Jeff Christian
PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGICAL REPORT
DRILLING TIME AND SAMPLE LOG

OPERATOR MURFIN DRILLING COMPANY
LEASE YOUNGMEYER 'A' # 1-11
LOCATION 2050' FNL & 2200' FEL
SEC. 11 TWSP 29 S RNG 8 E
COUNTY ELK STATE KANSAS
FIELD WILDCAT
API 15-049-22610-00-00

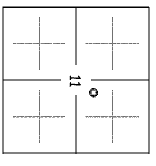
CONTRACTOR C & G RIG NO. 2
DRILLING STARTED 06/09/2017 COMPLETED 06/17/2017
MUD DISPLACED 900' MUD TYPE CHEMICAL
DRILLING TIME KEPT FROM 1000' TO RTD
SAMPLES SAVED FROM 1000' TO RTD
SAMPLES EXAMINED FROM 1000' TO RTD
GEOLOGICAL SUPERVISION FROM 1060' TO RTD

FORMATION NAME	LOG TOP	LOG DATUM	SAMPLE TOP	SAMPLE DATUM
HEEBNER	1284'	(+264)	1285'	(+263)
LANSING	1753'	(-205)	1700'	(-152)
KANSAS CITY	2016'	(-468)	2018'	(-470)
BKC	2228'	(-680)	2233'	(-685)
PAWNEE	2434'	(-886)	2435'	(-887)
EXCELLO	2512'	(-964)	2513'	(-965)
MISSISSIPPIAN	2798'	(-1250)	2803'	(-1255)
Kinderhook	3090'	(-1542)	3091'	(-1543)
ARBUCKLE	3145'	(-1597)	3143'	(-1595)
TOTAL DEPTH	3220'	(-1672)	3220'	(-1672)

ELEVATIONS
KB 1548'
GL 1539'
MEASUREMENTS FROM K.B.

CASING RECORD
Conductor NONE
Surface 8 5/8" @ 474'
W/ 150 SX
Production None

ELECTRICAL SURVEYS:
PIONEER:
DIL
CDL/CNL
MEL
BHCS



DATE	7:00 AM DEPTH	REMARKS
6/8/17	MIRT	
6/9/17	0'	Spud 7:20 am
6/10/17	474'	WOC dev. 1/4 deg.
6/11/17	1688'	Drlg.
6/12/17	2128'	Drlg.
6/13/17	2290'	Drlg dev. 3/4 deg. @ 2203'
6/14/17	2703'	Drlg.
6/15/17	2971'	Drlg. dev. 7/8 deg. @ 2980'
6/16/17	3058'	Drlg.
6/17/17	3215'	Drlg. RTD 3220' @ 7:30 am dev. 1 deg.
		Finish Logging @ 4:00 pm

Remarks

The Youngmeyer 'A' # 1-11 was declared dry and abandoned.
All sample shows of oil were drill stem tested and condemned.

Electric log measurements correlate about 1' to 2' high compared to rotary measurements.

Samples delivered to the Kansas Geological Survey in Wichita.

Respectfully Submitted,

Jeff Christian

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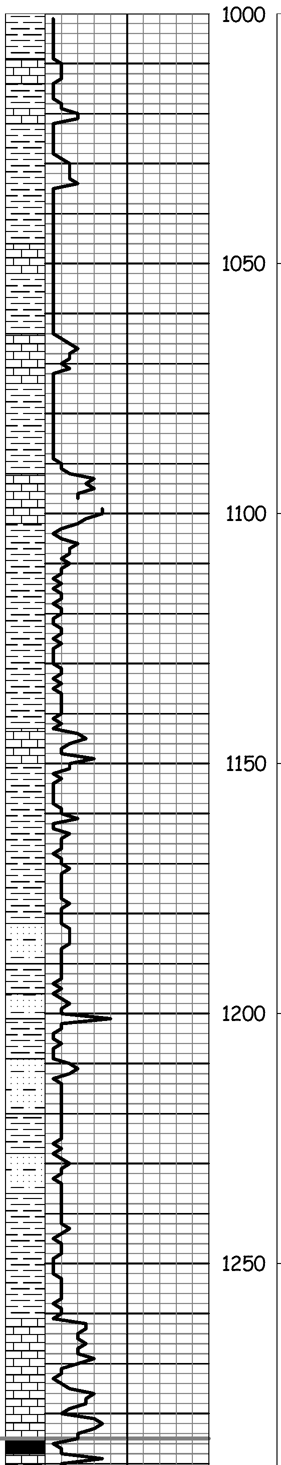
LITH.	0 DRILL TIME (MIN/FT) 10	DEPTH	SHW	SAMPLE DESCRIPTIONS	REMARKS



Ls: lt brn-lt gry, fn xln, sli grnlr, part dns, sli foss, sct pp-intrxln por, ns

Sh: red-grn-some gry

Ls: crm-lt gry, fn xln, part dns, sli foss, argil w/ sct Sh: gry

Ls: gry, argil- Sh: calc w/ sct Ls: wt-crm, fn xln, chlky

Sh: gry-brn

Ls: lt brn-brn-lt gry, fn-some med xln, foss-ool in part, pr intrxln por, ns

Sh: gry-brn, vy pyritic

Same

Sh: gry w/ Ls: gry, argil

Sh: gry w/ sct Ls: brn, fn xln, sndy, pr vis por, ns

Sh: gry

Same

Sh: as above w/ sct Sst: wt-lt gry, vfn-fn grn, sli calc, fri-hard, some drk inclsns, por intrgrn por, ns

Sst: as above

Sh: gry w/ Sst: as above

Same

Sh: gry

Ls: crm-lt brn, fn xln, part chlky, part dns, sli foss, pr vis por, ns

Ls: lt brn-brn, fn-some med xln, dns, sli foss, pr vis por, ns

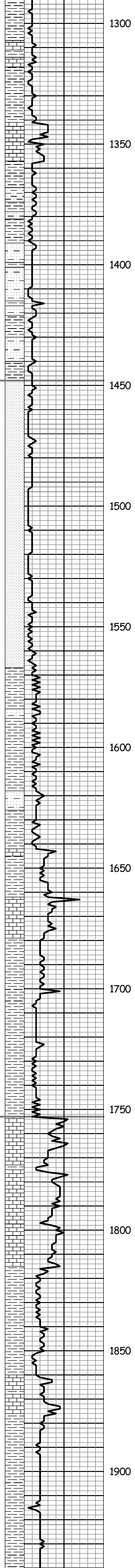
Sh: blk, carb (1300' smpl)

Remarks:

Fud Mud @ 925'; 6/10/17
Wt. 8.8, Vis. 36, WL. 12.2, Chl. 600, LCM. 0

Bit Trip @ 1097'
Pull PDC, Run GT 21XG
Deviation: 1/4 deg.

HEEBNER 1285' (+263)
E Log 1284 (+264)



Sh: grn-some gry, sli sndy

Ls: crm-lt brn, fn xln, sli grnlr, part dns, sli foss, pr vis por, ns

Ls: crm-lt brn, fn-some med xln, subchlky in part, sli foss, pr intrxln por, ns

Ls: as above w/ Sh: lt gry-some grn

Sh: gry w/ sct Sst: lt gry, vf-fn grn, sli calc, subfri-hard, pr intrgrn por, ns

Sh: lt gry w/ Sst: lt gry, vf grn, slty, subfri-hard, pr intrgrn por, ns

Sst: lt gry, vfn-fn grn, fri-subfri, fr intrgrn por, ns

Sst: as above, few w/ drkinclsns, ns

Sh: gry, fissl

Sh: as above w/ sct Sst: lt gry-crm, fn-med grn, fri, fr intrgrn por, ns

Sst: crm-lt gry, med-crs grn,qtz, subrnd, fr srt, subfri-hard, fr intrgrn por, ns

STALNAKER 1448' (+100)

E Log 1447' (+101)

Sst; as above, more fri, ns

Same

Sst: crm-lt gry, fn-med-crs grn, fri-subfri, subrnd, fr srt, fr intrgrn por, sct drk inclsns, ns

Sst: as above w/ Sh: gry

Sst: as above

Same w/ Sh: gry

Sh: gry w/ Sst: crm-lt gry, fn-med grn-some crs grn, fri, subrnd, fr srt, fr intrgrn por, ns

Sh: gry-trc grn w, Sst: as above

Sh: gry-some red & brn

Sh: as above w/ sct Ls: brn, cryptoxln, dns

Sst: lt gry, vfn-fn grn, sli calc, hard, drk inclsns, pr intrgrn por, ns

Sh: gry, slty, mica

Ls: crm, fn xln, part dns, sli foss, pr vis por, ns

Sh: lt gry-gry, slty, mica
sct Ls: brn, fn xln, dns, vy ool-foss, pr intrpart por, ns

Ls: crm-lt gry, fn xln, chlky in part, dns in part, sli foss, pr vis por, ns

Sh: gry, slty, mica

Sh: gry

Sh: as above w/ rare Ls: lt brn-lt gryfn xln, dns, few pcs wt, chlky, ns

Sh: drk gry w/ vy sct Sltst: lt gry, mica

Same

Sh: drk gry-blk, carb in part

Same

LANSING 1753' (-205)

E Log 1753' (-205)

Ls: wt-crm-lt gry, fn xln, subchlky, part dns, pr vis por, ns

Ls: crm-lt gry-gry, fn-some med xln, part dns, sli foss, pr vis por, ns

Ls: crm-lt brn-lt gry, fn-some med xln, subchlky, part dns, sli foss, pr vis por, ns

Ls: crm, fn xln, subchlky, foss, pr vis por, ns

Fud Mud @ 1782'; 6/11/17
Wt. 9.0, Vis. 41, WL. 9.2, Chl. 600, LCM. 2

Ls: crm-lt brn, fn-some med xln, subchlky, sli foss, pr vis por, ns

Ls: lt brn-brn-lt gry, fn xln, dns, some crm fn xln, subchlky, pr vis por, ns

Ls: as above

Sh: drk gry-blk, carb in part

Sh: drk gry-blk-some grn

Sh: gry-drk gry w/ vy sct Ls: brn, vy fn xln, dns

Sh: gry-drk gry-trc grn

Ls: crm-lt brn-lt gry, fn xln, dns, sli foss, pr vis por, ns

Sh: drk gry

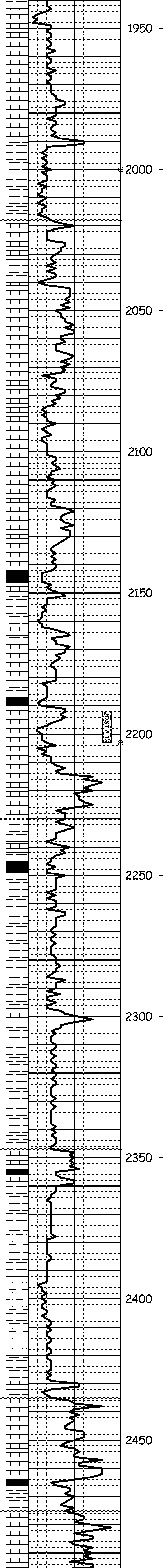
Ls & Sh: as above, trc ool chrt

Sh: gry, calc, w/ sct Sltst: lt gry, mica

Same

Sh: gry, calc, sli slty

Same



Sh: gry, calc, sli slty

Same

Ls: lt brn-lt gry, fn xln, dns, sli foss, pr vis por, ns

Sh: gry

Sltst: gry, vfn grn, calc, mica, hard, shly, pr intrgrn por, ns

Sltst: as above w/ Sh; gry-trc grn & red

KANSAS CITY 2018' (-470)

E Log 2016' (-468)

Ls: crm-lt brn-lt gry, fn xln, dns, sli foss, trc ool, pr vis por, ns

Sh: gry

Ls: lt gry-gry, vfn-fn xln, dns, sli foss, pr vis por, ns

Ls: lt gry-lt brn, fn xln, dns, ool-sli foss, pr intrpart por, ns

Ls: brn-lt gry, fn xln, dns, sli foss-ool, pr vis por, ns

Ls: crm-lt brn, fn xln, subchlky, sli foss, pr vis por, ns

Ls: as above, sli chrty

Ls: crm-lt brn, fn xln, subchlky, part dns, chrty, sli foss, pr vis por, ns

Same

Ls: lt gry-gry-brn, fn xln, dns, vy ool-sli foss, pr introol por, ns
w/ Sh: drk gry

Ls: brn-lt gry, fnxln, dns, sli ool-foss, pr vis por, ns

Sh: blk, carb

Ls: crm-lt brn, fn xln, grnlr, sli ool-foss, pr-trc fr intrxln-pp por, ns

Sh: gry w/ abndnt Sltst: lt gry, mica

Ls: lt brn-gry, vfn-fn xln, dns, pr vis por, ns
w/ Sh: gry-some grn

Ls:gry, fn xln, dns

Sh: blk, carb

Ls: crm-lt brn, fn xln, dns, subchlky in part, ns

Ls: lt brn, fn-some med xln, trc ool, fr pp-vug-trc oomld por, vy sct pcs w/ vssfo, trc gas, sli fr odor, drk brn sptd-trc subsat stn

Ls: brn, fn-some med xln, subool, sct fr por, ns

Ls: gry, fn xln, dns

Fud Mud @ 2203'; 6/12/17
Wt. 8.9, Vis. 44, WL. 9.2, Chl. 400, LCM. 3

DST # 1 2192' to 2203'
30"-60"-30"-60"
IF: Blow Built to 9" ISI: No Return
FF: BOB/11" FSI: No Return
RECOVERY: 575' total Fluid
15' SOCMW (4%O, 68%W, 28%M)
560' MW (85%W, 15%M)
IFP: 34-205# ISIP: 677#
FFP: 209-286# FSIP: 675#
IHP: 1054# FHP: 1039#
BHT: 104 deg. F
Chl. 155,000 ppm

Pipe Strap @ 2203': 1.31' Short to Board
Dev. 3/4 deg.

BKC 2230' (-682)

E Log 2228' (-680)

Sh: drk gry-blk

Sh: blk, carb

Sh: gry

Sh: gry

Sh: gry

Ls: crm-lt brn-lt gry, fn xln, dns, foss-ool, pr intrpart por, ns

Sltst: grn/gry, sli calc

Sst: lt gry-lt grn, vfn-fn grn, sli calc, sli mica, hard, pr intrgrn por, ns

Sst: as above w/ Sh: lt gry

Fud Mud @ 2345'; 6/13/17
Wt. 9.1, Vis. 40, WL. 8.8, Chl. 400, LCM. 3

Sh & Sltst: as above

ALTAMONT 2347' (-799)

E Log 2345' (-797)

Ls: crm-lt brn, fn xln, dns, sli foss in part, pr vis por, ns

Sh: blk, carb

Sh: lt gry-lt grn w/ Sltst: lt gry-lt grn, sli mica

Sst: lt gry, fvn-fn grn, sli calc, sli mica, subfri, pr intrgrn por, ns

Sh: lt gry-gry-grn

Sst: lt gry, fn-med grn, subrnd, fr srt, mica, sli calc, fri-subfri, pr-fr intrgrn por, ns

Sst: as above, argil in part

Sh: lt gry-gry

Ls: drk brn, fn xln, dns
Sh: gry

PAWNEE 2435' (-887)

E Log 2434' (-886)

Ls: as above

Ls: lt brn-gry, fn xln, dns, pr vis por, ns

Ls: lt-drk brn-some gry, fn xln, dns

Sh: blk, carb

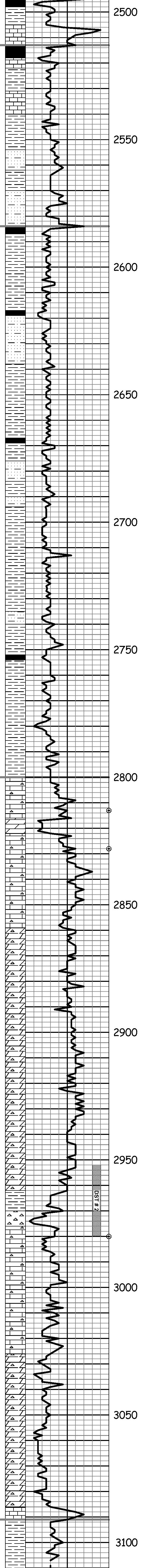
Sh: gry-drk gry

FT. SCOTT 2475' (-927)

E Log 2473' (-925)

Ls: crm-lt brn, fn xln, dns, foss-ool, pr intrpart por, ns

Ls: lt brn-lt gry, fn xln, dns, sli foss, pr vis por, ns



Sh: blk, carb

Sh: gry

Ls: lt gry, fn xln, dns

EXCELLO 2513' (-965)

E Log 2512' (-964)

Sh: blk, carb

Sltst: lt gry, calc, mica

Sh: lt gry-gry w/ Ls: lt gry-lt brn, fn xln, dns

Same

Sst: lt gry-gry, vfn grn, calc, hard, pr intrgrn por, ns

Sh: gry-drk gry

Sh: drk gry-blk w/ some Sltst: as above

Sst/Sltst: lt gry, vfn grn, calc, pyrit, ns

OAKLEY 2584' (-1036)

E Log 2583' (-1035)

Sh: blk, carb

Sh: lt gry-gry-some grn

Sh: as above, sndy

Sh: blk, carb

Sst/Sltst: lt gry-gry, vfn grn, sli calc, mica, trc pyrit, subfri, pr intrgrn por, ns

Same

Same w/ Sh: drk gry-blk, sndy/slty, mica

Same

Same

Sst: lt gry, vfn-fn grn, sli mica, fri-subfri, pr intrgrn por, ns

Same

Sh: grn/gry-drk gry-blk

Sh: gry/grn-drk gry-blk w/ sct Sltst: lt gry, sli calc, sli mica

Sh: lt -drk gry, sndy-slty in part

Same

Sh: gry

Sh: lt-drk gry-blk, carb

Fud Mud @ 2750'; 6/14/17
Wt. 9.3, Vis. 59, WL. 8.4, Chl. 800, LCM. 3

Sh: drk gry-blk-some lt gry

Sh: lt gry, waxy w/ sct Sltst: lt gry, mica

Same

Sh: lt-drk gry w/ trc Ls: brn, dns, foss-ool, pr intrpart por, ns

Mississippian 2800' (-1252)

E Log 2798' (-1250)

Ls: crm-lt brn-lt gry, fn-med xln, subool in part, pyrit w/ sct chrt, lt gry-lt brn, fresh, subtrans, pr vis por, ns

Dolo: lt brn, fn xln, sli suc, trc glauc, pr intrxln-pp por, ns

Ls & Chrt: as above

Ls: drk brn, fn xln, sli foss, sli chrty, pr vis por, ns

Ls: drk brn, fn-med xln, dns, sli foss, sct chrt, pr vis por, ns

Ls: crm-lt gry-brn, fn-med xln, sli foss, mott, pr vis por, ns

Dolo: drk brn, fn xln, dns, no vis por, ns

Same, vy sct lt gry, fresh chrt

Same

Dolo Ls: drk brn, fn xln, dns, vy sct lt gry, fresh chrt, pr vis por, ns

Same

Same

Dolo Ls: drk brn, fn xln, dns, argil in part, pr vis por, ns, fnt odor

Dolo Ls: as above, sli odor

Same

Dolo Sh: drk brn-blk

Fud Mud @ 2980'; 6/15/17
Wt. 9.0, Vis. 58, WL. 8.2, Chl. 700, LCM. 2

Same

Chrt: crm-lt gry, 40/60% fresh/wthrd, sli glauc in part, sct fr pp-vug por w/ drk brn sptd stn, nsfo, sli odor w/ Ls: lt brn-lt gry, fn xln, dns, pr vis por, trc stn

Chrty Ls: as above, 50/50 fresh/wthrd, pr pp-vug por, sct sptd stn, nsfo, sli odor

DST # 2 2952' to 2980'
30"-60"-60"-90"
IF: Blow Built to 4" ISI: No Return
FF: Blow Built to 3" FSI: No Return
RECOVERY:
175' VSO Sptd Mud (100% M, trc O)
IFP: 21-51# ISIP: 872#
FFP: 56-95# FSIP: 823#
IHP: 1415# FHP: 1383#
BHT: 116 deg. F

Crty Ls: lt-drk gry chrt, 10% wthrd, trc stn, nsfo, fnt odor w/ Ls: lt brn-brn-lt gry, fn xln, dns, pr por, ns

Chrty Ls: lt gry, fresh, opq Chert w/Ls: lt brn-lt gry, fn xln, dns, sli dolo in part, ns

Same

Chrty Dolo: lt brn-brn, fn xln, suc w/ lt gry, fresh chrt, ns

same w/ Sh: lt-drk gry-brn

Chrty Dolo: lt brn-brn, fn-trc med xln, suc, pr intrxln por w/ Chrt: crm-blu/gry, fresh, opq, ns, no odor

mostly Chrt: wt-crm, fresh-trc wthrd, opq w/ some Dolo: lt brn-brn, fn-trc med xln, suc, pr vis por, ns, no odor

Same

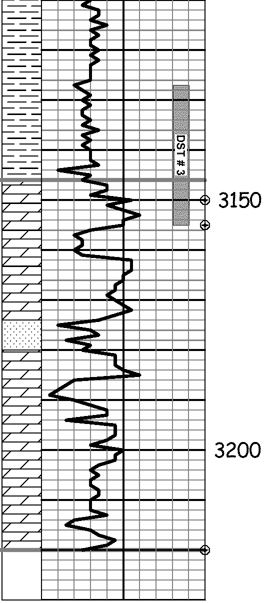
Ls: lt gry, fn xln, dns

KINDERHOOK 3091' (-1543)

E Log 3090' (-1542)

Sh: lt gry-grn/gry-some gry & brn, trc blk, carb

Same, sct blk, carb



Sh: grn/gry-drk gry-blk, carb

Sh: blk, carb

Same

Dolo: lt brn-lt gry, fn-trc med xln,dns,suc,vy sct pr intrxln por,trc brn-blk sptd stn,nsfo,fr odor

Dolo:crm-lt brn-lt gry, fn-trc med xln, dns, sct ool chrt, pt intrxln por, few pcs w/ edge stn, nsfo, sli-fr odor

Dolo: as above, vy chrty, pr-trc fr intrxln-vug por, ns, fnt odor

Dolo: lt brn-lt gry, fn xln, dns, sli suc, pr vis por, ns, no odor

Sst: wt-lt gry, fn-med grn, rnd, fr srt, sli calc, fri, fr intrgrn por, ns, no odor, no flur

Dolo: crm-lt brn, fn-med xln,some crs xln, gd intrxln-vug por, ns, no odor

Dolo: crm-brn-lt gry, fn xln, dns,suc, sct chrt, pr vis por, ns, no odor

Dolo: lt brn-lt gry, fn-med xln, suc, part dns, sct fr intrxln-vug por, ns

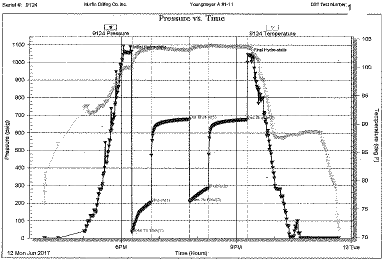
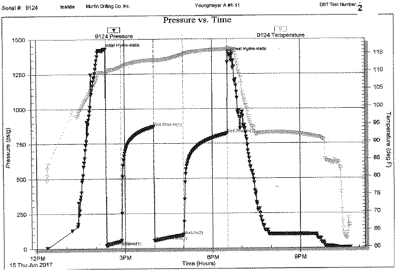
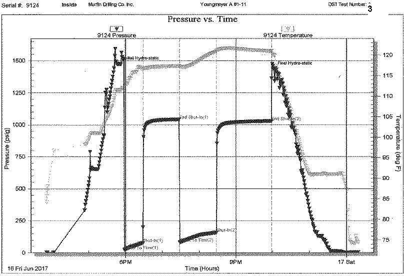
Fud Mud @ 3138'; 6/16/17
Wt. 9.0, Vis. 41, WL. 7.6, Chl. 800, LCM. 3

ARBUCKLE 3146' (-1598)
E Log 3145' (-1597)

DST # 3 3127' to 3155'
30"-60"-60"-90"
IF: Blow Built to 6" ISI: No Return
FF: Blow Built to 10" FSI: No Return
RECOVERY:
315' W & M (49%W, 51%M) nso
IFP: 23-78# ISIP: 1041#
FFP: 82-158# FSIP: 1029#
IHP: 1472# FHP: 1433#
BHT: 121 deg. F
CHL: 32,000 ppm

Fud Mud @ 3220'; 6/17/17
Wt. 8.8, Vis. 51, WL. 7.6, Chl. 700, LCM. 3

RTD 3220' (-1672)
E Log 3220' (-1672)

Drill Stem Test Charts