



**WESLEY D. HANSEN Consulting Petroleum Geologist**

212 N. Market, Suite 257, Wichita, KS 67202  
Office: 316-267-7313 Cellular ; 316-772-6188

**KGS  
AAPG  
Kansas License #418**



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

**Well Name:** Murfin Drilling Co., Inc. #1-7 Juenemann  
**Location:** 1210' FNL, 550' FEL of Section 7-5S-30W  
**License Number:** API: 15-039-21186  
**Spud Date:** 8-17-2013  
**Surface Coordinates:** 1210' FNL, 550' FEL of Section 7-5S-30W  
**Region:** Decatur County, KS  
**Drilling Completed:** 8-25-2013

**Bottom Hole Vertical hole  
Coordinates:**  
**Ground Elevation (ft):** 2918' **K.B. Elevation (ft):** 2929'  
**Logged Interval (ft):** 3640' **To:** RTD **Total Depth (ft):** 4600'  
**Formation:** Mississippian at RTD  
**Type of Drilling Fluid:** Chemical - Displaced at 3343'

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

#### **OPERATOR**

**Company:** Murfin Drilling Co., Inc.  
**Address:** 250 N. Water  
Suite 300  
Wichita, KS 67202

#### **GEOLOGIST**

**Name:** Wesley D. Hansen  
**Company:** Wesley D. Hansen - Consulting Petroleum Geologist  
**Address:** 212 N. Market, Suite 257  
Wichita, KS 67202  
**Office:** 316-263-7313 **Cellular:** 316-772-6188

## COMMENTS

Contractor: Murfin Drilling Co., Inc. Rig #2  
Pusher: Arturo Cabezas

Surface Casing: 8 5/8" set at 225' w/195sx  
Production Casing: 5 1/2" set at 4598' w/175 sx

Mud by: Morgan Mud - Dave and Cade Lines were the engineers

DST's by: Trilobite - James Winder was the tester

Logs by: Pioneer Wireline (DIL, CN-CD, MEL, BHCS)

Deviation Surveys: 1/2 deg. @ 225'; 3/4 deg. @ 1006'; 1/2 deg. @ 1542'; 1/2 deg. @ 2078'; 3/4 deg. @ 2582'; 1/4 deg. @ 3627'; 1/2 deg. @ 3970'; 1/2 deg. @ 4600'

Bit #	Size	MFG	Type	Depth Out	Footage Cut	Hours on bit
1	12 1/4"	HTC	B22	225'	225'	2
2	7 7/8"	HTC	DP506F	3627'	3402'	36 1/4
3	7 7/8"	HTC	GX-20C	4600'	973'	52

## FORMATION TOPS AND STRUCTURAL COMPARISON

FORMATION	SAMPLE TOPS		LOG TOPS		COMPARISON WELL MDCI Brown Farms 1-1 1-5S-31W 2852' KB
	Depth	Datum	Depth	Datum	
Anhydrite	2656'	+273	2656'	+273	+4
B/Anhydrite	2694'	+235	2692'	+237	+3
Topeka	3757'	-828	3758'	-829	-15
Heebner	3929'	-1000	3930'	-1001	-17
Lansing	3976'	-1047	3975'	-1046	-15
Stark Shale	4139'	-1210	4141'	-1212	-14
BKC	4192'	-1263	4194'	-1265	-15
Pawnee	4304'	-1375	4300'	-1371	-9
Fort Scott	4374'	-1445	4377'	-1448	-16
Cherokee Shale	4387'	-1458	4390'	-1461	-17
Mississippian	4488'	-1559	4492'	-1563	-5
RTD	4600'	-1671			
LTD			4603'	-1674	

# DRILL STEM TESTS

DST No. 1 Toronto  
Interval: 3930'-3970'  
Times: 30-60-30-60  
Recovery: 2' mud  
FP: 19-20/21-22 SIP: 270-139  
HP: 1941-1925 BHT: 115 deg. F

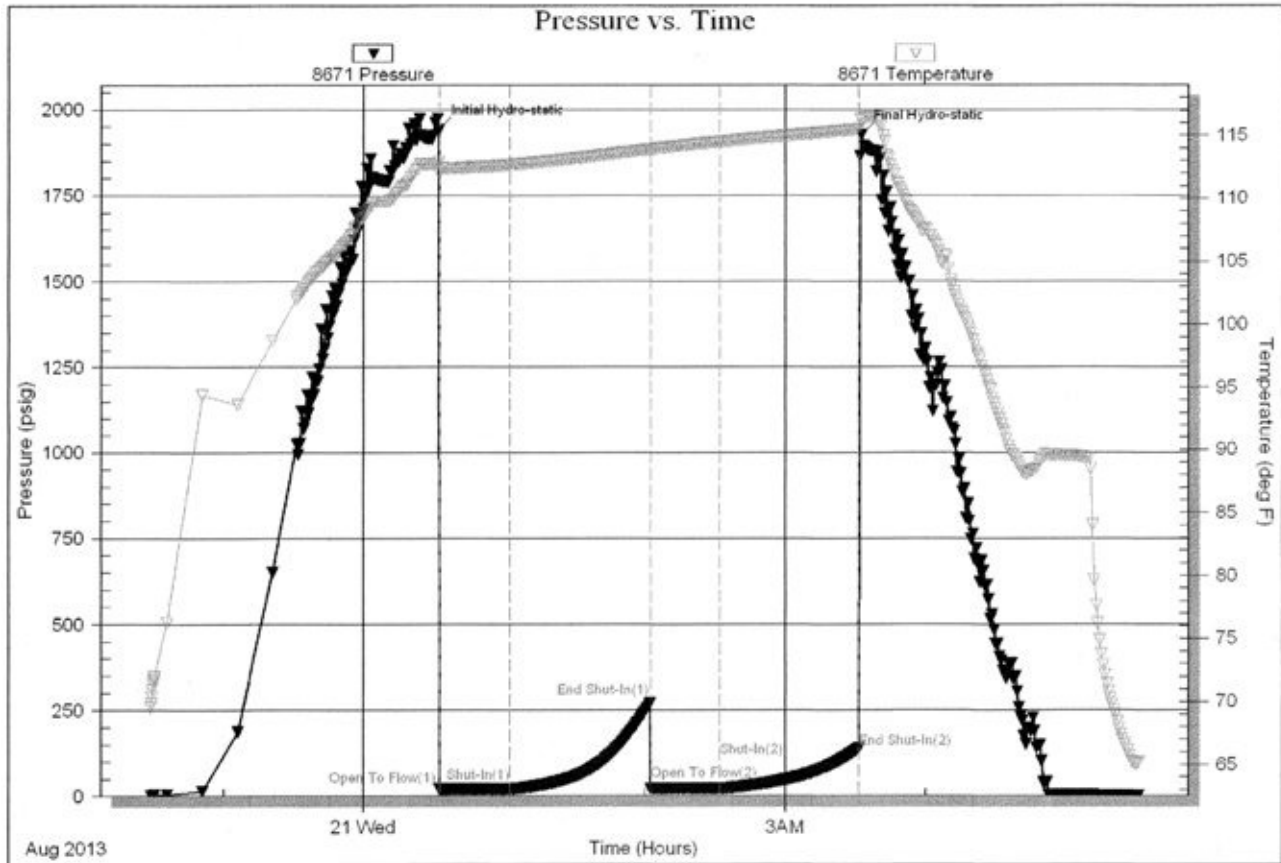
IFP: 1/4" blow, died back, dead in 17 minutes  
ISIP: no return blow  
FFP: no blow  
FSIP: no return blow

Serial #: 8671

Inside Marfin Drilling Co., Inc.

Juennemann #1-7

DST Test Number: 1



Tribbite Testing, Inc

Ref. No: 52665

Printed: 2013.08.21 @ 05:43:30

# DRILL STEM TESTS

DST No. 2 Lansing "A" and "B"  
Interval: 3980'-4015'  
Times: 30-60-60-90  
Recovery: 170' MCW (38m, 62w, trace oil); 62'  
SMCW (12m, 88w, trace oil); 498' VSMCW (4m,  
96w), chl. 25,000; total fluid 730'  
FP: 30-182/185-353 SIP: 1240-1229  
HP: 1990-1946 BHT: 123 deg. F

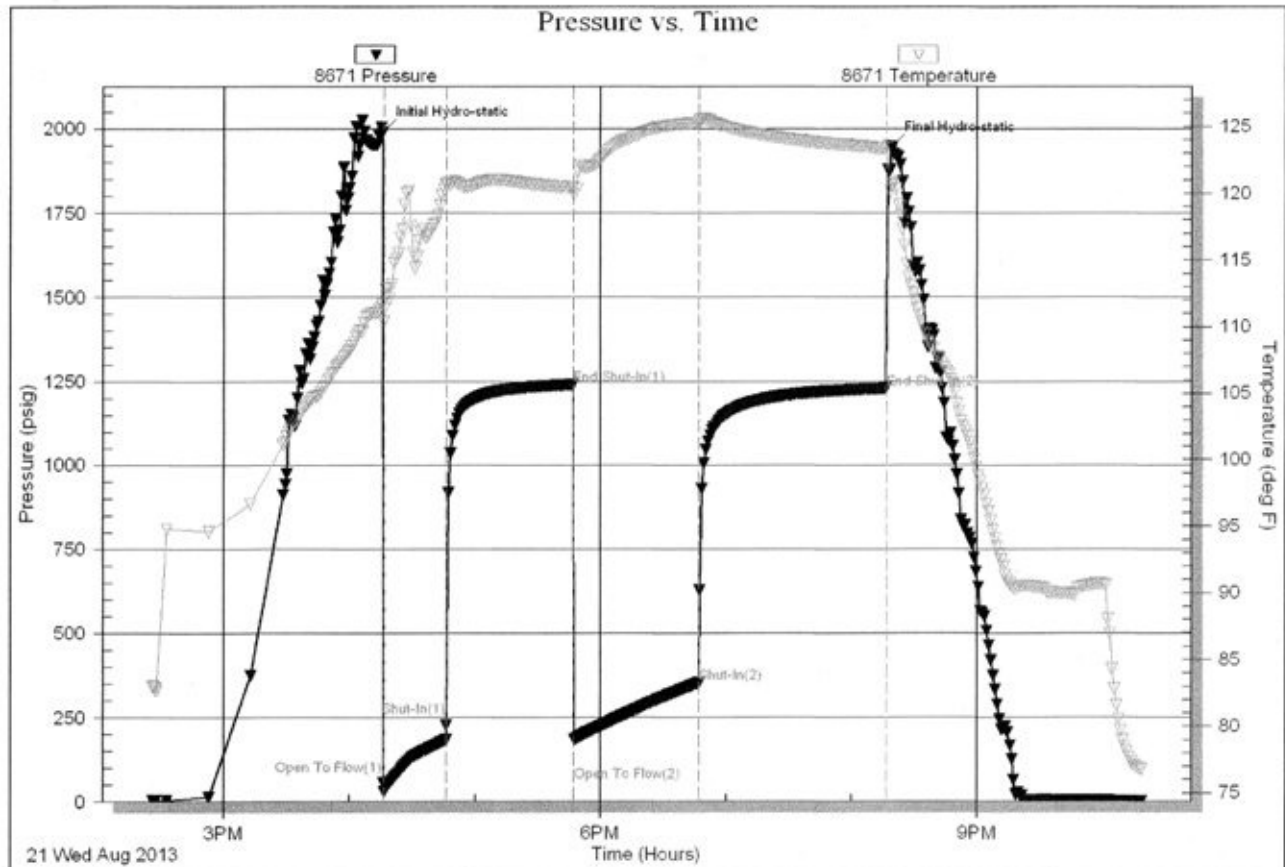
IFP: strong blow, B.O.B. in 11 minutes  
ISIP: no return blow  
FFP: fair to strong blow, B.O.B. in 16 minutes  
FSIP: weak return blow, bldg. to 1/4 inch

Serial #: 8671

Inside Marfin Drilling Co., Inc.

Juenemann #1-7

DST Test Number: 2



Tillobite Testing, Inc

Ref. No: 52666

Printed: 2013.08.21 @ 22:40:39

# DRILL STEM TESTS

DST No. 3 Lansing "F" and "G"  
Interval: 4028'-4066'  
Times: 30-60-30-60  
Recovery: 45' mud  
FP: 24-30/31-35 SIP: 1239-1218  
HP: 2019-2005 BHT: 116 deg. F

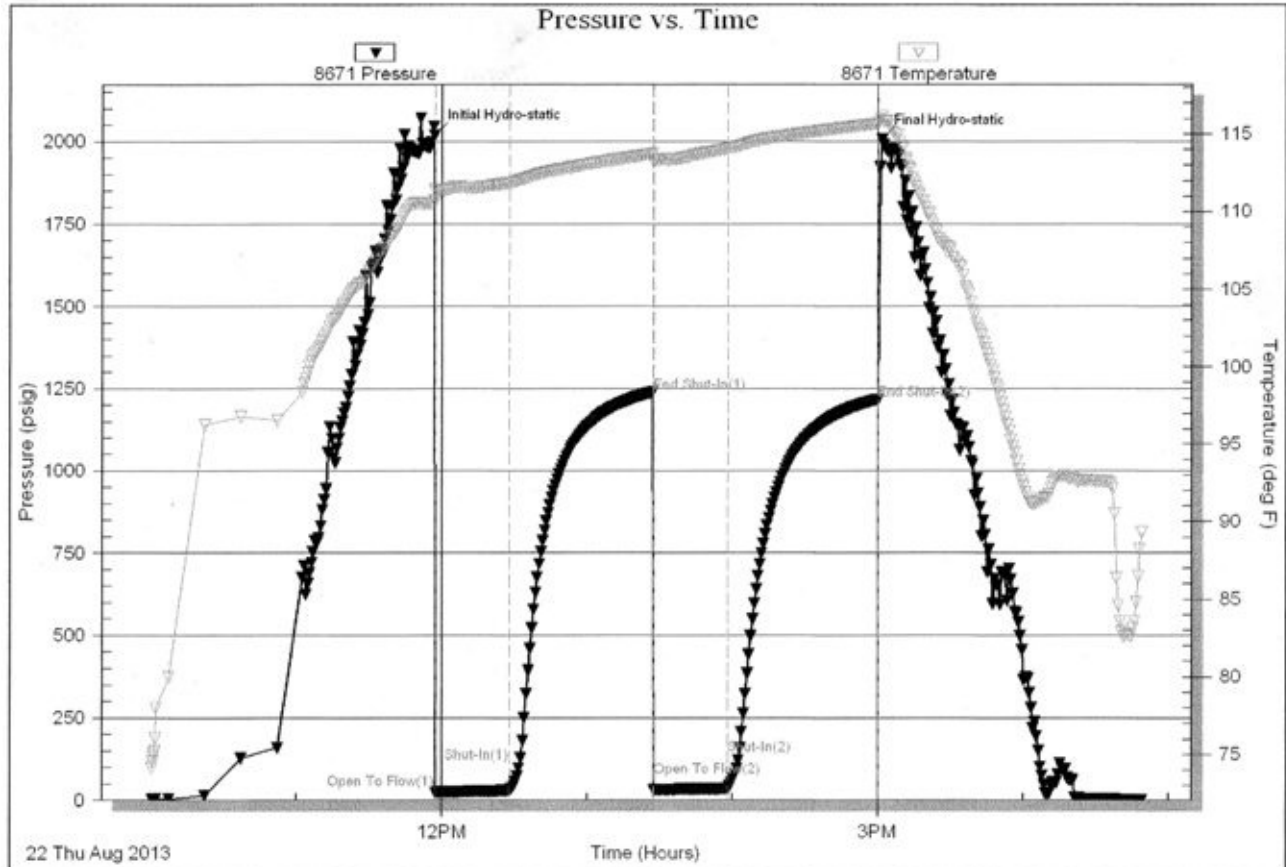
IFP: 1/4" blow bldg. to 1/2", dead at 25 minutes  
ISIP: no return blow  
FFP: no blow  
FSIP: no return blow

Serial #: 8671

Inside Marfin Drilling Co., Inc.

Juenemann #1-7

DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 52667

Printed: 2013.08.22 @ 17:03:58

# DRILL STEM TESTS

DST No. 4 Lansing "J" and "K"

Interval: 4098'-4170'

Times: 30-60-60-90

Recovery: 95' GIP; 31' SLG&MCO (6g, 4m, 90o);

117' SLG&OCM (4g, 37o, 59m); 59' SLGO&WCM

(7g, 7o, 31w, 55m); 58' SLO&MCW (2o, 22m,

76w), chl 19,500; oil gravity 35.8 deg.

FP: 23-73/79-130 SIP: 1253-1216

HP: 2069-2034 BHT: 122 deg. F

IFP: fair blow bldg. to 7 1/2"

ISIP: no return blow

FFP: fair blow bldg. to 11" in 42 minutes

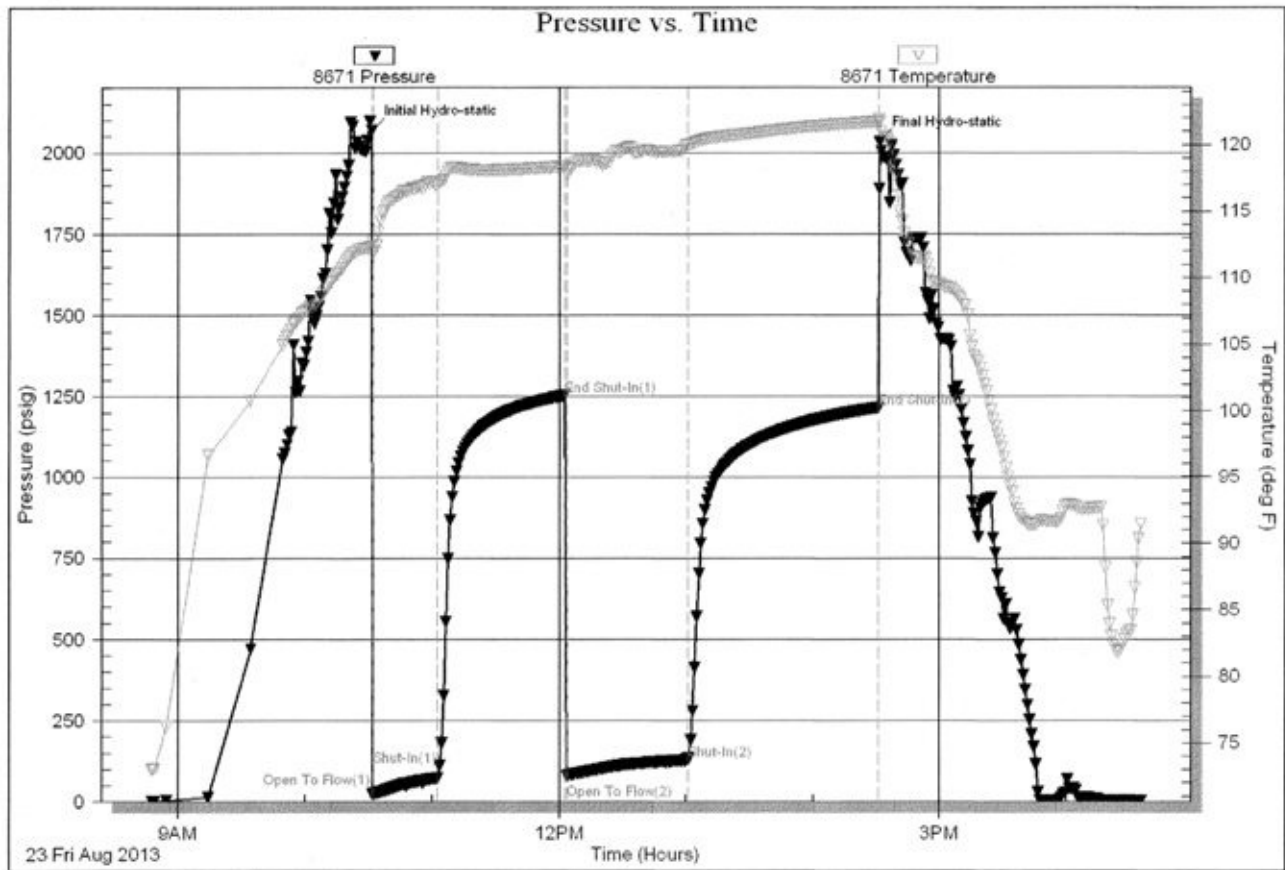
FSIP: 1" return blow

Serial #: 8671

Inside Marfin Drilling Co., Inc.

Juenemann #1-7

DST Test Number: 4



Tribble Testing, Inc

Ref. No: 52668

Printed: 2013.08.23 @ 17:13:13

## ROCK TYPES

Anhy  
 Cht  
 Coal  
 Congl  
 Gyp  
 Ls colorless  
 Lmst

Salt  
 Shale  
 Shcol  
 Shgy  
 Siltst  
 Ss  
 Carb sh

Dol  
 Dtd  
 Gry sh  
 Sandylms  
 redshale  
 Shale  
 Siltstn

Shlyslts  
 Slttysh  
 Sdy dolo  
 Silty dolo  
 Shy dolo  
 Shaly ls

## ACCESSORIES

### FOSSIL

- Algae
- Amph
- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram
- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite

- Plant
- Strom
- Fuss
- Oomold

### MINERAL

- 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
- Chlorite
- Dol
- Sand
- Sltly

### STRINGER

- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Sltstrg
- Ssstrg
- Carbsh
- Clystn
- Dol
- Grysh
- Gryslt
- Lms
- Sandylms
- Sh
- Sltstn

## OTHER SYMBOLS

### INTERVALS

- Core
- Dst
- Dst

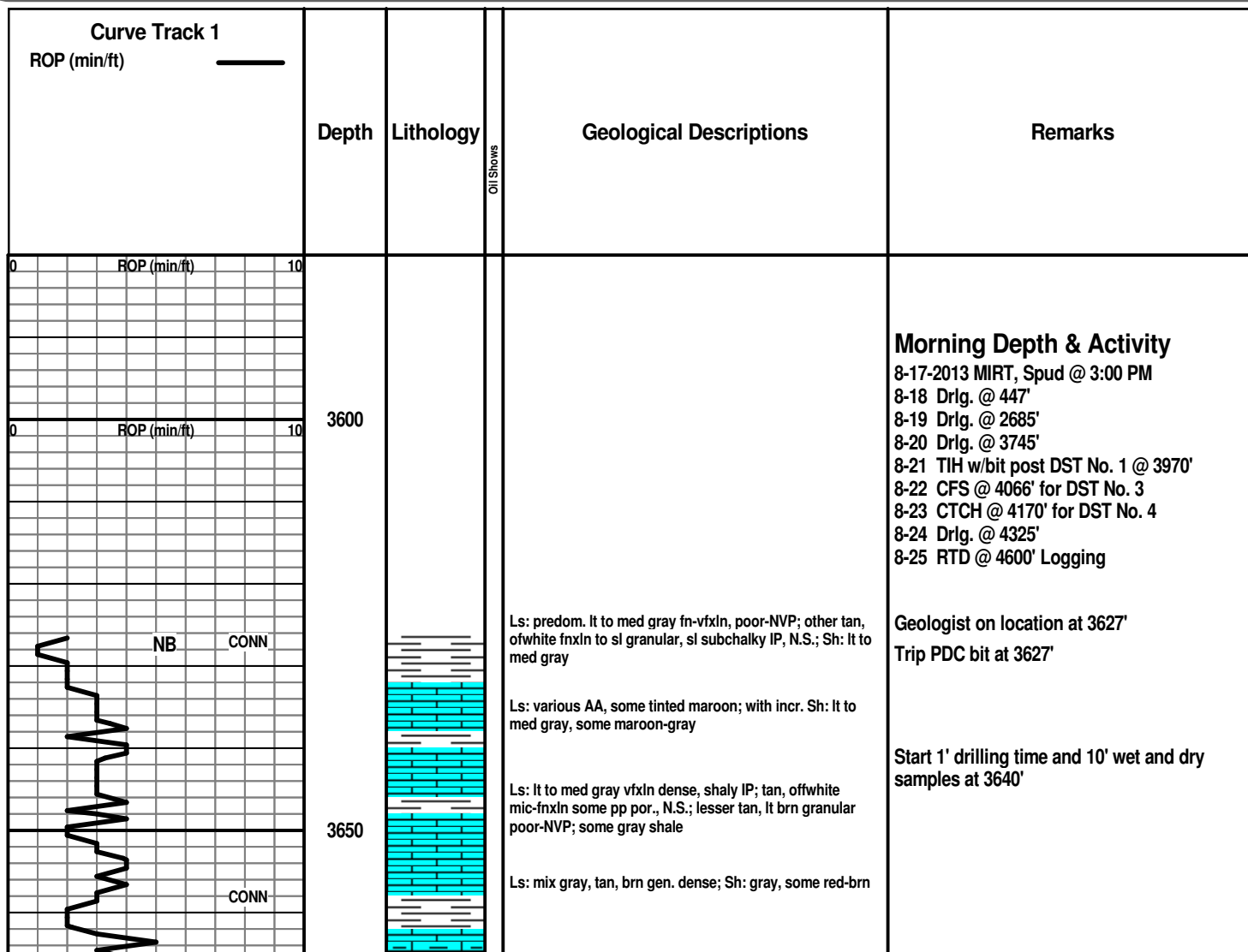
### EVENTS

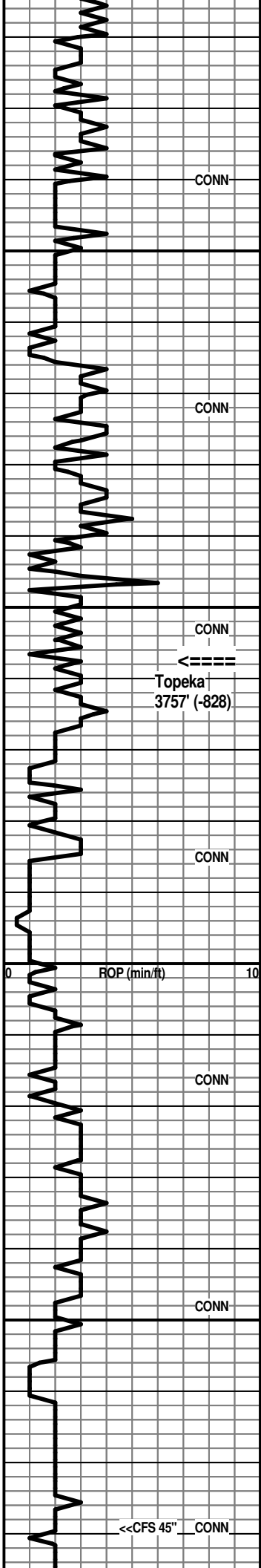
- Rft
- Dst top/base

### OIL SHOWS

- Even
- Spotted
- Quest.

- Trace
- Dead
- Gas show





3700

3750

3800

3850

Sh: incr. % med to dark gray calcar. and silty IP; Ls: mix AA

90' spl - Ls: strong influx tan, lt gray fn granular with micxn matrix, foss. IP, poor-NVP; some lt gray vf-cryptoxln; thin gray and red-brn shales

Ls: tan, lt gray vf-cryptoxln, NVP, occ foss.; lesser tan, offwhite mic-vfxln dense, subchalky IP, N.S.; scatt. red-brn and lt gray shale

Ls: tan, offwhite, lt gray vfxln dense; some tan, offwhite mic-fnxln with pp por., occ foss., N.S.; Sh: brn, red-brn gray

20' spl - incr. Sh: red-brn and gray; Ls: tan, lt gray, lt brn vf-cryptoxln, NVP, N.S.

30' spl - Sh: soft red-brn, some purplish-gray; abund. Ls: lt gray, tan, lt brn vfxln to fn granular, poor-NVP; trace gray/brn fg Sst, N.S.

Ls: tan, lt brn granular with some inter-particle por.; influx offwhite chalky; Sh: common red-brn, brn silty IP

Ls: mix offwhite, tan micxn to fn granular with some pp and inter-particle por., subchalky IP; common tan, lt gray vf-cryptoxln, N.S.; Sh: scatt. red-brn, gray

Ls: lt gray vf-cryptoxln and offwhite, lt gray mic-vfxln dense, NVP, N.S.; scatt. shales AA

Ls: very predom. med gray mic-vfxln dense; lesser lt gray cryptoxln; some tan, offwhite mic-fnxln with fair pp por., N.S.; Sh: red-brn, not abund.

80' spl - Sh: red-brn, soft, some purple; Ls: influx lt brn, tan granular poor-NVP, mottled with gray IP; lesser lt brn, gray-brn cryptoxln and sl influx offwhite chalky, N.S.

Ls: mix AA; scatt. med to dark brn smooth cryptoxln; Sh: red-brn, dark red

3800' spl - Sh: soft red-brn, washes red; abund Ls: mix lt to med brn, some gray cryptoxln; lt to med brn granular, NVP and offwhite, lt gray mic-fnxln subchalky to chalky IP

10' spl - Ls: flood lt gray, tan, offwhite mic-vfxln dense, rare small vug. por, N.S.

20' spl - Ls: various AA; influx Dolo: tan, lt brn, lt gray vfxln, some vug. and moldic por., N.S.

30' spl - flood Sh: red-brn soft, gummy and silty IP

40' spl - flood Sh: red-brn AA, washes red; sl influx lt to dark gray; scatt. gray vf-cryptoxln Ls

50' spl - flood Ls: lt gray, tan predom. vf-cryptoxln, some granular with poor-NVP, N.S.; scatt. white chalky

Ls: lt gray, offwhite, tan mic-vfxln dense

70' spl - Ls: lt gray, tan predom. vf-cryptoxln, sl granular IP, NVP; incr. offwhite mic-vfxln subchalky to occ chalky

3879' spl - washes red, Sh: dark red-brn, soft lt red, brick red, occ gray, gray-green; some various dense Ls's AA

CFS 3879' 20" spl - much decr. shale %; Ls: mix tan, lt brn granular IP, poor-NVP; common offwhite subchalky to chalky; lesser lt gray, med brn cryptoxln; 45" spl - Ls: various tan, lt gray cryptoxln to granular, NVP; incr. Sh: soft red-brn

Sh: red-brn, dark red, dark gray; common Ls: tan, offwhite granular with offwhite micxn matrix; lesser lt gray, lt brn

7:00 AM at 3745' on 8-20-2013

Topeka 3757' (-828)

vis 56 wt 8.9 lcm 3#

Morgan Mud Check at 3835'  
 10:40 AM on 8-20-2013  
 wt vis wl pH chl  
 8.8 57 6.8 11.5 1400  
 PV YP GeIS lcm solids  
 20 19 10/28 4# 3.6%



gray, gray, tan, brown, green, gray, red-bn

10' spl - Ls: tan, lt brn vfxln, NVP; offwhite, tan mic-fxnln dense; Sh: incr. med to dark gray, red-brn

Ls: tan, offwhite, some lt gray mic-vfxln dense, some chalky; some lt to med gray shale

30' spl - flood Ls: tan mic-fxnln with pp por. and flood white chalky, N.S.

40' spl - Ls: mix AA with some tan foss. with fossil moldic por.; tan, lt gray vfxln, NVP, N.S.

50' spl - Sh: sl influx black carbon.; Ls: flood med to dark brn, gray-brn cryptoxln

60' spl - Sh: med to dark gray, lesser red-brn; occ lt gray vfg silty Sst, N.S.

70' spl - Sh: good influx red-brn, lesser gray AA; some Ls: tan, offwhite vfxln with good vug. por. with dark brn to black oily patchy to subsat stain, dark brn to black listless oil to sl live oil, no odor

3970' CFS 20" spl - flood Ls: very predom. tan, lt gray vf-cryptoxln, vsl pyritic IP; common offwhite, tan mic-vfxln dense, subchalky IP; scatt. chips with shows AA; 45" spl - Ls: mix AA, scatt. shows; strong influx Sh: soft red-brn and red-maroon

Ls: tan, lt gray vf-cryptoxln predom. NVP, some scatt. vug. por., N.S.; abund. offwhite, tan mic-vfxln dense, subchalky

4000' spl - Ls: tan, lt gray, lt brn vf-cryptoxln, NVP; common offwhite dense, subchalky to chalky; 1-2 chips tan dense with patchy stain, nfo, no odor

CFS 4000' 20" spl - very predom. various dense subchalky to chalky and tan, lt brn vf-cryptoxln with scatt. small vug. por., N.S.; 2 chips tan, offwhite gran. with inter-particle por., good show lt to dark brn oil on break, no odor; 45" spl - flood Sh: soft red-brn, lesser lt to med gray, soft clayey lt gray

4015' spl - Ls: good influx tan, lt brn vfxln with some vug. and inter-particle por, occ sl oolitic with several chips with dark brn to black spotty stain, sfo on break, no odor; CFS 4015' spls >>>

20' spl - flood orange, tan and lt gray chert, subtransl to opq, sharp; 4028' spl - Ls: flood offwhite chalky; lesser tan, offwhite mic-vfxln dense, subchalky; some tan vf-cryptoxln with some vug. por., N.S.; decr. cherts AA

40' spl - Ls: lt gray, lt to med brn predom. cryptoxln, sl mottled and gran. IP, NVP, N.S.; scatt. tan vf-cryptoxln with some poor vug. por. with lt brn spotty stain, vsi sfo on break, no odor

50' spl - Ls: scatt. chips with shows AA; predom. lt gray, brn cryptoxln, N.S.; Sh: good influx lt green, lt to med gray, red-brn

CFS 4052' spls - >>>

4060' and 4066' spls - Ls: some tan, lt gray cryptoxln with scatt. vug. and moldic por. with pp lt stain, vsi shows minute oil on break, no odor; Sh: influx red-brn, washes red

CFS 4066' 30" spl - Ls: good influx lt to med gray vf-cryptoxln and offwhite, tan mic-vfxln dense, subchalky; sl influx orange and lt gray chert, N.S.; 60" spl - >>>

80/90' spls - Sh: some black carbon., dark gray, dark red-brn; Ls: influx offwhite micxln subchalky to chalky; tan, lt gray predom. cryptoxln, poor-NVP; Chert: tan, offwhite, orange, N.S.

Ls: mix tan, lt gray vf-cryptoxln, NVP and offwhite mic-vfxln dense, cherty AA; incr. Sh: dark red-brn, red-brn, some dark gray to black

CFS 4100' 30" spl - flood Ls: offwhite, lt gray mic-vfxln dense, subchalky to occ chalky; lesser cryptoxln AA; 60" spl - Ls mix AA, rare fossil moldic por., N.S.

Ls: mix various cryptoxln and tan, offwhite dense, some pp por., N.S.

DST No. 1 Toronto  
Interval: 3930'-3970'  
Times: 30-60-30-60  
IFP: 1/4" blow, died back, dead in 17 minutes  
ISIP: no return blow  
FFP: no blow  
FSIP: no return blow  
Recovery: 2' mud  
FP: 19-20/21-22 SIP: 270-139  
HP: 1941-1925 BHT: 115 deg. F

**Heebner Shale 3929' (-1000)**

DST No. 2 Lansing "A" and "B"  
Interval: 3980'-4015'  
Times: 30-60-60-90  
IFP: strong blow, B.O.B. in 11 minutes  
ISIP: no return blow  
FFP: fair to strong blow, B.O.B. in 16 minutes  
FSIP: weak return blow, bldg. to 1/4 inch  
Recovery: 170' MCW (38m, 62w, trace oil); 62' SMCW (12m, 88w, trace oil); 498' VSMCW (4m, 96w), chl. 25,000; total fluid 730'  
FP: 30-182/185-353 SIP: 1240-1229  
HP: 1990-1946 BHT: 123 deg. F

Strap at 3970' was 1.02' short to board  
7:00 AM at 3970' on 8-21-2013

**Lansing 3976' (-1047)**

Morgan Mud Check at 3970'  
7:40 AM on 8-21-2013  
wt vis wl pH chl  
9.0 57 6.8 11.5 1400  
PV YP GelS lcm solids  
18 18 11/31 5# 5.0%

CFS 4015' 20" spl - common shows AA; some gray fn gran. with shows and dess. pyrite; common offwhite subchalky to chalky; 45" spl - flood soft red-brn, dark red-brn and gray shales

CFS 4028' 30" spl - Ls: tan, offwhite mic-vfxln subchalky; influx lt gray, tan vf-cryptoxln, NVP, N.S.; persistant orange and tan cherts; 60" spl - cherty Ls mix AA; incr. Sh: med to dark gray, red-brn

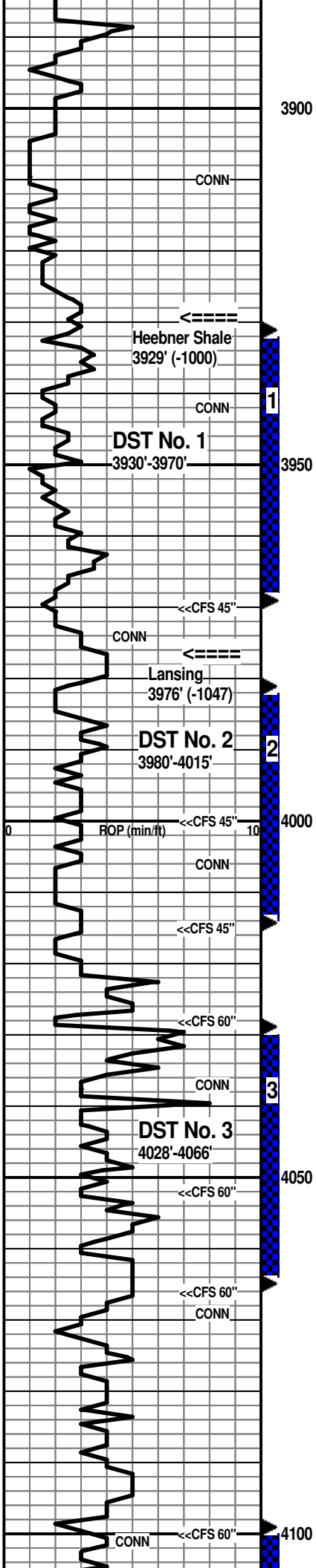
CFS 4052' 30" spl - Ls: mix lt gray, lt brn cryptoxln and offwhite, tan mic-vfxln dense, N.S.; some tan, offwhite mic-vfxln with spotty lt stain, nfo; scatt. tan and orange chert; Sh: red-brn, some gray, lt green; 60" spl - Ls: various tan, lt brn, lt gray vf-cryptoxln, rarely pyritic; lt gray, tan gran. and offwhite subchalky to chalky, N.S.

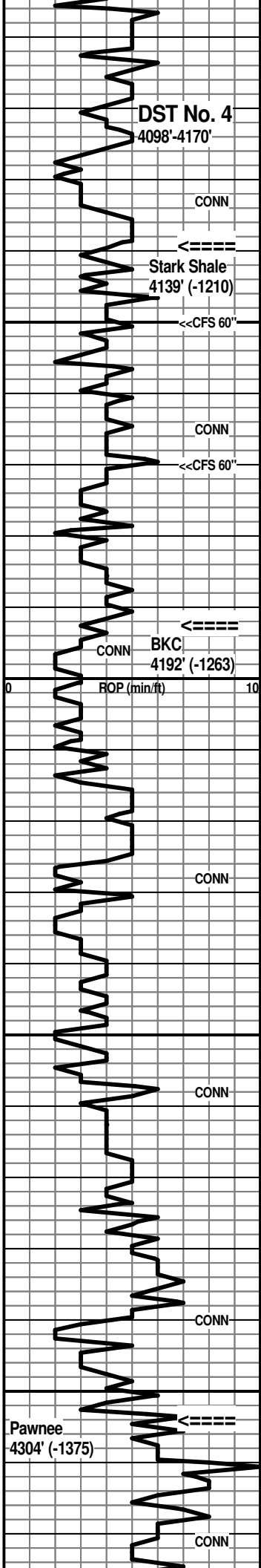
CFS 4066' 60" spl - Ls: various tan, lt gray, some lt brn cryptoxln to sl granular, NVP, N.S.; 1-2 chips with poor edge stain, nfo, no odor; common offwhite subchalky to chalky

7:00 AM at 4066' on 8-22-2013

Morgan Mud Check at 4066'  
4:20 PM on 8-22-2013  
wt vis wl pH chl  
9.2 66 6.4 10.5 1700  
PV YP GelS lcm solids  
23 21 10/32 5# 6.4%

DST No. 3 Lansing "F" and "G"  
Interval: 4028'-4066'  
Times: 30-60-30-60  
IFP: 1/4" blow bldg. to 1/2", dead at 25 minutes  
ISIP: no return blow  
FFP: no blow  
FSIP: no return blow  
Recovery: 45' mud  
FP: 24-20/31-25 SIP: 1239-1218





20' spl - Ls: good influx lt to med brn, gray sl mottled granular to cryptoxin, poor-NVP; common tan, offwhite dense; Sh: sl influx med to dark gray

30' spl - Ls: mix AA, some med brn cryptoxin; Sh: influx med to dark gray, gray-green

40' spl - Ls: influx tan, lt brn fn granular with poor to fair inter-particle and pp por., occ foss., with faint odor, pp stain, sfo on break, patchy to subsat. stain in dry spls; Sh: sl influx red-brn

50' spl - Ls: scatt. tan vf-cryptoxin with vug. and moldic por. with dark brn to black stain; good influx tan, lt gray, lt brn cryptoxin, NVP, N.S.; Sh: med to dark gray, dark red-brn

CFS 4150' 30" spl - Ls: tan, lt gray, lt brn cryptoxin; scatt. shows AA; Sh: sl incr. % dark red-brn, med-dark gray, occ dark purple; 60" spl - Ls: various cryptoxin, mottled IP; Sh: more med to dark red-brn, dark gray to black, pyritic gray

60'/70' spls - Sh: var. red-brn, silty IP; med to dark gray; Ls: offwhite, tan mic-vfxln dense, subchalky; tan, lt gray cryptoxin, NVP; some tan fn gran. (70' spl) with pp por., f-gd sfo on break, no odor, patchy-sat. stain in dry spls; CFS spls >>>

80' spl - trashy with common med to dark gray and red-brn shales; Ls: lt to med gray, lt brn cryptoxin to sl gran. NVP, N.S.; 90' spl - Ls: lt to med brn, lt-med gray gran. to cryptoxin. NVP; fairly common med to dark red-brn and med gray shales

4200' spl - Ls: mix AA, some smooth lt brn cryptoxin, trace crinoid fragments; shales AA

10' spl - Ls: lt to med gray, lt brn vf-cryptoxin, sl mottled and gran. IP; some yellow tinted dense gray; Sh: red-brn, dark gray, occ black

20' spl - Sh: influx red-brn silty to vf sandy; more gray to black, pyritic IP; common various cryptoxin Ls's

Ls: influx lt to med gray vf-cryptoxin; lt brn mottled gran. to oolitic, NVP, N.S.

40' spl - Ls: mix AA with influx Sh: lt to med gray, some yellow/gray, occ purple and soft red-brn, washes red

50' spl - predom. various shales AA; Ls: gray and lt brn granular, NVP, N.S.

Sh: red-brn, lt to med gray with Ls: lt to med gray vf-cryptoxin

70' spl - Sh: predom. red-brn silty IP with lt to med gray and purple; Ls: gray, brn granular, NVP, N.S.

80' spl - mix Sh: red-brn, lt to med gray and Ls: lt to med gray granular and med brn, gray cryptoxin, NVP, N.S.

90' spl - Ls: lt to med brn cryptoxin to granular and oolitic, NVP; lt to med gray vfxln dense, shaly; Sh: lt to med gray, purplish gray, purple

4300' spl - Ls/Sh mix AA with more purple shale

10' spl - still predom. multicolored shales with Ls: offwhite, lt gray mic-vfxln and lt gray vf-cryptoxin

20' spl - flood Ls: tan, lt brn granular, sl foss. IP, NVP, N.S.; lesser offwhite granular with micxln matrix, N.S.

30' spl - Ls: mix AA with strong influx lt to med gray shaly Ls and calcar. shale

FF: 24-30/31-33 SIP: 1253-1216  
 HP: 2019-2005 BHT: 116 deg. F  
 DST No. 4 Lansing "J" and "K"  
 Interval: 4098'-4170'  
 Times: 30-60-60-90  
 IFP: fair blow bldg. to 7 1/2"  
 ISIP: no return blow  
 FFP: fair blow bldg. to 11" in 42 minutes  
 FSIP: 1" return blow  
 Recovery: 95' GIP; 31' SLG&MCO (6g, 4m, 90c); 117' SLG&OCM (4g, 37c, 59m); 59' SLGO&WCM (7g, 7c, 31w, 55m); 58' SLO&MCW (2c, 22m, 76w), chl 19,500; oil gravity 35.8 deg.  
 FP: 23-73/79-130 SIP: 1253-1216  
 HP: 2069-2034 BHT: 122 deg. F

**Stark Shale 4139' (-1210)**

CFS 4170' 30" spl - Ls: predom. tan, lt gray cryptoxin, some gran. NVP, N.S.; occ tan fn-vfxln with pp and inter-particle por. with brn pp stain, dark brn gen. listless oil on break, no odor; Sh: scatt. med gray, red-brn; 60" spl - Ls: var. AA with lesser offwhite mic-vfxln dense; Sh: sl incr. med to dark red-brn and med gray

7:00 AM at 4170' on 8-23-2013

**Morgan Mud Check at 4170'**

1:15 PM on 8-23-2013  
 wt vis wl pH chl  
 9.2 61 6.4 10.5 1400  
 PV YP GeIS lcm solids  
 19 19 13/31 6# 6.4%

**BKC 4192' (-1263)**

**Pawnee 4304' (-1375)**

7:00 AM at 4304' on 8-24-2013

CFS 4330' 30" spl - flood Sh: dark gray to black carbon.

50' spl - Sh: med to dark gray and black; Ls: new med brn and gray mottled granular, poor-NVP, N.S.

60' spl - flood Ls: tan fn granular with inter-particle por.; other offwhite, tan mic-vfxln dense, subchalky; some lt gray, tan cryptoxln

CFS 4360' 20" spl - Ls: lt to med gray, offwhite mic-vfxln dense, shaly; occ gray-brn cryptoxln and tan granular, NVP, N.S.; 45" spl - flood Sh: lt to med gray, some dark gray calcar.

80' spl - flood Sh: dark gray to black carbon.

90' spl - Ls: lt to med gray and lt to med brn cryptoxln to granular, NVP, N.S.

4400' spl - Ls: lt to med brn, gray-brn cryptoxln and offwhite, tan mic-vfxln dense; incr. Sh: med to dark gray to black carbon.

10' spl - Sh: med to dark gray, soft lt gray, clayey; Sst: scatt. coarse to very coarse qtz grains, one cluster tan fg, friable, N.S.

20' spl - Ls: tan, lt brn cryptoxln, some granular, poor to NVP, N.S.; lesser offwhite mic-vfxln dense, subchalky to chalky; trace red-brn fg Sst, N.S.; Sh: med to dark gray, soft red-brn

CFS 4420' 20" spl - flood Ls: predom. tan, lt brn cryptoxln and offwhite, tan, lt gray mic-vfxln dense; 45" spl - flood Sh: vc gray to black, influx dark red-brn, purple, gray-green; scatt. very coarse qtz grains

40' spl - Sh: multi-colored, predom. red-brn with dark yellow, purple; scatt. qtz grains AA; trace lt gray vfg soft Sst with shale fragments

50' spl - Ls: minor tan, gray cryptoxln; Sh: multi-colored AA; influx Sst: orange tinted vf-med grnd, sl glauc.; some offwhite vf-fg, sl glauc., N.S.

60' spl - Sh: med to dark red-brn, dark yellow and purple, some lt green subwaxy

70' spl - Sh: mc AA with some mottled purple/yellow/ochre; influx Sst: clear to yellow, tan and red tinted fn-coarse grnd, poorly sorted, N.S.

80' spl - Sh: mc AA with influx purple; Sst: influx red-brn, fn-coarse grnd and red-brn quartzitic, N.S.; Ls: vari-colored cryptoxln and offwhite mic-vfxln dense

90' spl - mix Ls: tan, lt brn, lt gray cryptoxln and mc shales; Sst: scatt. tan fn-coarse clusters and very coarse single grains, N.S.

4500' spl - flood Sh: mottled med to dark red-brn, brick red, dark yellow, purple; scatt. very coarse qtz grains

10' spl - Sh: mc AA with more purple and orange-yellow; influx offwhite vf-fg calcar. Sst to finely sandy Ls (looks like possible St. Gen. remnant)

20' spl - flood Chert: offwhite, tan opq, some offwhite sl weath. with pp por., N.S.; spls sill shaly

30' spl - Chert: offwhite, tan, mottled offwhite/yellow opq; some offwhite weath. AA

40' spl - predom. cherts AA, weath. IP, N.S.; scatt. offwhite, tan vfxln Dolomite and offwhite sl glauc. Dolomite, N.S.

50' spl - mix Dolomite AA with some tan vfxln Ls; cherty AA

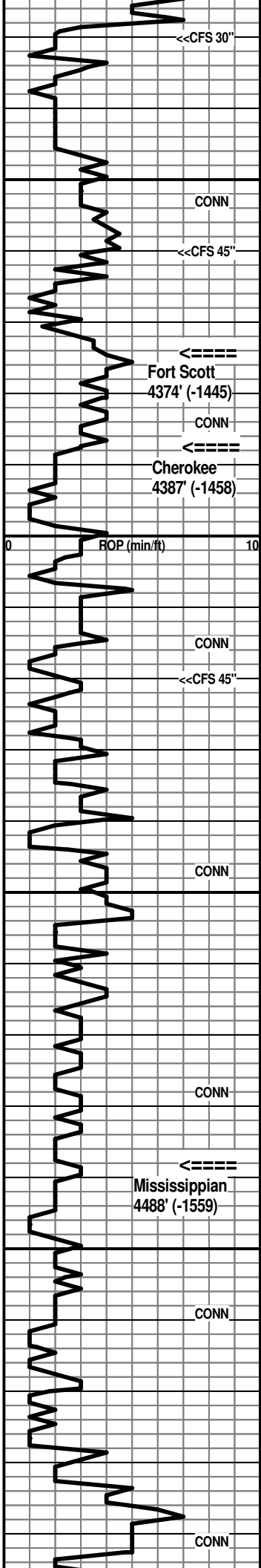
60' spl - mix Ls: offwhite, tan mic-vfxln dense with Dolo:

Fort Scott 4374' (-1445)

Cherokee 4387' (-1458)

Morgan Mud Check at 4385'  
12:05 PM on 8-24-2013  
wt vis wl pH chl  
9.2 67 6.4 10.0 1400  
PV YP GelS lcm solids  
19 22 15/35 5# 6.4%

Mississippian 4498' (-1559)

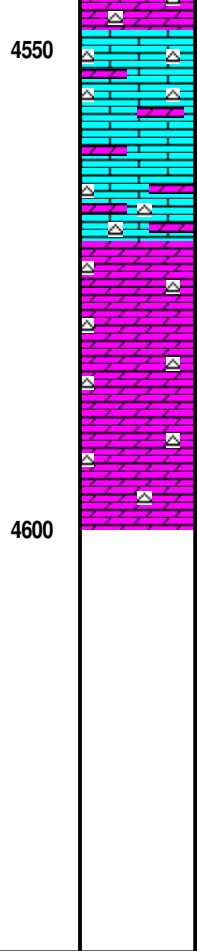
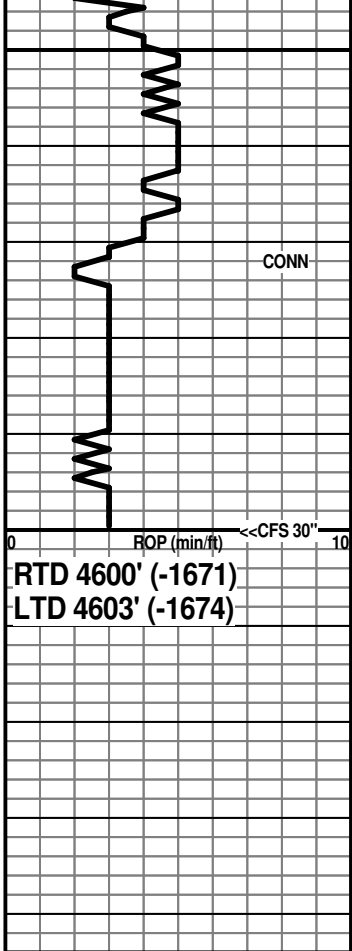


4350

4400

4450

4500



offwhite, tan fn-vfxln, some vug. por., N.S.; very cherty

70' spl - Ls: tan, offwhite mic-vfxln and Dolo: tan fn-vfxln dense to some fair small vug. por.; much decr. in chert

80' spl - Ls: AA with some tan granular; influx Dolo: lt gray vfxln dense; incr. Chert: lt gray, tan opq

90' spl - flood Dolo: lt brn, lt gray cryptoxln; some tan with interxln por., N.S.; Chert incr. offwhite, tan opq

4600' spl - Dolo: mix AA with incr. tan fnxln, sucrosic IP with good interxln por., sl cherty AA

CFS 4600' spls - Dolo: lt brn, lt gray vf-cryptoxln; lesser tan fnxln, sucrosic with interxln and vug. por., N.S.; sl cherty AA

After review of DST results and open hole log evaluation, the decision was made to run 5 1/2" casing for further testing through perforations.

Respectfully submitted,

Wesley D. Hansen  
 Petroleum Geologist  
 Kansas License No. 418

RTD reached at 11:45 PM on 8-24-2013  
 CFS - Short trip 12 stands - CTCH 75"  
 Drop Survey - TOFL