

GRAND MESA

OPERATING COMPANY

(316) 265-3000
FAX: (316) 265-3455

1700 N. WATERFRONT PARKWAY
BLDG. 600
WICHITA, KANSAS 67206-5514

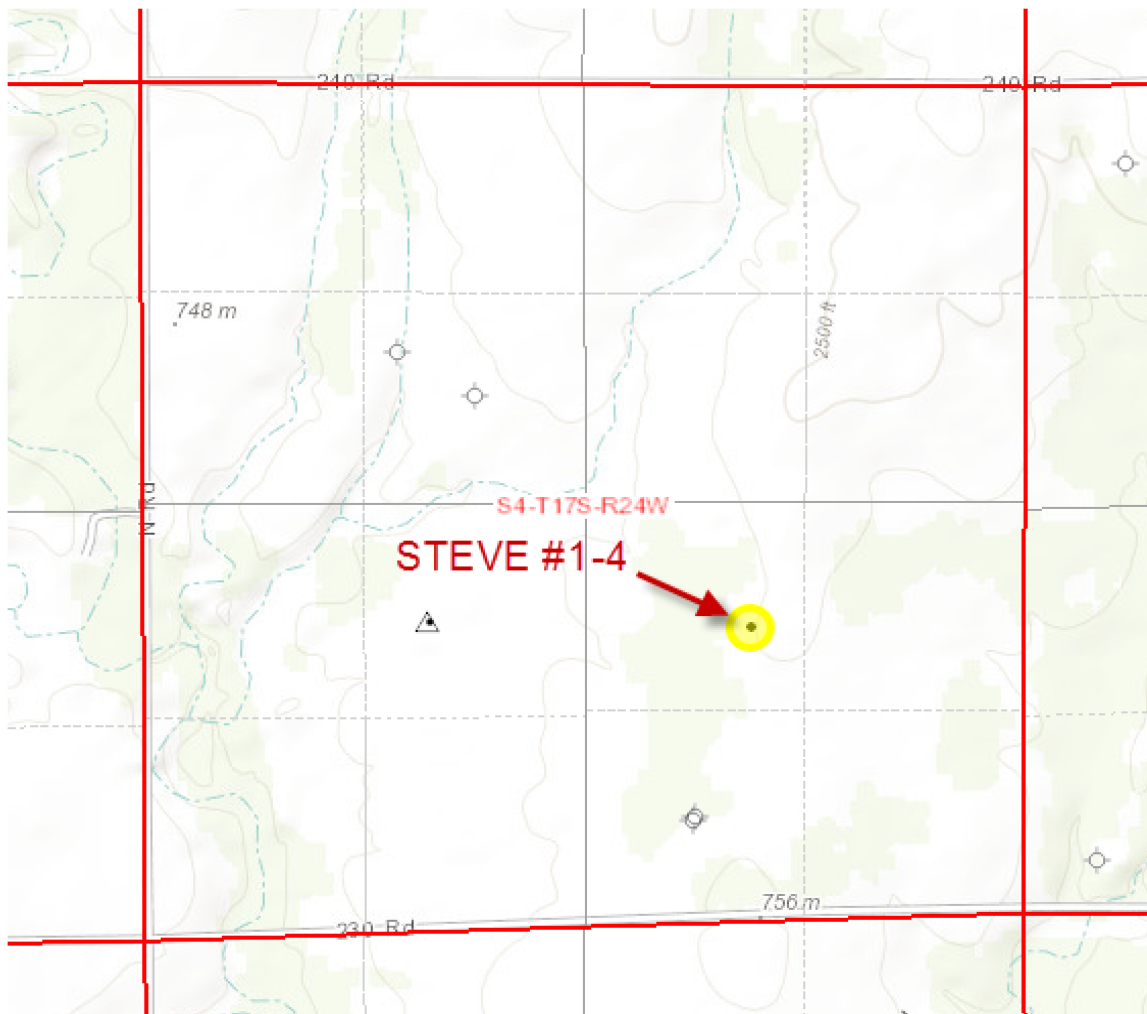
Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name: STEVE #1-4
Location: 1813' FSL, 1639' FEL, Sec 04-T17S-R24W, NESS County, Kansas
License Number: API: 15-135-25839 Region: NESS County
Spud Date: 12/08/2014 Drilling Completed: 12/16/2014
Surface Coordinates: Lat: 38.5998849
Long: -99.9793485
Bottom Hole Vertical hole
Coordinates:
Ground Elevation (ft): 2478' K.B. Elevation (ft): 2487'
Logged Interval (ft): 3750' To: RTD Total Depth (ft): 4660'
Formation: Mississippian at RTD
Type of Drilling Fluid: Chemical

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

GEOLOGIST

Name: Kent R. Matson
Company: Matson Geological Services, LLC
Address: 33300 W. 15th Street S.
Garden Plain, Kansas 67050
316-644-1975



COMMENTS

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

Drilling Contractor: Duke Drilling, Rig #4.

Tool Pusher: Rich Wheeler, 620-793-0834.

Surface Casing: 8 5/8" set at 221' (KB) w/150sx concrete.

Production Casing: Based on field observations of drill cuttings, DST results and electric log evaluation, production casing was not installed and the well was plugged and abandoned.

Mud by: MudCo/Service Mud, Inc.; Jason Whiting, 620-792-4544.

DST's by: Diamond Testing; Jeff Brown, 620-653-7550.

Logs by: Weatherford (DIL w/SP, CN-CD w/PEF); Jeff Randle 620-624-9324.

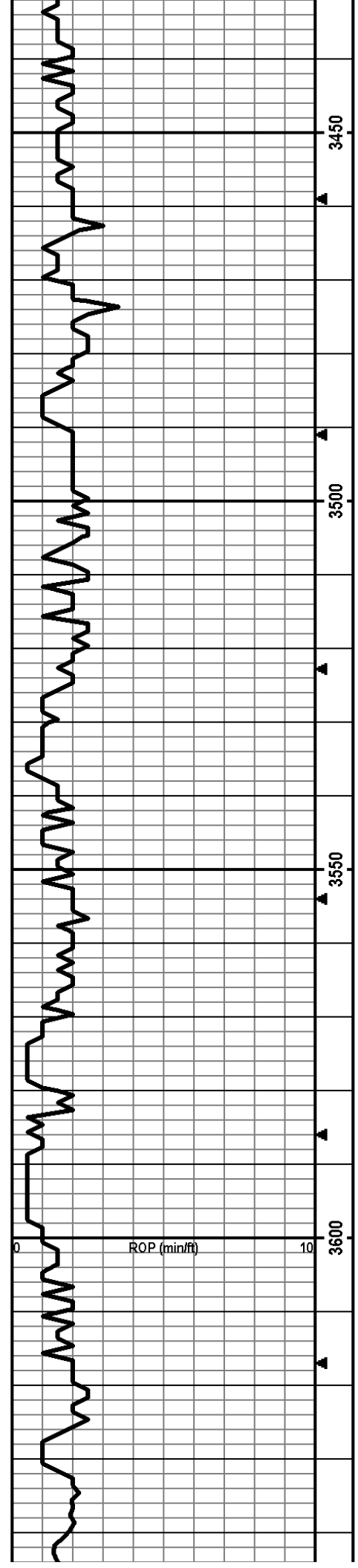
RTD= 4660'.

LTD= 4660'.

FORMATION TOPS

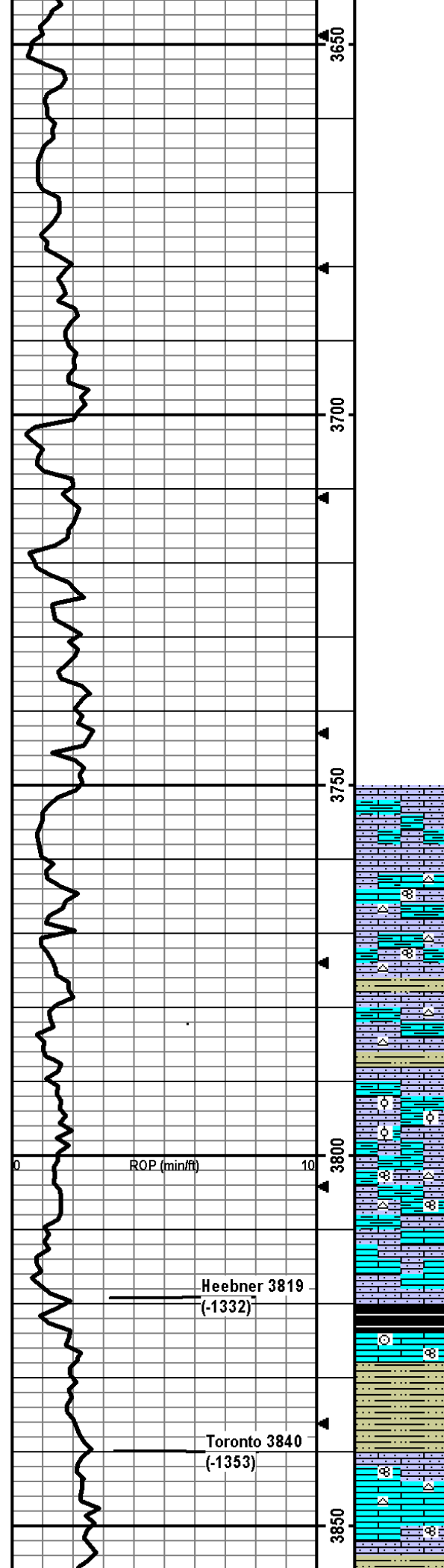
FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
Heebner Shale	3819'	-1332	3816'	-1329
Lansing	3861'	-1374	3859'	-1372
Stark Shale	4100'	-1613	4097'	-1610
Hushpuckney Shale	4131'	-1644	4127'	-1640
Marmaton	4204'	-1717	4201'	-1714
Excello Shale	4350'	-1863	4349'	-1862
Fort Scott	4356'	-1869	4354'	-1867
Mississippian	4446'	-1959	4444'	-1957
RTD	4660'	-2173		
LTD			4660'	-2173

rop ROP (min/ft)	Depth	Lithology	CFS Point	Oil Shows	Geological Descriptions	Remarks
rop ROP (min/ft)	Depth	Lithology	CFS Point	Oil Shows	Geological Descriptions	Remarks
0	10		33		<p>Morning Report Depth/Activity 12/08/2014, Spud. 12/09, dril @ 645'. 12/10, dril @ 2466'. 12/11, dril @ 3195'. 12/12, dril @ 3903'. 12/13, dril @ 4338'. 12/14, DST#2 @ 4469'. 12/15, DST#3 @ 4480'. 12/16, drill @ 4611; TD @ 4660'.</p> <p>Anhydrite: Top @ 1778', Bottom @ 1816' (Based on drill time).</p> <p>ROP Data begins @ 3400' on 12/11/2014</p>	<p>Mudco Check #1 @0' 12/07/14; predrilling recommendations.</p> <p>Mudco Check #2 @2569' 12/10/14 10:05am wt vis pH chl 10.0 29 7.0 88000 Filt LCM n/c 0</p> <p>Mudco Check #3 @3332' 12/11/14 12:30pm wt vis pH chl 9.6 31 7.0 65000 Filt LCM n/c tr</p>
0	10		3400			
0	10		3400			



Depth (ft)	ROP (min/ft)
3600	~1.5
3580	~2.5
3550	~3.5
3520	~4.5
3500	~5.5
3480	~6.5
3450	~7.5

Depth (ft)	ROP (min/ft)
3600	~1.5
3580	~2.5
3550	~3.5
3520	~4.5
3500	~5.5
3480	~6.5
3450	~7.5



Drill cutting samples at 10' intervals start at 3750'.

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

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

LS: as above w/some SH: med-dk gry, vry silty, carb, firm, fissile.

LS: wht/crm/gry/brn, micro-med xtal, vry chalky, arg, silty/sndy, foss frags, wht/lt brn chert, no vis por, no odor, ns. Some SH: lt gry, silty, chalky, carb, soft.

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

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

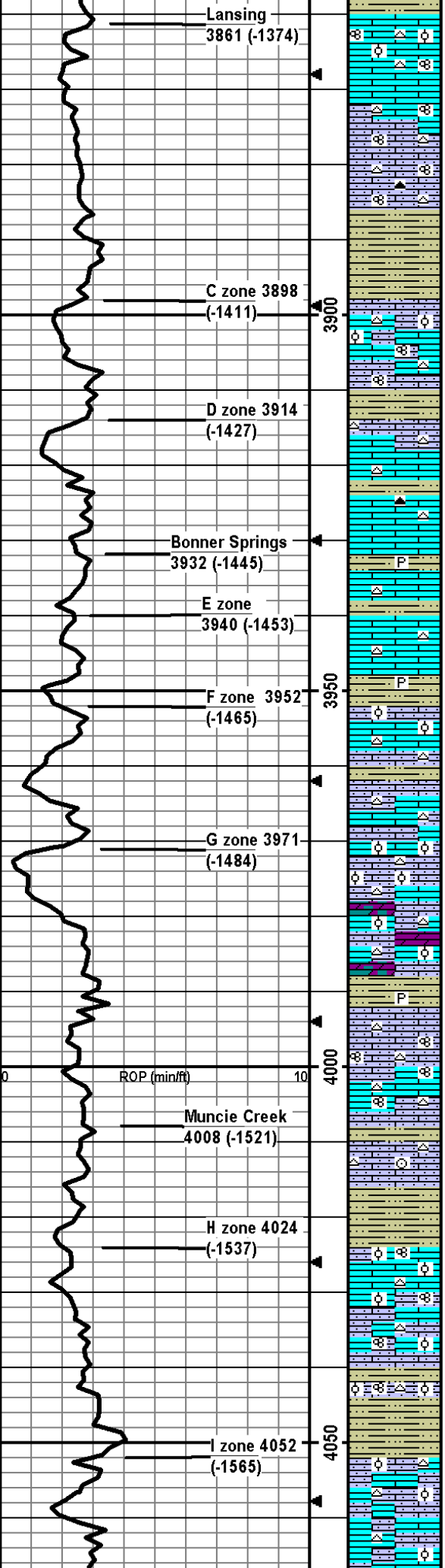
LS: crm/lt-med brn, micro-med xtal, vry chalky, vry sndy, foss frags, min frac por, no odor, ns.

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

LS: crm/lt-dk brn/gry, silty/sndy, chalky, foss frags/crin/fusln, min frac por, no odor, ns.

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

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



SH: lt-dk gry/dk brn, vry silty, carb, soft-firm, fissile.

LS: crm/tan, micro-med xtal, foss frags/fusln/few dense ool, wht/crm chert, min ppt-fn in-xtal por, no odor, ns.

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

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

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

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

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

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

LS: crm/tan/lt brn/lt gry, micro-med xtal, some chalky, wht/crm/orange/dk gry chert, some frac por, no odor, ns.

SH: lt-med gry/brn, silty, carb, pyritic, firm-vry firm, fissile.

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

SH: med-dk gry/lt green-gry, carb, silty, pyritic, firm, fissile.

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

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

LS: crm/tan, micro-med xtal, some silty/sndy, some chalky, some wht/crm chert, abund ool, med-vug ool-castic por, no odor, ns.
Some Dolo: tan, silty/sndy, fn xtal.

LS: crm/tan, micro-fn xtal, silty/sndy, some wht/crm chert, foss frags w/some pcs w/abund ool, some ool-castic vug por, no odor, ns. Some Dolo: tan, silty/sndy, fn xtal.

SH: lt-med gry/lt green-gry/brn, vry silty, carb, slt pyritic, soft-firm, fissile.

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

LS: crm/lt gry, micro-fn xtal, some vry silty/sndy, foss frags/fusln, min crm/tan chert, mostly dense w/min ppt-fn in-xtal por, no odor, ns.

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

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

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

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

LS: as above w/wht chalky pcs.

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

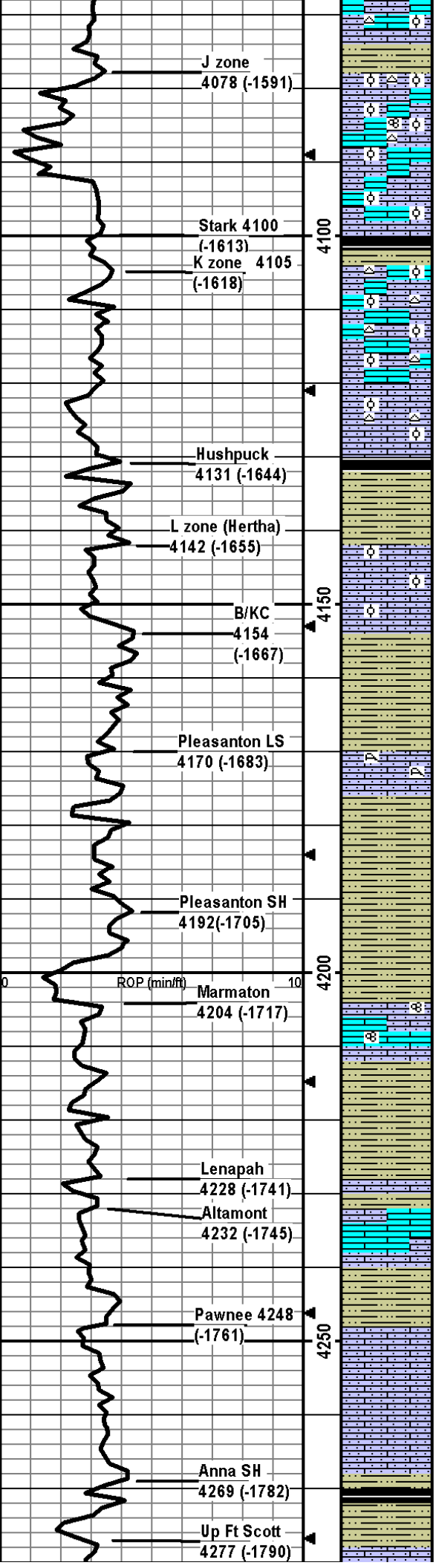
SH: lt-dk gry/lt green-gry, silty, carb, firm, fissile.

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

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

Mudco Check #4 @ 4052'
 12/12/14 01:05pm
 wt vis pH chl
 9.1 51 10.5 5100
 Filtr LCM
 8.8 1

CFS @ 4089'
30"60"



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

SH: lt-dk gry/brn, vry silty/sdy, carb, soft-firm, fissile.

LS: crm/tn/lt brn, micro-med xtal, some vry silty/sndy, some vry chalky, min wht chert, foss frags/fusln/abund ool, ppt-med in-xtal por w/frn-crs/vug oo-castic por, no odor, ns.

LS: crm/lt brn, micro-med xtal, foss frags/abund ool, some vry silty/sndy, min wht chalky pcs, ppt-fn in-xtal/in-ool and fn-crs oo-castic por, no odor, ns.

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

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

LS: same as above, no odor, ns.

LS: crm/tan/gry, micro-fn xtal, silty/sndy, some chalky, wht/crm ool chert, min frac por, no odor, ns.

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

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

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

SH: lt-med gry, silty, carb, soft-firm.

LS: crm/gry-brn/gry, micro-med xtal, some silty/sndy, some chalky, arg, foss frags/coral/ool, some ppt-med in-xtal por, no odor, ns.

SH: lt-med gry/brn/maroon brn, vry silty/some sndy, carb, firm, fissile.

SH: lt-med gry/brn/min mustard yel, vry silty, carb, firm, fissile.

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

SH: lt-med gry min dk gry/brn/min maroon/mustard yel, vry silty, carb, firm, fissile.

SH: lt-med gry/red brn/min maroon/mustard yel, vry silty, carb, soft-firm.

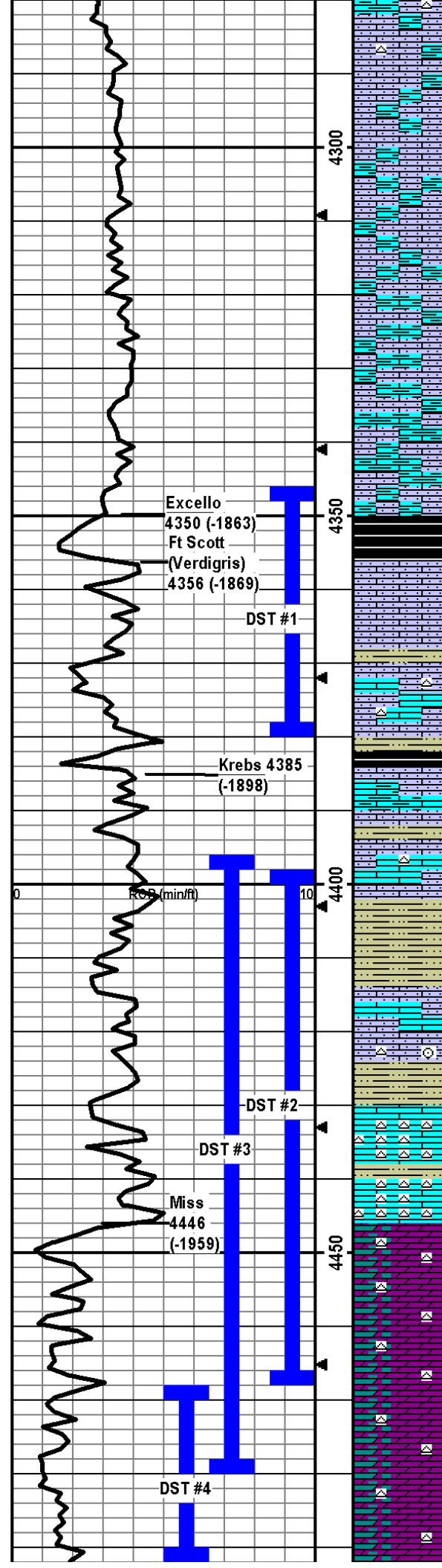
LS: crm/lt brn/lt gry, micro-fn xtal, some vry silty, some frac por, no odor, ns.

SH: med-dk gry/maroon/mustard yel, vry silty, carb, firm, fissile.

LS: crm/lt gry/tan, micro-fn xtal, vry silty, some chalky, some ppt-fn in-xtal/frac por, no odor, ns.

LS: crm/lt gry/lt brn, micro-fn xtal, vry silty, arg, min chalky, some frac por, no odor, ns.

SH: tan/lt-dk gry/maroon, vry silty, carb, firm, fissile.



LS: crm/lt gry, micro-fn xtal, vry silty/sndy, arg, some chalky, some lt brn/orange chert, no vis por, no odor, ns.

LS: crm/lt-med brn/lt gry, micro-fn xtal, vry silty/sndy, arg, some chalky, no vis por, no odor, ns.

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

LS: crm/gry-brn, micro-fn xtal, vry silty/sndy, arg, min chalky, min frac por, no odor, ns.

LS: lt brn/lt-med gry, micro-fn xtal, vry silty/sndy, vry arg, some easily crushed/friable, some frac por, no odor, ns.

LS: med-dk gry, micro-fn xtal, vry silty, vry arg, some crushes easily/friable, min frac por, no odor, ns.

LS: same as above, no odor, ns.

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

LS: crm/brn, micro-fn xtal, silty/sndy, foss frags, vry gd ppt-crs in-xtal por, strg cup odor, yel flor, approx 10-15% of tray pcs w/vgsfo.

LS: same as above; 26 pcs w/ppt-crs in-xtal por w/sfo, strg cup odor, vgsfo.

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

LS: crm/tan, micro-med xtal, some silty/sndy, foss frags, some wht/crm chert, some chalky, gd cup odor and few pcs w/sfo assume from above.

SH: crm/lt-dk gry/green-gry, some vry silty, slt carb, firm, fissile

LS: crm/tan/lt gry-brn/gry, micro-med xtal, some vry silty, some arg, foss frags, some frac por, no odor, ns.

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

SH: lt-dk gry/blk/lt green-gry, some vry silty, carb, soft-firm.

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

LS: crm/tan/lt brn, micro-med xtal, some vry silty/sndy, some chalky, min foss frags/crin, some wht/crm/lt yel chert, some frac por, no odor, ns. Some SH: lt-dk gry/lt green-gry/dk maroon brn, vry silty/sndy, firm.

LS: crm/lt brn/lt gry, micro-med xtal, some silty, wht/crm/yel/orange chert, 16 pcs of chert w/ppt-crs in-xtal por/frac por w/sfo, dul yel flor, slt cup odor, sfo.

Some SH: lt-dk gry/maroon/mustard yel, some silty, slt carb, firm.

DOLO: crm/lt gry, micro-fn xtal, grainy, vry sndy, some chert as above, fn-med in-xtal por, strg cup odor, approx 10-15% of smpl w/sfo, ppt-fn w/min med in-xtal por, dul yel flor and vgsfo.

DOLO: as above w/25-30% of tray smple w/sfo, some blk tar oil, strg odor, vgsfo.

DOLO: as above w/40-50% of tray smpl w/sfo, increase in por size up to crs/vug, strg odor, vgsfo.

DOLO: wht/crm/lt gry, micro-fn xtal, silty/grainy, some wht/yel chert, fn-med w/some crs/vug in-xtal por, strg cup odor, decrease in amt of sfo to approx 10% of tray.

DOLO: crm/tan/gry, micro-fn xtal, silty/sndy, some yel/orange chert, fn-med w/some crs in-xtal por, 22 pcs in 30 min and 9 pcs in 60 min smpls w/sfo or staining, few pcs w/thk blk tarry oil, dul yel flor, gd cup odor, gsfo.

Note: This Ft Scott top is a local pick and not equivalent to western Kansas (Equivalent to Verdigris).

DST1) 4346-4380 Ft Scott

30/20/20/20
1st) weak surf blow died in 25 min, no BB.
2nd) no blow, no BB
IFP 10-11#
ISIP 53#
FFP 14-12#
FSIP 34#
HP 2129-2120#
Recvd: 5' VSOCM (3%O).

CFS @ 4380'
30"60"

Mudco Check #5 @ 4380'
12/13/14 12:40pm
wt vis pH chl
9.3 55 10.5 3300
Filt LCM
8.4 1

DST2) 4398-4469 Mississippian

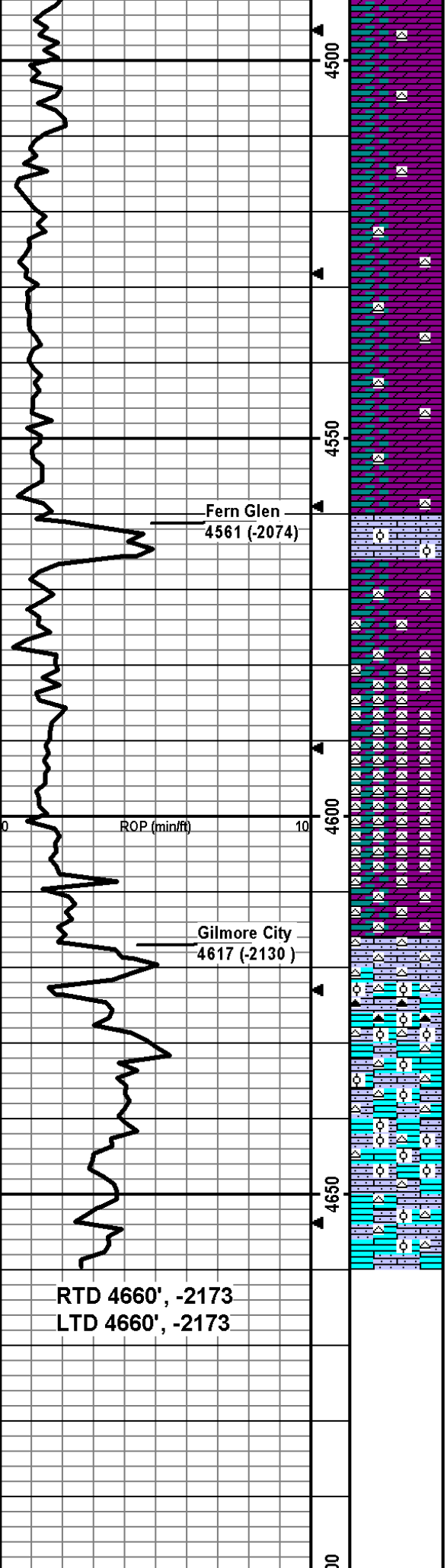
30/45/35/0
1st) Wk blw built to 3.25", no BB.
2nd) no blw so flushed tool and had surge then dead, pulled tool 35 min into 2nd open.
IFP 14-30#
ISIP 447#
FFP 29-36#
FSIP n/a
HP 2222-2147#
Recvd: 50' OCM (20%O).

Mudco Check #6 @ 4469'
12/14/14 12:45pm
wt vis pH chl
9.3 45 9.5 4600
Filt LCM
8.8 tr

CFS @ 4469'
30"60"

CFS @ 4480'
30"60"

CFS @ 4492'



DOLO: wht/lt gryish crm-crm, micro-fn xtal, silty/sndy, min wht chert, fn-crs in-xtal por, 4 pcs w/sfo or staining, dul yel flor, slt odor, sfo.

DOLO: Lt gry/crm, micro-fn xtal, vry silty/sndy, some dk green min, some chalky, min wht chert, ppt-med in-xtal por, no odor, ns.

DOLO: as above, no odor, ns.

DOLO: crm/tan, micro-fn xtal, silty/sndy, min dk green min, increase in wht chert, some chalky, ppt-med in-xtal por, no odor, ns.

DOLO: crm, micro-fn xtal, silty/sndy, min dk green min, wht/crm chert, some chalky, ppt in-xtal por, no odor, ns.

DOLO: as above, no odor, ns.

DOLO: crm/tan/lt brn, micro-fn xtal, silty/sndy, min dk green min, wht/crm chert, some chalky, ppt-med in-xtal por, no odor, ns.

LS: tan/lt brn, micro-fn xtal, silty, some dense ool pcs, no vis por, no odor, ns.

DOLO: crm/lt brn, micro-fn xtal, silty/sndy, abund wht/crm/gry chert, some frac por, no odor, ns.

DOLO: as above w/increase in wht/crm/tan/lt yel chert, no odor ns.

DOLO and abund chert as above, no odor, ns.

DOLO: wht/crm/tan/lt brn, micro-fn xtal, silty/sndy, abund wht/crm/tan/lt yel chert, ppt-fn in-xtal por, no odor, ns.

LS: lt gryish wht, micro-fn xtal, vry silty/sndy, some frac por, no odor, ns. Cont flood of chert.

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

LS: crm/tan, micro-med xtal, min foss frags w/abund ool pcs, some silty/sndy, some chalky, abund wht/crm/lt gry chert, some frac por, no odor, ns. Some SH: lt-dk gry/dk maroon/dk brn, some silty, carb, firm (assume sluff from above).

LS: wht/crm/lt-med brn, micro-med xtal, abund ool, some silty/sndy, some chalky, abund wht/crm chert, some frac por, no odor, ns. Cont SH as above.

LS: wht/crm/lt brn, micro-med xtal, few abund ool pcs, some chalky, some silty/sndy, abund wht/crm/lt gry chert, some frac por, no odor, ns. Cont SH as above.

TD at 4660'.

30" #60"

Mudco Check #7 @ 4481'
 12/15/14 01:05pm
 wt vis pH chl
 9.4 52 8.5 5300
 Filt LCM
 8.0 tr

DST3) 4396-4480
Mississippian
 3045/6090
 1st) weak blow built to 2.25", no BB.
 2nd) weak surface blw built to 1 1/4", no BB.
 IFP 15-39#
 ISIP 746#
 FFP 33-41#
 FSIP 691#
 HP 2144-2133#
 Recvd: 5' O, 63' OCM (10%/O).

DST4) 4468-4492
Mississippian
 3030/3030
 1st) weak surface blow built to 3/4", no BB.
 2nd) no blow, no BB.
 IFP 12-21#
 ISIP 978#
 FFP 18-21#
 FSIP 861#
 HP 2200-2178#
 Recvd: 25' mud w/oil spots.

Mudco Check #8 @ 4660'
 12/16/14 12:30pm
 wt vis pH chl
 9.4 53 10.5 3400
 Filt LCM
 8.4 1

CFS @ 4660' 30" #60". Cir total of 1.5 hrs to clean hole prior to logging.

RTD 4660', -2173
 LTD 4660', -2173