

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: #1-22 Vaile
Location: 2065' FSL, 573' FWL, Section 22-13S-32W Logan County, KS
License Number: API: 15-109-20964 Region: Wildcat
Spud Date: 12-2-2010 Drilling Completed: 12-11-2010
Surface Coordinates: Lat: 38.9075447
Long: -100.8686626
Bottom Hole Coordinates: Vertical hole
Ground Elevation (ft): 3033' K.B. Elevation (ft): 3038'
Logged Interval (ft): 3600' To: RTD Total Depth (ft): 4734'
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: Steven P. Carl
Company: Grand Mesa Operating Company
Address: 1700 N. Waterfront Parkway, Bldg 600
Wichita, Kansas 67206
316-256-3000



COMMENTS

Contractor: Murfin Drilling Company Rig #24
Pusher: Tony Martin
Surface Casing: 8 5/8" set at 221' w/165sx
Production Casing: 5 1/2" set at 4453', to further test the KC "L" zone.
Mud by: MudCo
DST's by: Eagle Testing
Logs by: Weatherford (DIL, CN-CD, ML)
RTD=4734'
LTD=4735'

FORMATION TOPS

FORMATION

SAMPLE TOPS
Depth Datum

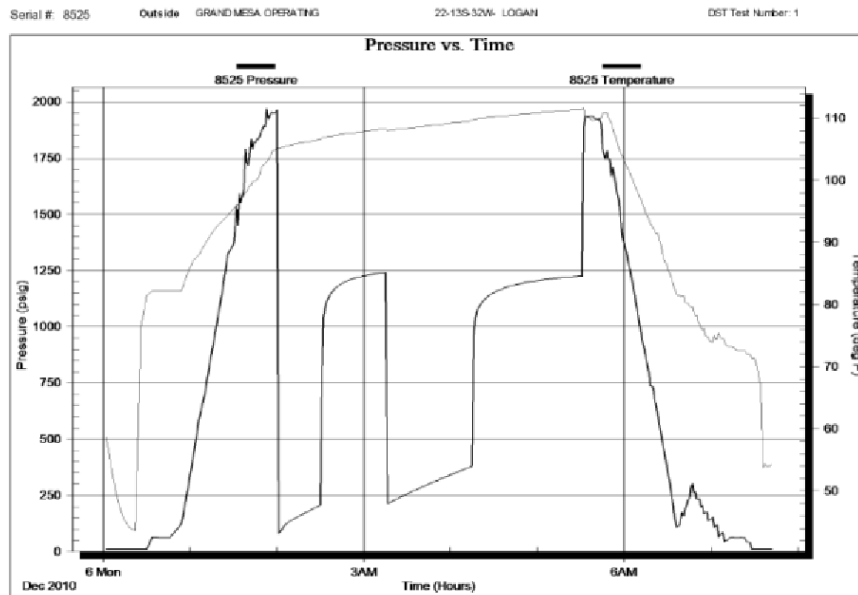
LOG TOPS
Depth Datum

Stone Corral	2513'	+525	2513'	+525
B/Stone Corral	2532'	+465	2533'	+505
Heebner Shale	3990'	-952	3987'	-949
Lansing	4035'	-997	4033'	-995
Muncie Creek Shale	4185'	-1147	4184'	-1146
Stark Shale	4269'	-1231	4270'	-1232
Hushpuckney Shale	4305'	-1267	4306'	-1268
Marmaton	4372'	-1334	4372'	-1334
Upper Fort Scott	4472'	-1434	4473'	-1435
Little Osage Shale	4499'	-1461	4500'	-1462
Excello Shale	4523'	-1485	4524'	-1486
Johnson Zone	4599'	-1561	4602'	-1564
Morrow	4623'	-1585	4625'	-1587
Mississippian	4659'	-1621	4661'	-1623
RTD	4734'	-1696		
LTD			4735'	-1697

DRILL STEM TESTS

DST No. 1 Oread/Toronto
Interval: 3937'-4030'
Times: 30-45-60-75
Recovery: 660' Water
FP: 86-209/217-381#
SIP: 1244-1229#

IFP: Fair blow, B.O.B. in 13 minute
ISIP: no return
FFP: Fair blow, B.O.B. in 14 minutes
FSIP: no return



DRILL STEM TESTS

DST No. 2 Lansing "C-D"
Interval: 4054'-4105'
Times: 30-45-60-75
Recovery: 30' Mud, 120' WCM, 360' MW
FP: 63-176/169-293#
SIP: 1205-1177#

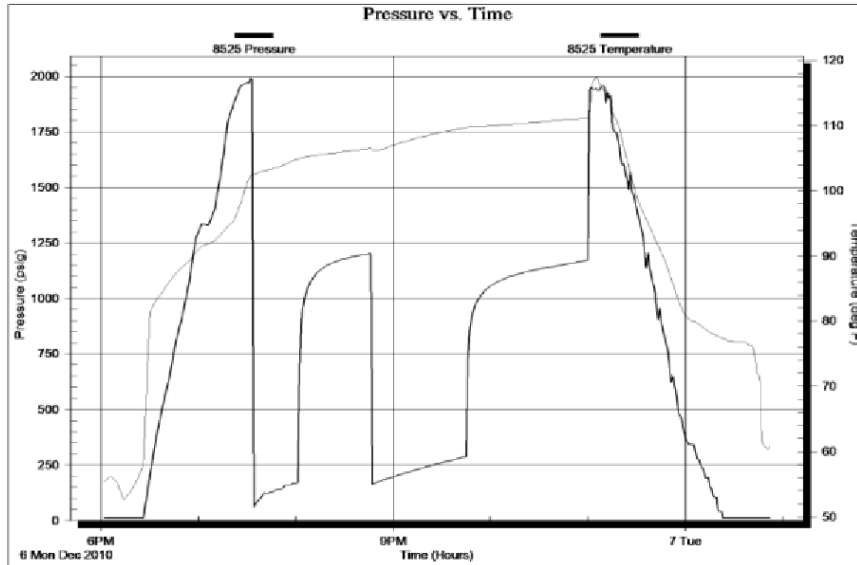
IFP: Weak B.O.B. in 28 minutes
ISIP: no return
FFP: Weak B.O.B. in 24 minutes
FSIP: no return

Serial #: 8525

Outside GRAND MESA OPERATING

22-135-32W- LOGAN

DST Test Number: 2



DRILL STEM TESTS

DST No. 3 Lansing "E-F"
 Interval: 4097'-4135'
 Times: 30-45-45-60
 Recovery: 90' WCM, 180'MW
 FP: 51-119/124-172#
 SIP: 1111-1042#

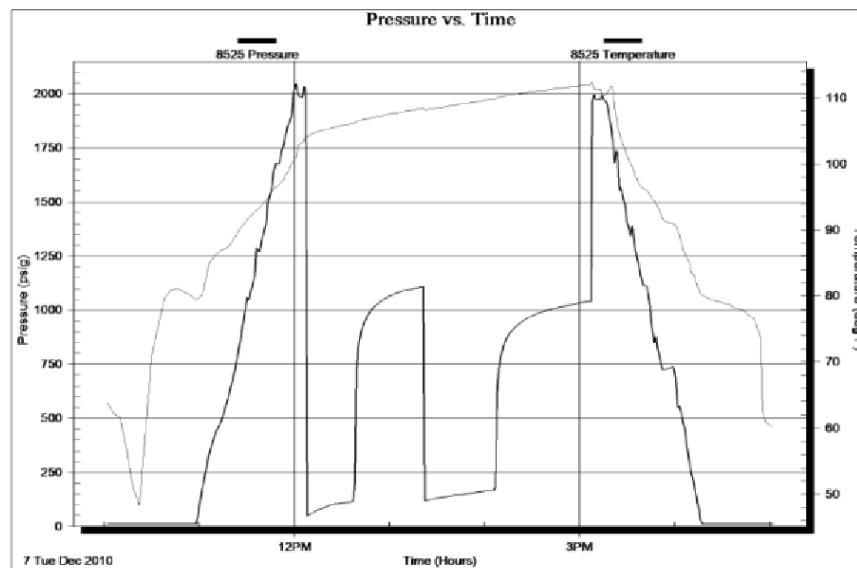
IFP: Weak blow built to 8in
 ISIP: No blow back
 FFP: Weak blow built to 10in
 FSIP: No blow back

Serial #: 8525

Outside GRAND MESA OPERATING

22-135-32W- LOGAN

DST Test Number: 3

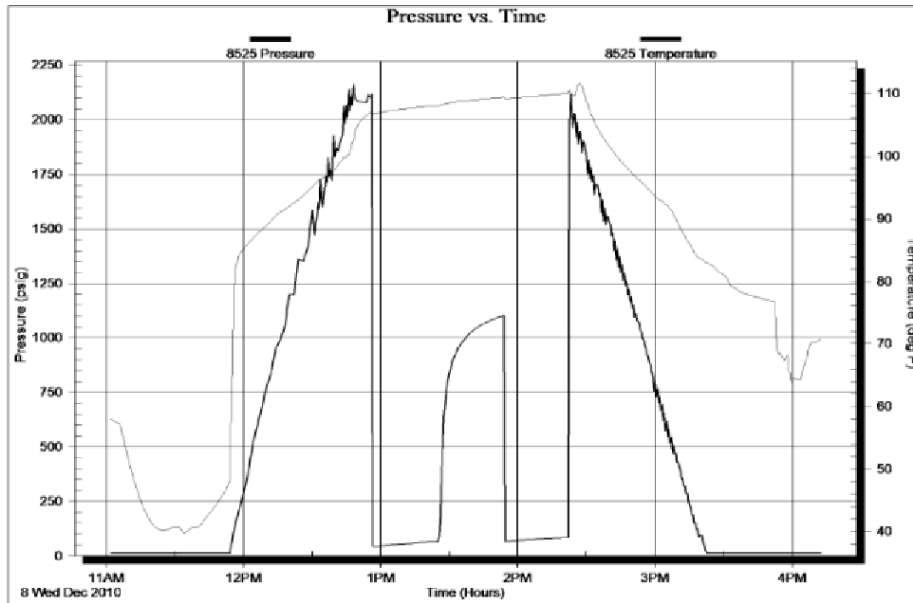


DRILL STEM TESTS

DST No. 4 Lansing "K"
 Interval: 4265'-4300'
 Times: 30-30-20-OUT
 Recovery: 80' Mud Trace of Water
 FP: 49-69/72-88#
 SIP: 1103#

IFP: Surface blow
 ISIP: no return
 FFP: Surface blow

Serial #: 8525 Outside GRAND MESA OPERATING 22-135-32W- LOGAN DST Test Number: 4

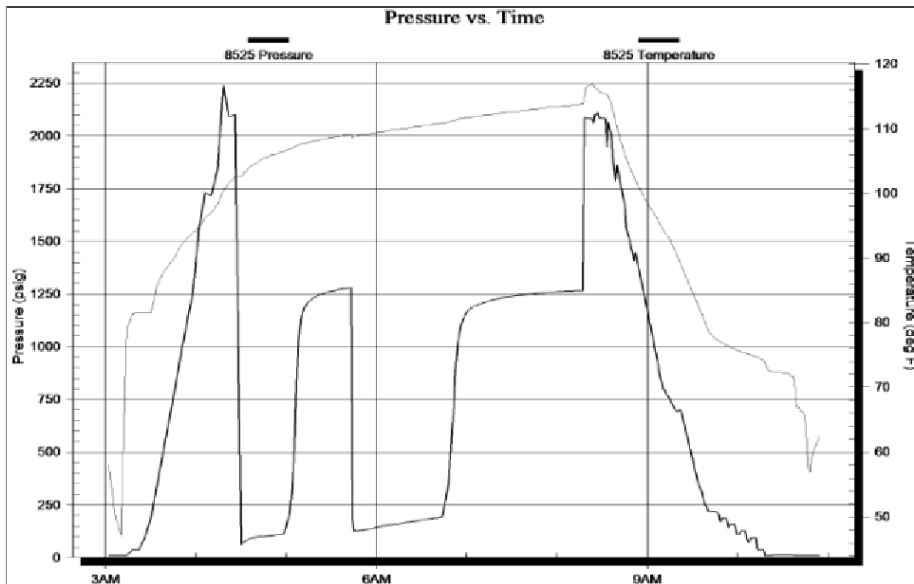


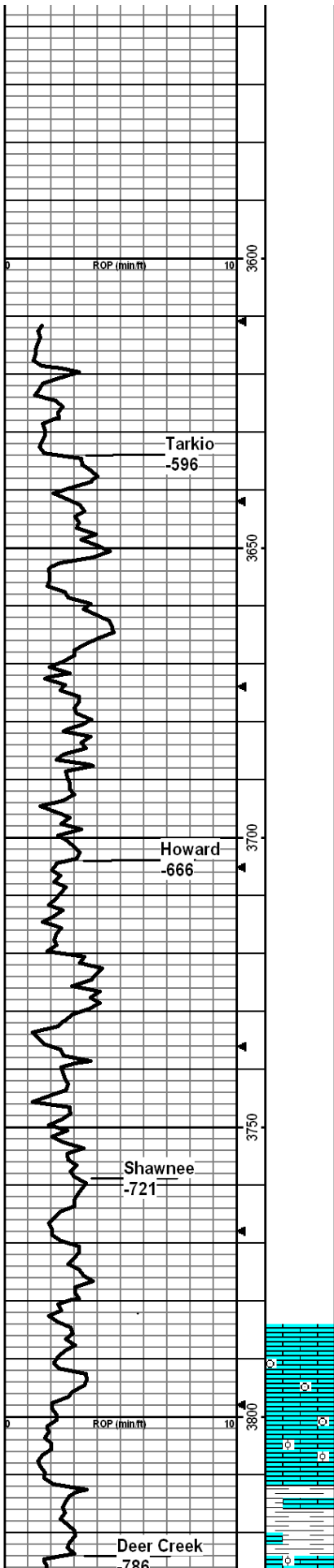
DRILL STEM TESTS

DST No. 5 Lansing "L"
 Interval: 4300'-4336'
 Times: 30-45-60-90
 Recovery: 1140'GIP, 260' CGO, 120' MCO
 FP: 54-116/130-195#
 SIP: 1282-1270#

IFP: Fair blow bldg to B.O.B. in 18min
 ISIP: 5in return blow
 FFP: Fair blow bldg. to B.O.B. in 15min
 FSIP: B.O.B. on return

Serial #: 8525 Outside GRAND MESA OPERATING 22-135-32W- LOGAN DST Test Number: 5





Bit trip @ 3611'
 Survey = 3/4 degrees
 Strap = 0.31' Long

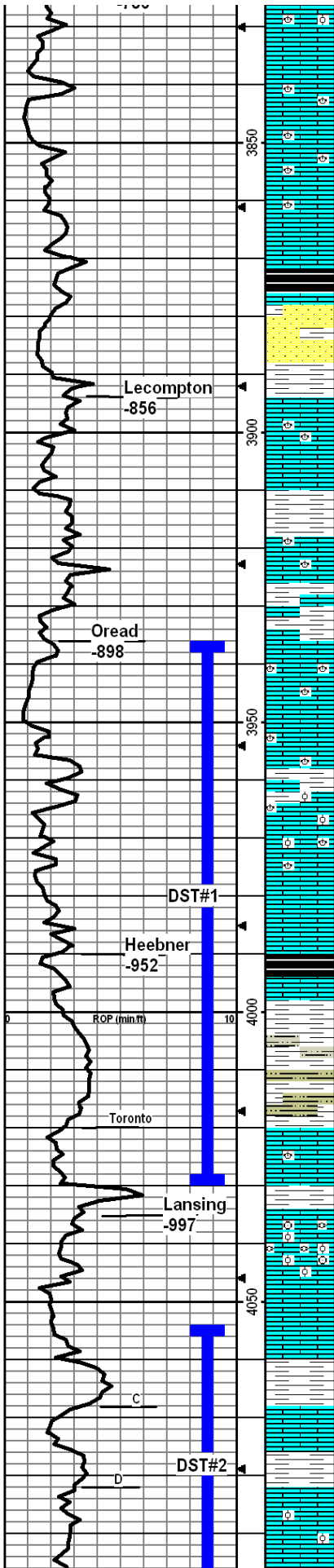
ROP Data begins @ 3612'

LS-crm/lt tan/wht, crs xln, grainy, foss-crin/misc, sm chalk, fr-gd int xln por, no odr, no fluor, ns.

LS-med-lt tan, mottled, crs xln, foss-crin/misc, incr chalk, fr int xln por, few chert-gry, foss, op, no odr, ns.

LS-drk gry, mottled, crs xln, foss-misc, ool in part, deformed ool, chalky, easy crush, few chert as above, scat pr int xln por, Shalely-drk gry, few blk carb, no odr, ns.

LS-mostly as above, sm LS-lt tan, crs xln, foss, fr int xln por, sm silty



SS, cup water is muddy brn/red, no odr, ns.

LS-lt tan, crs xln, foss-misc, sparry, mostly dense, scat fr int xln por, no cup odr, ns.

LS-lt gry/crm, fn-med xln, sm crs xln, foss-brach/misc, grainy, chalky, scat int xln/vug por, no odr, ns.

LS-med-lt tan/crm, crs xln, mealy, grainy, chalky, foss-brach/crin/misc, med crush, fr-gd int xln/foss por, no odr, ns.

LS-med-lt tan, med xln, foss-brach/fus/crin, decr chalk, mostly dense, scat pr int xln por, no odr, ns.

LS-mostly as above, sm SH-blk, carb, sm SH-gry, SS-vfn grn, arg, no odr, ns.

SS-lt gry/blu, fn grn, well srtd, friable to semi well cem, nvp, SH-red/brn/gry, sm silty, ns.

SH-red/gry-silty, sandy, firm to v soft, muddy, sticky, no cup odr, ns.

LS-lt tan/gry, med xln, mealy, grainy, foss/misc, chalky, mostly dense, med crush, scat int xln por, no odr, ns.

SH-gry/red/maroon, firm, fissile, sandy, silty, sm soft/waxy, few pcs blk, carb.

LS-tan, crs xln, profus foss-brach/bryz/fus/crin, mealy, grainy, easy-med crush, mostly dense, scat fr int xln/foss por, no odr, ns.

SH-lt gry, silty, sm sandy, LS-med-lt gry, fn xln, foss, dense, hard, brittle, diff crush, nvp, ns, sm LS-foss, as above, no odr, ns.

LS-gry, fn xln, sparry, sm foss, slty chalky, mostly dense w/pr int xln por, few pcs w/gd int xln/vug/frac por, gsfo in rare pcs, scat dead oil (does not cut), vssfo in many pcs per tray, no cup odr.

LS-lt tan, med xln, slty chalky, mealy, foss-misc, mostly dense w/nvp, few pcs w/pr int xln por w/ssfo as above, no cup odr, no fluor.

LS-lt tan, med-crs xln, profus foss-misc, ool in part, mostly dense w/nvp, sm w/fr int ool/foss por, frac'd w/lrg calcite rhombs, ss to fs drk fo in several pcs per tray, no cup odr, no fluor.

LS-lt tan, med xln, foss, mealy, chalky, mostly dense, scat int xln por, no cup odr, few pcs LS as above, ssfo.

SH-blk, carb.

LS-tan, crs xln, foss, dense, hard, diff crush, nvp, ns.

SH-med gry, mostly firm, waxy, sm silty.

SH and Mudstone, red/brn/gry, firm-fissile to v soft/muddy, sticky, cup water dirty red/brn.

30min, LS-wht, fn xln, dense, brittle, med crush, nvp, no odr, ns.

60min, as above, LS-wht, fn xln, dense, foss-brach, nvp, ns.

SH-med gry, firm.

LS-wht, crs xln, mealy, flakey, foss-fus/crin, ool, easy crush, sm dense/uniform, med crush, scat pr int xln/foss/ool por, brt mineral fluor, no cup odr, ns.

LS-med tan, fn xln, decr foss, decr ool, dense, diff crush, rare int xln/foss por, no cup odr, ns.

SH-gry/blk, firm.

SH-lt gry/blu, mudstone, v soft, sticky, silty.

30min, LS-lt tan/crm, fn xln, uniform, rare foss, mostly dense, slty chalk, sm w/fr int xln por, st sho med brn fo in all por, few pcs chert-wht op, no cup odr, sm dul min fluor.

60min, LS- as above, decr sfo, mostly dense, brittle, no cup odr, SH-med gry, firm.

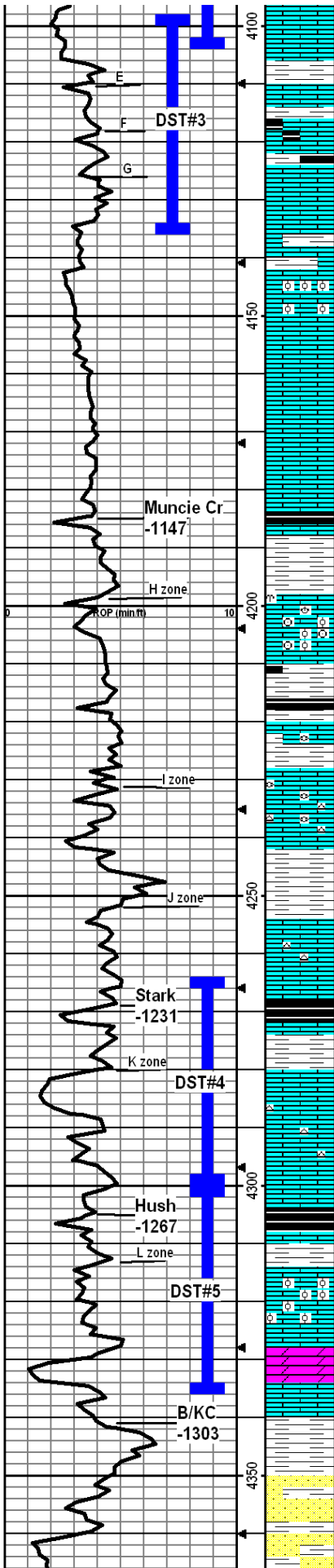
LS-crm, fn xln, mostly dense, uniform, med-diff crush, pr int xln por, ssfo in all por, may be from above, no cup odr, scat min fluor.

LS-crm, fn xln, sm crs xln, all dense, mostly uniform, rare foss, rare ool, few pcs chert-gry op, no cup odr, scat min fluor, ns.

30min, LS-lt gry, mostly fn xln, uniform, dense, sm med xln, scat pr int

DST#1
 3937'-4030'
 30-45-60-75
 Rec: 660' MW
 Chlor: 42,000
 IFP: 86-209#
 FFP: 217-381#
 ISIP: 1244#
 FSIP: 1229#
 BHT: 110degF

DST#2
 4054'-4105'
 30-45-60-75
 Rec: 30' Mud
 120' MW
 360' MW
 Chlor: 35,000
 IFP: 63-176#
 FFP: 169-293#
 ISIP: 1205#
 FSIP: 1177#
 BHT: 114degF



xln/pp por, chalky, no cup odr, no fluor, no stn in dry, ns.

60min, no change.

SH-med-drk gry, sm red/brn, firm, waxy.

LS-t tan/crm, fn xln, mostly dense, scat int xln pp por, abund barren por, med crush, stly chalky, 2-4 pcs per tray w/sfo, no cup odr.

LS-mostly as above, stly chalky, rare ool, many pcs per tray w/pr fr int xln/vug por, fs med brn fo in most por, sm thick tarry oil, no gas bub, no cup odr.

LS-crm, fn xln, mostly dense, few pcs w/pr fr int xln por, sho med brn fo as above, no cup odr, SH-drk gry blk.

30min, LS-crm, fn xln, sm crs, mostly dense, sm chert-wht, op, few pcs per tray w/pr int xln por, sfo in most por, no cup odr, no fluor.

60min, LS-as above, crm, fn xln, dense, uniform, decr in sho lith, fnt odr on break, no cup odr, no fluor.

SH-gry/grn, waxy, LS-crm, fn xln, mostly uniform, dense, sm profus ool, v small ool's densely packed w/nvp, no cup odr, no fluor, ns.

LS-lt gry/crm, fn xln, dense, brittle, med crush, uniform, rare foss/ool, nvp, no odr, ns.

LS-crm/gry, fn-med xln, sm ool, mostly dense/uniform, sm stylo, nvp, no cup odr, ns.

LS-lt gry, fn-med xln, uniform, stly chalky, nvp, no cup odr, ns.

SH-blk, carb.

LS-brn, med-crs xln, foss-crin/fus, dense, hard, sm frac por, few fracs filled w/flakey dead oil, cuts pale blu, no cup odr, nsfo.

SH-gry, soft to firm, fissile, waxy.

LS-med gry, mottled, fn-med xln, foss-crin/brach/fus, dense, hard, diff crush, nvp, no odr, ns.

LS-crm, crs xln, profus ool, densely packed ool, nvp, no cup odr, ns.

SH-predom brn/red, sm gry, sm orn, few pcs blk carb.

LS-med tan, fn xln, foss-fus, dense, brittle, hard, diff crush, nvp, no cup odr, ns.

LS-lt tan/gry, fn xln, foss, dense, nvp, no cup odr, ns.

LS-med brn, md-crs xln, foss-crin/fus, brittle, hard, dense, nvp, sm chalk, sm LS-crm, fn xln, foss-fus, grainy, dense, sm chert-milky, foss, transl, no cup odr, ns.

SH-equal mix of red/brn/gry, sm silty, sm waxy.

LS-crm, fn xln, dense, hard, uniform, few foss, few chert, abund chalk, nvp, no cup odr, ns.

SH-blk, carb.

LS-mottled brn, fn xln, dense, diff crush, brittle, sm foss, scat pr int xln por, vnt cup odr, slt sho lt fro, not vis under wht light, brt fluor.

SH-red/brn/gry.

LS-lt gry, fn xln, grainy, uniform, sm stly foss, stly chalky, pr int xln por, scat lt brn stn in dry, cuts dul yel, spotty sat, no cup odr, rare sfo, sm chert-wht, op.

LS-gry, fn xln, dense, hard, rare foss, sm chert as above, scat pr vug por, no fluor, no cup odr, nsfo.

LS-gry, fn-med xln, dense, hard, mostly uniform, rare foss, scat int xln, por, no cup odr, ns.

SH-blk, carb.

LS-med brn, fn xln, rare foss, hard, dense, nvp, no odr, ns.

LS-predom gry, fn xln, dense, hard, nvp, plus LS-gry, crs xln, profus foss/ool, gd int ool/foss por, gd sho med brn fro, bleed o&g on break, gd cup odr, dul yel fluor.

LS-gry, fn xln, dense, hard, stly foss, nvp, ns, decr sho lith from above, fnt cup odr.

DOLO-gry, vfn xln, rare foss, mostly uniform, dense, diff crush, nvp, no cup odr, dul yel min (dolo) fluor, ns.

SH-predom brick red, 40% med-drk gry, sm silty.

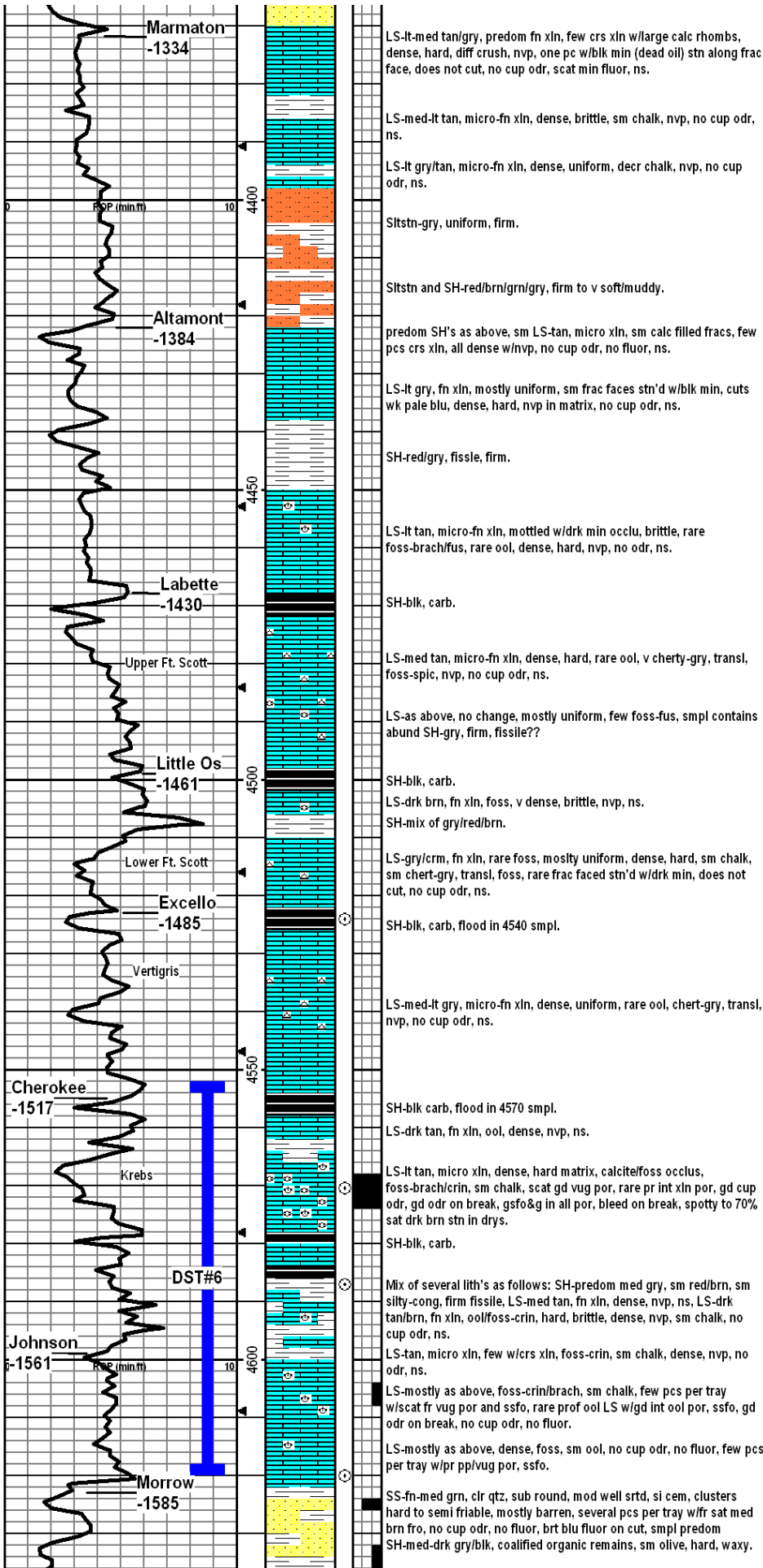
Predom SH as above, sm SS-gry, vfn grn, arg, nvp, ns.

SS-gry/grn, vfn grn, well srtd, arg, abund SH-all colors, sm silty/sandy, sm waxy, few cong, no cup odr, ns.

DST#3
 4097'-4135'
 30-45-45-60
 Rec: 90' WCM
 180' MW
 Chlcr: 37,000
 IFP: 51-119#
 FFP: 124-172#
 ISIP: 1111#
 FSIP: 1042#

DST#4
 4265'-4300'
 30-30-20-out
 Rec: 80' Mud
 Tr Wtr
 IFP: 48-69#
 FFP: 72-88#
 ISIP: 1103#
 FSIP: N/A

DST#5
 4300'-4336'
 30-45-60-90
 Rec: 260' CGO
 120' MCO
 1140' GIP
 Grav: 34deg
 IFP: 53-116#
 FFP: 130-195#
 ISIP: 1282#
 FSIP: 1270#



LS-lt-med tan/gry, predom fn xln, few crs xln w/large calc rhombs, dense, hard, diff crush, nvp, one pc w/blk min (dead oil) stn along frac face, does not cut, no cup odr, scat min fluor, ns.

LS-med-lt tan, micro-fn xln, dense, brittle, sm chalk, nvp, no cup odr, ns.

LS-lt gry/tan, micro-fn xln, dense, uniform, decr chalk, nvp, no cup odr, ns.

Slstn-gry, uniform, firm.

Slstn and SH-red/brn/grn/gry, firm to v soft/muddy.

predom SH's as above, sm LS-tan, micro xln, sm calc filled frac, few pcs crs xln, all dense w/nvp, no cup odr, no fluor, ns.

LS-lt gry, fn xln, mostly uniform, sm frac faces stn'd w/blk min, cuts wk pale blu, dense, hard, nvp in matrix, no cup odr, ns.

SH-red/gry, fissile, firm.

LS-lt tan, micro-fn xln, mottled w/drck min occlu, brittle, rare foss-brach/fus, rare ool, dense, hard, nvp, no odr, ns.

SH-blk, carb.

LS-med tan, micro-fn xln, dense, hard, rare ool, v cherty-gry, transl, foss-splic, nvp, no cup odr, ns.

LS-as above, no change, mostly uniform, few foss-fus, smpl contains abund SH-gry, firm, fissile??

SH-blk, carb.

LS-drk brn, fn xln, foss, v dense, brittle, nvp, ns.

SH-mix of gry/red/brn.

LS-gry/crm, fn xln, rare foss, mostly uniform, dense, hard, sm chalk, sm chert-gry, transl, foss, rare frac faced stn'd w/drck min, does not cut, no cup odr, ns.

SH-blk, carb, flood in 4540 smpl.

LS-med-lt gry, micro-fn xln, dense, uniform, rare ool, chert-gry, transl, nvp, no cup odr, ns.

SH-blk carb, flood in 4570 smpl.

LS-drk tan, fn xln, ool, dense, nvp, ns.

LS-lt tan, micro xln, dense, hard matrix, calcitefoss occlus, foss-brach/crin, sm chalk, scat gd vug por, rare pr int xln por, gd cup odr, gd odr on break, gsf&g in all por, bleed on break, spotty to 70% sat drk brn stn in dry.

SH-blk, carb.

Mix of several lith's as follows: SH-predom med gry, sm red/brn, sm silty-cong, firm fissile, LS-med tan, fn xln, dense, nvp, ns, LS-drk tan/brn, fn xln, ool/foss-crin, hard, brittle, dense, nvp, sm chalk, no cup odr, ns.

LS-tan, micro xln, few w/crs xln, foss-crin, sm chalk, dense, nvp, no odr, ns.

LS-mostly as above, foss-crin/brach, sm chalk, few pcs per tray w/scat fr vug por and sso, rare prof ool LS w/gd int ool por, sso, gd odr on break, no cup odr, no fluor.

LS-mostly as above, dense, foss, sm ool, no cup odr, no fluor, few pcs per tray w/pr pp/vug por, sso.

SS-fn-med grn, clr qtz, sub round, mod well srtd, si cem, clusters hard to semi friable, mostly barren, several pcs per tray w/fr sat med brn fro, no cup odr, no fluor, brt blu fluor on cut, smpl predom SH-med-drk gry/blk, coalified organic remains, sm olive, hard, waxy.

VIS: 53secs
WT: 9.3lbs

4510 and 4520 samples were nearly all shale. Circ'd at 4524 for 45min to condition hole.

Sample quality thru the vertigris was poor. Shut down at 4570 to short trip and condition mud system.

Short trip at 4570

DST#6
4552'-4620'
30-30-30-30
Rec: 10' Mud
Trace Oil
IFP: 64-80#
FFP: 67-72#
ISIP: 183#
FSIP: 170#

