

Straight Hole Survey @ 3420': 1.6° Dev.

Displaced mud at 3482'

Wabaunsee 3548' (-824) EL

Mud Co / Service Mud check @ 3558':
53 Vis, 8.6 Wt, 6.8 WL, 3# LCM

Straight Hole Survey @ 3639': 1.3° Dev.

Geologist on location 3697. Started wet samples 3690'-3700'.

Enlarged size of holes in sample cleaning bucket for bigger sample chips

Mud Vis dropped to 47. Added mud to raise Vis to 50-55.

reduced weight on bit from 38K to 32K to improve samples

Heebner 3984 (-1260) EL

reduced pump pressure to 900#, 58 SPM, & slowed rotation to 70 RPM to improve samples

Lansing 4021' (-1297) EL

Mud Co / Service Mud check @ 4018':
48 Vis, 9.1 Wt, 6.8 WL, 2# LCM

4040' 30" Circ: LS: crm-tan, fxln, fos w/ tr ool w/ por A.A., tr cht (crm), NS (mstly small pcs). Sh: A.A. (30%)

4040' 60" Circ: Sh: gry-grn, some red-brn (75%), LS: A.A., NS

Added mud to raise viscosity to 60 to improve samples. This resolved problems of high shale content and small sample cuttings.

4068' 30" Circ: LS: A.A. w/ some chky, sli chty, pr por, NS
Sh: gry-grn, some red-brn (15%)

4087' 30" Circ: LS: A.A., some brn, NS
Sh: A.A. (10%)

4116' 30" Circ: LS: crm-tan, fxln, fos in prt, sub chky-prtly dns w/ some chky-vry chky, fr-gd fos por, NS

Muncie Creek 4187' (-1463) EL

4219' 30" Circ: LS: A.A., NS
Sh: gry, grn, some red-brn (40%)

Added mud to raise viscosity above 60

4255' 30" Circ: LS: A.A., NS. Sh: gry, grn, some red-brn (50%)
Added mud to raise viscosity above 60

Mud Co / Service Mud check @ 4308':
60 Vis, 9.4 Wt, 7.2 WL, 3# LCM
(9:45 am while CFS prior to DST #1)

Stark 4288' (-1564) EL

DST #1 4276'-4308' L/KC 200' zn
IF: blow built to 1.5" FF: no blow
Rec. 125' MW w/show of oil (50%W, 50%M)
Chl ppm: 21,000 DST; 3,500 Mud
IFP: 21-44#/30" ISIP: 479#/60"
FFP: 50-76#/45" FSIP: 464#/75"

4308' 30" Circ: LS: A.A., vry scat stn & SFO (1 pc FS), fnt odor. 4308' 60" Circ: LS: A.A., tr stn & SFO, no odor

Pipe Strap @ 4308': Strap long 1.71'
Straight Hole Survey @ 4308': 2.2° Dev.
Ran 25 stand short trip prior to DST #1

Hushpuckney 4328' (-1604) EL

4329' 30" Circ: LS: crm-tan (incrs crm), fxln, fos in prt, sub chky-prtly dns, pr w/ tr ooc por A.A., NS. Sh: tr Blk Carb w/ gry-grn & red-brn (5%)

4329'-50' samples had some questionable brn stn, some looks like mineralization, some w/ lt yell fluor, no cut, no odor

4353' 30" Circ: LS: crm-lt brn, fxln, fos in prt, sub chky-prtly dns, w/ some chky, pr por, NS. 60": Circ: A.A.

Mud Co / Service Mud check @ 4353':
68 Vis, 9.35 Wt, 7.2 WL, 2# LCM
(9:40 am while TOH for DST #2)

B/KC 4370' (-1646) EL

DST #2 4316'-4353' L/KC 220' zn
IF: blow built to 1.75"
FF: light surge at open then dead
Rec. 60' Mud (100% M)
IFP: 19-29#/30" ISIP: 866#/60"
FFP: 34-40#/45" FSIP: 845#/75"

Marmaton 4401' (-1677) EL

Altamont 4425' (-1701) EL

Electricity and heater went totally out in geologist trailer at about 4456' (5:00 am) & 14° outside temperature. Unknowingly the weight on bit declined to 25K while driller worked on electrical problem. Added weight back to 30K @ 4468'. Electricity restored about 4505'

Pawnee 4488' (-1764) EL

Mud Co / Service Mud check @ 4500':
58 Vis, 9.2 Wt, 6.4 WL, 2# LCM
(9:15 am during Circ)

4500' 30" Circ: LS: A.A. w/ mstly LS: tan-brn, fxln, sli fos, sli chty (brn), sub chky-dns, pr por, NS. Sh: Blk Carb & grn (10%)

Myrick Station 4516' (-1792) EL

Fort Scott 4545' (-1821) EL

4563' 20" Circ: LS: crm-tan, fos-ool in prt, sub chk-prt dns, pr-fr w/ some gd intrprt-sm vug por, tr lt brn sptd stn, NSFO, 40" Circ: LS: A.A., vry scat stn & SFO no odor & LS: brn, prt dns, pr por, NS. Sh: Blk Carb, gry, some grn (40%). 60" Circ: LS: A.A., tr stn, NSFO

Cherokee 4569' (-1845) EL

DST #3 4522'-4636'
Fort Scott - Basal Penn Sand
IF: blow built to 1", then died to 0.5"
FF: surface blow for 1", then dead
Rec. 30' Mud w/ show of oil (100% M)
IFP: 22-22#/30" ISIP: 165#/60"
FFP: 17-20#/45" FSIP: 76#/75"

4611' 30" Circ: LS: A.A. w/ tr cht (tan-brn), pr por, NS. Sh: gry-grn (15%)

B/Penn Lm 4622' (-1898) EL

4636' 30" Circ: Sd: mstly wh A.A., w/ some Sd: clr-wh, fn-med grain, sil, semi fri-semi brittle, pr vis por, NS. Sh: mstly gry (5%). 60" Circ: LS: A.A., Sh: gry & grn (10%)

Straight Hole Survey @ 4636': 2.5° Dev.

Mud Co / Service Mud check @ 4636':
55 Vis, 9.3 Wt, 6.4 WL, 2# LCM
(9:05 am during FSIP on DST #3)

Miss. 4672' (-1948) EL

Ran 10 stand short trip @ 4750' after CFS

R.T.D. 4750' (-2026)

L.T.D. 4760' (-2036)

Straight Hole Survey @ 4750': 2.8° Dev.