

COMMENTS

Grand Mesa Company Geologist: Steve Stribling, 316-265-3000.

Drilling Contractor: WW Drilling Company Rig #6.

Tool Pusher: Mark Bigge; Cell: 785-259-1836.

Surface Casing: 8 5/8" set at 217' (KB) w/165sx cement.

Production Casing: Production casing (5.5") was installed to RTD, based on field observations of drill cuttings, DST results and electric log evaluation.

Mud by: MudCo/Service Mud, Inc.; Reid Atkins, 785-694-3741.

DST's by: Diamond Testing; Ricky Ray, 620-617-7261.

Logs by: Weatherford (DI w/SP, CN-CD, ML), Jeffrey Randle, 620-624-9324.

RTD = 4710'

LTD = 4709'

NOTE: While on location, no prairie chickens were observed during drilling operations. Drilling operations were located at the boundry of a corn stubble field and CRP grass field.

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
Queen Hill	3878'	-968	3879'	-969
Heebner Shale	3941'	-1031	3941'	-1031
Toronto	3962'	-1052	3963'	-1053
Lansing	3979'	-1069	3979'	-1069
Muncie Creek Shale	4134'	-1224	4133'	-1223
Stark Shale	4222'	-1312	4221'	-1311
Hushpuckney Shale	4257'	-1347	4256'	-1346
Marmaton	4327'	-1417	4327'	-1417
Upper Fort Scott	4422'	-1512	4424'	-1514
Little Osage Shale	4450'	-1540	4449'	-1539
Excello Shale	4474'	-1564	4474'	-1564
Johnson Zone	4551'	-1641	4550'	-1640
Morrow	4574'	-1664	4576'	-1666
Mississippian	4610'	-1700	4608'	-1698
RTD	4710'	-1800		
LTD			4709'	-1799

ROCK TYPES

LITHOLOGY

	Anhy
	Cht
	Coal
	Congl
	Dol
	Gyp
	Lmst
	Salt
	Shale
	Shcol
	Shgy
	Sltst
	Ss
	Carb sh
	Dol
	Dtd
	Gry sh
	Sandylms
	Shale
	Sltstn
	Shlyslts

	Sitysh
	Sdy dolo
	Silty dolo
	Shy dolo
	Shaly ls

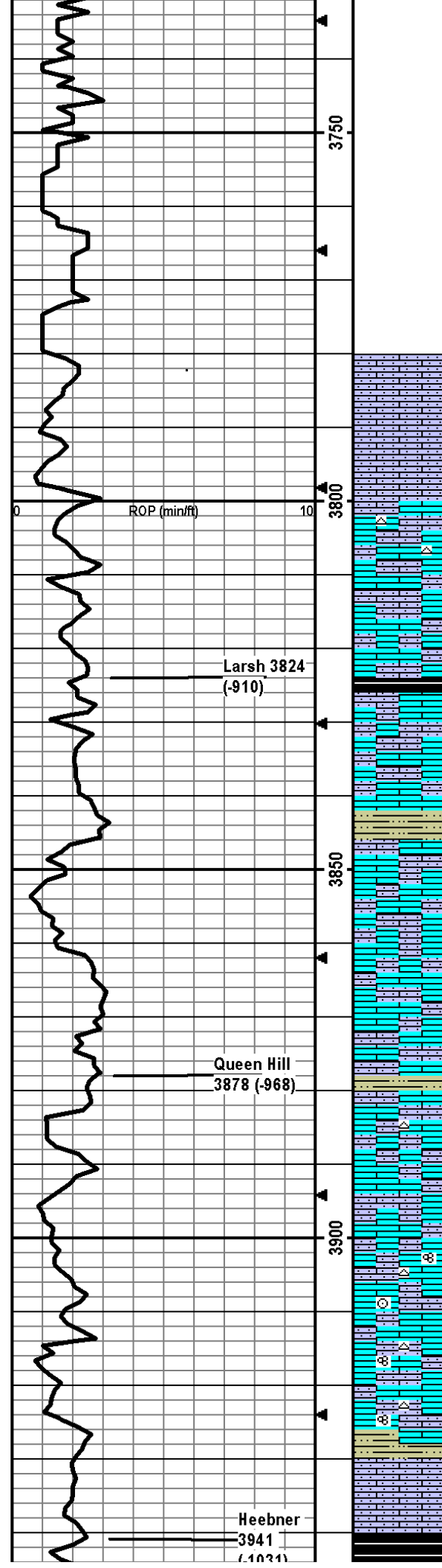
FOSSIL

	Algae
	Amph
	Belm
	Bioclst
	Brach
	Bryozoa
	Cephal
	Coral
	Crin
	Echin
	Fish
	Foram
	Fossil
	Gastro
	Oolite

MINERAL

	Ostra
	Pelec
	Pellet
	Pisolite
	Plant
	Strom
	Fuss
	Oomold
	Anhy
	Arggrn
	Arg
	Bent
	Bit
	Brecfrag
	Calc
	Carb
	Chtdk
	Chtlt
	Dol
	Feldspar

	Ferrpel
	Ferr
	Glau
	Gyp
	Hvymin
	Kaol
	Marl
	Minxl
	Nodule
	Phos
	Pyr
	Salt
	Sandy
	Silt
	Sil
	Sulphur
	Tuff
	Chlorite
	Dol
	Sand
	Sly



Drill cutting samples at 10' intervals start at 3800'.

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

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

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

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

SH: dk gry/blk, slt carb, firm.

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

SH: med gry/green-gry/red brn, vry silty/sndy, soft-firm.

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

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

LS: crm/lt brn/gry-brn, micro-med xtal, foss frags, some vry sndy, min ppt-fn in-xtal por, no odor, ns. Some SH: lt-med gry, firm, slt carb, silty.

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

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

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

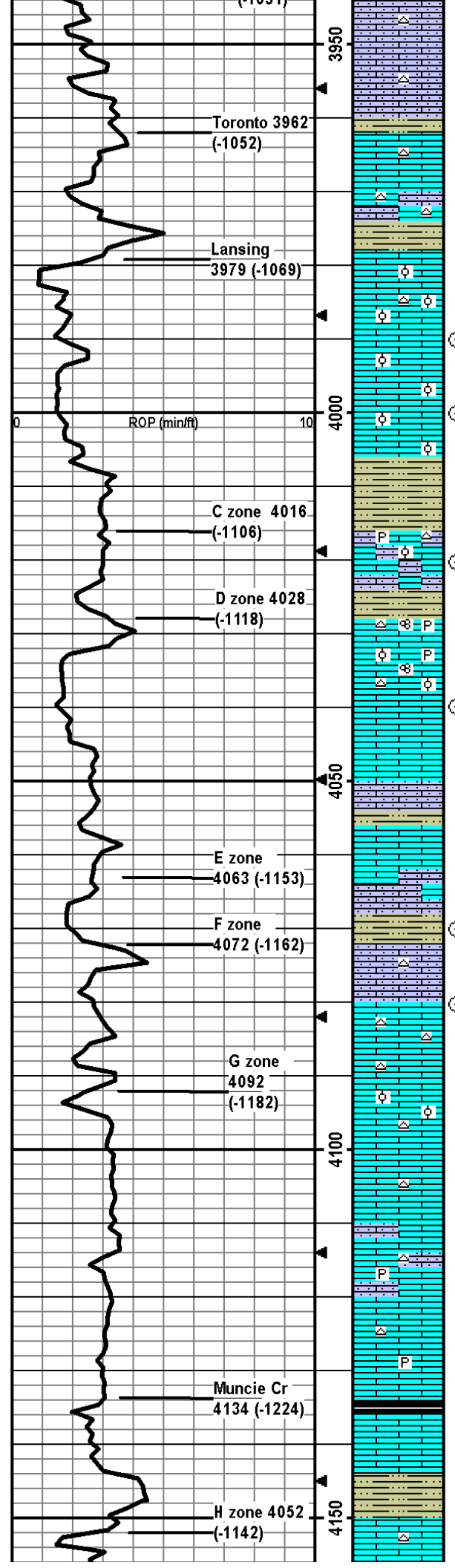
LS: crm/lt brn/lt gry, micro-med xtal, foss frags/fusln, some sndy, wht/lt gry chert, min ppt in-xtal/frac por, no odor, ns.

LS: crm/lt brn/lt gry, micro-med xtal, some foss frags/fusln, some vry sndy, wht/lt gry chert, min ppt in-xtal/frac por, no odor, ns. Some SH: med gry, silty, firm, slt carb.

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

SH: dk brn-gry/blk, silty, carb, firm.

Heebner
3941
(1021)



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

LS: crm/lt brn, micro-med xtal, foss frags, vry sndy, some chalky, min crm chert, min ppt in-xtal/frac por, no odor, ns. Some SH: med gry, silty, carb, firm.

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

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

SH: lt-dk gry, vry silty, slt carb, firm.

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

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

LS: same as above.

SH: med-dk gry/red brn, some vry silty, slt carb, soft-firm.

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

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

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

LS: crm/lt brn/lt gry, micro-med xtal, foss frags/ool/fusln, min crm/wht chert, min pyritic, some stly chalky easily crushed pcs, ppt-fn in-xtal/in-ool por w/some med-crs oo-castic por, no odor, ns.

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

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

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

LS: crm/lt brn, micro-med xtal, foss frags/some dense ool, some silty/sndy, some ppt-med in-xtal por, no odor, ns.

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

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

LS: crm, fn-med xtal, chalky, gd amt of wht/crm chert, min frac por, no odor, ns.

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

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

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

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

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

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

SH: lt-dk gry, silty, slt carb, soft-firm.

LS: crm/lt brn, micro-fn xtal, min foss frags, some chalky,

CFS @ 3990'
30"60"

CFS @ 4000'
30"60"

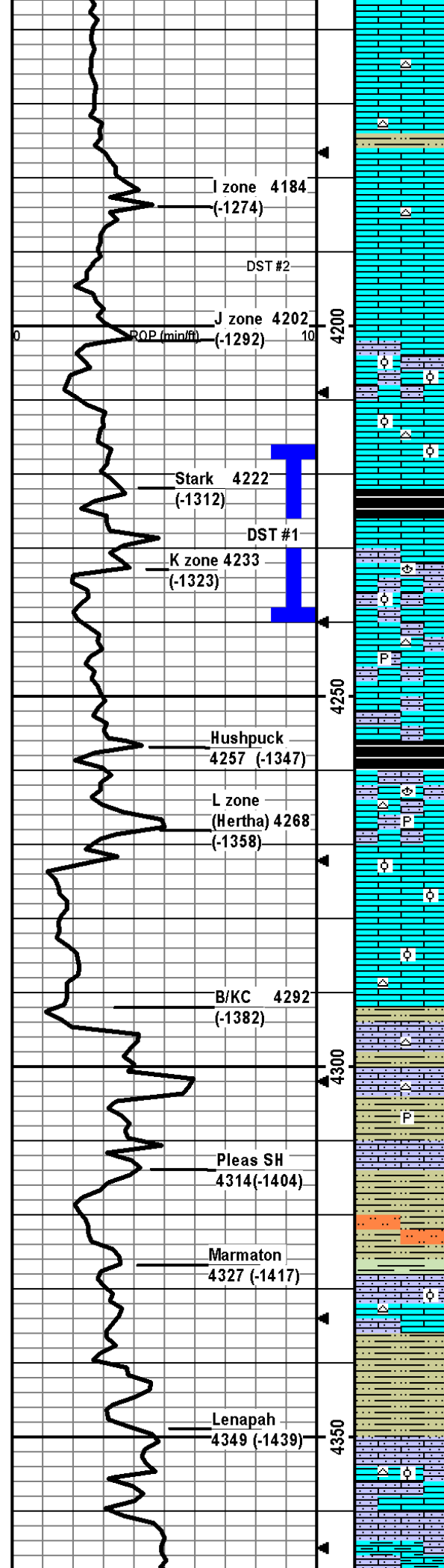
CFS @ 4020'
30"60"

CFS @ 4040'
30"60"

Mudco Check #4 @ 4071'
07/20/15 12:20pm
wt vis pH chl
9.4 57 9.5 2500
Filt LCM
10.4 1

CFS @ 4070'
30"60"

CFS @ 4080'
30"60"



wh/lt brn chert, min ppt in-xtal/frac por, no odor, ns.

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

LS: crm/lt-med brn, micro-fn xtal, foss frags, min wht/lt gry chert, min frac por, no odor, ns. Some SH: med-dk gry, silty, firm.

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

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

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

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

SH: blk, silty, carb, soft-firm.

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

LS: crm/lt-med brn, micro-med xtal, foss frags/brac/ool, some sndy, 9 pcs in 30 min and 10 pcs in 60 min smpls w/fn-crs in-xtal/in-oo por w/sfo, yel flor, oil scum in cup, strg odor, gsfo.

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

LS: crm/lt-med brn, micro-med xtal, some sndy, min frac por, no odor, ns.

SH: blk, slt carb, silty, firm, fissile.

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

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

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

SH: med-dk gry/blk/med-dk red brn, silty, carb, firm, fissile. LS: lt-med brn, micro-med xtal, min foss frags, silty/sndy, min wht/lt gry chert, some frac por, no odor, ns.

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

SH: med-dk gry/med green-gry/red brn, slt carb, min pyritic, silty, firm, fissile.

LS: lt-med brn, micro-med xtal, foss frags, vry silty/sndy, some chalky, some frac por, no odor, ns. SH: med-dk gry/med green-gry, silty, slt carb, firm, fissile.

SH: med-dk gry/red brn, silty/sndy, some siltystn, firm, fissile.

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

SH: med-dk gry/med green-gry/red brn, silty/sndy, carb, firm, fissile.

LS: crm/lt-med brn/some w/dk red brn clay, micro-med xtal, some vry sndy, foss frags/ool, min wht chert, min frac por, no odor, ns.

LS: crm/lt brn/lt gry, micro-med xtal, foss frags/min ool, vry sndy, vry arg, min frac por, no odor, ns.

CFS @ 4160'
30"60"

CFS @ 4200'
30"60"

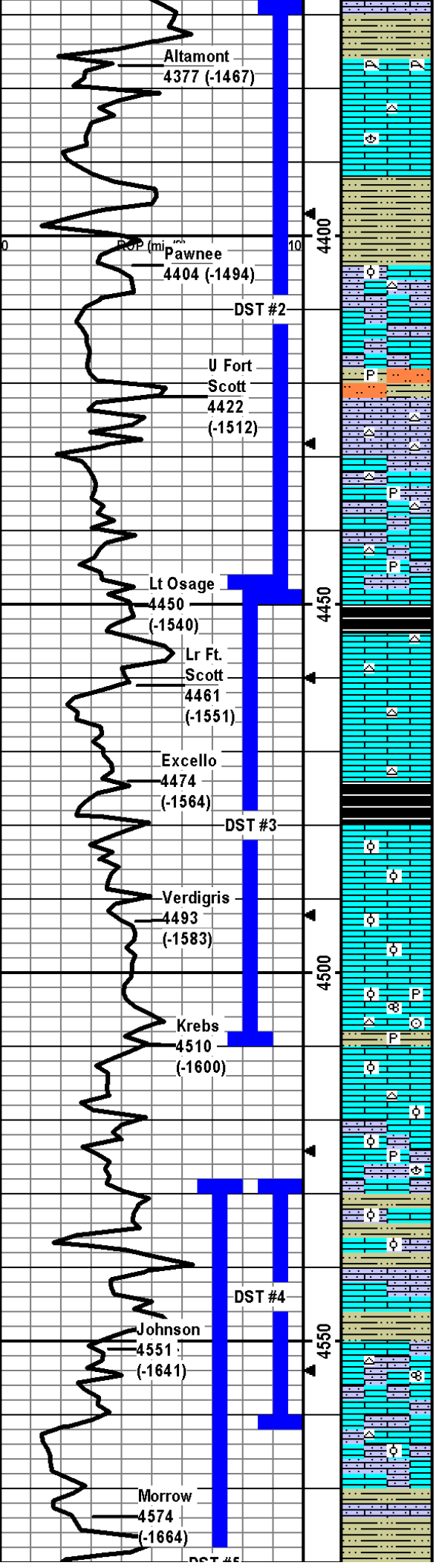
**DST1) 4216-4240
Lansing K-zone**

3030/3030
1st) Weak surface blow, no BB.
2nd) No blow, no BB.
IFP 13-34#
ISIP 1049#
FFP 37-51#
FSIP 1027#
HP 2021-1986#
Recvd: 66' SLOWM (1% O, 30% W, 69% M).

CFS @ 4240'
30"60"

Mudco Check #5 @4240'
07/21/15 10:45am
wt vis pH chl
9.5 55 9.5 3000
Filt LCM
9.6 1

CFS @ 4290'
30"60"



SH: med-dk gry/dk red brn, silt carb, silty, firm, fissile.
 LS: crm/lt brn, micro-med xtal, foss frags/coral, fn-med in-xtal por in coral, 1 pcs w/sfo, dul yel flor, no odor, ssfo.
 LS: crm, micro-fn xtal, foss frags/brac, crm/lt brn/orange chert, some chalky, 10 pcs in 30 min and 5 pcs in 60 min smpls w/ppt-med in-xtal por w/sfo, yel flor, gd odor, sfo.

SH: med-dk gry/med-dk red brn/med green-gry, some vry silty, stly carb, soft-firm, fissile.

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

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

Some SH: lt-dk gry/med-dk red brn, some vry silty/sndy, some siltstn/SS, stly carb, some pyritic, soft-firm.

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

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

LS: crm/lt brn, micro-med xtal, foss frags, some silty/sndy, crm/lt brn chert, min pyritic, min frac por, no odor, ns. Some SH: lt-med gry/lt-dk red brn, silty, silt carb, firm.

SH: med-dk gry/min blk, some vry silty, silt carb, soft-firm.

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

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

LS: same as above w/2 pcs in 30 min and 0 in 60 min smpls w/ppt-fn in-xtal por w/sfo, dul yel flor, silt cup odor, ssfo.

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

LS: crm/lt brn, micro-med xtal, min foss frags/ool, 4 pcs w/ppt-fn in-xtal por w/sfo, dul yel flor/cut, no odor, ssfo.

LS: crm/lt-med brn, micro-med xtal, foss frags/ool, lt gry/brn chert, silt pyritic, min frac por, no odor, ns.

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

SH: med-dk gry, vry stly/some sndy, carb, pyritic, firm, fissile.

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

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

LS: crm/lt-med brn/lt gry, micro-med xtal, foss fraga/min ool, some silty, some chalky, min frac por, no odor, ns. Some SH: med-dk gry/brn gry, some silty, carb, firm, fissile.

LS: crm/lt brn, micro-med xtal, some foss frags, some silty/sndy, 11 pcs w/ppt-fn w/min med-crs in-xtal por w/sfo, dul yel flor, silt odor, sfo.

LS: crm/lt brn, micro-med xtal, min foss frags/fusln, some silty/sndy, min chalky, min lt brn chert, 31 pcs in 30" and 13 pcs in 60" smpls w/ppt-med in-xtal por w/sfo, dul yel flor, gd odor, gsfo.

LS: crm/lt-med brn, micro-med xtal, foss frags, some silty/sndy, crm/lt brn chert, 2 pcs w/ppt-fn in-xtal por w/sfo, dul yel flor, no odor, ssfo.

SH: lt-dk gry/brn/red brn, vry silty, carb, firm, fissile. LS: crm/lt-med brn, micro-med xtal, min foss frags, lt brn chert, some frac por, no odor, ns.

Mudco Check #6 @ 4390'
 07/22/15 08:15am
 wt vis pH chl
 9.2 58 10.5 2800
 Filt LCM
 8.8 1

CFS @ 4390'
 30"60"

DST2) 4368-4450
Altamont thru
Upper Ft Scott
 30/15/15/15
 1st) Weak surface blow died w/in 2 min, no BB.
 2nd) No blow, no BB.
 IFP 17-24#
 ISIP 303#
 FFP 22-26#
 FSIP 448#
 HP 2155-2153#
 Recvd: 55' M.

CFS @ 4450'
 30"60"

CFS @ 4480'
 30"60"

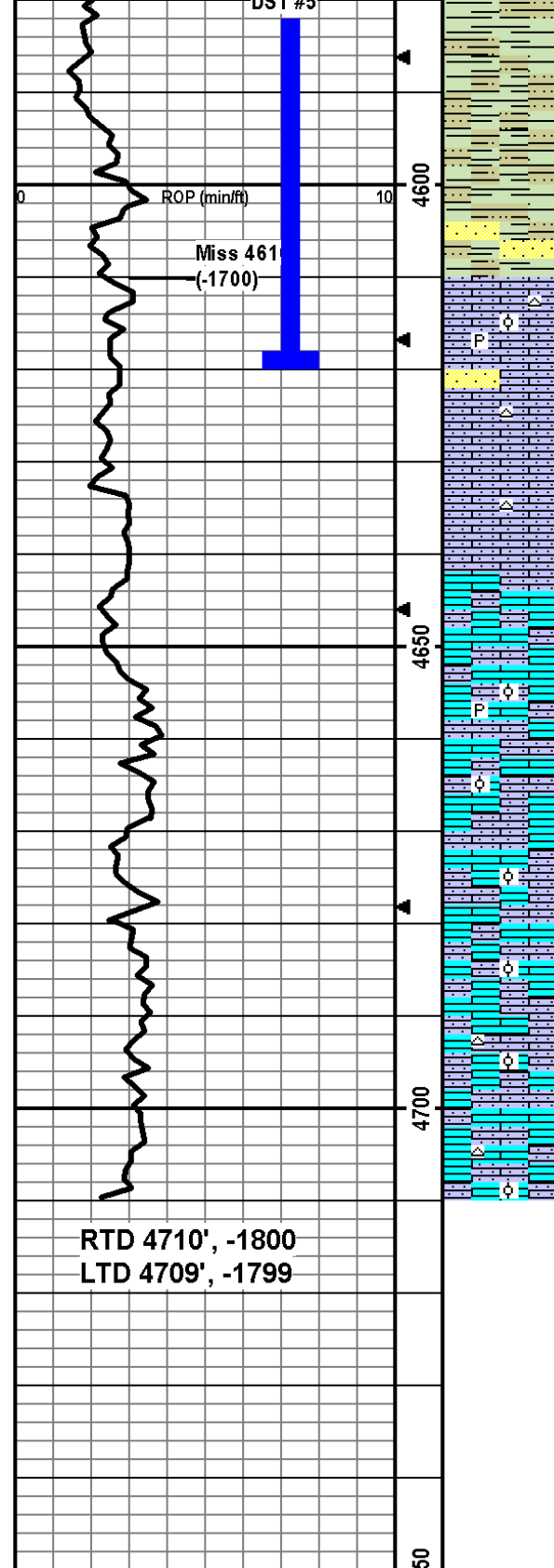
Mudco Check #7 @ 4510'
 07/23/15 08:50am
 wt vis pH chl
 9.4 59 9.0 2500
 Filt LCM
 9.6 1

CFS @ 4510'
 30"60"

DST3) 4446-4510
Lr Ft Scott thru
Verdigris
 30/15/15/15
 1st) Weak surface blow died in 19 min, no BB.
 2nd) No blow, no BB.
 IFP 12-18#
 ISIP 308#
 FFP 15-18#
 FSIP 385#
 HP 2165-2196#
 Recvd: 3' M.

CFS @ 4561'
 30"60"

DST4) 4528-4561
Johnson
 30/45/60/90
 1st) Weak surface blow built to 5.25" in 2 min, weak BB.
 2nd) Weak surface blow built



SH: lt-dk gry/brn/red brn/lt green-gry/mustard yel, some vry silty, carb, firm-vry firm, fissile.

SH: as above w/some maroon.

SH: as above w/some SS: vf-med, sr-wr, arg, firm, friable, no odor, ns.

LS: crm/lt gry, micro-med xtal, foss frags/some ool, sndy, some chalky, min pyritic, some lt brn chert, min frac por, 1 pcs w/ppt-fn in-xtal por w/sfo, dul yel flor, no odor, ssfo.

LS: crm, micro-med xtal, min foss frags, vry sndy, some chalky, min orange chert, min frac por, no odor, ns. Min SS: wht, vf-f, sr-wr, hard, friable, ns.

LS: same as above w/increase in chalky, no SS, no odor, ns.

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

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

LS: crm, micro-med xtal, some ool, some sndy, some chalky, min frac por, no odor, ns.

LS: crm/lt gry-brn, micro-crs xtal, some ool, some sndy, some chalky, min frac por, no odor, ns.

LS: as above w/some crm-med brn micro xtal, no odor, ns.

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

LS: as above w/flood of SH (assumed sluffing), no odor, ns.

to BOB in 21 min, 3.5" BB.
 IFP 12-70#
 ISIP 1180#
 FFP 70-113#
 FSIP 1161#
 HP 2169-2148#
 Recvd: 724' GIP, 144' O, 122' GOM (30%G, 30%O, 40%M).

CFS @ 4610'
 30"i60"
 Mudco Check #8 @4561'
 07/24/15 01:00am
 wt vis pH chl
 9.2 52 9.5 3000
 Filt LCM
 9.6 1

DST4) 4527-4620 Johnson (Straddle Test)
 30/45/60/90
 1st) Weak surface blow built to 8.25" in 30 min, no BB.
 2nd) 1/4" blow built to BOB in 33.5 min, 1" BB.
 IFP 19-87#
 ISIP 1146#
 FFP 93-145#
 FSIP 1140#
 HP 2181-2279#
 Recvd: 424' GIP, 10' O, 186' MO (75%O, 25%M), 122' GMO (20%G, 55%O, 25%M).

CFS @ 4710', 30"i60",
 Cir 1.5 hrs total to clean hole.

RTD 4710', -1800'
 LTD 4709', -1799'