



WESLEY D. HANSEN Consulting Petroleum Geologist

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**KGS
AAPG
Kansas License #418**



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

Well Name: Murfin Drilling Co., Inc. #2-23 Frisbie
Location: 2290' FNL, 1950' FEL of Section 23-2S-36W
License Number: API: 15-153-20925
Spud Date: 7-2-2013
Surface Coordinates: 2290' FNL, 1950' FEL of Section 23-2S-36W
Region: Rawlins County, KS
Drilling Completed: 7-12-2013

Bottom Hole Vertical hole
Coordinates:
Ground Elevation (ft): 3284' **K.B. Elevation (ft):** 3294'
Logged Interval (ft): 3550' **To:** RTD **Total Depth (ft):** 4980'
Formation: Mississippian at RTD
Type of Drilling Fluid: Chemical - Displaced at 3300'

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 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 #14
Pusher: Greg Unruh

Surface Casing: 8 5/8" set at 392' w/350sx
Production Casing: 5 1/2" set at 4559' w/650 sx

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

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

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

Deviation Surveys: 3/4 deg. @393'; 1 deg. @ 1209'; 1 deg. @3620'; 1 1/2 deg. @ 4140'; 2 deg. @ 4980'

Bit #	Size	MFG	Type	Depth Out	Footage Cut	Hours on bit
1	12 1/4"	rr	MTC-1	393'	393'	5 1/4
2	7 7/8"	HTC	DP5067	3620'	3227'	28 3/4
3	7 7/8"	HTC	GX20Crr	4980'	1360'	71 3/4

FORMATION TOPS AND STRUCTURAL COMPARISON

FORMATION	SAMPLE TOPS		LOG TOPS		COMPARISON WELLS MDCI Frisbie 1-23 23-2S-36W 3305' KB
	Depth	Datum	Depth	Datum	
Anhydrite	3156'	+138	3152'	+142	-7
B/Anhydrite	3187'	+107	3182'	+112	-1
Neva	3651'	-357	3649'	-355	-1
Red Eagle	3720'	-426	3710'	-416	+3
Foraker	3770'	-476	3764'	-470	+1
Stotler	3926'	-632	3921'	-627	-1
Topeka	3998'	-704	3994'	-700	-3
Oread	4114'	-820	4109'	-815	-1
Heebner	4162'	-868	4155'	-861	-2
Lansing	4209'	-915	4206'	-912	-3
Stark Shale	4430'	-1136	4424'	-1130	+4
BKC	4481'	-1187	4476'	-1182	+1
Pawnee	4608'	-1314	4605'	-1311	-3
Cherokee Shale	4681'	-1387	4673'	-1379	+2
Mississippian	4880'	-1586	4875'	-1581	+4
RTD	4980'	-1686			
LTD			4977'	-683	

DRILL STEM TESTS

DST No. 1 Lecompton-Oread
 Interval: 4029'-4140'
 Times: 30-60-60-90
 Recovery: 95' VSLG&OCM (1g, 3o, 96m);
 275' VSLO&G&MCW (5g, 3o, 45m, 47w);
 630' MCW with trace oil (19m, 81w); chl.
 32,000; total fluid 1000'
 FP: 42-301/305-475 SIP: 1181-1148
 HP: 2038-2009 BHT: 139 deg. F

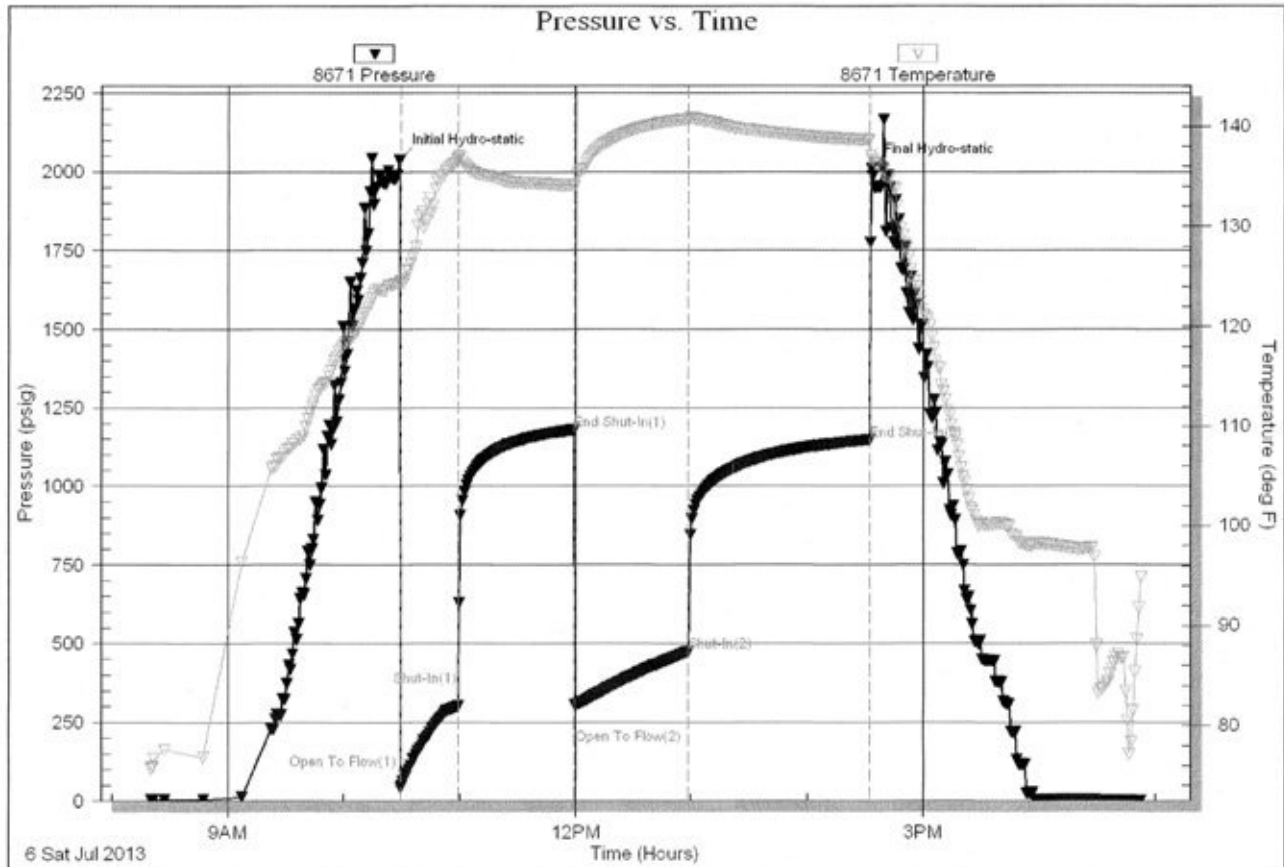
IFP: fair blow, bldg. to B.O.B. in 11 minutes
 ISIP: no return blow
 FFP: blow started in 2 minutes, reached
 B.O.B. in 16 minutes
 FSIP: no return blow

Serial #: 8671

Inside Marfin Drilling Co., Inc

Friskie #2-23

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 52758

Printed: 2013.07.06 @ 17:33:49

DRILL STEM TESTS

DST No. 2 Leavenworth - Lansing "A"
Interval: 4154'-4235'
Times: 30-60-45-60
Recovery: 60' SLO&GCM (4g, 7o, 89m)
FP: 20-29/33-45 SIP: 1165-1091
HP: 2052-2026 BHT: 132 deg. F

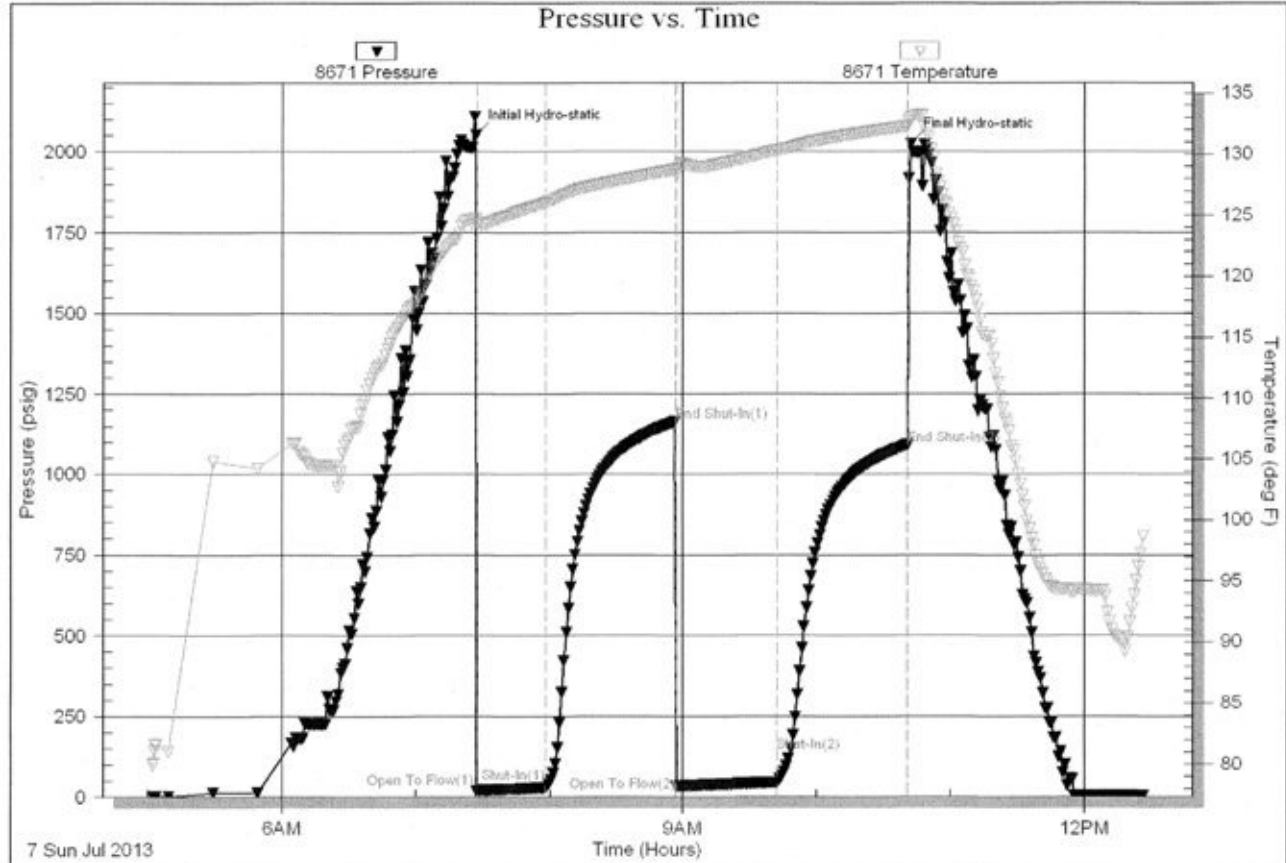
IFP: weak blow, bldg. to 1 1/8"
ISIP: no return blow
FFP: no blow
FSIP: no return blow

Serial #: 8671

Inside Marfin Drilling Co., Inc

Frisbie #2-23

DST Test Number: 2



DRILL STEM TESTS

DST No. 3 Lansing "A" Sand - "E" Zone
 Interval: 4230'-4300'
 Times: 30-60-60-90
 Recovery: 180' GIP; 10' G&MCO (4g, 1m, 95o);
 205' G&MCO (34g, 3m, 63o); 238' G&MCO
 (31g, 31m, 38o); gravity 29 deg.
 FP: 35-130/143-197 SIP: 1279-1279
 HP: 2124-2059 BHT: 137 deg. F

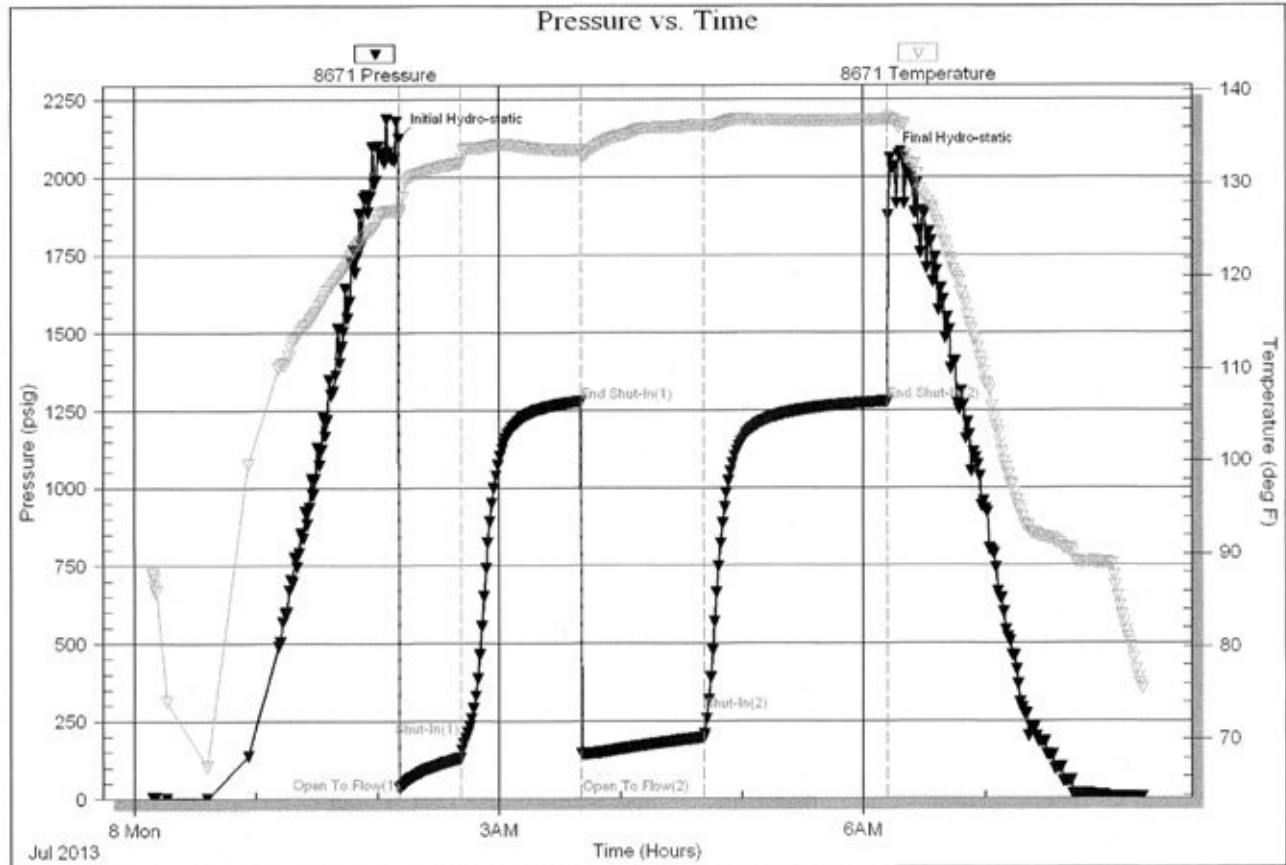
IFP: good blow, bldg. to B.O.B. in 17
 minutes
 ISIP: 1" return blow
 FFP: fair blow, bldg. to B.O.B. in 47 1/2
 minutes
 FSIP: no return blow

Serial #: 8671

Inside Murfin Drilling Co., Inc

Frisbie #2-23

DST Test Number: 3



Tribble Testing, Inc

Ref. No: 52760

Printed: 2013.07.06 @ 08:52:57

DRILL STEM TESTS

DST No. 4 Lansing "G"
 Interval: 4299'-4335'
 Times: 30-60-60-90
 Recovery: 180' GIP; 264' GCO (22g, 3m, 75o); 89'
 G&OCM (24g, 30o, 46m), Gravity 30.4 deg.
 FP: 22-75/81-152 SIP: 483-475
 HP: 2128-2084 BHT: 137 deg. F

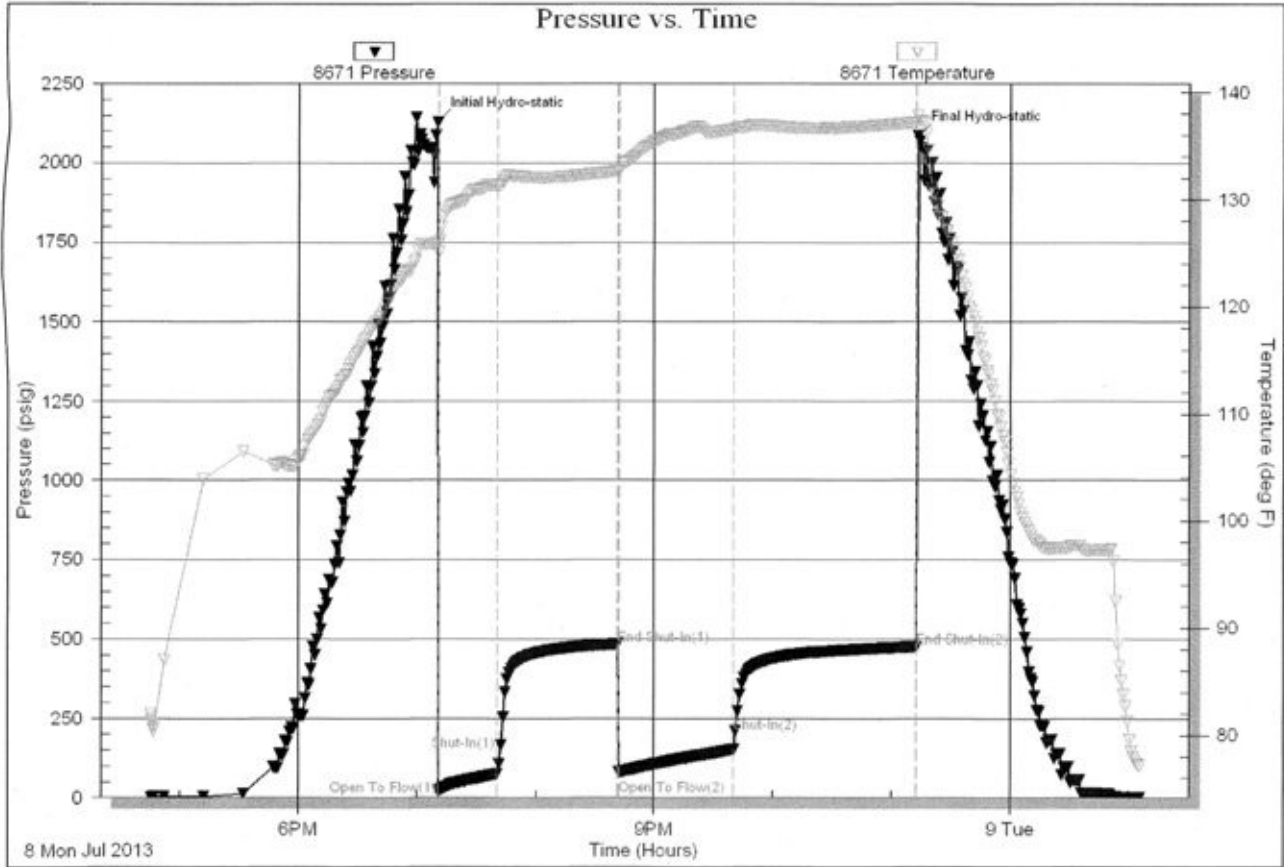
IFP: fair blow, bldg. to 9"
 ISIP: 1/8" return blow
 FFP: fair blow, bldg. to B.O.B. in 38
 minutes
 FSIP: 1/8" return blow

Serial # 8671

Inside Murfin Drilling Co., Inc

Frisbie #2-23

DST Test Number: 4



Triblote Testing, Inc

Ref. No: 52761

Printed: 2013.07.09 @ 01:28:31

DRILL STEM TESTS

DST No. 5 Lansing "H" and "J"
 Interval: 4376'-4430'
 Times: 30-60-60-90
 Recovery: 1205' GIP; 125' CGO (1m, 33g, 66o); 2090' total fluid (reversed 17 bbl ((1876')) to tank truck) - 3 min. samples first 15 min. then 5 min. samples at 20 min. and 25 min. - average first 15 min. (84o, 11g, 5m); 20 min. sample (65o, 22m, 13g); 25 min. sample (93o, 4m, 3g); bottom stand of collars (89') (35m, 35g, 25o, 5w); gravity 39.6 degrees
 FP: 77-408/415-755 SIP: 1339-1327
 HP: 2152-2095 BHT: 147 deg. F

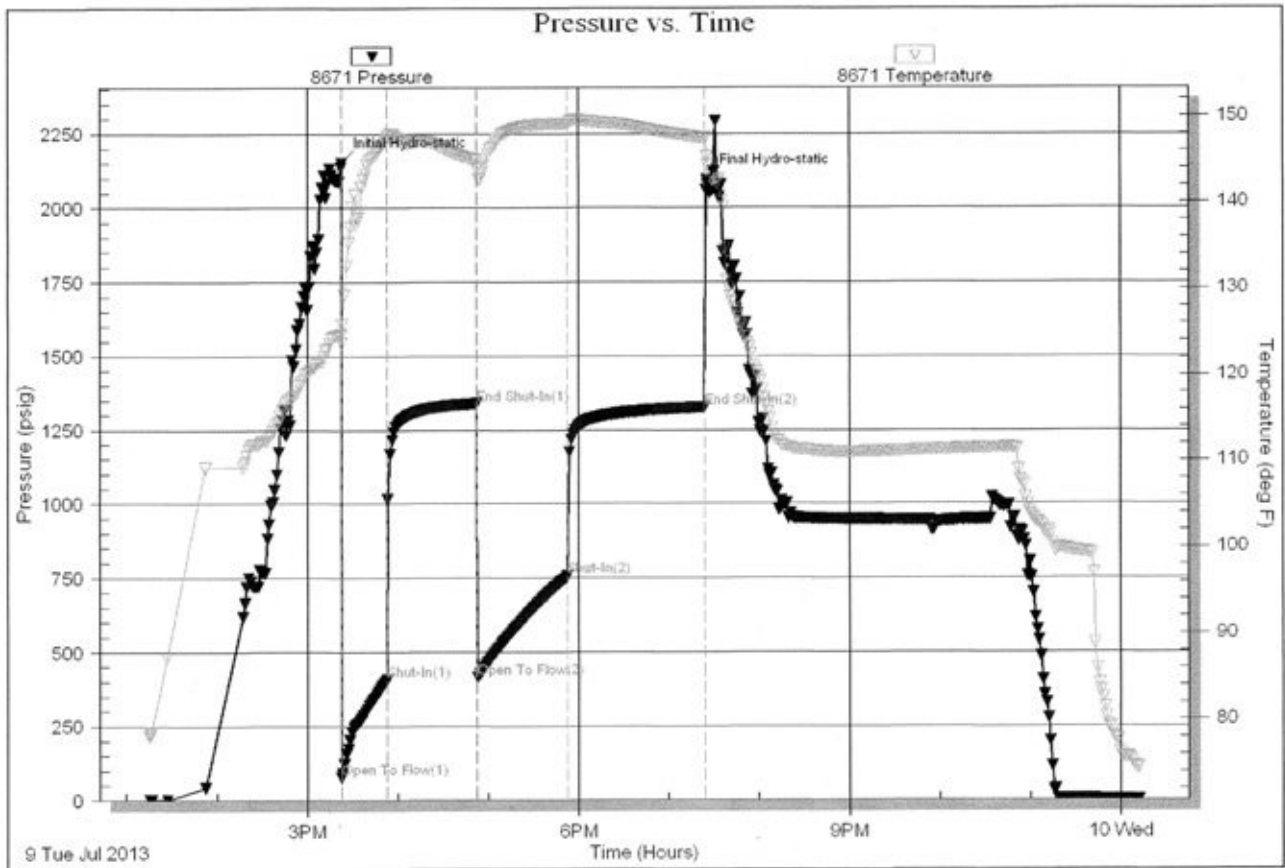
IFP: strong blow, B.O.B. in 3 minutes
 ISIP: return blow, B.O.B. in 17 minutes
 FFP: strong blow, B.O.B. in 4 minutes
 FSIP: no return blow?

Serial #: 8671

Inside Marfin Drilling Co., Inc

Frisbie #2-23

DST Test Number: 5

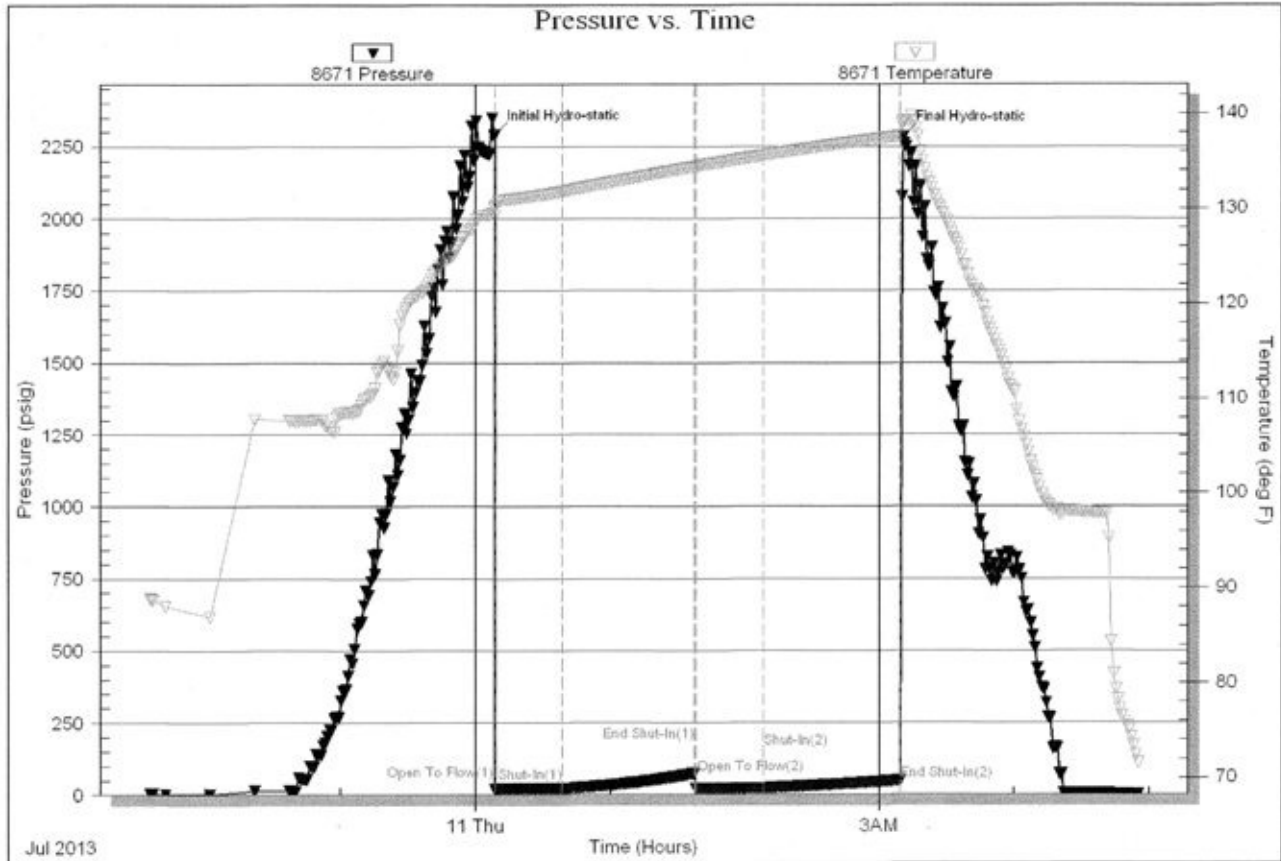


DRILL STEM TESTS

DST No. 6 Pawnee-Lower Pawnee
 Interval: 4584'-4660'
 Times: 30-60-30-60
 Recovery: 2' SG&OCM (2g, 2o, 96m)
 FP: 20-21/21-22 SIP: 74-49
 HP: 2291-2284 BHT: 138 deg. F

IFP: weak 1/2" blow, died in 22
 minutes
 ISIP: no return blow
 FFP: no blow
 FSIP: no return blow

Serial #: 8671 Inside Marfin Drilling Co., Inc Frisbie #2-23 DST Test Number: 6



Tribble Testing, Inc

Ref. No: 52763

Printed: 2013.07.11 @ 05:12:52

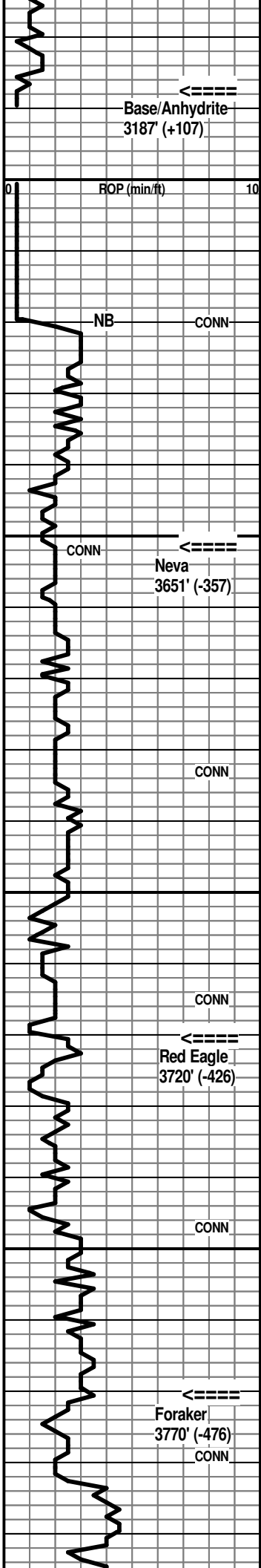
ROCK TYPES

Anhy
 Cht
 Coal
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 Gyp
 Ls colorless
 Lmst

Salt
 Shale
 Shcol
 Shgy
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Dol
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 Shy dolo
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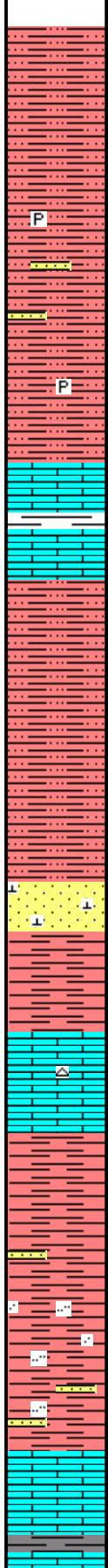


3600

3650

3700

3750



Sh: red silty, soft, finely sandy IP

P

Sh: AA with occ gray fn-med grnd pyritic Sst and gray pyritic shale

P

Sh: red silty and finely sandy; scatt. gray shaly pyrite

70' spl - flood Ls: mix tan fn granular with micxn matrix; abund. offwhite subchalky to chalky, N.S.

80' spl - Ls: mix AA with influx tan, lt brn, pinkish brn vf-cryptoxln, NVP; minor shale %

90' spl - Sh: influx red, red-brn silty and finely sandy; much decr. Ls %, predom. tan, offwhite fn granular

3700' spl - flood Sh: red, red-brn AA

AA

20' spl - Sst: good influx offwhite, lt gray vfg-vfg, calcar., N.S.

30' spl - decr. Sst with good influx red, soft gummy shale

40' spl - flood Ls: mix tan, lt gray fn granular with common offwhite subchalky to chalky; some offwhite, tan mic-vfxln dense; occ lt brn cryptoxln; occ mottled orange chert

50' spl - Ls: mix AA with influx Sh: lt red-brn, soft gummy; some med gray

Sh: some red, gummy with Sst: offwhite, lt gray vfg-vfg calcar.; much decr. Ls %

very predom. Sh: red-brn, silty and vfg sandy IP

80' spl - very predom. shale AA; some vfg-vfg Sst AA; vs! influx Sst: mottled red/offwhite/gray shaly and calcar.

90' spl - flood Ls: predom. tan, offwhite fn granular with inter-particle and pp por.; other brnsh gray vf-cryptoxln, NVP, N.S.

Sh: some med gray to black

Ls: good influx med gray, gray-brn vf-cryptoxln, shaly IP; some mottled granular, NVP, N.S.

Base/Anhydrite 3187' (+107)

Bit trip at 3620' - pulled PDC
Pipe strap was 1.53' short to board

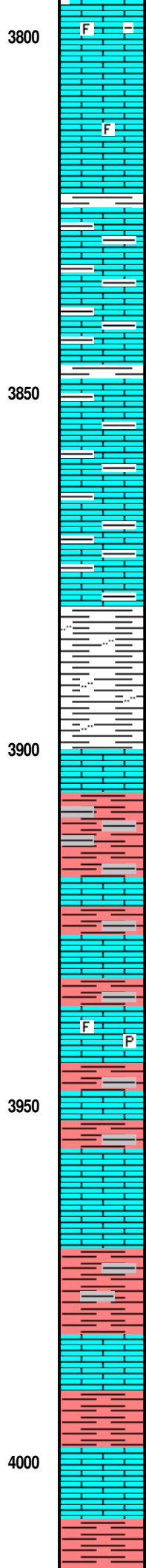
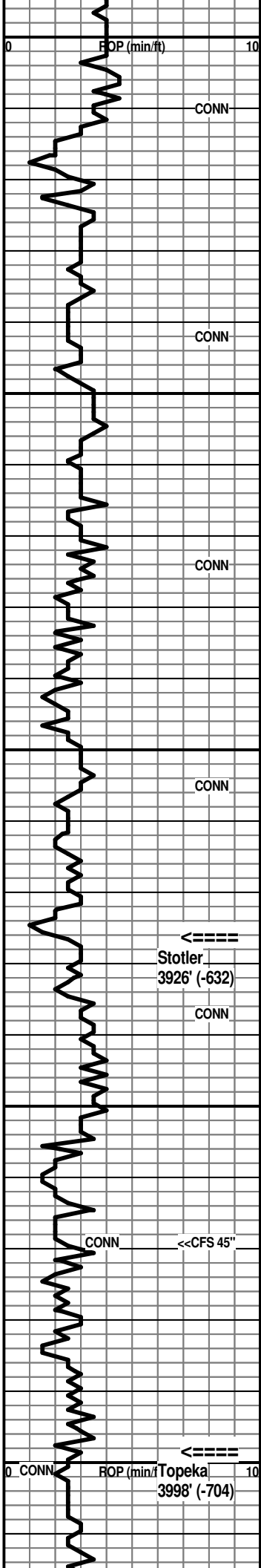
Geologist on location at 3620'

Neva 3651' (-357)

Red Eagle 3720' (-426)

Foraker 3770' (-476)

7:00 AM at 3775' on 7-5-2013



Ls: various gray, gray-brn mottled granular to dense, shaly; lesser tan granular, sl foss. and offwhite mic-vfxln dense

Ls: flood tan, lt brn, lt gray vfxln dense, rare fossils;, NVP

30' spl - Ls: various dense, vsl foss. AA with vsl influx offwhite subchalky to chalky

Ls: tan, lt brn vfxln dense; incr. lt to med gray fn-vfxln dense, shaly IP; Sh: sl incr. med gray, calcar. and finely pyritic IP

Ls: various tan, lt brn and gray dense, mixed AA with some lt to med gray shales

60' spl - Ls: mix AA with sl influx gray, lt brn, gray-brn vf-cryptoxln, NVP; some Sh: med gray, sl influx red-brn

Ls: various gray, tan, lt brn vf-cryptoxln, NVP; with Sh: streaks med to dark gray, red-brn

80' spl - Ls: various tan, lt gray, lt brn vfxln dense, NVP, occ pinkish red granular; thin shales of gray, red-brn and red-maroon

90' spl - Ls: lt to med gray, lt brn cryptoxln and offwhite, lt gray mic-vfxln dense; Sh: streaks red-brn and gray, calcar.

3900' spl - Ls: various gray, brn and offwhite dense AA; incr. Sh: red-brn, pinkish brn and gray, finely micac. and silty

10' spl - Sh: various AA with Ls: lt to med gray vf-cryptoxln and offwhite mic-vfxln dense

20' spl - dominantly Shales AA with lesser Ls's AA

30' spl - Ls: offwhite, lt gray, tan mic-vfxln; lesser med gray cryptoxln; Sh: red, red-brn and gray

40' spl - Ls: predom. lt to med gray cryptoxln; some mottled brn and lesser offwhite, tan mic-fxln dense; Sh: red-brn and med to dark gray

50' spl - much decr. shale %; Ls: tan, lt brn fn granular, foss., poor to NVP, N.S., occ with dess. pyrite; influx tan, lt brn foss. with black tarry stain and gilsonite flecks in vug and fossil moldic por., no odor, nfo

60' spl - Ls: influx lt to med brn and lt to med gray cryptoxln, NVP, N.S.; lesser offwhite mic-vfxln dense; several chips with shows and porosity AA; some red-brn and gray shale

69' spl - Ls: tan, lt to med brn fn granular, poor vis. por.; influx offwhite subchalky to chalky, very scatt. chips with black asphaltic stain, no odor, nfo

CFS 3969' 20" spl - Ls: influx tan, lt gray, lt brn cryptoxln, NVP; thin red-brn and gray shale beds; CFS 45" spl >>>

80' and 90' spls - Sh: flood red-brn with lesser med gray, gray-green; Ls: good influx tan, offwhite fn granular ith poor inter-particle por. with black and brn tarry pp stain, no odor, nfo

4000' spl - much decr. shale %; Ls: flood offwhite, tan mic-vfxln dense, subchalky IP, some spotty pp black gilsonite flecks; common tan, lt brn fn-med granular with gen. poor vis. por. with spotty black stain, no odor, nfo

10' spl - Sh: good influx red-brn, brick red; Ls: influx mottled red/offwhite/tan granular, N.S.

20' spl - Ls: influx pink mottled cryptoxln to granular, NVP; other lt to med brn cryptoxln

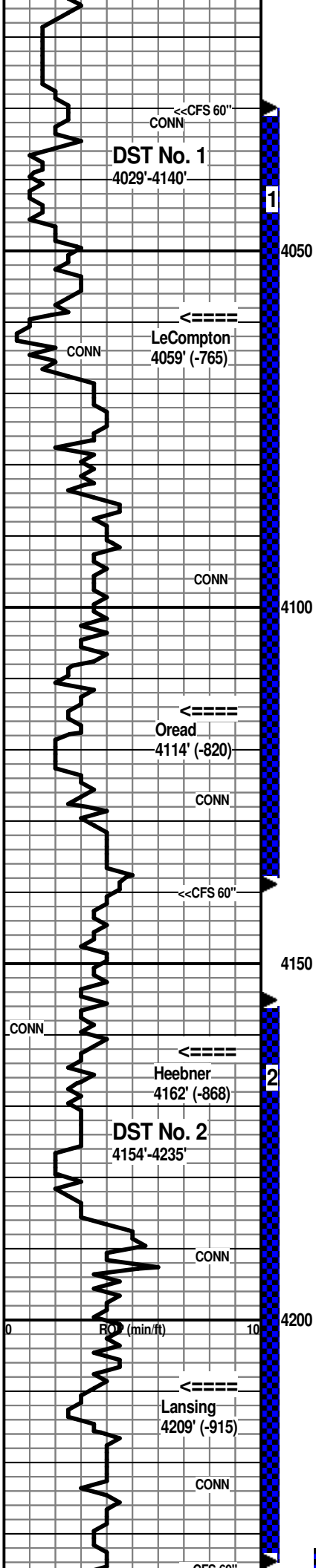
30' spl - Sh: good influx red-brn; Ls: brn, tan, gray cryptoxln

Morgan Mud Check at 3830'
 9:30 AM on 7-5-2013
 wt vis wl pH chl
 8.9 75 6.2 9.5 550
 PV YP GelS lcm solids
 28 34 6/22 5# 4.3%

Stotler 3926' (-632)

45" spl - Ls: predom. lt gray, lt brn cryptoxln; lesser offwhite, lt gray mic-vfxln dense, no new shows; fairly minor shale %

Topeka 3998' (-704)



CFS 4030' 30" spl - flood Ls: tan, lt brn fn-vfxln with some pp and interln por., N.S.; common offwhite, tan mic-vfxln dense, subchalky IP, occ with very spotty asphaltic stain, no odor, nfo; 60" spl - Ls: tan fn-vfxln gen. dense, dolomitic IP; offwhite dense subchalky AA with very scatt. shows AA; Sh: sl incr. red-brn and gray

50' spl - strong influx Sh: dark red-brn, maroon-brn; lesser Ls: tan, lt gray, lt brn cryptoxln

60' spl - very predom. red-brn shale, commonly silty and finely sandy; scatt. Ls

70' spl - much decr. shale AA; Ls: tan, offwhite mic-fnxln gen. dense, N.S.; scatt. tan fn granular with some vug. and inter-particle por. with thick oily stain, no odor, nfo

80' spl - Ls: strong influx offwhite, tan finely oolitic with fair to good small oomoldic por. and some vug. por. with subsat. to sat. black gooe stain, vsl show black oil droplets, ?odor; some offwhite subchalky to chalky with spotty stain

90' spl - Ls: flood predom. lt gray vfxln, NVP; lesser tan, lt to med brn cryptoxln and offwhite mic-vfxln dense, N.S.

4100' spl - Ls: various dense AA with sl influx Sh: med to dark gray, pinkish-brn, red-brn

10' spl - good influx med to dark gray very calcar shale to shaly Ls; various dense Ls's AA; 3-4 chips brn granular with patchy to subsat. dark brn to black stain, pyritic IP, no odor, nfo

20' spl - abund. shaly Ls/calcar. shale AA; other med brn and gray cryptoxln Ls

30' spl - flood Ls: tan, offwhite mic-vfxln dense, N.S.; tan, lt brn cryptoxln with patchy stain and several chips tan, offwhite fn granular, foss. IP, with brn to black pp stain, ft odor, sfo in some pp and small vug. por.

40' spl - flood Ls: tan, lt brn cryptoxln, NVP, and offwhite, tan mic-vfxln dense, subchalky IP, NVP, N.S.

CFS 4140' 30" spl - Ls: mix AA, N.S.; 60" spl - Ls: predom. tan, lt brn cryptoxln AA; vsl influx red-brn shale

50' spl - trashy from trip; Ls: various dense AA; Sh: common med to dark gray

60' spl - Ls: tan, lt gray vf-cryptoxln and tan, offwhite mic-vfxln dense, NVP, N.S.; much decr. shale %

70' spl - flood Ls: med to dark gray and gray-brn cryptoxln, NVP

80' spl - Sh: strong influx dark gray, very calcar.; trace Sst: tan fn-med with Ls frag., vsl show very lt oil

90' spl - flood Sst: lt gray vvf-g vfg gen. poor to NVP, calcar., most clusters with pp stain, occ clusters with sat. stain, trace fo, no odor

4200' spl - Sst: very predom. lt gray, offwhite vvf-g, some pyritic, decr. shows AA; sl influx dark gray to black shale

10' spl - mix Sst AA with incr. shale % of med to dark gray, some pyritic

20' spl - shales and sst AA; Ls: good influx lt to med brn granular with good inter-particle and vug. por. with dark brn to black stain, gd sfo, sl sg, vsl lt odor; other lt to med brn cryptoxln, rarely pyritic, some with edge stain

30' spl - Ls: flood med brn cryptoxln, NVP; much lesser offwhite mic-vfxln dense

35' spl - Ls: very predom. cryptoxln AA

CFS 4235' 30" spl - Ls: very predom. cryptoxln AA; lesser offwhite, lt gray mic-vfxln dense, subchalky IP, N.S.; 60" spl - AA; one chip with spotty black stain

LeCompton 4059' (-765)

DST No. 1 LeCompton-Oread
 Interval: 4029'-4140'
 Times: 30-60-60-90
 IFP: fair blow, bldg. to B.O.B. in 11 minutes
 ISIP: no return blow
 FFP: blow started in 2 minutes, reached B.O.B. in 16 minutes
 FSIP: no return blow
 Recovery: 95' VSLG&OCM (1g, 3o, 96m); 275' VSLO&G&MCW (5g, 3o, 45m, 47w); 630' MCW with trace oil (19m, 81w); chl. 32,000; total fluid 1000'
 FP: 42-301/305-475 SIP: 1181-1148
 HP: 2038-2009 BHT: 139 deg. F

Oread 4114' (-820)

7:00 AM at 4140' on 7-6-2013
Morgan Mud Check at 4140'
 11:15 AM on 7-6-2013
 wt vis wl pH chl
 9.4 60 6.8 8.5 600
 PV YP GelS lcm solids
 22 26 7/24 5# 7.8%

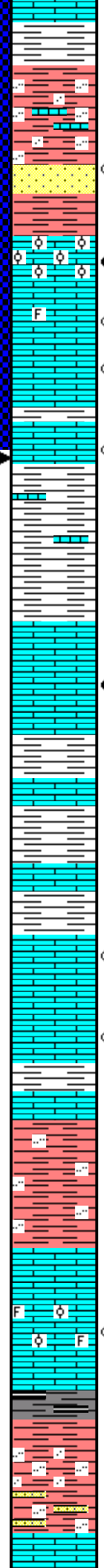
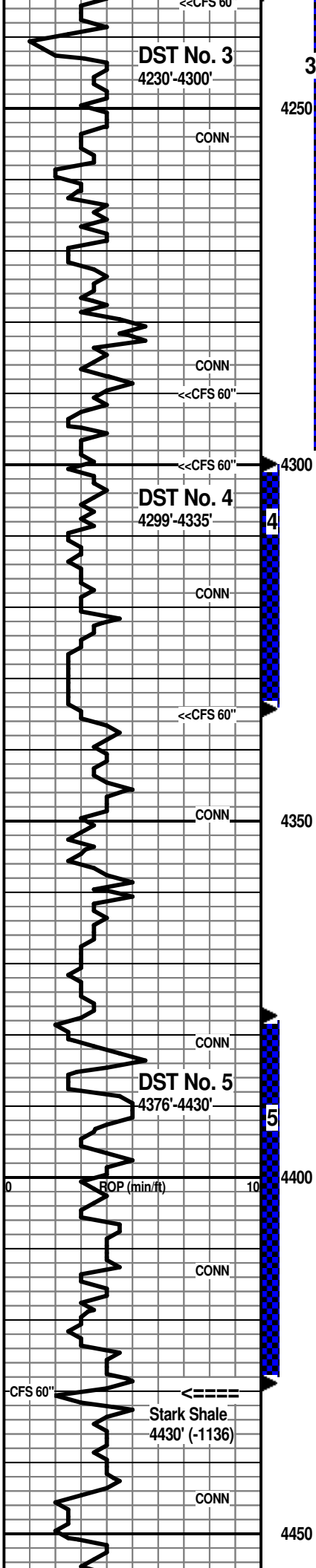
Heebner 4162' (-868)

DST No. 2 Leavenworth - Lansing "A"
 Interval: 4154'-4235'
 Times: 30-60-45-60
 IFP: weak blow, bldg. to 1 1/8"
 ISIP: no return blow
 FFP: no blow
 FSIP: no return blow
 Recovery: 60' SLO&GCM (4g, 7o, 89m)
 FP: 20-29/33-45 SIP: 1165-1091
 HP: 2052-2026 BHT: 132 deg. F

Lansing 4209' (-915)

Morgan Mud Check at 4235'
 10:20 AM on 7-7-2013
 wt vis wl pH chl
 9.3 62 7.2 9.0 1,000
 PV YP GelS lcm solids
 18 23 10/28 5# 7.1%

7:00 AM at 4235' on 7-7-2013



50' spl - Ls: various cryptoxln AA; some offwhite fn-vfxln with spotty asphaltic stain in inter-particle and vug. por.; Sh: good influx lt to med gray, gray-green

60' spl - flood Sh: red-brn, silty and finely sandy; lt to med gray; minor Sst: offwhite, lt gray vvf, poor por. with some pp stain; occ Ls: med brn and red-brn cryptoxln

70' spl - Sh: various AA; good influx Sst: lt gray fg friable, finely micac. with sl sfo and some sat. stain; predom. offwhite, lt gray vvf-fg, N.S.; some clusters with dead black spotty stain

80' spl - still very shaly; influx Ls: offwhite, tan oolitic to granular with inter-oolitic and interparticle por., some vug. por. with subsat. to sat. stain, sfo, vsf sg; other mottled brn/gray granular, N.S.; tan, lt gray vf-cryptoxln, NVP, N.S.

90' spl - flood Ls: offwhite, tan, some lt gray vf-cryptoxln, foss. IP with interxln, vug. and edge por. with pp brn stain, ft odor, sl shows dark brn to black oil; abund. tan, offwhite vf-cryptoxln, NVP, N.S. and some offwhite dense, subchalky, N.S.

4290' CFS spls - >>>>

4300' CFS spls - >>>>

10'/20' spls - becoming shale dominated: lt to med gray, red-brn; Ls: med gray, med brn cryptoxln

30' spl - flood Sh: red-brn, maroon-brn, med gray; lesser Ls: gray, brn cryptoxln and offwhite, lt gray mic-fnxln dense

35' spl - very shaly AA with lesser various dense Ls's; scatt. patchy stain in offwhite, tan, brn cryptoxln Ls

CFS 4335' 30" spl - much decr. shale %; Ls: influx tan, brn cryptoxln to gran. IP with inter-particle and some vug. por., with ft odor, fair-gd shows dark brn to black oil, some sl gassy, patchy to sat. brn stain

50' spl - Ls: mix lt gray, lt brn cryptoxln and offwhite mic-vfxln dense, subchalky to chalky, N.S.; very scatt. lt gray, tan cryptoxln with some edge and vug. por. with lt stain, no odor, nfo; with Sh: med gray, red-brn; 60' spl - >>>>

70' spl - Sh: good influx med to dark gray; Ls: influx med to dark brn, gray-brn cryptoxln, gran. IP, NVP, N.S.

80' spl - predom. Sh: med to dark gray, influx red-brn; Ls: various gray, brn cryptoxln; lesser gray gran.; occ tan, brn gran. with patchy to subsat. dark brn to black tarry stain

90' spl - Ls: mix tan, lt brn, gray cryptoxln, NVP, N.S.; lesser offwhite, tan mic-vfxln dense with scatt. spotty stain; some tan granular with dark brn to black stain in inter-particle por., trace fo on break; some tan more cryptoxln with scatt. vug. por. with dark stain, trace fo on break, no odor

4400' spl - Ls: predom. tan, lt brn vf-cryptoxln; mix AA; Sh: influx med gray and gray-green

10' spl - Sh: influx red-brn silty IP; Ls: some lt gray, tan cryptoxln and tan, offwhite mic-vfxln dense

20' spl - Sh: predom. red-brn; minor Ls's AA; occ mottled brn and gray gran., NVP, N.S.

30' spl - flood Ls: predom. tan, offwhite mic-vfxln dense, foss. IP with some pp and moldic por., patchy to sat. stain; some tan foss., oolitic to granular with inter-particle and vug. por. with pp brn stain, even fluor., sl shows dark brn oil on break, milky to sl strn cut, no odor

CFS 4430' 30" spl - Ls: AA decr. shows; mix tan, offwhite mic-vfxln dense, subchalky to chalky IP and tan, lt gray cryptoxln, NVP; 60" spl - Ls's AA with some dark gray to black shale

40' spl - Sh: abund. dark gray, some black carbon. and fissile

50' spl - flood Sh: lt to med red-brn, finely sandy and silty IP; Sst: red-brn, silty and lt gray vvf, shaly and silty, N.S.

60' spl - Sh: good influx dark red-brn, silty, non-sandy; lesser med gray, gray-green; minor brn, gray cryptoxln Ls

DST No. 3 Lansing "A" Sand - "E" Zone
Interval: 4230'-4300'
Times: 30-60-60-90
IFP: good blow, bldg. to B.O.B. in 17 minutes
ISIP: 1" return blow
FFP: fair blow, bldg. to B.O.B. in 47 1/2 minutes
FSIP: no return blow
Recovery: 180' GIP; 10' G&MCO (4g, 1m, 95o); 205' G&MCO (34g, 3m, 63o); 238' G&MCO (31g, 31m, 38o); gravity 29 deg.
FP: 35-130/143-197 SIP: 1279-1279
HP: 2124-2059 BHT: 137 deg. F

CFS 4290' 30" spl - Ls: very predom. offwhite, tan vf-cryptoxln and offwhite mic-vfxln dense, N.S.; scatt. shows AA; 60" spl - Ls: various dense, N.S.; scatt. chips with pp lt brn stain, sfo, vsf sg, ft odor; Sh: incr. red-brn, med gray

CFS 4300' 30" spl - Ls: pred. tan, lt gray, lt brn cryptoxln, NVP, N.S.; some offwhite mic-vfxln subchalky with spotty pp stain and offwhite, tan vf-cryptoxln with some interxln and edge por. with stain, sfo; 60" spl - Ls: occ fn gran. with inter-particle por. with spotty to sat. stain, sl show dark brn to black oil, no odor

7:00 AM at 4300' on 7-8-2013
Morgan Mud Check at 4300'
10:10 AM on 7-8-2013
wt vis wl pH chl
9.2 73 6.0 10.5 1,200
PV YP GelS lcm solids
20 24 11/26 5# 6.4%

CFS 4335' 60" spl - still shaly AA; Ls: scatt. shows AA; various brn, gray cryptoxln and offwhite, tan mic-vfxln dense, NVP, N.S.

60' spl - decr. Shale %; Ls: lt gray, tan, lt brn cryptoxln, gran. IP; offwhite dense subchalky to chalky

DST No. 4 Lansing "G"
Interval: 4299'-4335'
Times: 30-60-60-90
IFP: fair blow, bldg. to 9"
ISIP: 1/8" return blow
FFP: fair blow, bldg. to B.O.B. in 38 minutes
FSIP: 1/8" return blow
Recovery: 180' GIP; 264' GCO (22g, 3m, 75o); 89' G&OCM (24g, 30o, 46m), Gravity 30.4 deg.
FP: 22-75/81-152 SIP: 483-475
HP: 2128-2084 BHT: 137 deg. F

7:00 AM at 4380' on 7-9-2013
Morgan Mud Check at 4414'
9:30 AM on 7-9-2013
wt vis wl pH chl
9.1 90 6.4 11.5 1,000
PV YP GelS lcm solids
25 35 10/60 2# 5.7%

Stark Shale 4430' (-1136)
DST No. 5 Lansing "H" and "J"
Interval: 4376'-4430'
Times: 30-60-60-90
IFP: strong blow, B.O.B. in 3 minutes
ISIP: return blow, B.O.B. in 17 minutes
FFP: strong blow, B.O.B. in 4 minutes
FSIP: no return blow?
Recovery: 1205' GIP; 125' CGO (1m, 33g, 66o); 2090' total fluid (reversed 17 bbl ((1876'')) to tank truck) - 3 min. samples first 15 min. then 5 min. samples at 20 min. and 25 min. - average first 15 min. (84o, 11g, 5m); 20 min. sample (65o, 22m, 13g); 25 min. sample (93o, 4m, 3g); bottom stand of collars (89') (35m, 35g, 25o, 5w); gravity 29 deg. F

39.6 degrees
FP: 77-408/415-755 SIP: 1339-1327
HP: 2152-2095 BHT: 147 deg. F

7:00 AM at 4465' on 7-10-2013

BKC 4481' (-1187)

Morgan Mud Check at 4527'
10:10 AM on 7-10-2013

wt vis wl pH chl
9.0 57 5.8 11.0 800
PV YP GelS lcm solids
20 20 5/26 1# 5.0%

Pawnee 4608' (-1314)

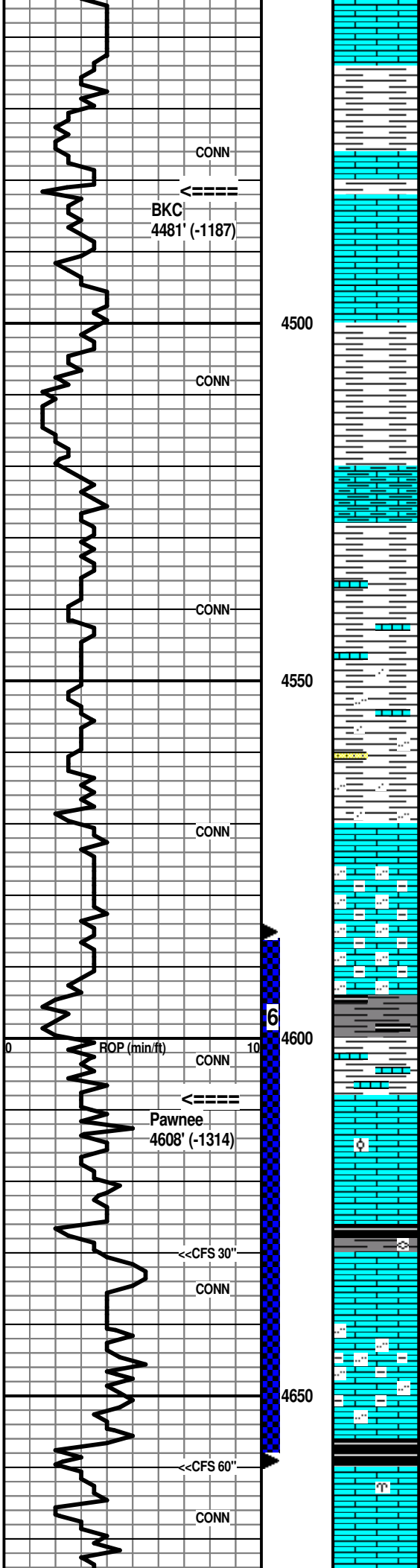
DST No. 6 Pawnee-Lower Pawnee
Interval: 4584'-4660'
Times: 30-60-30-60
IFP: weak 1/2" blow, died in 22 minutes
ISIP: no return blow
FFP: no blow
FSIP: no return blow
Recovery: 2' SG&OCM (2g, 2o, 96m)
FP: 20-21/21-22 SIP: 74-49
HP: 2291-2284 BHT: 138 deg. F

7:00 AM at 4660' on 7-11-2013

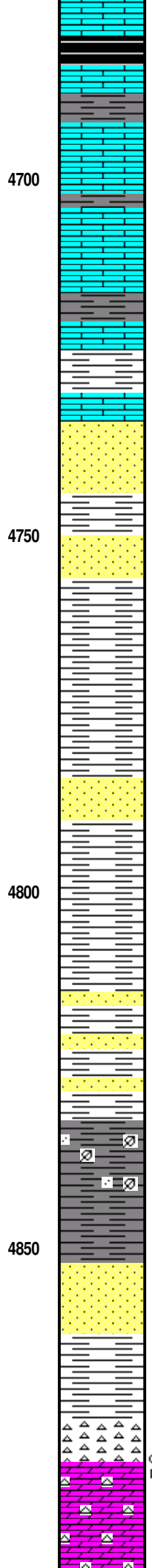
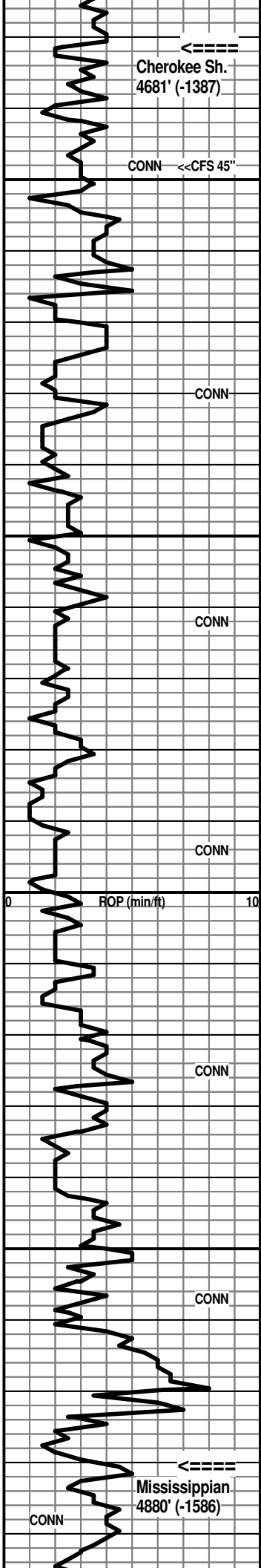
Morgan Mud Check at 4660'

8:15 AM on 7-11-2013
wt vis wl pH chl
9.2 90 5.2 11.0 700
PV YP GelS lcm solids

70' spl - flood Ls: mix tan, lt brn, lt gray cryptoxln; lesser offwhite dense and gray granular
80' spl - Ls: mix AA with med to dark brn cryptoxln; Sh: strong influx dark red-brn, med to dark gray, calcar.; some med gray dense, very shaly Ls
90' spl - Sh: abund. dark red-brn AA, some dark maroon; Ls med brn cryptoxln and med brn granular, NVP, N.S.
4500' spl - Ls: good influx med brn, lt gray, gray-brn cryptoxln to granular IP; offwhite, tan mic-fnxln sl gran. with micxn matrix; scatt. subchalky
10' spl - flood Ls: lt to med brn, lt gray predom. cryptoxln, NVP, N.S.
20' spl - Ls's AA; influx Sh: dark red-brn and maroon-brn
30' spl - Sh: incr. % of red-brn; Ls: various cryptoxln and granular AA; some mottled red granular to cryptoxln, shaly IP
40' spl - Ls: flood lt to med gray vfxln dense, shaly; Sh: common gray calcar. with red-brn and influx of brick red
50' spl - Sh: becoming dominant, lt to med gray calcar., some gray-green; decr. % Ls: mottled lt gray granular and gray vf-cryptoxln
60' spl - Sh: lt to med gray, red-brn, abund. maroon, brick red, gray-green; Ls: minor % of mottled tan/yellow/gray gran.
70' spl - Sh: influx dark red-brn, silty and vf sandy, finely micac.; other brick red and lt to med gray; occ lt gray vvfq shaly Sst, N.S.
80' spl - Sh: AA decr. %; Ls: good influx tan, lt gray granular, NVP; lesser lt gray, gray-brn cryptoxln and offwhite subchalky
90' spl - flood Ls: lt to med gray dense, silty to sl shaly, NVP, N.S.
4600' spl - Ls: lt gray, offwhite vfxln dense, silty, shaly IP
10' spl - Sh: flood dark gray to black carbon., subfissile
20' spl - Sh: red-brn, maroon-brn, med to dark gray, brick red; Ls: mix tan, lt brn vf-cryptoxln and tan sl granular, NVP; sl influx offwhite, lt brn vf-cryptoxln, poor vis. por. with dark brn to black pp stain, vsl show dark brn to black oil on break, no odor, patchy to sat. stain in dry spls
30' spl - flood Ls: tan vf-cryptoxln, faintly ool. IP with spar matrix; some offwhite subchalky and lt to med gray cryptoxln, N.S.
CFS 4630' 30" spl - Ls: lt to med brn cryptoxln and med gray dense, shaly; Sh: good influx med to dark gray, some black fissile, trace fusulinids
40' spl - decr. Sh %; Ls: flood tan, lt gray cryptoxln and offwhite, lt gray mic-vfxln dense, subchalky to white chalky, NVP, N.S.
50' spl - Ls: flood lt to med gray dense, silty and shaly, NVP, N.S.
60' spl - Ls: AA
CFS 4660' 30" spl - Ls: med to dark gray vf-cryptoxln; Sh: flood black carbon., fissile; 60" spl - Sh: AA; Ls: incr. med to dark gray vf-cryptoxln; some lt brn cryptoxln to sl granular and some offwhite, lt gray mic-vfxln dense, N.S.
80' spl - Sh: dark gray to black; Ls: tan, lt gray, lt brn granular to cryptoxln, poor to NVP, N.S.; occ bryozoan foss. fragments
90' spl - flood Ls: lt gray, lt brn vf-cryptoxln; sl mottled tan, lt brn gran. with micxn matrix; abund. offwhite subchalky



Cherokee Sh. 4681' (-1387)



to chalky

98' spl - not caught

CFS 4698' 20" spl - Sh: med to dark gray, black, some red-brn; Ls: mix lt to med brn, lt gray cryptoxln and offwhite mic-vfxln dense, subchalky; 45" spl - Ls: good influx med to dark brn mottled gran. to cryptoxln, NVP, N.S.; incr. red-brn shale

10' spl - Ls: mix AA; Sh: med to dark gray, black, red-brn and maroon

20' spl - very minor shale; Ls: various lt to med brn, tan, lt gray cryptoxln to granular; lesser offwhite mic-vfxln subchalky

30' spl - Ls: mix AA with sl incr. Sh: med to dark gray, some maroon

40' spl - mix Ls's AA; Sh: minor % med to dark gray, dark red, dark maroon and purple; trace sst

50' spl - decr. Ls's AA, still common; Sh: good influx vc gray, red-brn, maroon, purple; Sst: sl influx lt to med red fg, calcar, IP, some f-gd inter granular por., N.S.

60' spl - flood Sst: coarse to very coarse, ang. to subrnd, loose grains, lt gray, yellow, orange, offwhite, transl to opq; lesser clusters fn-med grnd, N.S.; abund. multi-colored shales AA, occ dark yellow

70' spl - mix loose grains and sst clusters AA with abund. multi-colored shales; Ls: scatt. lt gray, lt brn cryptoxln

80' spl - predom. Sh: red-brn, maroon, purple, mottled maroon-green; decr. loose sand grains; Ls: incr. % lt gray, tan, lt brn cryptoxln

90' spl - Sh: multi-colored AA; Sst: influx red-brn, tan, offwhite vfg dirty, shaly; occ tan fn-med grnd, N.S.; very scatt. Ls

4800' spl - Sh: predom. red-brn, maroon and purple, some finely sandy; rare coarse qtz grains, scatt. tan, offwhite clusters, N.S.

10' spl - Sh: predom. maroon, purple, red-brn, some red-brn sandy; scatt. coarse to very coarse qtz grains

20' spl - Sh: influx lt gray, lt gray-green, dark yellow, other multi-colored AA with scatt. qtz grains; Ls: sl incr. med brn smooth cryptoxln

30' spl - flood red-brn fg shaly Sst and dark maroon shaly Sst; some tan, brn fg Sst, N.S.; multi-colored shales AA

40' spl - very predom. multi-colored shales; occ lt green fg Sst, sl glauc. and pyritic; occ tan vf-fg Sst, N.S.

50' spl - Sh: strong influx lt to med gray, some carbon. material, med to dark gray and black; scatt. Sst and coarse qtz grains

60' spl - Sh: predom. vc gray to black, sandy IP; Ls: scatt. gray vfxln, shaly; Sst: very minor fg shaly

70' spl - Sh: predom. med to dark gray, some black and dark maroon; Sst: good influx offwhite fg, sl glauc. tight to friable, sl micac., silica cement, some very shaly, N.S.

80' spl - predom. Sh: vc gray, black, dark red, dark maroon, brick red, purple, occ yellow; Sst: scatt. clusters AA, scatt. loose coarse grains; minor dark gray and offwhite dense Ls

90' spl - influx Chert: tan, yellow fresh, limy IP, some vug. por.; some white weath. with pp por., N.S.; occ cream sl weath. with black gilsonite specks, no odor, nfo, weak cut; occ Dolo: tan cryptoxln, cherty NVP, N.S.

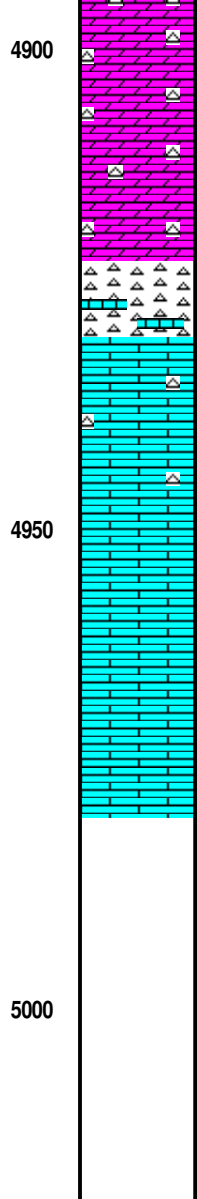
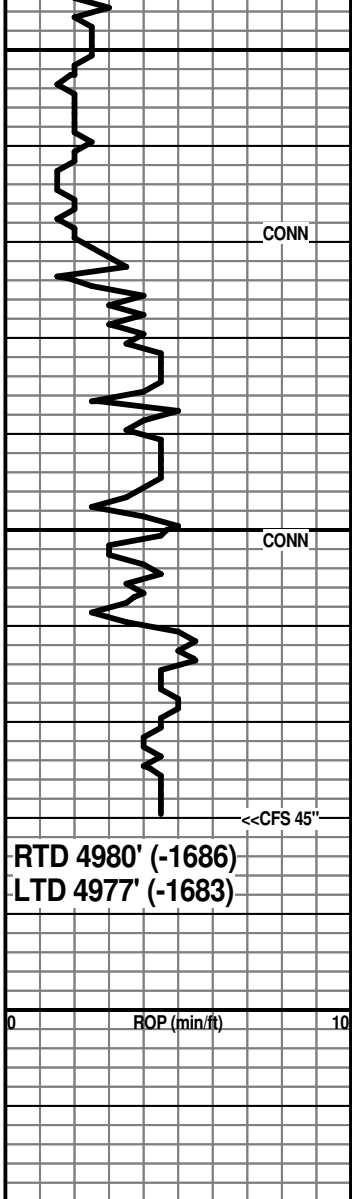
4900' spl - >>>>

10' spl - >>>>

20' spl - flood Dolo: tan, offwhite vfxln, vf sucrosic: with

Mississippian 4880' (-1586)

4900' spl - Dolo: influx lt gray vf-cryptoxln, NVP, N.S.; some offwhite, tan finely sucrosic, N.S.; with tan, brn and yellow fresh chert, trace tan oolitic chert; some Ls: sl mottled tan med granular



20' spl - flood Dolo tan, offwhite vxn, v. sucrosic, with offwhite soft weath. and fresh cherts

30' spl - Dolo: AA with good influx Chert: offwhite, opq sharp; lt gray subopq, common offwhite weath., N.S.

40' spl - predom. Chert: offwhite, lt gray opq, fresh; much decr. Dolo; influx Ls: med to dark brn cryptoxln

50' spl - flood Ls: med to dark brn cryptoxln, mottled IP, NVP, N.S.; scatt. offwhite chert

60' spl - Ls: AA, some offwhite dense; occ chert

70' spl - Ls: influx dark brn cryptoxln

80' spl - Ls: dark brn cryptoxln AA; some offwhite micxn, subchalky and tan fn granular with offwhite micxn matrix, N.S.

CFS 4980' spls - Ls: flood offwhite chalky; lesser tan, lt brn granular, NVP, N.S.

Because of the positive results of DST's 3 through 5; 5 1/2" casing was set for completion.

Respectfully submitted,

Wesley D. Hansen
Petroleum Geologist
Kansas License No. 418

10' spl - flood Chert: offwhite, tan, yellow, fresh, opq; some white weath., N.S.; Dolo: tan, offwhite, lt gray fn-vfxln sucrosic, N.S.; some Ls: tan, offwhite micxn to fn granular, NVP, N.S.

7:00 AM at 4980' on 7-12-2013

RTD reached at 5:00 AM on 7-12-2013
CFS 45" - short trip 10 stands - CTCH for 1 1/2 hours - drop survey - TOFL

Deviation at 4980' was 2 deg.