

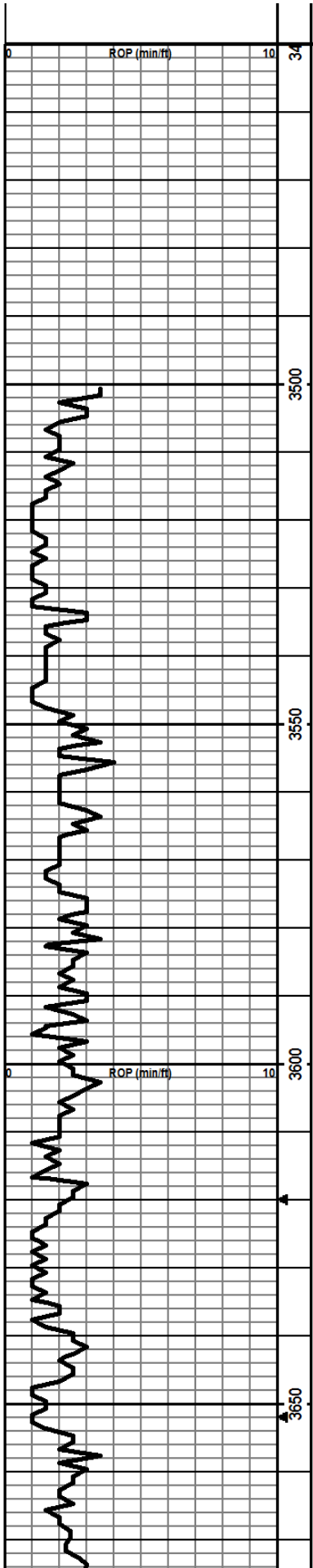
COMMENTS

Contractor: Duke Drilling Rig #4.
 Pusher: Rich Wheeler.
 Surface Casing: 8 5/8" set at 221' (KB) w/165sx cement.
 Production Casing: Production casing was not installed and the hole was plugged and abandoned based on field observations of drill cuttings and electric log review. DSTs were not conducted based on drill cutting evaluations.
 Mud by: MudCo.
 DST's by: Diamond Testing - No DSTs were conducted.
 Logs by: Weatherford (DIL w/SP, CN-CD, ML).
 RTD= 4798', -1787'.
 LTD= 4800', -1789'.

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
Queen Hill	3866'	-855	3868'	-857
Heebner Shale	3930'	-919	3931'	-920
Toronto	3949'	-938	3951'	-940
Lansing	3975'	-964	3977'	-966
Muncie Creek Shale	4148'	-1137	4148'	-1137
Stark Shale	4248'	-1237	4248'	-1237
Hushpuckney Shale	4296'	-1285	4296'	-1285
Marmaton	4371'	-1360	4371'	-1360
Upper Fort Scott	4475'	-1464	4477'	-1466
Little Osage Shale	4499'	-1488	4499'	-1488
Excello Shale	4517'	-1506	4517'	-1506
Johnson Zone	4590'	-1579	4590'	-1579
Morrow	4654'	-1643	4655'	-1644
Mississippian	4715'	-1704	4716'	-1705
RTD	4798'	-1787		
LTD			4800'	-1789

ROP (min/ft)	rop	Depth	Lithology	CFS Point	Oil Shows	Geological Descriptions	Remarks
	—						



Morning Report Depth/Activity

12/27/2013, Spud
 12/28, drill @ 790'
 12/29, drill @ 2390'
 12/30, drill @ 3164'
 12/31, drill @ 3593'
 01/01/2014, drill @ 4018'
 01/02, drill @ 4265'
 01/03, drill @ 4570'
 01/04, drill @ 4766'; TD @ 4798', E-logging.

Anhydrite: Top @ 2354', Botton @ 2376'

ROP Data begins @ 3500' on 12/31/2013

NOTE: No DSTs were conducted during drilling operations based on drill cutting evaluations.

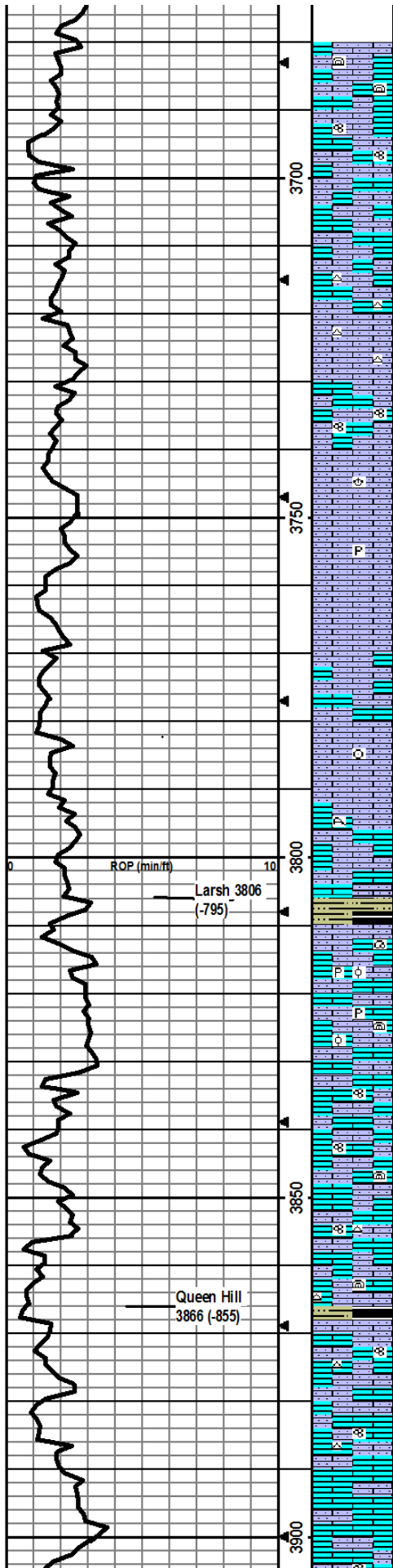
Mudco Check #1 @ 0'
 12/21/13; predrilling recommendations.

Mudco Check #2 @ 2639'
 12/29/13 12:00pm
 wt vis pH chl
 9.8 29 7.0 60000
 Filt LCM
 n/c 1

Mudco Check #3 @ 3181'
 12/30/13 11:30am
 wt vis pH chl
 9.5 30 7.0 42000
 Filt LCM
 n/c 1

Mudco Check #4 @ 3608'
 12/31/13 10:40am
 wt vis pH chl
 8.6 61 11.0 2200
 Filt LCM
 5.6 2

Drill cutting samples at 10' intervals start at



3700'.

LS: lt brn/gry, micro-med xtal, foss frags/algae, some vry silty, some ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn/gry, micro-med xtal, foss frags/fusn, silty, min in-xtal/frac por, no odor, ns.

LS: crm/lt-med gry, micro-med xtal, foss frags, some vry silty, some wht chalk, min in-xtal por, no odor, ns.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags, some vry silty, some wht grainy chert, min in-xtal por, no odor, ns.

LS: lt brn/lt-med gry, micro-med xtal, min foss frags, vry silty, some wht grainy chert, min in-xtal/frac por, no odor, ns.

LS: lt brn, micro-med xtal, foss frags/fusn, some vry silty, some ppt in-xtal por, no odor, ns.

LS: crm/lt brn/lt-med gry, micro-fn xtal, min foss frags/brac, vry silty, some chalky, min ppt in-xtal por, no odor, ns.

LS: crm/lt brn/lt-med gry, micro-fn xtal, min foss frags, vry silty, slt pyritic, some soft wht chalky pcs, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn/lt gry, micro-fn xtal, foss frags, vry silty, some wht chalky pcs, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt-med gry, micro-fn xtal, min foss frags, vry silty, increase in wht soft chalk, min in-xtal/frac por, no odor, ns.

LS: crm/lt brn/lt-med gry, micro-fn xtal, min foss frags/crin, vry silty, some chalky, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn/lt-med gry, micro-med xtal, foss frags/coral, silty, some chalky, min frac por, no odor, ns.

LS: crm/lt brn/lt-med gry, micro-fn xtal, min foss frags, vry silty, some chalky, some ppt in-xtal/frac por, no odor, ns.

SH: med-dk gry, silty, carb, soft-firm, fissile.

LS: lt brn/lt gry, micro-med xtal, foss frags/gas/ool, some vry silty, min pyrite, some ppt in-xtal por, no odor, ns.

LS: lt brn/lt-med gry, micro-med xtal, foss frags/algae/ool, some vry silty, some chalky, min pyrite, min ppt in-xtal/frac por, no odor, ns.

LS: lt brn/lt-med gry, micro-fn xtal, foss frags/fusn, some silty, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt-med brn/lt-med gry, micro-med xtal, min foss frags/fusn/algae, some silty, some chalky, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn, micro-fn xtal, foss frags/fusn, some silty, some soft wht chalky pcs, some wht/lt gry chert, min ppt in-xtal por, no odor, ns.

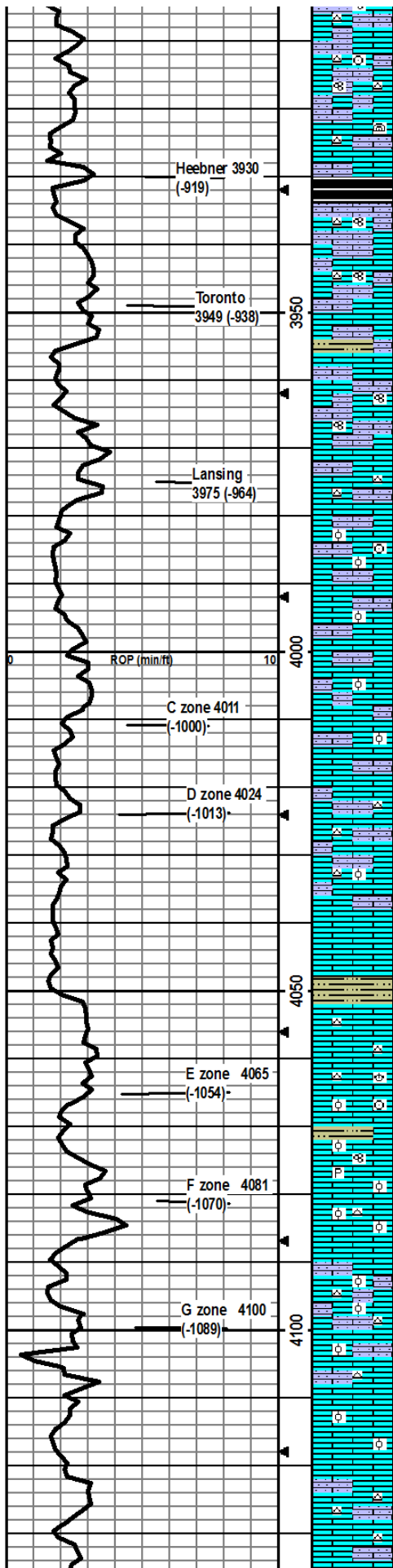
SH: med-dk gry/blk, silty, carb, soft-firm, fissile.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags/fusn, some silty, some wht chert, some chalky, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn/lt gry, micro-med xtal, min foss frags/fusn, some silty, some wht/lt gry/orange chert, some ppt in-xtal/frac por, no odor, ns.

LS: crm/lt-dk brn/gry, micro-fn xtal, foss frags, some silty, min soft wht chalky pcs, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn/lt gry, micro-fn xtal, foss frags/min fusn, some silty, some chalky, some wht/lt gry chert, min ppt in-xtal/frac por, no odor, ns.



some cherty, some lt gry chert, min frac por, no odor, ns.

LS: crm/lt gry, micro-med xtal, foss frags/fusln/crin, some silty, wht/lt gry chert, some chalky, min frac por, no odor, ns.

LS: crm/lt brn/lt gry, micro-med xtal, min foss frags/algae, some silty, some wht/lt gry chert, min ppt in-xtal/frac por, no odor, ns.

SH: dk gry-blk, silty, carb, firm, fissile.

LS: crm/lt brn/gry, micro-fn xtal, min foss frags/fusln, some silty, min lt gry chert, min ppt in-xtal por, no odor, ns.

LS: crm/lt brn/gry, micro-fn xtal, foss frags/fusln, some silty, some wht/lt gry chert, min in-xtal/frac por, no odor, ns.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags, some silty, some gry soft silty SH, min frac por, no odor, ns.

LS: crm/lt brn, micro-fn xtal, min foss frags/fusln, some silty, wht/lt gry chert, some frac por, no odor, ns.

LS: crm/lt brn, micro-fn xtal, min foss frags, some silty, some chalky pcs, some wht/lt gry chert, min frac por, no odor, ns.

LS: crm/lt gry, micro-med xtal, foss frags/crin/ool, silty, some chalky pcs, wht/lt gry chert, min frac por, no odor, 1 pcs in 60 min smpl w/ppt-fn in-xtal por w/sfo, yel flor/cut, ssfo.

LS: crm/lt brn, micro-med xtal, min foss frags/ool, some chalky, some wht/lt gry chert, min ppt in-xtal por, no odor, ns.

Same as above w/3 pcs w/ppt-fn in-xtal por w/sfo, no odor, yel flor/cut, ssfo.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags/min ool, some pyritic, some chalky, min ppt in-xtal por, 1 pce in 30 min smpl w/brn oil stain, 1 pcs wfo in 4030 smpl, no odor, silty el flor/cut, ssfo.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags, some silty, some chalky, wht/lt brn chert, some ppt-fn in-xtal por, no odor, ns.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags/ool, some silty, some chalky, some wht chert, some ppt-med in-xtal por, no odor, 1 pcs in 60 min smpl w/sfo, yel flor/cut, ssfo.

LS: crm/lt brn, micro-med xtal, min foss frags, some ppt-fn in-xtal por, no odor, ns.

SH: lt-med gry/greenish gry/gryish brn, silty, firm-hard.

LS: crm/lt brn, micro-med xtal, min foss frags, wht/crm/brn chert, some chalky, some ppt-fn in-xtal por, no odor, ns.

LS: crm/lt brn/lt gry, micro-fn xtal, min foss frags/brac/crin/ool, min pyritic, some chalky, some wht chert, min ppt-fn in-xtal por, 3 pcs in 30 min and 1 pce in 60 min smpls w/sfo, 1 pce wdk brn thicker tar oil, yel flor/cut, slit crush odor, sfo.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags/fusln/ some w/abund ool, ool pcs are dense, min pyritic, med-dk gry silty SH, min frac por, no odor, ns.

LS: crm/lt brn, micro-med xtal, foss frags/ool, some chalky, some lt gry chert, 1 pce in 30 min w/in-ool ppt-fn por w/sfo, yel flor/cut, slit crush odor, ssfo.

LS: crm/lt brn, micro-med xtal, foss frags/ool, some silty, wht chert, some med-dk gry silty SH, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn, micro-med xtal, foss frags/some ool, some silty, wht chert, min frac por, no odor, ns.

LS: crm, micro-med xtal, min foss frags w/some ool/oo-castic, some fn-med in-ool/oo-castic por, no odor, ns.

LS: crm/lt brn, micro-med xtal, min foss frags, some silty, some wht chert, some chalky, min ppt in-xtal por, no odor, ns.

LS: same as above.

CF S @ 3990'
30"/60"

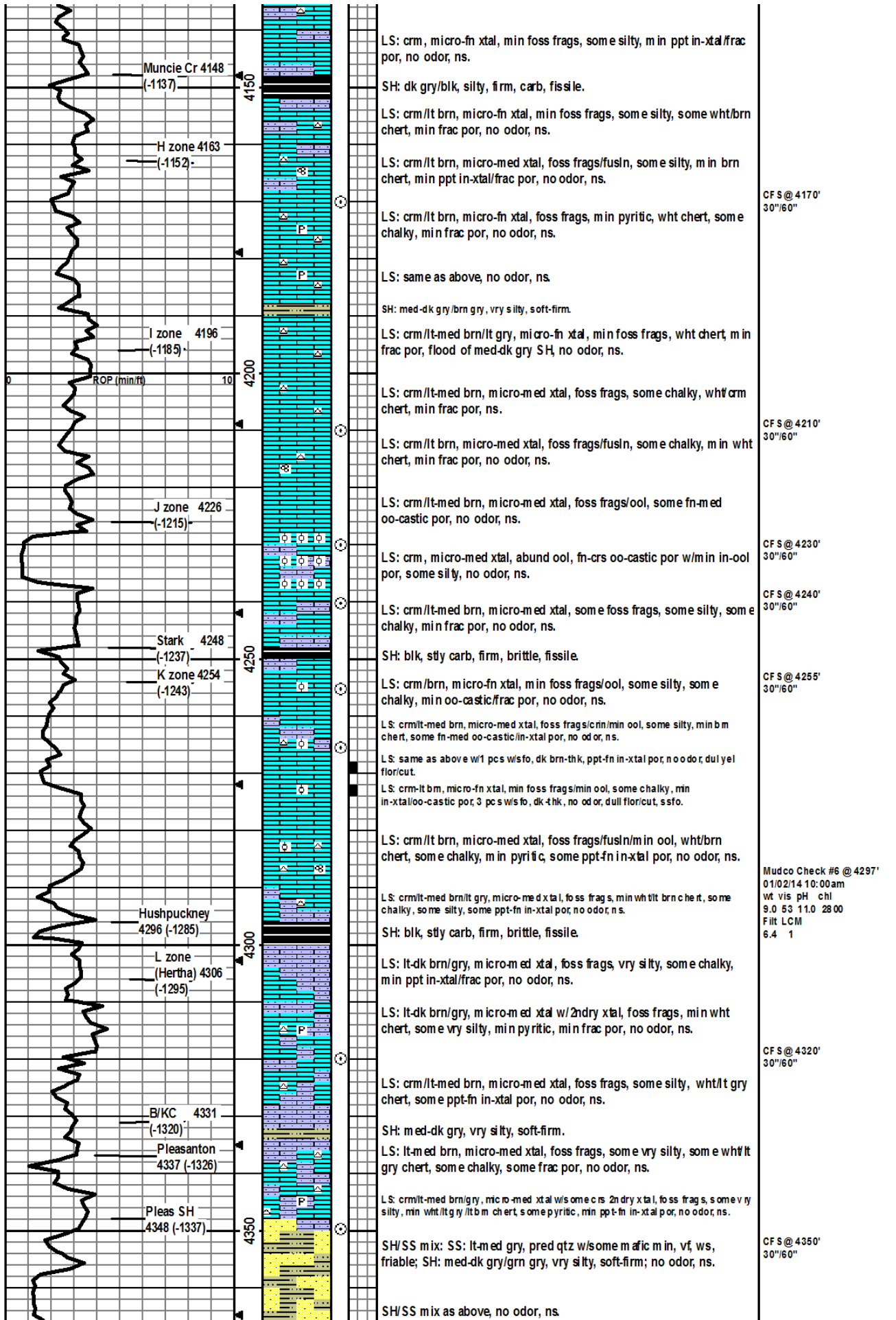
CF S @ 4015'
30"/60"

CF S @ 4035'
30"/60"

Mudco Check #5 @ 4060'
01/01/14 10:00am
wt vis pH chl
9.0 59 10.0 2500
Filt LCM
6.8 2

CF S @ 4070'
30"/60"

CF S @ 4085'
30"/60"



Muncie Cr 4148
(-1137)

H zone 4163
(-1152)

I zone 4196
(-1185)

J zone 4226
(-1215)

Stark 4248
(-1237)

K zone 4254
(-1243)

Hushpuckney 4296
(-1285)

L zone (Hertha) 4306
(-1295)

B/KC 4331
(-1320)

Pleasanton 4337
(-1326)

Pleas SH 4348
(-1337)

LS: crm, micro-fn xtal, min foss frags, some silty, m in ppt in-xtal/frac por, no odor, ns.

SH: dk gry/blk, silty, firm, carb, fissile.

LS: crm/lt brn, micro-fn xtal, min foss frags, some silty, some wht/brn chert, min frac por, no odor, ns.

LS: crm/lt brn, micro-med xtal, foss frags/fusln, some silty, m in brn chert, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn, micro-fn xtal, foss frags, min pyritic, wht chert, some chalky, min frac por, no odor, ns.

LS: same as above, no odor, ns.

SH: med-dk gry/brn gry, vry silty, soft-firm.

LS: crm/lt-med brn/lt gry, micro-fn xtal, min foss frags, wht chert, m in frac por, flood of med-dk gry SH, no odor, ns.

LS: crm/lt-med brn, micro-med xtal, foss frags, some chalky, wht crm chert, min frac por, ns.

LS: crm/lt brn, micro-med xtal, foss frags/fusln, some chalky, m in wht chert, min frac por, no odor, ns.

LS: crm/lt-med brn, micro-med xtal, foss frags/ool, some fn-med oo-castic por, no odor, ns.

LS: crm, micro-med xtal, abund ool, fn-crs oo-castic por w/m in in-ool por, some silty, no odor, ns.

LS: crm/lt-med brn, micro-med xtal, some foss frags, some silty, some chalky, min frac por, no odor, ns.

SH: blk, stly carb, firm, brittle, fissile.

LS: crm/brn, micro-fn xtal, m in foss frags/ool, some silty, some chalky, min oo-castic/frac por, no odor, ns.

LS: crm/lt-med brn, micro-med xtal, foss frags/crn/min ool, some silty, min b m chert, some fn-med oo-castic/in-xtal por, no odor, ns.

LS: same as above w/1 pcs w/sfo, dk brn-thk, ppt-fn in-xtal por, no odor, dull yel flor/cut.

LS: crm-lt brn, micro-fn xtal, min foss frags/min ool, some chalky, min in-xtal/oo-castic por, 3 pcs w/s fo, dk-thk, no odor, dull flor/cut, s sfo.

LS: crm/lt brn, micro-med xtal, foss frags/fusln/m in ool, wht/brn chert, some chalky, m in pyritic, some ppt-fn in-xtal por, no odor, ns.

LS: crm/lt-med brn/lt gry, micro-med xtal, foss frags, min wht/lt brn chert, some chalky, some silty, some ppt-fn in-xtal por, no odor, ns.

SH: blk, stly carb, firm, brittle, fissile.

LS: lt-dk brn/gry, micro-med xtal, foss frags, vry silty, some chalky, m in ppt in-xtal/frac por, no odor, ns.

LS: lt-dk brn/gry, micro-med xtal w/2ndry xtal, foss frags, min wht chert, some vry silty, min pyritic, min frac por, no odor, ns.

LS: crm/lt-med brn, micro-med xtal, foss frags, some silty, wht/lt gry chert, some ppt-fn in-xtal por, no odor, ns.

SH: med-dk gry, vry silty, soft-firm.

LS: lt-med brn, micro-med xtal, foss frags, some vry silty, some wht/lt gry chert, some chalky, some frac por, no odor, ns.

LS: crm/lt-med brn/gry, micro-med xtal w/some crs 2ndry xtal, foss frags, some vry silty, min wht/lt gry/lt brn chert, some pyritic, min ppt-fn in-xtal por, no odor, ns.

SH/SS mix: SS: lt-med gry, pred qtz w/some mafic m in, vf, ws, friable; SH: med-dk gry/grn gry, vry silty, soft-firm; no odor, ns.

SH/SS mix as above, no odor, ns.

CFS @ 4170'
30"/60"

CFS @ 4210'
30"/60"

CFS @ 4230'
30"/60"

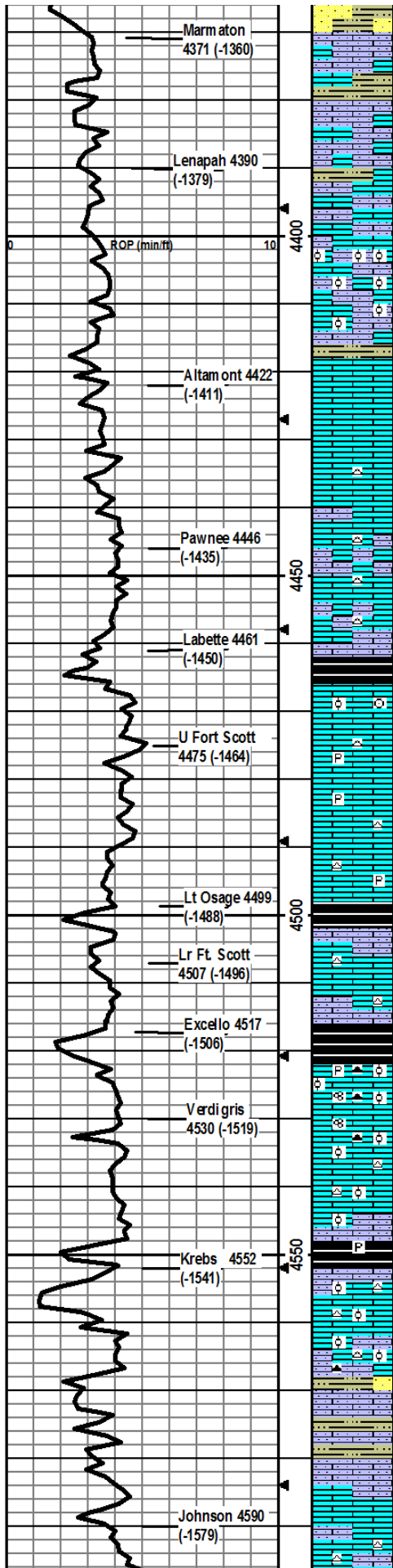
CFS @ 4240'
30"/60"

CFS @ 4255'
30"/60"

Mudco Check #6 @ 4297'
01/02/14 10:00am
wt vis pH chl
9.0 53 11.0 28 00
Filt LCM
6.4 1

CFS @ 4320'
30"/60"

CFS @ 4350'
30"/60"



LS: crm/lt brn, micro-fn xtal, some foss frags, some chalky, some silty, min frac por, no odor, ns.
 SH: med-dk gry/grn gry, vry silty, soft-firm.

LS: crm/lt brn, micro-fn xtal, min foss frags, some silty, some chalky, min frac por, no odor, ns.
 LS: crm/lt brn/lt gry, m micro-fn xtal, m in foss frags, some silty, some gry firm silty SH, min ppt in-xtal por, no odor, ns.
 LS: crm/lt brn/yel brn, m micro-med xtal, min foss frags w/abund ool, some silty, some chalky, min frac por, no odor, ns.
 LS: crm/lt brn/yel brn, m micro-med w/some crs xtal, min foss frags w/some ool, some chalky, min frac por, no odor, ns.
 SH: lt-med gry, vry silty, soft.

LS: crm, micro-fn xtal, min foss frags, some chalky, m in frac por, no odor, ns.
 LS: crm/lt brn, micro-med xtal, m in foss frags, some lt gry chert, m in frac por, no odor, ns.
 LS: crm/lt brn, micro-fn xtal, min foss frags, some silty, some wht/lt gry chert, some frac por, no odor, ns.

LS: crm, micro-fn xtal, min foss frags, some silty, some wht/lt gry chert, some chalky, m in frac por, no odor, ns.
 SH: dk gry/blk, slt carb, firm, fissile.
 LS: crm/lt brn, micro-med xtal, m in foss frags/crin w/some dense ool pcs, m in frac por, no odor, ns.
 LS: crm/lt gry, m micro-fn xtal, m in foss frags, crm/lt brn chert, m in pyritic, min frac por, no odor, ns.
 LS: same above, some chalky, no odor, ns.

LS: crm/lt gry, m micro-fn xtal, foss frags, stly pyritic, some chalky, lt brn chert, no vis por, no odor, ns.
 SH: blk, carb, gas bubbles, hard, fissile.

LS: crm/lt-med brn/lt gry, micro-med xtal, m in foss frags, some silty, crm/lt-med brn chert, min frac por, no odor, ns.
 SH: dk gry/blk/some brn tint, carb, slt gas bubbles, some silty, firm, fissile.

LS: crm/lt-med brn, micro-med xtal, foss frags/fusin/ool, lt-med brn chert, 2 pcs w/ppt fn in-ool por w/sfo, yel flor/cut, no odor, ss fo.
 LS: crm/lt-dk brn, micro-med xtal, foss frags/fusin/ool, some chalky, wht/lt gry chert, stly pyritic, mostly dense w/1 pce w/ppt-fn in-ool por w/sfo, yel flor/cut, no odor, sfo.
 LS: crm/lt-med brn, micro-med xtal, foss frags/ool, some silty, some chalky, wht/lt brn chert, some frac por, no odor, ns.

SH: dk gry/blk/dk brn, carb, silty, pyritic, firm, fissile.
 LS: crm/lt-med brn, micro-med xtal, min foss frags w/some abund ool pcs, some silty, lt brn chert, 4 pcs w/ppt-fn in-ool por w/sfo, yel flor/cut, no odor, sfo.

LS: crm/lt brn, micro-med xtal, foss frags/ w/dense ool ps, some silty, wht/lt gry/lt-dk brn chert, frac vis por, no odor, ns.

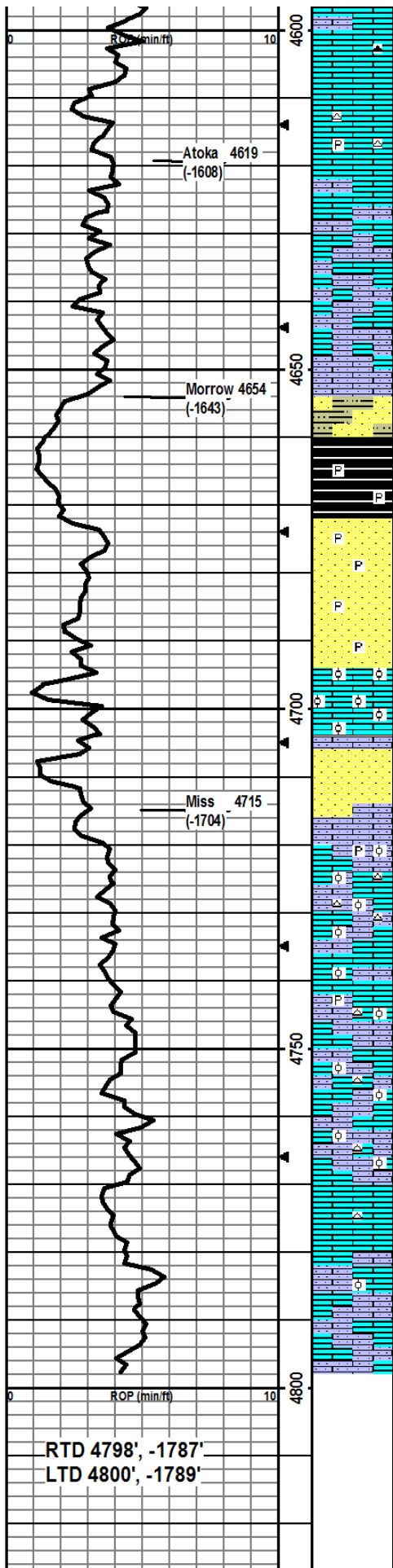
SH/SS/LS mix: SH: med-dk gry/greenish gry/dk brn, soft-firm, silty; SS: gry, med qtz vs w friable; LS: crm/lt brn/lt gry, micro-med xtal, min foss frags, vry silty, min ppt in-xtal por, no odor, ns.

LS: crm/lt-med brn/gry, m micro-med xtal, min foss frags, some vry silty/sndy, some chalky, frac por, no odor, ns.

LS: crm/lt-med brn, micro-med xtal, foss frags, wht/lt brn chert, some silty, 1 pce w/ppt in-xtal por w/sfo, dul yel flor/yel cut, slt crush odor,

CF S @ 4570'
 30"/60"

Mudco Check #7 @ 4574'
 01/03/14 08:30am
 wt vis pH chl
 9.3 54 11.0 4000
 Filt LCM
 6.4 1



ssfo.

LS: crm/lt-med brn, micro-med xtal, foss frags/fusin, lt brn chert, 8 pcs w/ppt in-xtal por w/sfo, dul yel flor/cut, no odor, sfo.

LS: crm/lt brn, micro-fn xtal, min foss frags, some lt brn gry chert, 5 pcs in 30 min and 4 pcs in 60 min smpls w/ppt por w/sfo, no odor, yel flor/cut, sfo.

LS: lt-med brn, micro-med xtal, foss frags, some vry silty, min frac por, no odor, ns.

LS: crm/lt-med brn/some green encrusted, min foss frags, some vry silty, flood of m-e-dk gry/greenish gry/brn vry silty SH, 3 pcs w/ppt-med in-xtal por w/sfo, dull yel flor/cut, no odor, ssfo.

LS: as above w/ns of oil; cont flood of SH as above.

SS/SH mix: SH - med-dk gry/greenish gry/maroon brn, vry silty, soft-firm SS - lt-med br/lt greenish gry/lt gry, p red qtz, glau, ws, wr, vf, some hard, some friable, ns. 1 pce of LS w/ppt-fn in-xtal por w/sfo.

SH: flood of dk gry/blk, carb, vry silty, some pyritic, soft-firm, fissile

SS: lt-med gry, ws, vf, wr, hard but friable, CaCO3 matrix, some pyritic, no odor, ns.

SS: same as above w/some glau, no odor, ns.

LS: crm/lt brn, micro-med xtal, min foss frags w/abund ool pcs, some lt brn chert, min oo-castic por, no odor, ns.

LS: crm/lt brn, micro-fn xtal, vry sandy, chalky, soft, no odor, ns.

SS: wht/lt gry, vf-m, mod sort, sr-wr, some vry chalky, chalky is soft non-chalky is hard, friable, no odor, ns.

LS: crm, micro-med xtal, foss frags/dense ool pcs, some chalky, some silty/sandy, min pyritic, min wht grainy chert, min ppt-fn in-xtal/in-ool por, no odor, ns.

LS: crm, micro-med xtal, foss frags/ool, some chalky, some silty/sndy, wht/crm chert, min frac por, no odor, ns.

LS: crm/lt brn, micro-med xtal, min foss frags w/some abund ool pcs, some silty/sndy, some chalky pcs, wht/lt brn chert, min pyritic, some frac por, no odor, ns.

LS: crm/lt gryish crm, micro-med xtal, some ool pcs, some silty/sndy, lt brn/lt orangish brn chert, min frac por, no odor, ns.

LS: crm/lt brn w/some dk brn, micro-med xtal, some ool pcs, some vry sndy, some chalky, min crm chert, some frac por, no odor, ns.

LS: crm, micro xtal, no foss, some wht/lt brn grainy chert, no vis por, no odor, ns.

LS: crm/m in lt brn, micro-med xtal, some ool pcs, some sandy pcs, some chalky pcs, min frac por, no odor, ns.

LS: crm/lt gryish crm, micro-fn xtal, some sndy pcs, some chalky, min frac por, no odor, ns.

TD @ 4798.

CF S @ 4620'
30"/60"

CF S @ 4665'
30"/60"

CF S @ 4675'
30"/60"

CF S @ 4685'
30"/60"

CF S @ 4695'
30"/60"

CF S @ 4715'
30"/60"

CF S @ 4735'
30"/60"

Mudco Check #8 @ 4779'
01/04/14 08:00am
wt vis pH chl
9.4 54 10.5 4000
Filt LCM
7.2 1

CF S @ 4798'
30"/60"
Cir 1.5 hrs total to clean hole.

RTD 4798', -1787'
LTD 4800', -1789'

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