

Covey

The Well Watchers

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

Well Name: SHEETZ #1
Location: Section 16 - Township 12 South - Range 32 West
Licence Number: 15-109-20,974. 0000 Region: Logan County, KS.
Spud Date: 4 February 2011 Drilling Completed:
Surface Coordinates: 1,382' FSL & 1,773' FWL
(Approximately SE SW NE SW)

Bottom Hole
Coordinates:
Ground Elevation (ft): 2,995' K.B. Elevation (ft): 3,003'
Logged Interval (ft): 3,350' To: Total Depth (ft):
Formation: Stotler -----> Miss
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

2011

DAILY DRILLING STATUS -- FEBRUARY

2011

	12-1/4" Hole	7-7/8" Hole	7-7/8" Hole
4 Feb	--- Spud @ 6:30pm. Drill to 272'.	5 Feb	--- Resumed Drilling @ 12:55am.
5	--- Run 8-5/8" casing (23#) Set casing @ 269'. Cemented w/ 200 sx Class A (2% Gel + 3% CC). [Consolidated] Cement did circulate. Plug down @ 2:45am. WOC.	--- WOC. 6:30am @ 272'. Under surface casing @ 11:30am. 6 --- 6:30am @ 1,935'. 7 --- 6:30am @ 2,760'. 8 --- Displace Mud @ 3,339'. 6:30am @ 3,445'. 9 --- 6:30am @ 4,030'. Start & 10 --- 6:30am @ 4,115'. Finish DST #1: Lansing (4,087' - 4,115'). Resumed Drilling @ 3:30pm. 11 --- 6:30am @ 4,225'. DST #2: Lansing (4,143' - 4,256').	12 Feb --- Resumed Drilling @ 12:55am. 6:30am @ 4,360'. 13 --- Start & 6:30am @ 4,584'. Finish DST # 3: 'Johnson' Zone (4,510' - 4,583'). 14 ---

KB: 3,003'

FORMATION TOPS

GL: 2,995'

Formation	Rotary Sample Depth (Datum)	E-log Depth (Datum)
AnHydrite	2,517' (+486') *	
B / AnHdrite	2,540' (+463') *	
Stotler	3,620' (-617')	
Topeka	3,851' (-748')	
Heebner Shale	3,963' (-960')	
Toronto	3,996' (-993')	
Lansing	4,003' (-1,000')	
Muncie Creek SH	4,153' (-1,150')	
Stark SH	4,234' (-1,231')	
B / KC	4,301' (-1,298')	
Pawnee LS	4,442' (-1,439')	
Ft. Scott	4,492' (-1,486')	
Cherokee Sh		
'Johnson' Zone		
Morrow Shale		
Miss (Erosional)		

* Contractor

RTD: LTD: ATD: E-log is to rotary sample depth, uphole. E-log is to rotary sample depth, mid- & down hole. Loggers: Schlumberger Elk City, Oklahoma

DST # 1 - LANSING

Rotary Depth: 4,087' - 4,115'
 Logger's Depth: Recovery: 715' Gassy Muddy Wtr (2%G,18%M,80%W)
 Total Fluid: 715'
 IFP: 12# - 135#/30" IF: BOB in 11 minutes.
 ISIP: 1,175# / 45" ISI: No Blow Back.
 FFP: 141# - 335# / 60" FF: BOB in 18 minutes.
 FSIP: 1,166# / 90" FSI: No Blow Back.
 129 deg F
 MH: 1,939# - 1,928#
 Diamond Testing
 Hoisington, KS.
 Recovery Water: (40,000 ppm)
 System Water: (2,200 ppm)
 Reported Rw = 0.12 ohms @ 80 deg F
 Recovery Water - Mud Engineer: (42,000 ppm)
 Sampler: Wtr w/ OIL spots

DST # 2 - LANSING

Rotary Depth: 4,143' - 4,256'
 Logger's Depth: Recovery: 140' GAS in Pipe
 171' Clean OIL (41.2 API @ 60 deg F)
 378' Gassy Oily Muddy Wtr (10%G,11%O,19%W,60%M)
 315' Muddy Water (17%M,83%W - Oil spots)
 Total Fluid: 864'
 IFP: 15# - 155#/30" IF: BOB in 7 minutes.
 ISIP: 1,276# / 45" ISI: 1-1/4 inch Blow Back.
 FFP: 165# - 379# / 60" FF: BOB in 8 minutes.
 FSIP: 1,260# / 90" FSI: 1-1/2 inch Blow Back.
 117 deg F
 MH: 1,967# - 1,958#
 Diamond Testing
 Hoisington, KS
 Recovery Water: (48,000 ppm)
 System Water: (2,900 ppm)
 Reported Rw = 0.10 ohms @ 79 deg F
 Recovery Water - Mud Engineer: (ppm)
 Sampler: 4% OIL + 96% Water

HOLE DEVIATION (272' - ') & STRAP

DEPTH / TVD	INCLINATION	AZIMUTH	NORTH	SOUTH	EAST	WEST	DOGLEG deg/100'
272' /	--- 0.75 (Surface)						
1,291' /	--- 1.00						
2,234' /	--- 1.00						
3,110' /	--- 1.00						
4,115' /	--- 1.50 (DST #1)						
4,583' /	--- (DST #3)						

STRAP ON DST # 1
Board: 4,141.98'
Strap: 4,141.92'
Diff: 0.06'

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.
1,000 PSI @ Standpipe.

Uphole Hole:
WOB 35M @ 80 RPM.

After Mudup / Main Hole:
WOB 40M @ 70 RPM.

Drill Collars: 6-1/8" x 2.50" --- 469'. (83.5#/ft)
Dry Collar Weight: 39,162#
(@ 9.5 ppg / Buoyancy Factor 0.8545)
Bouyancy Collar Weight: 33,464#
Design Factor: 15%, therefore:
available WOB is 28,444#
Drill Pipe: 4-1/2"XH. (16#/ft - used)

BIT RECORD

DATE	SIZE	TYPE	JET SIZE	DEPTH IN / OUT	CUM. FT.	HOURS	ROP
4 Feb 2011	12-1/4"	REED RR	3 / 15's	0' / 272'	272'	2.50	108.8
5 Feb 2001	7-7/8"	JZ QX-21	13 - 14 - 13	272' /			

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
	Mrst
	Salt
	Shale 3
	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

STRINGER

	Calc dol
	Silty dol
	Anhy

	Minxl
	Nodule
	Phos
	Pyr
	Salt
	Sandy
	Silt
	Sil
	Sulphur
	Tuff
	Copper
	Ooliticastic
	Ooloid
	Oolite
	Sucrosic
	Dark specks

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

- Mica
- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Breclrag

- 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

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

- STRINGER**
 Calc dol

OTHER SYMBOLS

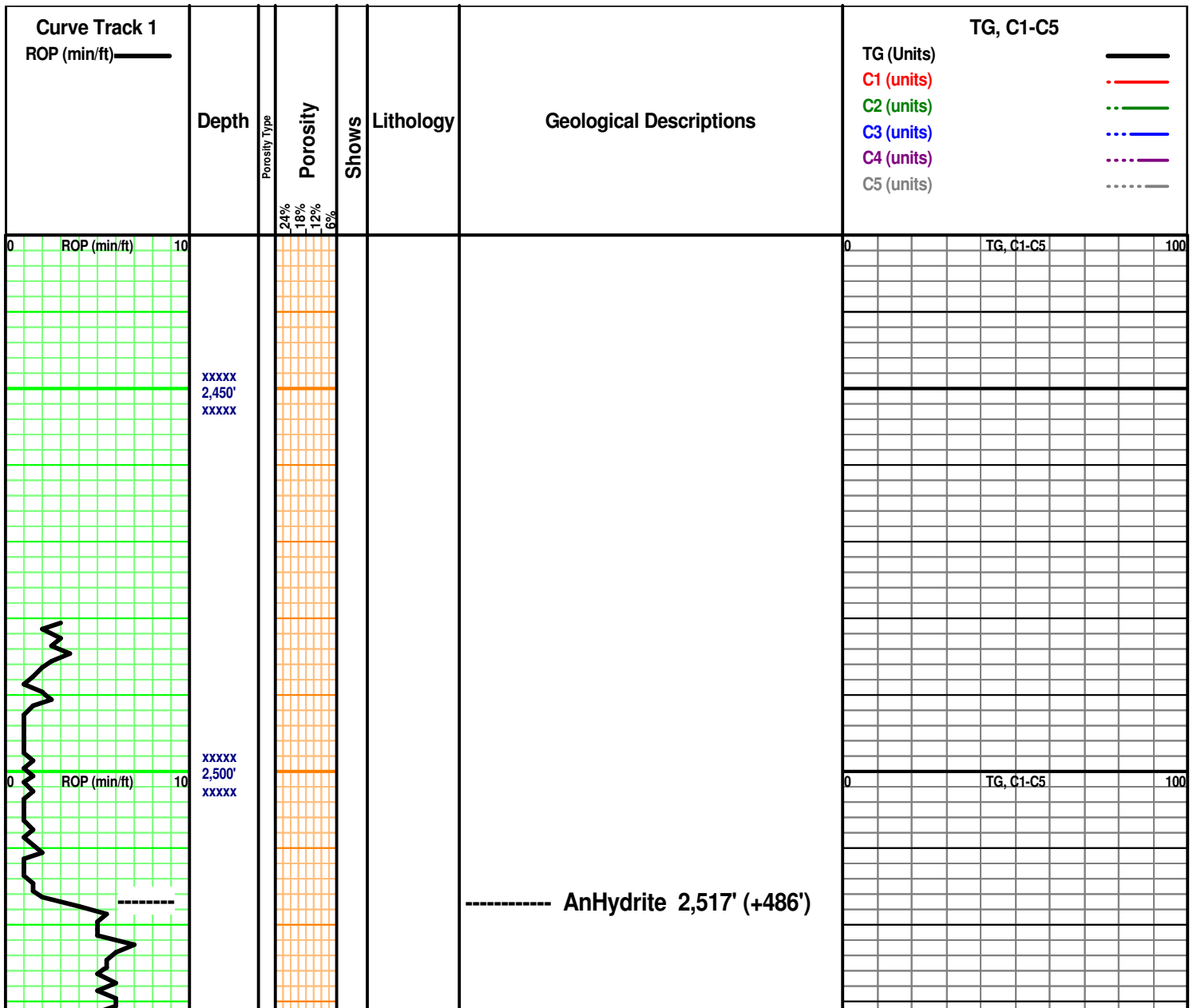
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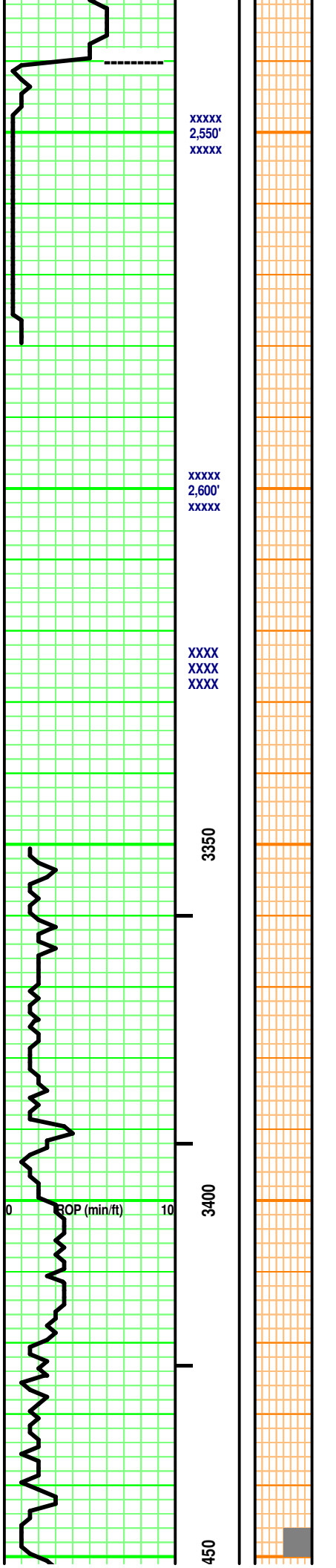
- Lost circluation
- Circulate for same

- Circulate for same
- Rtd
- Trip

- Connection
- Rft

- Sidewall





XXXXX
2,550'
XXXXX

XXXXX
2,600'
XXXXX

XXXX
XXXX
XXXX

3350

3400

450

0 BOP (min/ft) 10

----- B / AnHydrite 2,540' (+463')

DISPLACE MUD @ 3,339'

Vis: 54
Wt: 8.6
LCM: 2#

Vis: 54
Wt: 8.7
LCM: 2#

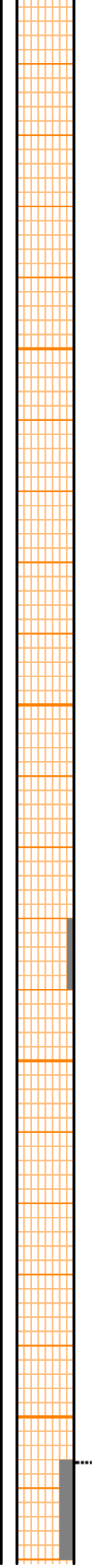
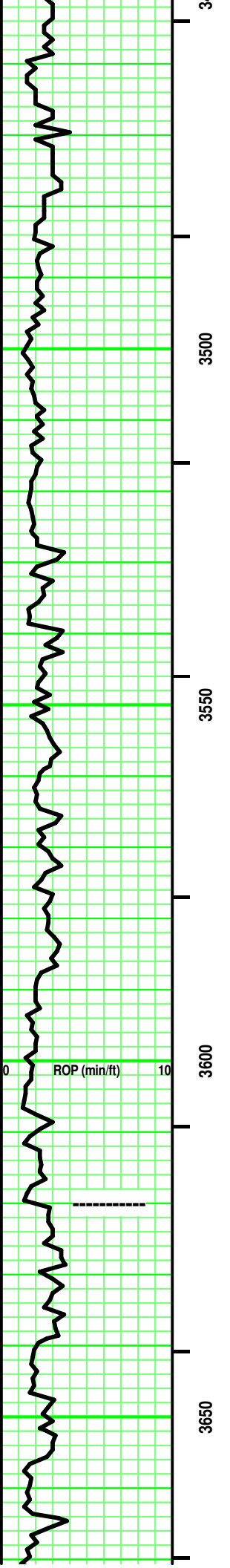
100 units = 1% Gas

0 TG, C1-C5 100

Vis: 54
Wt: 89.7
LCM: 2#

Dry Wt of Collars: 39,162#
[469' x 83.5#/ft = 39,162#]
Drill Collars: 6-1/8" x 2.5"
Buoyancy Wt of Collars: 33,973#
[39,162# x .8675 (8.7ppg) = 33,973#]
Available WOB: 28,877#
[33,973# x .85 = 28,877#]

Vis: 54
Wt: 8.7
LCM: 2#



Interbedded SH & LS
 SH - Lt/ Med Gray. tr Tannish Gray to Brownish Gray. some limy streaks. some calc in part. rare fossil frag. soft.
 LS - Tan/ tr to some Pale to Lt Gray. Sing. XF-/ Micro-xln. xln por. tr argil in part. rare fossil frag. partly Firm. No/ tr vis por.

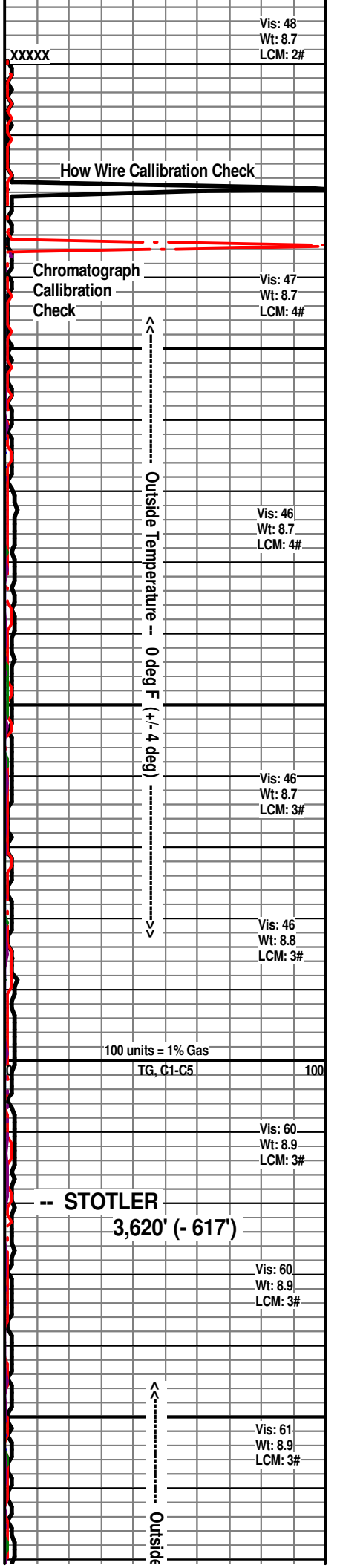
Interbedded SH & LS
 SH - Lt/ Med Gray. tr Tannish Gray to Brownish Gray. some limy streaks. some calc in part. rare fossil frag. soft.
 LS - Tan/ tr to some Pale to Lt Gray. Sing. XF-/ Micro-xln. xln por. tr subchalky in part. tr argil in part. rare fossil frag. partly Firm. No/ tr vis por.

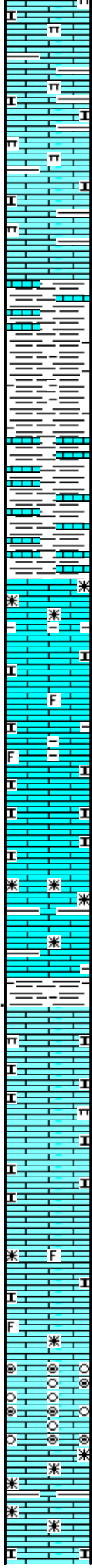
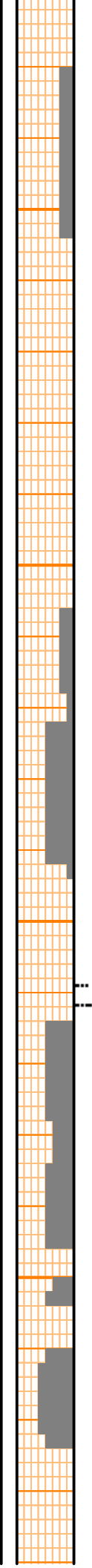
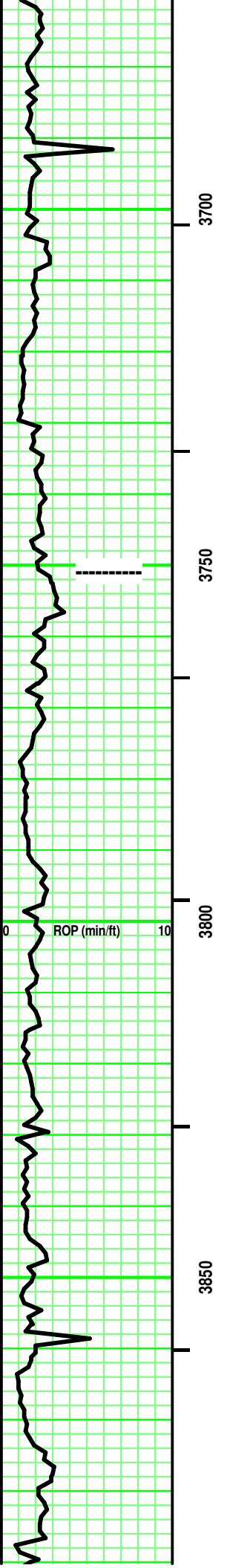
LS (1) - Tans/ tr Off White. some Lt Gray in part. Sing/ tr Mot. tr VF/ mostly XF-xln & Micro-xln. xln por. tr Re-xln. some interbedded argil/shale (Grays). mostly Firm. No/ tr vis por.

SH - Med Gray. Sing. soft. tr blocky.

LS - similiar to (1) above.

Interbedded SH & LS
 SH - Lt/ Med Gray. tr Tannish Gray. some limy streaks. some calc in part. soft.
 LS - Tans / tr Pale to Lt Gray. Sing. XF-/ Micro-xln.





xln por. rare Re-xln. tr argil in part. subchalky in part. tr marly in part. No/ tr vis por.

SH - Lt/ Med Gray. Sing. highly limy (Tannish Gray) to LS stringers (Tan, Micro-xln).

LS - Grays/ Tans. Sing/ somt to mostly Mot. XF-/ mostly Micro-xln. xln por. some subchalky. tr fossil frags. some intermixed/ interbedded argil or shale (Med/Dark Gray). Firm. No/ tr vis por.

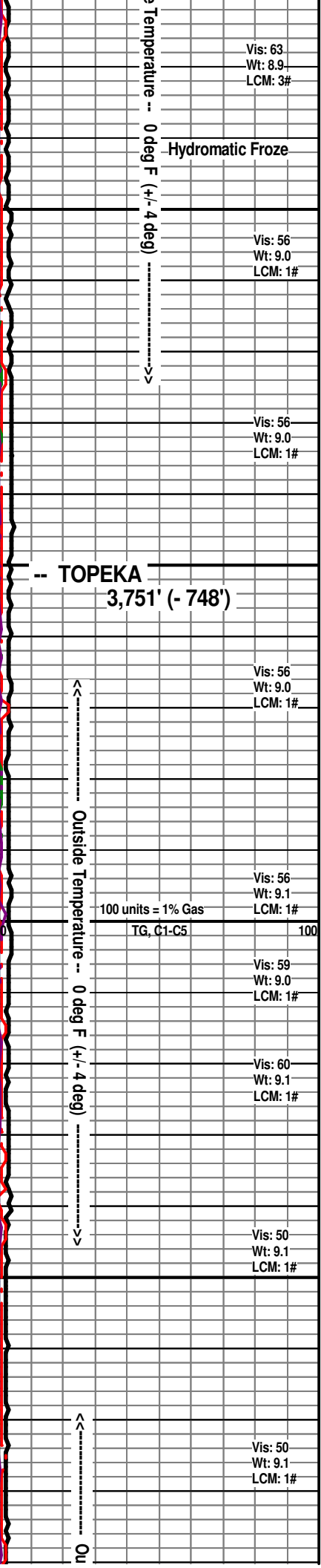
SH - Med Gray. Sing. Firm.

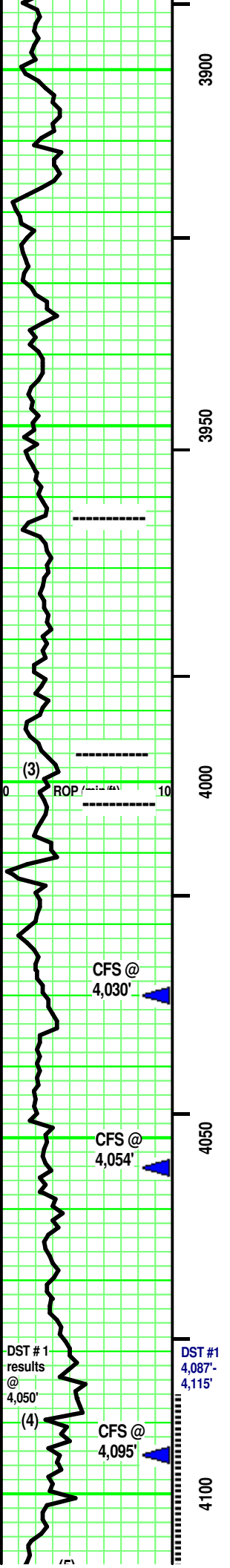
Intermixed & Interbedded:
 LS - Lt/ rare to some Med Gray, Tans. tr Tannish Pale Gray. some Sing/ mostly Mot. VF-/ XF-/ Micro-xln. xln por. some subchalky/ marly. argil/shaly. rare fossil frags. partly Firm. No/ tr/ rare Fair vis por.

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

SH - Grays. Sing. tr calc to limy in part. some Firm. Blocky.

Add: VF Oolites/ Oolcasts. Clear/ Lt Tan, semitransparent Matrix.





LS (2) - Tan. Sing. Micro-xln. xln por. tr Re-xln. Firm. No/ tr vis por.

SH - Black. Sing. Carb. Soft.
LS - similar to (2) above.

LS - Lt/ Med Gray, Tans. Sing/ Mot. XF-/ Micro-xln. xln por. some Re-xln. subchalky in part. argil/shaly. some interbedded Re-xln. partly Firm. No/ tr/ rare Fair vis por. Dense at top/depth

LS - Tans/ some Pale Lt Gray, tr Off White. Sing/Mot. Micro-xln. xln & some part por. Subchalky. some fossil frags. some argil. Friable. Tr/ Fair vis por.

SH - Black. Sing. Carb. Soft.
LS - Lt Gray. Sing. Micro-xln. xln por. No/ tr vis por.

SH - Med Gray. Sing. Calc/ LS stringers. . Firm. Massive.

LS (3) - SH - Lt Gray. Sing. calc.

LS - Off White/ Tan. Sing/ tr Mot. Micro-xln. xln & tr Vuggy por. [some VF Oolites in part, Off White. Clear/ Pale Tan, semitransparent Matrix. Friable. Tr vis por.] some Re-xln. rare subchalky in part. mostly Firm. No/ tr vis por.

SH - Med Gray. Sing. Massive. soft.

LS - Lt & Med Tan. Sing/ Mot. XF-/ Micro-xln. xln & tr part por. rare Fossil frags. subchalky in part. partly Friable. No/ tr vis por.

SH - Med Gray. Sing. Massive. soft.

LS - Tans/ tr Off White. Sing/ tr Mot. XF-/ Micro-xln. xln por. tr Re-xln at depth. subchalky in part. partly Friable. No/ tr vis por.

SH - Med/ Dark Gray. Sing. Massive. soft.

LS (4) - Lt & Med Tan. Sing/ Mot. XF-/ Micro-xln. xln & particle por. tr Re-xln. rare subchalky in part. Firm. No/ tr vis por. No odor. Spotted high yellow

SH - Lt Gray. Sing. calc. firm.

LS (5) - Tan/ Tannish Off White. Sing. Micro-xln. Chalky. fossil frags in part. Friable. No/ tr vis por. ? odor. Spotted, dull yellow fluorescence. No free oil or gas. Spotted, irregular Med Brown stain. No/ V Weak pos cut. No/ V Weak pos acid/ residual.

Side Temperature -- 0 deg F (+/- 4 deg)

Vis: 50	Wt: 9.1	LCM: 1#
Vis: 59	Wt: 9.1	LCM: 1#
Vis: 60	Wt: 9.1	LCM: 1#
Vis: 50	Wt: 9.1	LCM: 1#

-- HEEBNER SH
3,963' (-960')

Vis: 50	Wt: 9.1	LCM: 1#
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LS (3) - Off White/ Tan. Sing/ tr Mot. Micro-xln. xln & tr Vuggy por. mostly Firm. No/ tr vis por.

Vis: 50	Wt: 9.1	LCM: 1#
---------	---------	---------

-- TORONTO
3,996' (-993')

TG, C1-C5 100

100 units = 1% Gas

LANSING
4,003' (-1,000')

Vis: 52	Wt: 9.1	LCM: 1#
Vis: 52	LCM: 9.1	LCM: 1#

←----- CFS @ 4,030': 50"

4,047' -	Vis: 52	Wt: 9.2
DST #1 LANSING	Wtr Loss: 8.8	
(4,087"-4,115')	PV: 13	YP: 17
	Gels: 9/20	
Rec:	pH: 10.0	LCM: 2#
715' Gassy Muddy Wtr	Cl (2,200)	Ca (80)
(2%G,18%M,80%W)	Solids: 6.1%	

←----- CFS @ 4,054': 50"

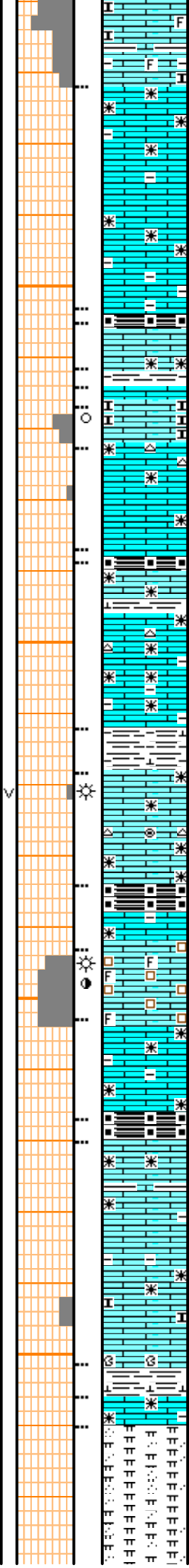
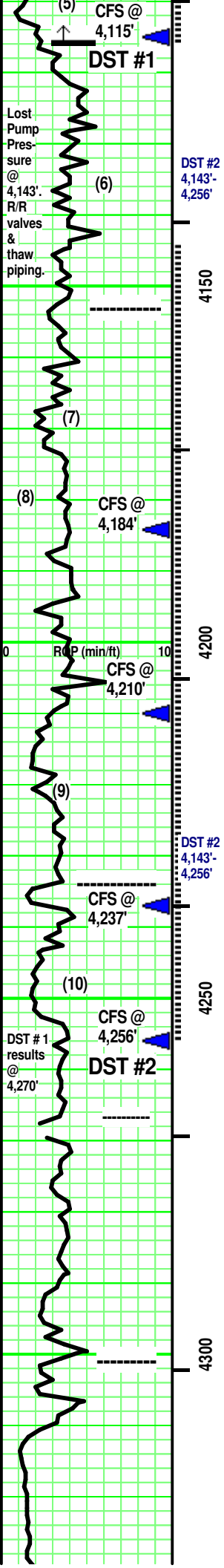
IFP: 12# - 135#/30"	Vis: 50
ISIP: 1,175# / 45"	Wt: 9.1
FFP: 141# - 335# / 60"	LCM: 2#
FSIP: 1,166# / 90"	
	129 deg F
MH: 1,939# - 1,928#	

LS (4) - fluorescence. On own, tr minute gas bubbles. No free oil. spotted Lt/Med Brown, irregular stain. V Weak cut/ residual. Weak acid/residual

HW: 6u/ 3u (Bk)

←----- CFS @ 4,095': 50"

After DST #1, HW: 5u from	DST #1 @ 4,115' -	Vis: 54	Wt: 9.1
	Wtr Loss: 7.2	PV: 14	YP: 18
	Gels: 11/19	pH: 10.5	LCM: 2#
	Cl (2,500)		
	Cl (tr) Solids: 6.3%		



LS (6) - Lt & Med Tan. some Off White Sing/ tr Mot. tr XF-/ Micro-xln. some Crypto-xln. xln and rare, intermixed pinpoint por. Re-xln. some argil with depth. Firm. mostly No/ tr vis por.

----- MUNCIE CREEK 4,153' (-1,150')
 SH - Black. Sing. Carb. Soft.
 LS - Similar to (6) above. adding: Lt & Med Gray. Sing.

SH - Lt/ Med. Gray. Sing. tr calc. Firm.
 LS - similar to (6) above. minute, spotted Med ----->
 LS (7) - Tan/ White. Sing. Micro-xln. xln por. Subchalky to Chalk. Friable. No/ tr vis por. ----->

LS (8) - Tan/ Off White/ Grayish Tan, tr Pale Lt Gray with depth. 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.

SH - Black. Sing. Carb. Soft.
 LS - Similar to (8) above. adding: Lt & Med Gray. Sing.

SH - Med Gray. Sing. tr calc.
 LS - Tan - Grayish Tan/ Lt Gray with depth. Sing/ tr Mot. 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.

SH - Med Gray, tr Tannish Gray. Sing. some calc. tr soft. tr ductile.
 1 pc LS (9) - Lt Gray. Sing. Crypto-xln. tr vuggy por. Firm. tr/some vis por. No odor. Spotted yellow fluorescence. No free oil. some minute gas bubbles in vuggy por. tr oil 'wet' facies. spotted Lt Brown stain. Weak Pos cut/ residual. Weak acid/ residual.

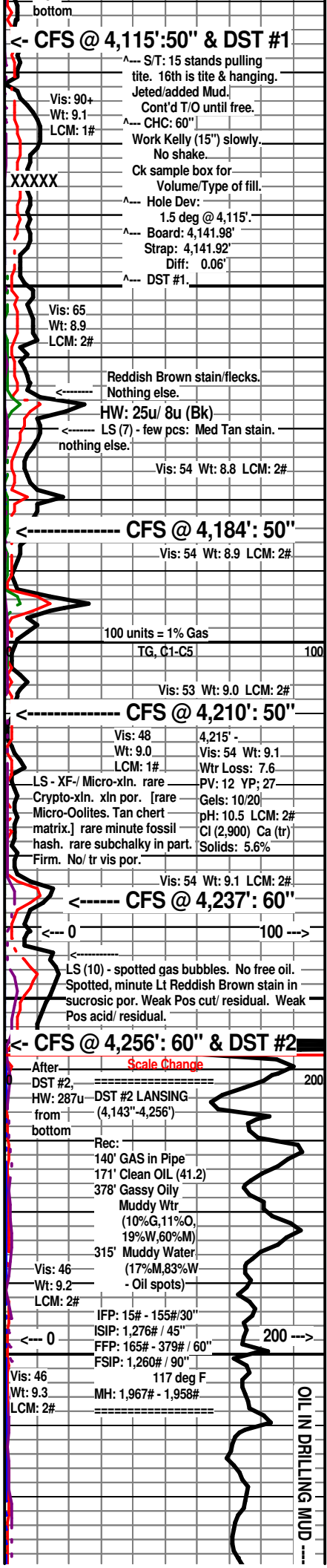
----- STARK SH 4,234' (-1,231')
 SH - Black. Sing. Carb. Soft.
 LS - Tan/ Lt Gray. Sing/ tr Mot. tr XF-/ Micro-xln. xln por. tr Re-xln. tr argil. Firm. No/ tr vis por.

LS (10) - Tan. Sing. VF-xln. xln & sucrosic por. fossil frags & hash. Friable. tr/ Fair vis por. ?/Fair odor. spotted dull yellow fluorescence, A/C, minute, ----->

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

----- HUSHPUCKNEY SH 4,267' (-1,264')
 SH - Black. Sing. Carb. Soft.
 LS - Tans/ Grays. Sing/ some Mot. XF-/ Micro-xln. xln por. some Re-xln. [subchalky at depth/ Friable.] tr fossil frags. some argil in part/ interbedded. Firm. No/ tr vis por.

----- B / KC 4,301' (-1,298')
 Interbedded SH, Marl & LS
 SH - Grays / Greenish Gray. Sing. some calc. some marly in part.
 Marl - Off White/ Reddish hue Off White. silt sized, SA qtz grains floating in marl matrix.
 LS - Tans/ Grays. Sing/ some Mot. XF-/ Micro-xln. xln por. some Re-xln. tr fossil frags. some argil in part/ interbedded. Firm. No/ tr vis por.



<- CFS @ 4,115':50' & DST #1
 S/T: 15 stands pulling tite. 16th is tite & hanging. Jeted/added Mud. Cont'd T/O until free. CHC: 60" Work Kelly (15") slowly. No shake. Ck sample box for Volume/Type of fill. Hole Dev: 1.5 deg @ 4,115'. Board: 4,141.98' Strap: 4,141.92' Diff: 0.06' DST #1.

Vis: 90+ Wt: 9.1 LCM: 1#
 Vis: 65 Wt: 8.9 LCM: 2#
 Reddish Brown stain/flecks. Nothing else.
 HW: 25u/ 8u (Bk)
 LS (7) - few pcs: Med Tan stain. nothing else.
 Vis: 54 Wt: 8.8 LCM: 2#

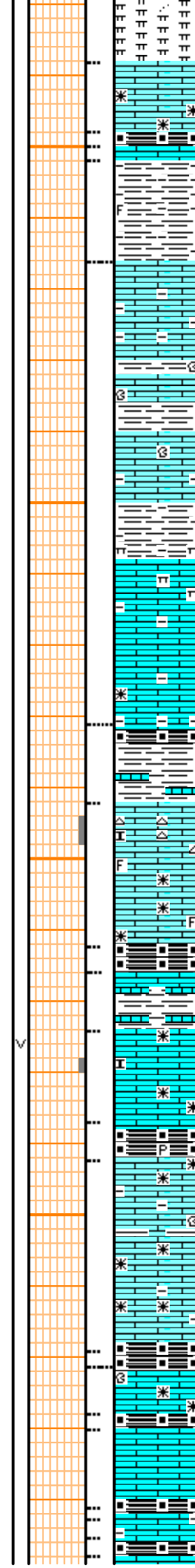
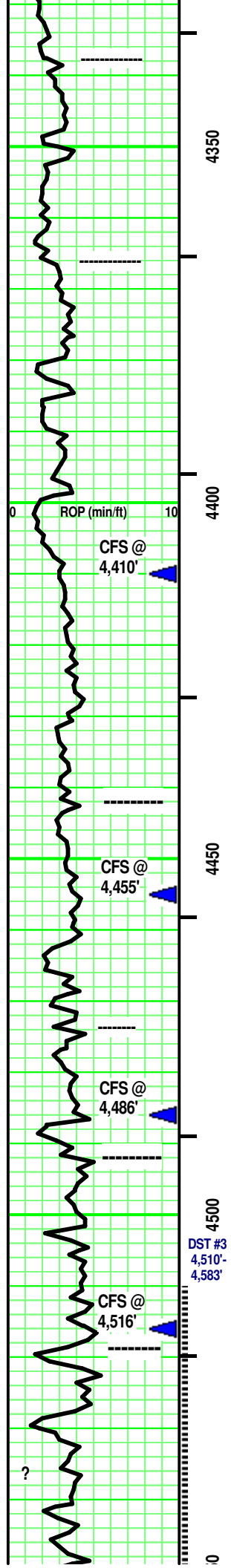
<- CFS @ 4,184': 50"
 Vis: 54 Wt: 8.9 LCM: 2#
 100 units = 1% Gas
 TG, C1-C5 100
 Vis: 53 Wt: 9.0 LCM: 2#

<- CFS @ 4,210': 50"
 Vis: 48 Wt: 9.0 LCM: 1#
 4,215' -
 Wt: 54 Wt: 9.1
 Wtr Loss: 7.6
 PV: 12 YP; 27
 Gels: 10/20
 pH: 10.5 LCM: 2#
 Cl (2,900) Ca (tr)
 Solids: 5.6%
 LS - XF-/ Micro-xln. rare Crypto-xln. xln por. [rare Micro-Oolites. Tan chert matrix.] rare minute fossil hash. rare subchalky in part. Firm. No/ tr vis por.
 Vis: 54 Wt: 9.1 LCM: 2#

<- CFS @ 4,237': 60"
 Vis: 46 Wt: 9.2 LCM: 2#
 LS (10) - spotted gas bubbles. No free oil. Spotted, minute Lt Reddish Brown stain in sucrosic por. Weak Pos cut/ residual. Weak Pos acid/ residual.

<- CFS @ 4,256': 60'' & DST #2
 After Scale Change
 DST #2, ----- 200
 HW: 287u DST #2 LANSING
 from (4,143'-4,256')
 bottom
 Rec: 140' GAS in Pipe
 171' Clean OIL (41.2)
 378' Gassy Oily
 Muddy Wtr (10%G,11%O, 19%W,60%M)
 315' Muddy Water (17%M,83%W - Oil spots)
 Vis: 46 Wt: 9.2 LCM: 2#
 IFP: 15# - 155#/30"
 ISIP: 1,276# / 45"
 FFP: 165# - 379# / 60"
 FSIP: 1,260# / 90"
 117 deg F
 MH: 1,967# - 1,958#
 Vis: 46 Wt: 9.3 LCM: 2#

OIL IN DRILLING MUD



MARMATON 4,338' (-1,335')
 LS (11) - Tans/ tr Off White, Lt Gray. Sing/ some Mot. XF-/ Micro-xln. xln por. some Re-xln. tr argil in part. Firm. No/ tr vis por.
 SH - Black. Sing. Carb. Soft.
 LS - similar to 11 above.
 SH - Med Gray, some Tannish Gray. Sing. Massive. rare fossil frag.

ALTAMONT 4,366' (-1,363')
 LS - Tan/ Lt Gray/ some Yellow, Purple. some Sing/ Mot. tr XF-/ Micro-xln. xln por. some Re-xln. tr argil. some interbedded sh (Lt/Med Gray, Reddish Brown). mostly Firm. No/ tr vis por.
 Add: Bluish Gray. Sing. soft. tr marly.
 LS - Tans/ some Grays. Sing/ some Mot. tr XF-/ mostly Micro-xln. xln por. some Re-xln. tr argil/shaly in part. subchalky (marly). Firm at top. No/ tr vis por.
 SH - Black. Sing. carb. tr fissile.
 SH - Med Gray. Sing. highly limy/ LS streaks.

PAWNEE 4,442' (-1,439')
 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 fossil frag. tr ls 'rubble'. tr argil. No/ tr vis por.
 SH - Black. Sing. carb. tr fissile.
 LS - similar to 12 below.
 SH - Grays/ Bluish Gray, Tannish Gray. Sing/ tr Mot. some highly limy/ LS streaks.
 LS (12) - Tans/ some Off White. Sing. XF-xln at top/ Micro-xln at depth. xln por. tr Re-xln. subchalky in part. Friable at break. Break has tr/ Fair vis por. mostly No/ tr vis por.
 SH - Black. Sing. carb. tr pyritic soft

FT. SCOTT 4,492' (-1,486')
 LS - Tan/ Pale Lt Gray/ some Off White. 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.

CHEROKEE SH 4,519' (-1,516')
 SH - Black. Sing. carb. soft.
 Interbedded SH & LS
 SH - Black. Sing. carb. soft.
 LS - Tan/ Pale Lt Gray/ rare Off White. 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.

