

# Covey

## The Well Watchers

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

Well Name: ZERR #4  
Location: Section 20 - Township 12 South - Range 32 West  
Licence Number: 15-109-21,106. 0000 Region: Logan County, KS.  
Spud Date: 19 June 2012 Drilling Completed:  
Surface Coordinates: 2,310' FNL & 497' FEL , NE/4  
(Approximately W/S SE SE NE)  
Bottom Hole  
Coordinates:  
Ground Elevation (ft): 3,042' K.B. Elevation (ft): 3,052'  
Logged Interval (ft): 3,450' To: Total Depth (ft):  
Formation: Stotler -----> Miss (St. Louis)  
Type of Drilling Fluid: Chemical; Low Solids (non-dispersed)

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

### OPERATOR

Company: NEW GULF OPERATING, LLC.  
Address: 6310 East 102nd Street  
Tulsa, Oklahoma 74137  
(918) 728-3020  
POC Geologist:  
Joe Baker

### GEOLOGIST

Name: Curtis Covey  
Company: COVEY - The Well Watchers  
Address: 6548 Bedford Circle  
Derby, Kansas 67037  
Office: (316) 776 - 0367 Cell: (316) 258-9976

KB: 3,052'

### FORMATION TOPS

GL: 3,042'

Formation	Rotary Sample Depth (Datum)	E-log Depth (Datum)
Anhydrite .....	2,571' (+481') .....	
B / Anhydrite .....	2,595' (+457') .....	
Stotler .....	3,662' (-610') .....	
Topeka .....	3,787' (-735') .....	
Heebner Shale .....	4,011' (-959') .....	
Toronto .....	4,035' (-983') .....	
Lansing .....	4,051' (-999') .....	
Muncie Creek SH .....	4,196' (-1,144') .....	
Stark SH .....	4,279' (-1,227') .....	
B / KC .....	4,346' (-1,294') .....	
Marmaton .....	4,377' (-1,325') .....	
Pawnee LS .....	4,480' (-1,428') .....	
Cherokee Sh .....	4,558' (-1,506') .....	
'Johnson' Zone .....	4,593' (-1,541') .....	
Morrow SH .....		
Miss (Lithological) .....		

RTD: LTD: ATD: E-log is to rotary sample depth.

Loggers:  
Log Tech - Hays, Kansas

### DST #1 --- LANSING

Rotary Depth: 4,184' - 4,224'  
 Logger's Depth:  
 IFP: 14# - 21# / 30"  
 ISIP: 1,158# / 30"  
 FFP: 25# - 426# / 30"  
 FSIP: 1.102# / 30"  
 119 deg F  
 MH: 2,015# - 2,014#

Recovery: 25' Mud  
 (Free Oil at top of tool. Slight odor.)  
 Total Fluid: 25'  
 IF: Weak Intermittent Surface Blow.  
 ISI: No Blow.  
 FF: Few bubbles upon opening --  
 then No Blow.  
 FSI: No Blow.

Recovery Water: NA  
 System Water: (2,800 ppm)  
 Recovery Water (Engineer): (NA)  
 Reported Rw = NA  
 Diamond Testing ... Hoisington, KS.  
 Sampler: Gassy Mud - some OIL spots.

### DST #2 --- LANSING

Rotary Depth: 4,236' - 4,306'  
 Logger's Depth:  
 IFP: 20# - 87# / 30"  
 ISIP: 1,206# / 45"  
 FFP: 91# - 185# / 60"  
 FSIP: 1.164# / 60"  
 121 deg F  
 MH: 2,056# - 2,039#

Recovery: 180' Gas cut Watery Mud (6%G,40%M, 54%W)  
 190' Gas cut Muddy Water (5%G,15%M, 80%W)  
 Total Fluid: 370'  
 IF: Weak Surface Blow built to 11 inches.  
 ISI: No Blow.  
 FF: Weak Surface Blow built to  
 BOB in 45.5 inches.  
 FSI: No Blow.

Recovery Water: (38,000 ppm)  
 System Water: (2,800 ppm)  
 Recovery Water (Engineer):  
 Reported Rw =  
 0.11 ohms @ 111 deg F  
 Diamond Testing ... Hoisington, KS  
 Sampler: Gassy Muddy Water with  
 some OIL specks.

2012

### DAILY DRILLING STATUS -- JUNE

2012

12-1/4" Hole

7-7/8" Hole

7-7/8" Hole

19 June --- Spud @ 12:45am.  
 Drill to 262'.  
 Run 8-5/8" casing (23#)  
 Set casing @ 258'.  
 Cemented w/ 200 sx Class A  
 (2% Gel + 3% CC).  
 [Consolidated]  
 Cement did circulate.  
 Plug down @ 7:15am.  
 WOC.

19 June --- WOC.  
 6:30am @ 262'.  
 Under surface casing @ 4:15pm.  
 20 --- 6:30am @ 1,725'.  
 21 --- 6:30am @ 3,095'.  
 22 --- 6:30am @ 3,815'.  
 Displace Mud @ 3,414'.  
 S/T 25 stands @ 4,050'.  
 23 --- 6:30am @ 4,185'.  
 DST #1: Lansing (4,184'-4,224').  
 24 --- Resumed Drilling @ 2am.  
 6:30am @ 4,290'.  
 DST #2: Lansing (4,236'-4,306').  
 Resumed Drilling @

25 June --- 6:30am @ 4,415'.  
 Start ....  
 26 --- 6:30am @ 4,635'. Finish  
 DST #3: Lansing (4,556'-4,635').  
 Resume Drilling @

### HOLE DEVIATION 262' - ') )

DEPTH / TVD	--- INCLINATION	AZIMUTH	NORTH	SOUTH	EAST	WEST	DOGLEG deg/100'
262' /	--- 1.00 (Surface)						
1,250' /	--- 1.00						
2,288' /	--- 1.00						
3,285' /	--- 0.75						
4,224' /	--- 1.00 (DST #1)						

STRAP @ DST #1  
 Board: 4,252.39'  
 Strap: 4,248.52'  
 Diff: 3.87'

## CONTRACTOR

### VAL Energy --- Rig #4

10,500 E. Berkeley Square Parkway, Suite 1000  
Wichita, Kansas 67230  
Office: (316) 636-2090

Rig #4 - (620) 617-2793

Larry Hinderliter - (620) 804-0097

Pump: National K-500A  
6" x 15" @ 58 SPM.  
800-950 PSI @ Standpipe.

After Mudup / Main Hole:  
WOB 32M @ 75 RPM.

Drill Collars: 6-1/8" x 2.50" --- 486'. (83.5#/ft)  
Dry Collar Weight: 40,832#  
(@ 9.2 ppg / Buoyancy Factor 0.86)  
Bouyancy Collar Weight: 35,115#  
Design Factor: 15%, therefore:  
available WOB is 29,848#  
Drill Pipe: 4-1/2"XH. (16#/ft - used)

## BIT RECORD

DATE	SIZE	TYPE	JET SIZE	DEPTH IN / OUT	CUM. FT.	HOURS	ROP
19 June 2012	12-1/4"	REED RR	3 / 15's	0' / 262'	262'	2.00	131.0
19 June 2012	7-7/8"	JZ QX-21S	15 - 14 - 15	262' /			

## ROCK TYPES

### POROSITY

- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

### LITHOLOGY

- Anhy
- Bent
- Brec
- Cht
- Clyst
- Coal
- Granite wash
- Congl
- Dol Imst
- Silty dol

- Calc dol
- Dol 2
- Dol
- Gyp
- Igne
- Lmst 2
- Lmst
- Meta
- Mrlst
- Salt
- Shale 3
- Shale
- Shcol
- Shgy
- Sltst
- Ss
- Till
- Ss 2

### MINERAL

- Mica
- 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
- Copper
- Ooliticastic
- Ooloid
- Oolite
- Sucrosic
- Dark specks

### STRINGER

- Calc dol
- Silty dol
- Anhy

- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Calc dol
- Sltstrg
- Ssstrg
- Chalk
- New symbol

### SHOW

- Oil
- Spotted
- Ques
- Dead
- Gas
- Oil/gas
- Bed contact

## ACCESSORIES

### FOSSIL

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

- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite
- Plant
- Strom

### MINERAL

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### STRINGER

- Calc dol

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- Mrst
- Calc dol
- Sltstrg
- Ssstrg
- Chalk
- New symbol

OTHER SYMBOLS

ACTIVITY

-  Lost circulation
-  Circulate for same



Circulate for same EVENT

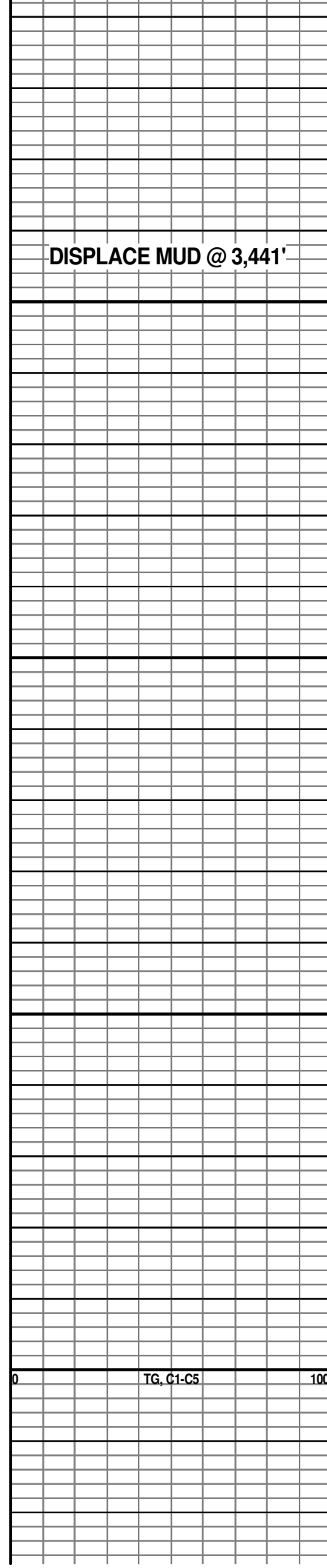
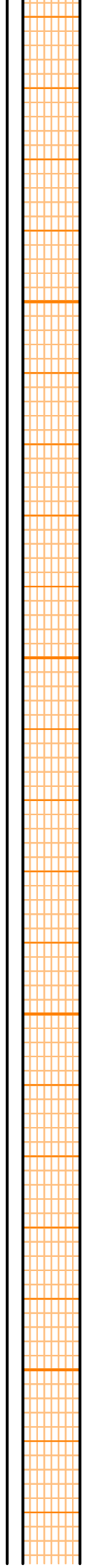
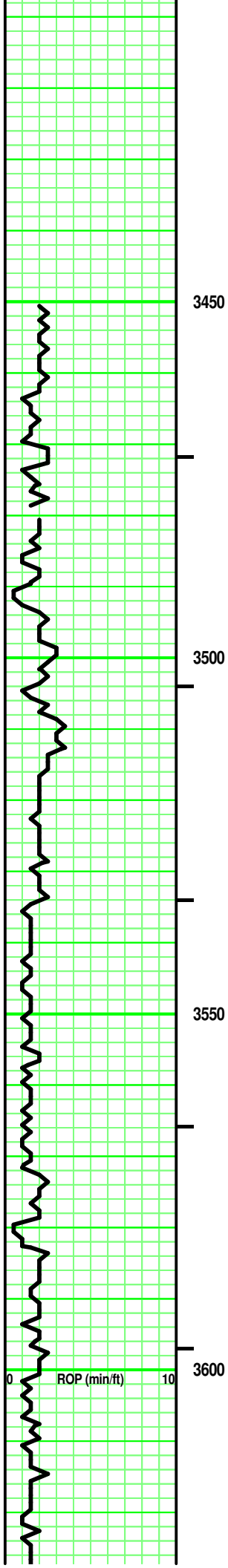
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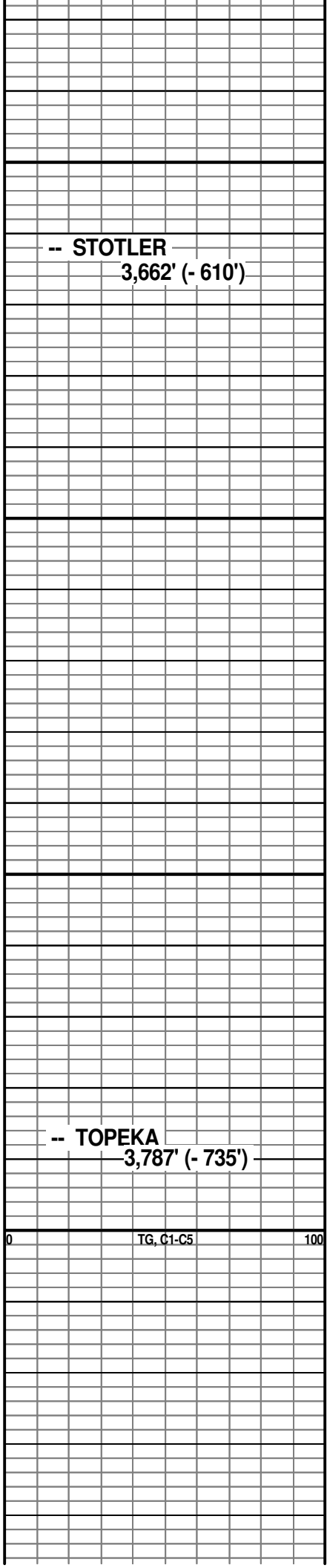
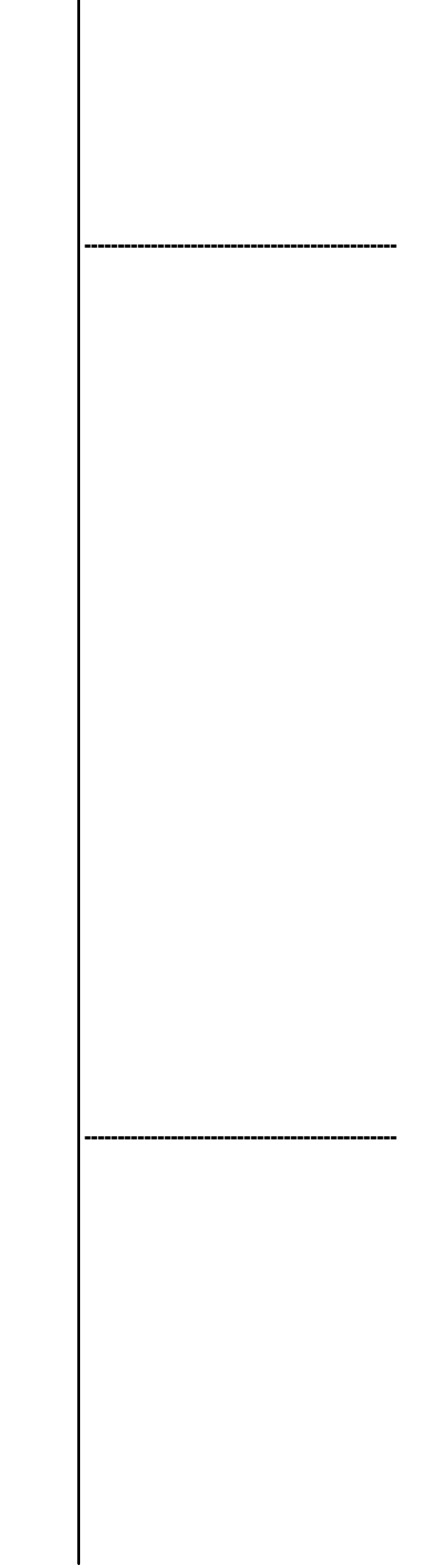
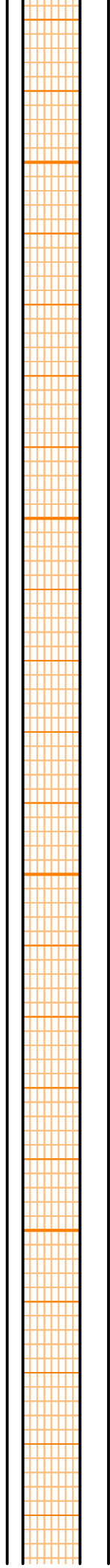
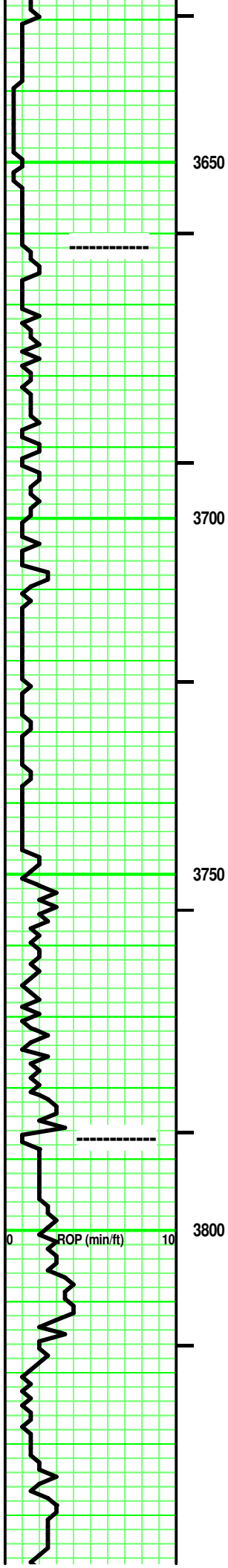
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-  Rft

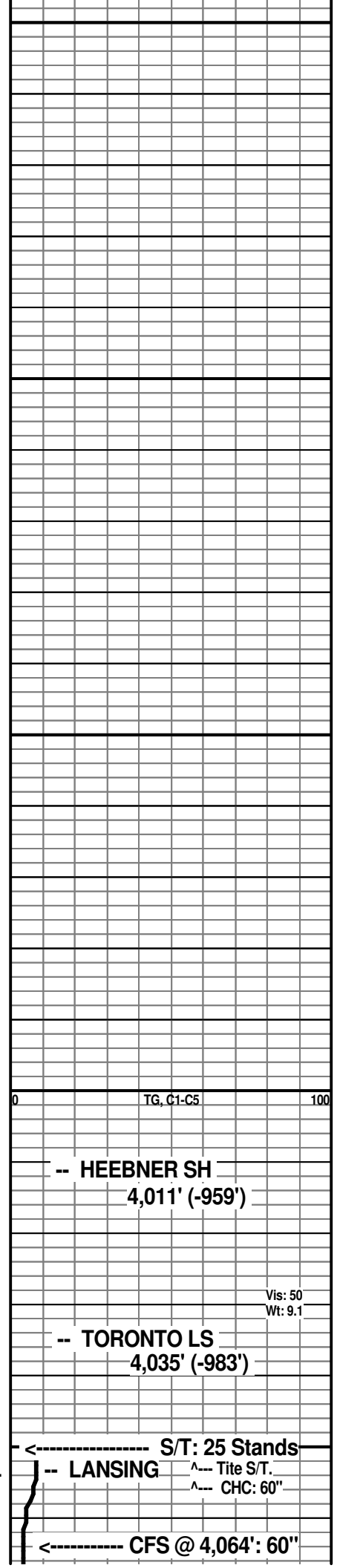
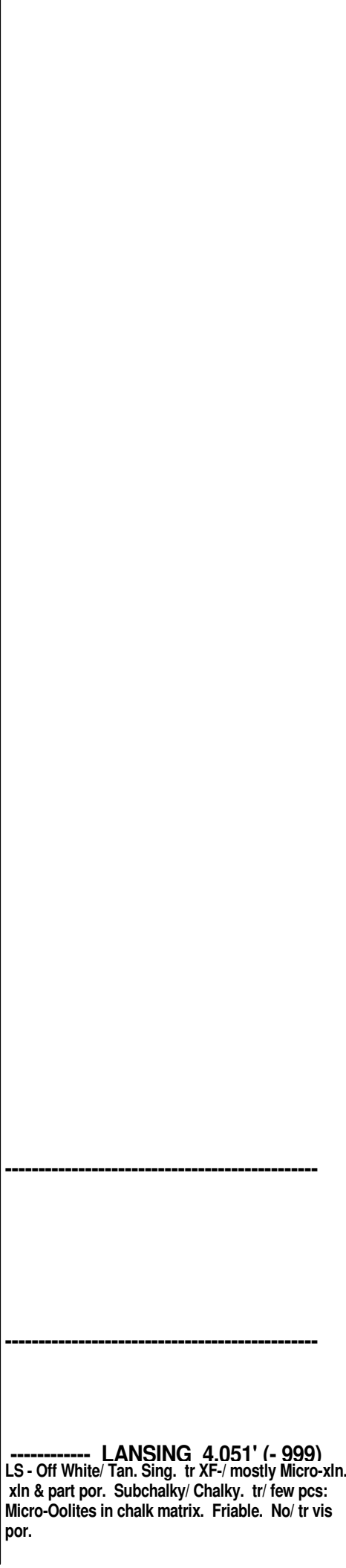
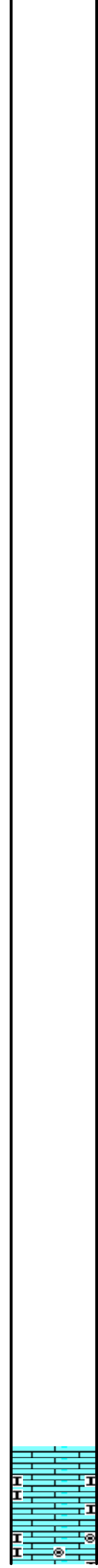
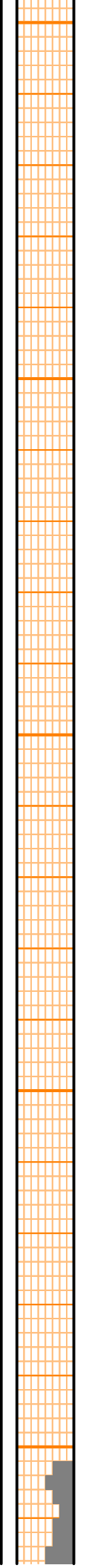
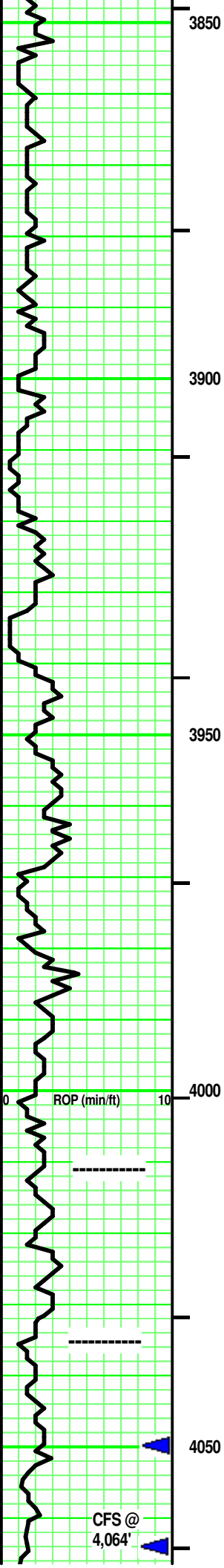


Sidewall

Curve Track 1 ROP (min/ft)	Depth	Porosity Type	Porosity	Shows	Lithology	Geological Descriptions	TG, C1-C5
0 10			24% 18% 12% 6%				TG (Units) ——— C1 (units) - - - - - C2 (units) . . . . . C3 (units) : : : : : C4 (units) - - - - - C5 (units) . . . . .
0 10	2500						0 100 TG, C1-C5
							<p>Dry Wt of Collars: 40,832# [489' x 83.5#/ft = 40,832#] Drill Collars: 6-1/8" x 2.5" Buoyancy Wt of Collars: 35,115# [40,832 x .860 (9.2ppg) = 35,115#] Available WOB: 29,848# [35,115# x .85 = 29,848#]</p>
	2550						<p>Weight Indicator Check @ 4,095'</p>
						----- AnHydrite 2,571' (+481')	<p>Dry Wt of: DC - (See Above) = 40,832# DP - 3,566' x 16#/ft = 57,056# Total Dry Wt = 97,888#  Buoyancy Wt = 87,151# [97,888# x .86 (9.2ppg) = 84,184#]  Buoyancy Wt + Surface Equipment = String Weight [84,184# + 20,000# = 104,184#] String Weight = 104,184#</p>
	2600					----- B/AnHydrite 2,595' (+457')	<p>Weight Indicator shows 110M; therefore, weight indicator is 6% heavy</p>
							<p>Contractor reports running 38M# on bit by WI and has actually 35.7M# WOB. -vs- Calculated available WOB of 29,848#.</p>
							<p>Contractor is running all of the buoyanced Drill Collar weight on bit.</p>
0 10	XXX XXXXX XXX						0 100 TG, C1-C5







-- HEEBNER SH  
4,011' (-959')

-- TORONTO LS  
4,035' (-983')

Vis: 50  
Wt: 9.1

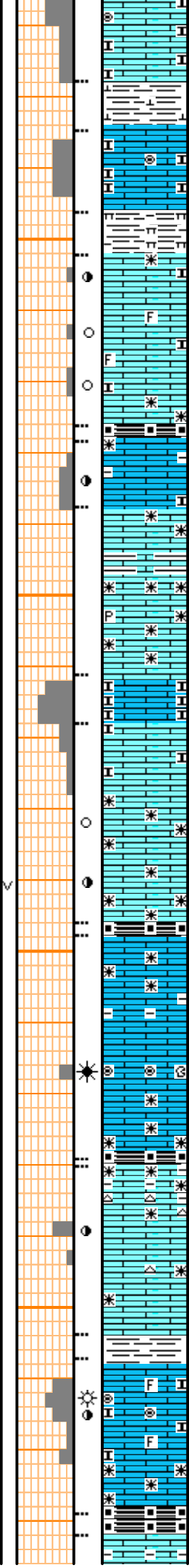
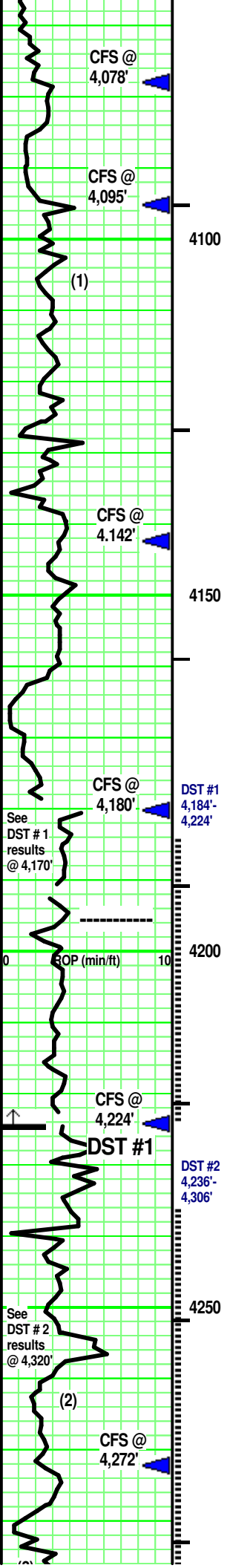
<----- S/T: 25 Stands

-- LANSING ^--- Tite S/T.  
                  ^--- CHC: 60"

<----- CFS @ 4,064': 60"

----- LANSING 4.051' (- 999)  
LS - Off White/ Tan. Sing. tr XF-/ mostly Micro-xln.  
xln & part por. Subchalky/ Chalky. tr/ few pcs:  
Micro-Oolites in chalk matrix. Friable. No/ tr vis  
por.

CFS @  
4,064'



SH - Lt/ Med Gray. Sing. tr calc. Firm.

LS - Off White/ Tan. Sing. tr XF-/ mostly Micro-xln. xln & part por. Subchalky/ Chalky. rare Micro- Oolites in chalk matrix. Friable. No/ tr vis por.

SH - Lt Gray/ Grayish Tan. Sing. marly.

LS (1) - Lt/ Med Tan. Sing. XF-/ Micro-xln. xln por. rare/ tr Re-xln. rare fossil frag. tr subchalky intermixed. partly Friable. No/ tr vis por. No odor. spotted, minute v dull yellow fluorescence. No free oil. rare minute small gas bubble clinging to por. spotted, irregular Dark Brown stain. tr/ some carb flecks. ?/ V Weak Pos cut & residual. /? V Weak Pos acid & residual.

SH - Black. Sing. carb. soft.

LS - similar to (1) above. similar show.

LS - Tans/ some Off White. Sing. XF-/ Micro-xln. xln por. No/ tr Re-xln. some interbedded argil/ calc shale. No/ rare minute pyrite xtal. Firm. No/ tr vis por.

LS - White/ Off White. Sing. Micro-xln. xln por. Chalk. Friable. No/ tr vis por.

LS - Tans/ Pale Greenish Lt Tan/ some Off White. Sing. XF-/ Micro-xln. xln por. No/ tr Re-xln. subchalky in part at top. Firm with depth. No/ tr vis por.

Adding: few pcs: LS - Tan. Sing. XF-xln. xln & rare vuggy Re-xln. tr/ rare Fair vis por. Fair odor. spotted dull/ med yellow fluorescence. A/C, no free oil or gas. Spotted, irregular/veiny Med to Dark Brown 'heavy' stain. Weak Pos cut & residual. Weak Pos acid & residual.

----- MUNCIE CREEK 4,196' (-1,144')

SH - Black. Sing. carb. soft.

LS - Tans. Sing. XF/ Micro-xln., xln & some isolated vuggy por. Re-xln in part. Firm. No/ tr/ isolated Fair/Good vis por.

Add: LS - Tan Micr-Oolites. Clear/ Brown semi-transparent Matrix. Fossil frag 'hash'. Friable. Fair vis por. Fair odor. Spotted/ tr uniform Yellow fluorescence. On own, minute gas bubbles in oolomoldic por. v rare minute Black oil bleb. spotted Med Brown stain. Weak Pos cut/ residual. Weak Pos acid/ residual.

SH - Black. Singl carb. soft.

LS - Tan/ Off White/ Grayish Tan, tr Pale Lt Gray at top. Sing/ tr Mot. XF-/ Micro-xln. xln por. some Re-xln. [few pcs: CHERT - Off White/ Tan. Sing/ Mot. Opaque. some, minute white inclusions. No tripolitic.] Firm. No/ tr vis por.

two pcs: LS - similar to above. ?/ Faint odor. Spotted Yellow fluorescence. No free oil or gas. spotted Med Brown stain. Weak Pos cut/ residual. Weak Pos acid/ residual.

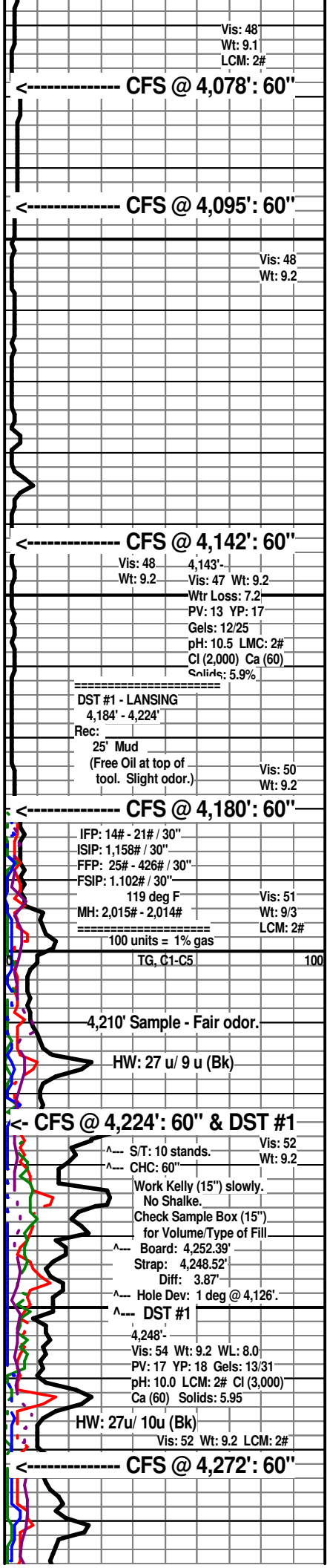
SH - Med Gray/ Tannish Gray. Sing. Firm.

LS - Off White/ Lt Gray rare F/VF Oolite, tr Oolotids and tr misc fossil frags. Clear/ trans-parent Lt Gray Matrix. part & vuggy por. Chak. Friable. No to Fair/Good vis por. ?/ Faint odor. Spotted/ rare Uniform Yellow fluorescence. No free oil. rare minute gas bubbles in vuggy por. spotted Lt Brown stain around vuggy por. Weak Pos cut/ residual. Weak Pos acid/ residual

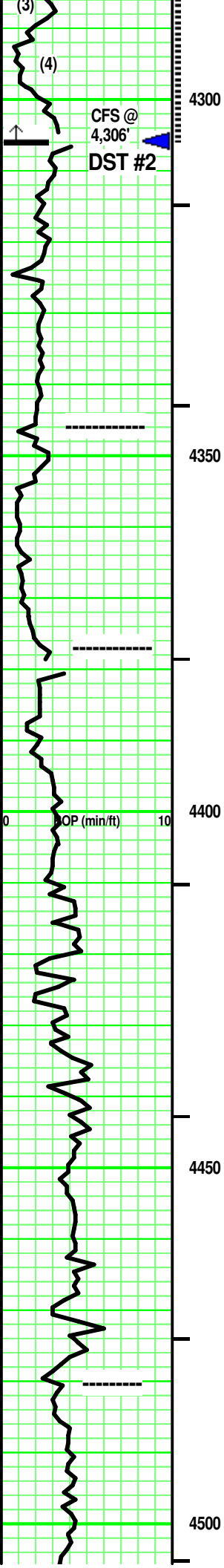
----- STARK SH 4,279' (-1,227')

SH - Black. Sing. Carb. Soft.

LS (3) - Tan/ Lt Gray. Sing/ tr Mot. tr XF-/ Micro-xln. xln por. tr Re-xln. tr argil/ tr interbedded SH. Firm. No/ tr vis por







LS (3) - Tan. Sing. VF-xln. xln & rare sucrosic por. 'ghost' fossil frags & hash. Chalky. Friable. tr/ Fair vis por. Good odor. spotted/ rare uniform yellow fluorescence, A/C, rare minute, spotted gas bubbles. No free oil. Spotted, minute Lt Brown stain. Pos cut/ residual. Pos acid/ residual.

LS - similar to (3) above.

few pcs SH - Black. Sing. carb. soft

LS - Tans/ Grays. Sing/ some Mot. XF-/ Micro-xln. xln por. some Re-xln. tr fossil frags. some argil/ shale in part/ interbedded. Firm. No/ tr vis por.

----- **B / KC 4,346' (-1,294')** -----

Interbedded LS, Marl & SH

LS - Tan. Sing/ some Mot. XF-/ Micro-xln. xln por. some Re-xln. tr argil in part. Firm. No/ tr vis por.

Marl - Off White/ Reddish hue Off White. silt sized, SA qtz grains floating in marl matrix. Highly limy with depth.

SH - Lt & Med Gray / Greenish Gray. Sing. some calc. some marly in part.

----- **MARMATON 4,377' (-1,325')** -----

Interbedded LS & SH

LS - Tans/ Lt & Gray. Sing/ some Mot. tr XF-/ mostly Micro-xln. xln por. tr/ some Re-xln. tr argil/shaly in part & interbedded. tr fossil frags in part. subchalky (marly) in part. partly Firm. No/ tr vis por.

SH - Black. Sing. carb. tr fissile.

SH - Med Gray. Sing. tr calc. some Firm.

LS - Tans/ some Grays. Sing/ some Mot. tr XF-/ mostly Micro-xln. xln por. some Re-xln. tr argil/shaly in part. Firm at top. No/ tr vis por.

LS - Tans/ some Off White. Sing. XF-xln at top/ Micro-xln at depth. xln por. tr Re-xln. Subchalky in part. mostly No/ tr vis por. -- interbedded with -- SH - Grays/ Bluish Gray, Tannish Gray/ Greenish Gray.

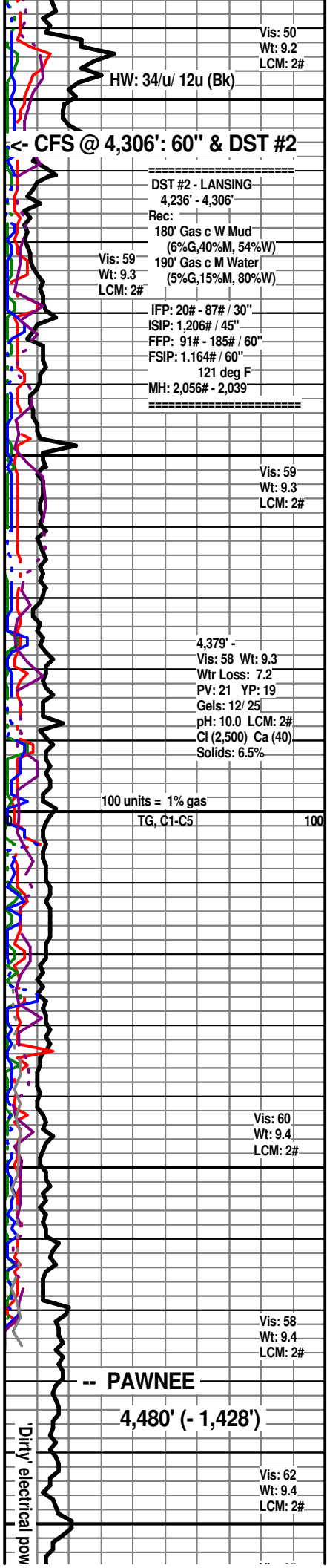
SH - Black. Sing. carb. tr fissile.

SH - Med Gray. Sing. highly limy/ LS streaks & interbedded.

----- **PAWNEE 4,480' (-1,428')** -----

LS - Tans/ tr Lt Gray. Sing/ Mot. XF-/ some Micro-xln. xln & part por. tr Re-xln. [some Chert - Silvery White/ Off White/ Grayish Tan. Mot. misc minute Off White inclusions. No tripolitic/ 'fresh'.] mostly Firm. rare/ tr fossil frag. tr ls 'rubble'. tr argil. No/ tr vis por.

few SH - Black. Sing. carb. tr fissile.



Vis: 50  
Wt: 9.2  
LCM: 2#

HW: 34/u/ 12u (BK)

----- **CFS @ 4,306': 60" & DST #2** -----

DST #2 - LANSING  
4,236' - 4,306'

Rec:  
180' Gas c W Mud  
(6%G,40%M,54%W)  
190' Gas c M Water  
(5%G,15%M,80%W)

Vis: 59  
Wt: 9.3  
LCM: 2#

IFP: 20# - 87# / 30"  
ISIP: 1,206# / 45"  
FFP: 91# - 185# / 60"  
FSIP: 1.164# / 60"  
121 deg F  
MH: 2,056# - 2,039'

Vis: 59  
Wt: 9.3  
LCM: 2#

4,379' -  
Vis: 58 Wt: 9.3  
Wtr Loss: 7.2  
PV: 21 YP: 19  
Gels: 12/ 25  
pH: 10.0 LCM: 2#  
Cl (2,500) Ca (40)  
Solids: 6.5%

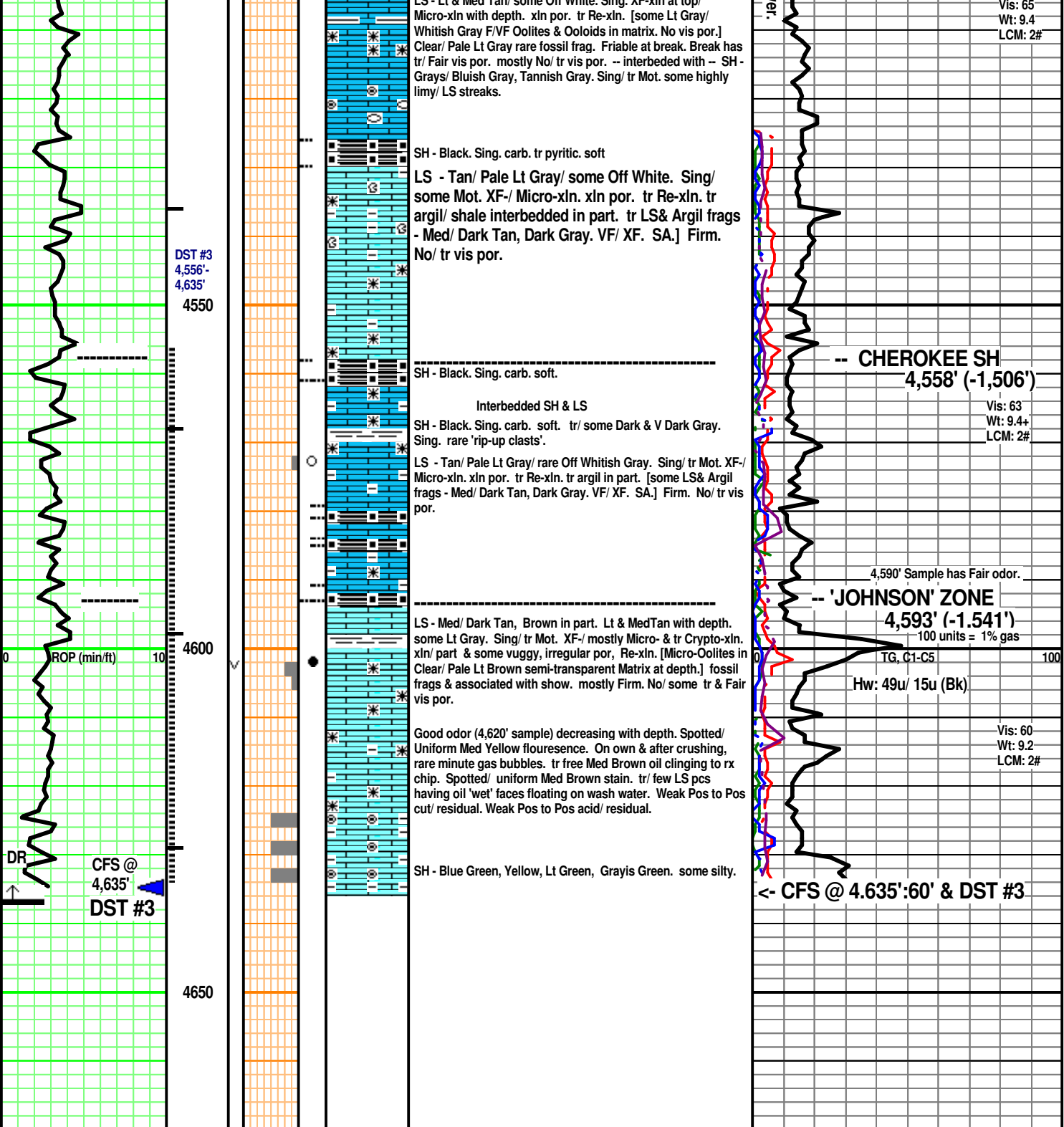
100 units = 1% gas  
TG, C1-C5 100

Vis: 60  
Wt: 9.4  
LCM: 2#

Vis: 58  
Wt: 9.4  
LCM: 2#

Vis: 62  
Wt: 9.4  
LCM: 2#

'Dirty' electrical pow



LS - Lt & med Tan/ some Off White. Sing. XF-xln at top/ Micro-xln with depth. xln por. tr Re-xln. [some Lt Gray/ Whitish Gray F/VF Oolites & Ooloids in matrix. No vis por.] Clear/ Pale Lt Gray rare fossil frag. Friable at break. Break has tr/ Fair vis por. mostly No/ tr vis por. -- interbedded with -- SH - Grays/ Bluish Gray, Tannish Gray. Sing/ tr Mot. some highly limy/ LS streaks.

SH - Black. Sing. carb. tr pyritic. soft  
 LS - Tan/ Pale Lt Gray/ some Off White. Sing/ some Mot. XF-/ Micro-xln. xln por. tr Re-xln. tr argil/ shale interbedded in part. tr LS& Argil frags - Med/ Dark Tan, Dark Gray. VF/ XF. SA.] Firm. No/ tr vis por.

SH - Black. Sing. carb. soft.  
 Interbedded SH & LS  
 SH - Black. Sing. carb. soft. tr/ some Dark & V Dark Gray. Sing. rare 'rip-up clasts'.  
 LS - Tan/ Pale Lt Gray/ rare Off Whitish Gray. Sing/ tr Mot. XF-/ Micro-xln. xln por. tr Re-xln. tr argil in part. [some LS& Argil frags - Med/ Dark Tan, Dark Gray. VF/ XF. SA.] Firm. No/ tr vis por.

LS - Med/ Dark Tan, Brown in part. Lt & MedTan with depth. some Lt Gray. Sing/ tr Mot. XF-/ mostly Micro- & tr Crypto-xln. xln/ part & some vuggy, irregular por., Re-xln. [Micro-Oolites in Clear/ Pale Lt Brown semi-transparent Matrix at depth.] fossil frags & associated with show. mostly Firm. No/ some tr & Fair vis por.  
 Good odor (4,620' sample) decreasing with depth. Spotted/ Uniform Med Yellow fluorescence. On own & after crushing, rare minute gas bubbles. tr free Med Brown oil clinging to rx chip. Spotted/ uniform Med Brown stain. tr/ few LS pcs having oil 'wet' faces floating on wash water. Weak Pos to Pos cut/ residual. Weak Pos to Pos acid/ residual.

SH - Blue Green, Yellow, Lt Green, Grayis Green. some silty.

Vis: 65  
 Wt: 9.4  
 LCM: 2#

-- CHEROKEE SH  
 4,558' (-1,506')

Vis: 63  
 Wt: 9.4+  
 LCM: 2#

4,590' Sample has Fair odor.  
 -- 'JOHNSON' ZONE  
 4,593' (-1,541')

100 units = 1% gas

TG, C1-C5

Hw: 49u/ 15u (Bk)

Vis: 60  
 Wt: 9.2  
 LCM: 2#

<- CFS @ 4.635':60' & DST #3