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

MURFIN DRILLING COMPANY, INC.
WICHITA, KANSAS

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

Well Name:	Murfin Drilling Co., Inc. #1-1 Mary Ann		
Location:	330' FNL, 630' FWL of Section 1-1S-36W		
License Number:	API: 15-153-20929	Region:	Rawlins County, KS
Spud Date:	7-16-2013	Drilling Completed:	7-24-2013
Surface Coordinates:	330' FNL, 630' FWL of Section 1-1S-36W		
Bottom Hole Coordinates:	Vertical hole		
Ground Elevation (ft):	3171'	K.B. Elevation (ft):	3181'
Logged Interval (ft):	3490' To: RTD	Total Depth (ft):	4475'
Formation:	Marmaton at RTD		
Type of Drilling Fluid:	Chemical - Displaced at 3362'		

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 222' w/190 sx
Production Casing: 5 1/2" set at 4469' w/450 sx

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

DST's by: Trilobite - Sam Esparza was the tester

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

Deviation Surveys: 1/2 deg. @225'; 1 deg. @ 1272'; 1 deg. @ 3619'; 1 deg. @ 4170'; 1 deg. @ 4475'

Bit #	Size	MFG	Type	Depth Out	Footage Cut	Hours on bit
1	12 1/4"	HTC	rerun	225'	225'	3
2	7 7/8"	HTC	DP506F	3619'	3394'	30 3/4
3	7 7/8"	HTC	GXR20C	4475'	856'	42 1/2

FORMATION TOPS AND STRUCTURAL COMPARISON

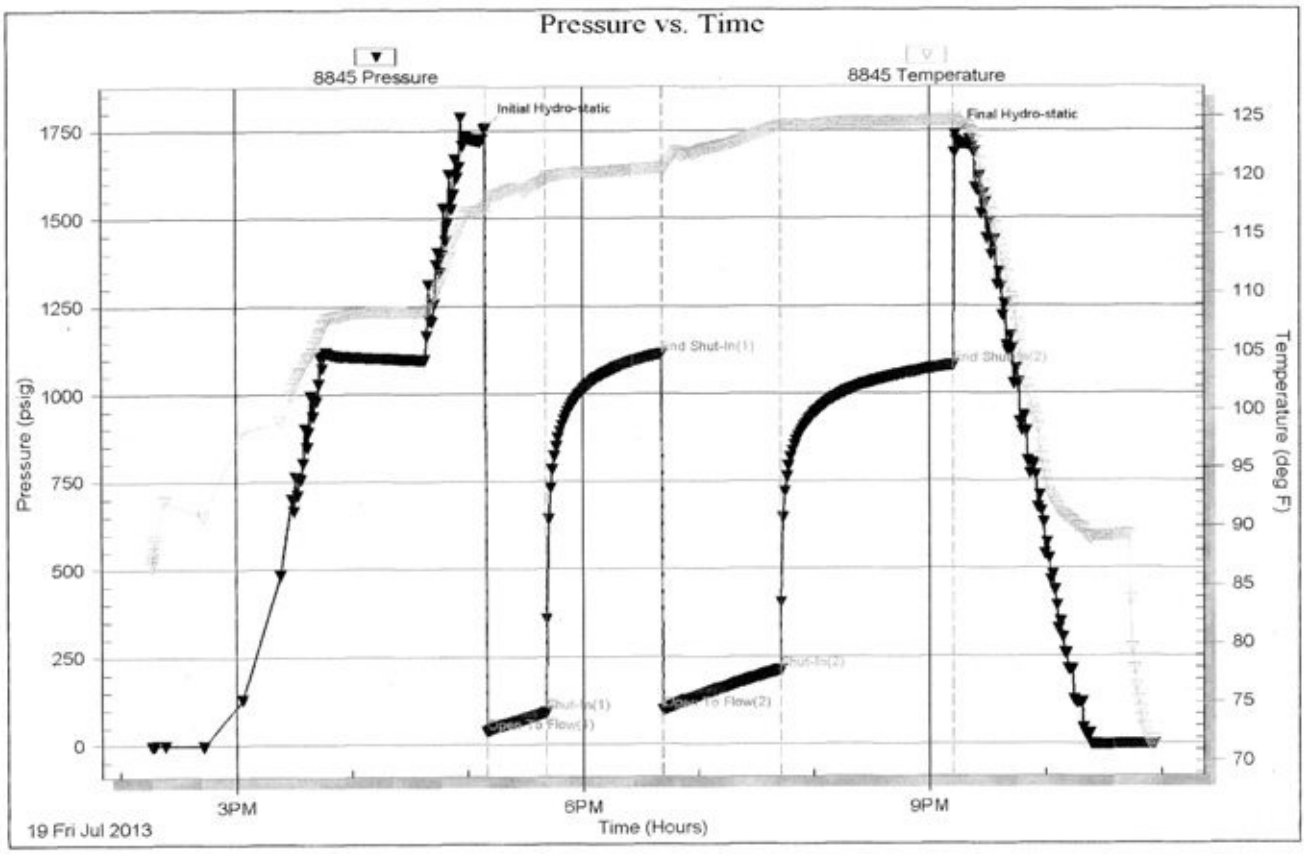
FORMATION	SAMPLE TOPS		LOG TOPS		COMPARISON WELLS
	Depth	Datum	Depth	Datum	Berexco LLC Cheryl #15-31 31-1N-35W Hitchcock County, NE 3136' KB
Anhydrite	3112'	+69	3114'	+67	-3
B/Anhydrite	3146'	+35	3146'	+35	+3
Neva	No call PDC bit		3592'	-411	-1
Red Eagle	3658'	-477	3656'	-475	-1
Foraker	3703'	-522	3702'	-521	-2
Topeka	3915'	-734	3918'	-737	-10
Oread	4032'	-851	4032'	-851	-11
Lansing	4137'	-956	4135'	-954	-8
Stark Shale	4351'	-1170	4348'	-1167	-9
BKC	4406'	-1225	4407'	-1226	-16
RTD	4475'	-1294			
LTD			4474'	-1293	

DRILL STEM TESTS

DST No. 1 Foraker
Interval: 3672'-3720'
Times: 30-60-60-90
Recovery: 210' OCM (5o, 95m); 180' WCM (40w, 60m), chl. 36,000, system 500
FP: 36-91/98-212 SIP: 1114-1079
HP: 1757-1735 BHT: 125 deg. F

IFP: tool slid 5'; blow bldg. to 5 1/4"
ISIP: no return blow
FFP: weak blow bldg. to 6 3/4"
FSIP: no return blow

Serial #: 8845 Outside Murfin Drilling Company, Inc. Mary Ann #1-1 DST Test Number: 1



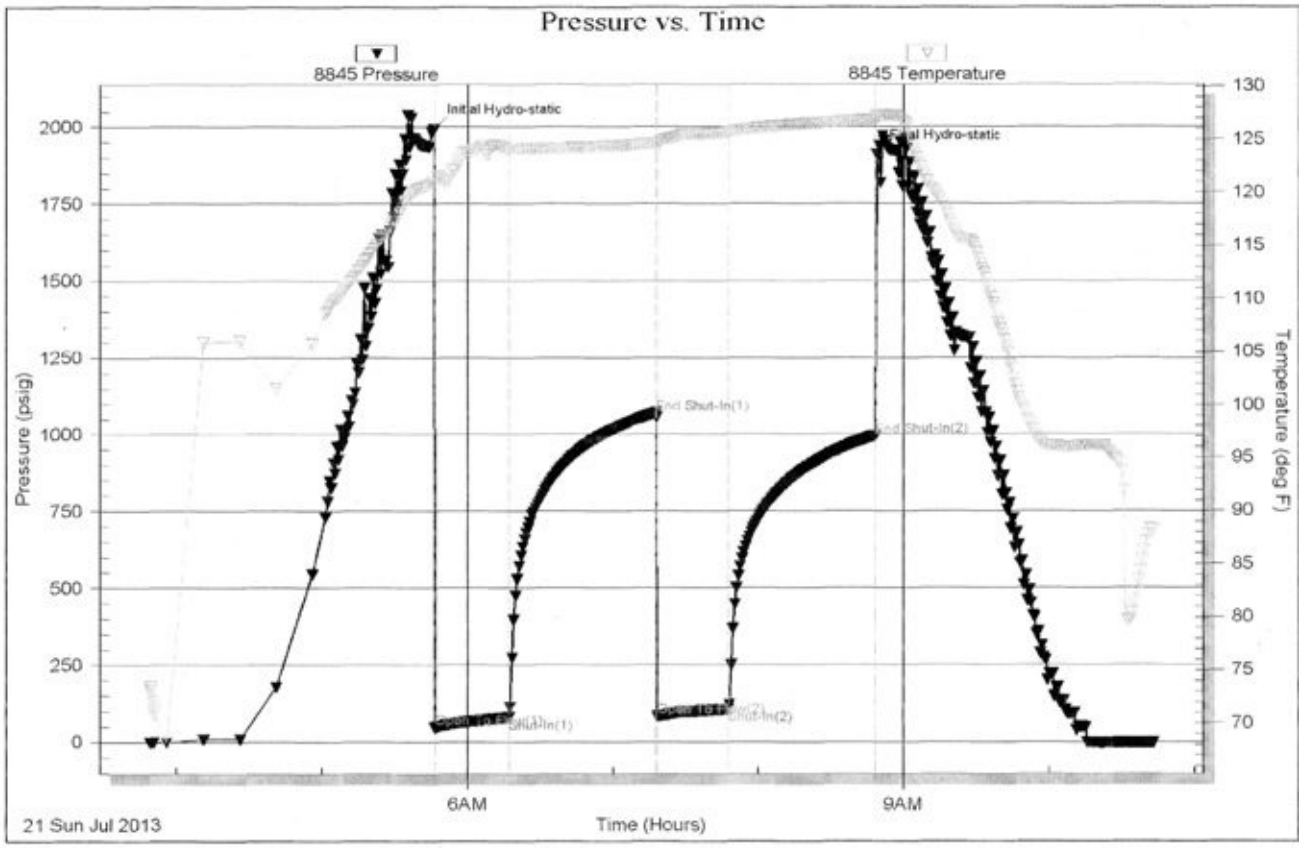
Triobite Testing, Inc Ref. No: 52805 Printed: 2013.07.19 @ 23:10:29

DRILL STEM TESTS

DST No. 2 Lansing "A"
Interval: 4056'-4170'
Times: 30-60-30-60
Recovery: 180' mud with oil spots
FP: 45-79/83-106 SIP: 1071-995
HP: 1993-1910 BHT: 127 deg. F

IFP: slid 8', 2" blow, died back to 3/4"
ISIP: no return blow
FFP: weak surface blow
FSIP: no return blow

Serial #: 8845 Outside Murfin Drilling Company, Inc. Mary Ann #1-1 DST Test Number: 2



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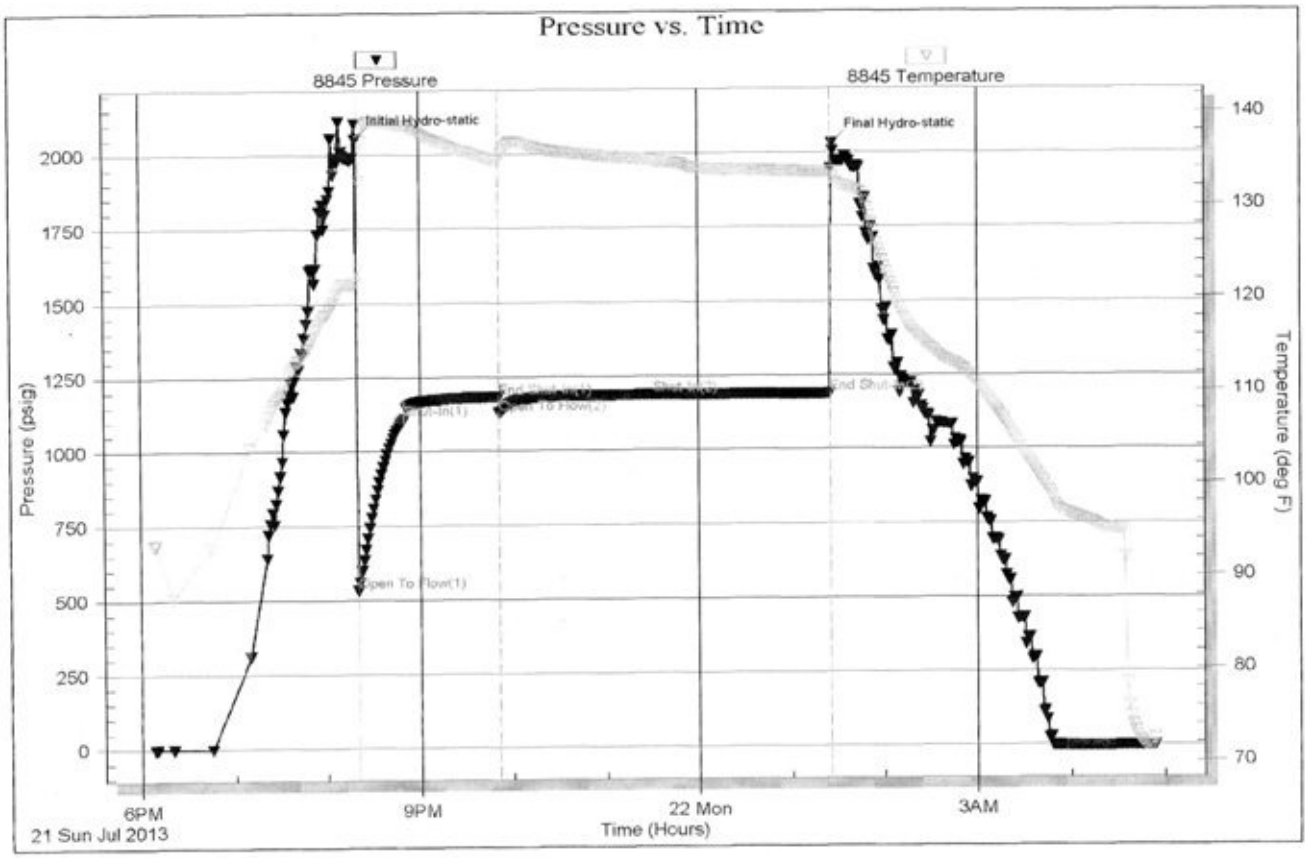
DRILL STEM TESTS

DST No. 3 Lansing "D"
Interval: 4156'-4200'
Times: 30-60-90-120
Recovery: 130' O&WCM (20o,10w, 70m); 475' O&WCM (5o, 45w, 50m); 1045' O&MCW (5o, 20m, 75w); 950' W, chl 20,000
FP: 530-1112/1128-1187 SIP: 1183-1188
HP: 2049-2028 BHT: 134 deg. F

IFP: strong blow, B.O.B. in 1 minute
ISIP: 1/4" return blow, died in 40 minutes
FFP: strong blow, B.O.B. in 2 1/2 minutes, died back to 10" blow
FSIP: no return blow



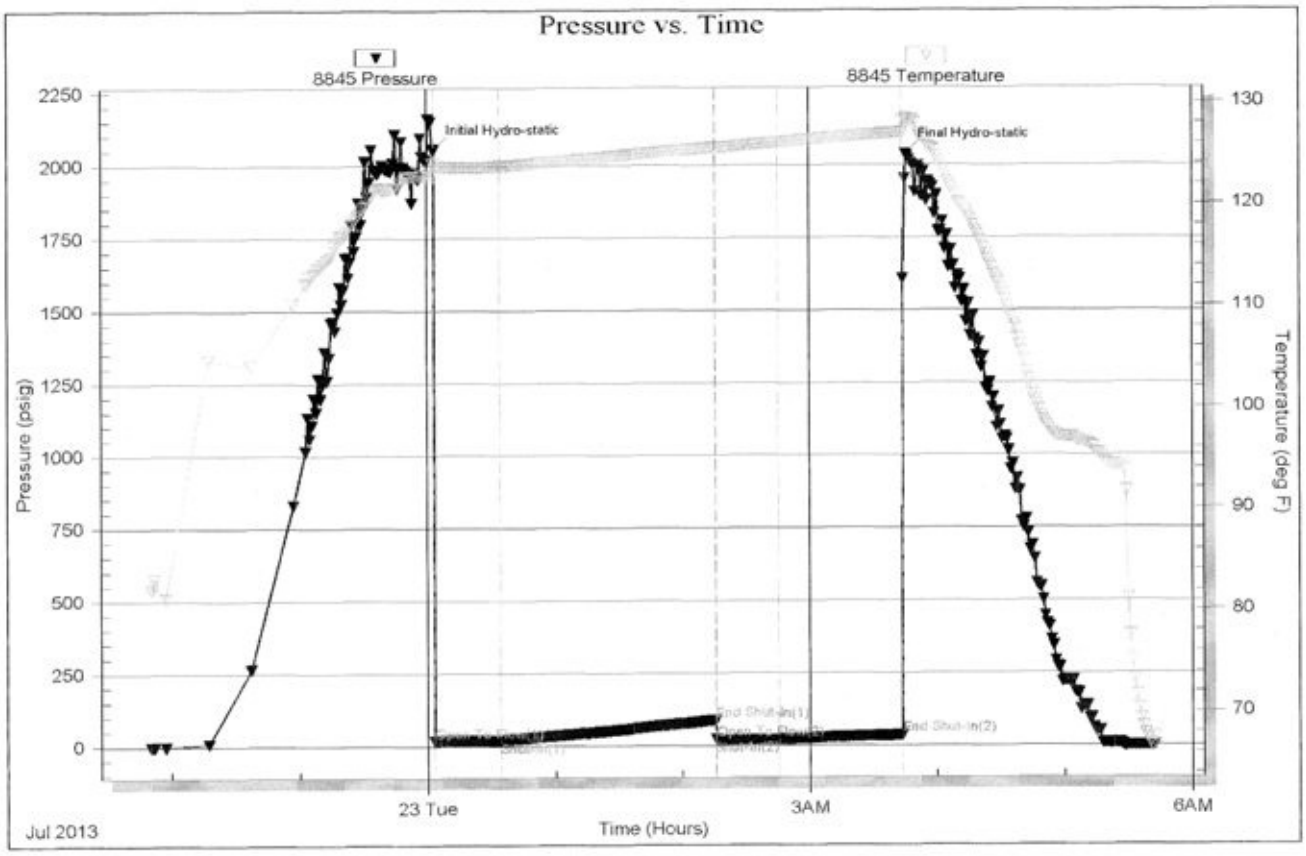
Trilobite Testing, Inc Ref. No: 52807 Printed: 2013.07.22 @ 05:15:03

DRILL STEM TESTS

DST No. 4 Lansing "G"-"H"-"I"
Interval: 4202'-4320'
Times: 30-90-30-60 (tester error on ISIP)
Recovery: 5' mud
FP: 17-19/22-20 SIP: 88-35
HP: 2054-2036 BHT: 127 deg. F

IFP: tool slid 10', 1/2" blow, died back to weak surface blow
ISIP: no return blow
FFP: no blow
FSIP: no return blow

Serial #: 8845 Outside Murfin Drilling Company, Inc. Mary Ann #1-1 DST Test Number: 4

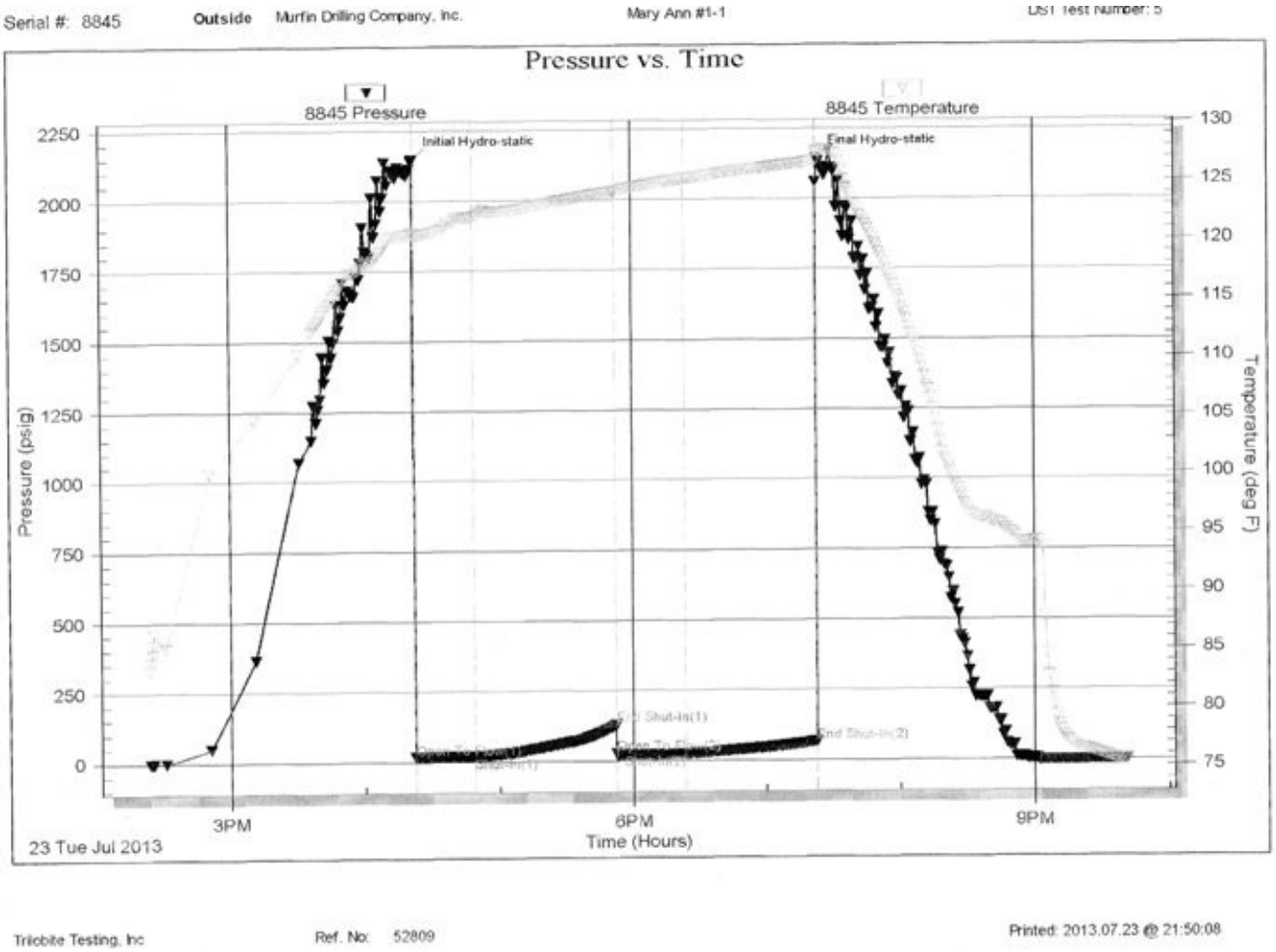


Trilobite Testing, Inc Ref. No: 52808 Printed: 2013.07.23 @ 05:53:15

DRILL STEM TESTS

DST No. 5 Lansing "J"
Interval: 4308'-4360'
Times: 30-60-30-60
Recovery: 5' mud with oil spots
FP: 15-19/26-23 SIP: 129-64
HP: 2143-2139 BHT: 127 deg. F

IFP: weak surface blow, died in 20 minutes
ISIP: no return blow
FFP: no blow
FSIP: no return blow



ROCK TYPES

Anhy	Salt	Dol	Shlyslts
Cht	Shale	Dtd	Sltysh
Coal	Shcol	Gry sh	Sdy dolo
Congl	Shgy	Sandylms	Silty dolo
Gyp	Sltst	redshale	Shy dolo
Ls colorless	Ss	Shale	Shaly ls
Lmst	Carb sh	Sltstn	

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
- Brecfrag
- 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
- Slty

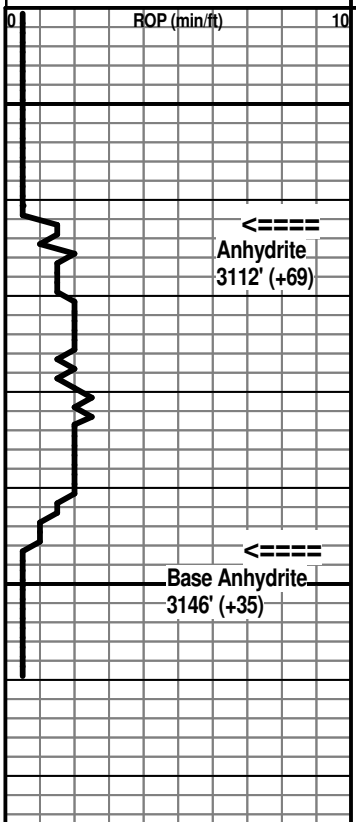
STRINGER
- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Sltstrg
- Ssstrg
- Carbsh
- Clystn
- Dol
- Grysh
- Gryslt
- Lms
- Sandylms
- Sh
- Sltstn

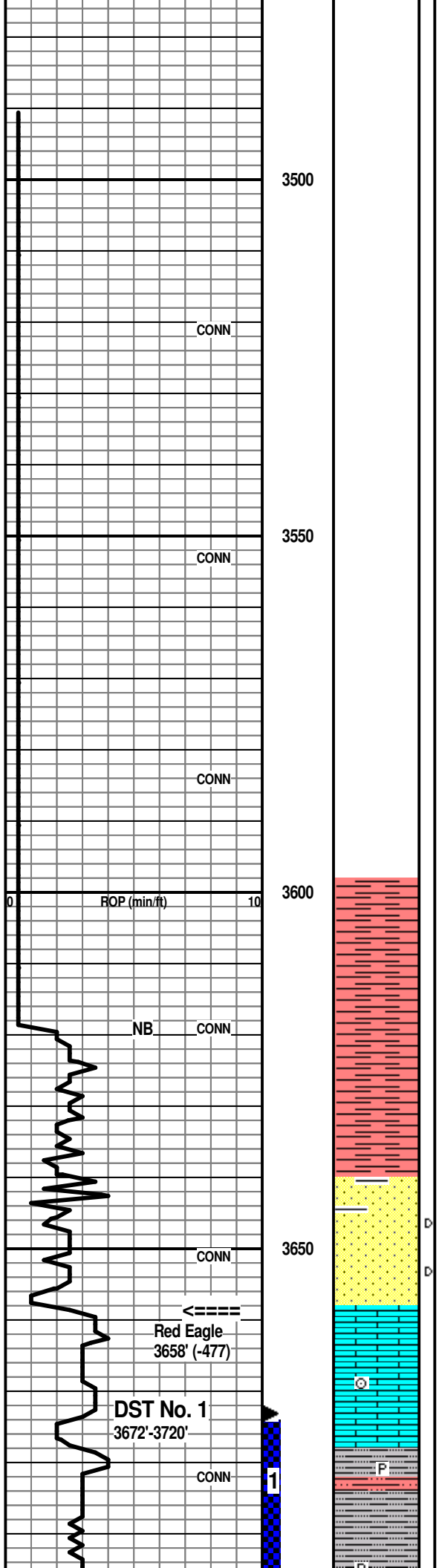
OTHER SYMBOLS

INTERVALS
- Core
- Dst
- Dst

EVENTS
- Rft
- Dst top/base

OIL SHOWS
- Even
- Spotted
- Quest.
- Trace
- Dead
- Gas show

Curve Track 1 ROP (min/ft)	Depth	Lithology	Oil Shows	Geological Descriptions	Remarks
	3100 3150				Anhydrite 3112' (+69) Base Anhydrite 3146' (+35) **Report Depth & Activity** 7-16-2013 MIRT, Spud at 6:30 PM 7-17 WOC @ 225' 7-18 Drlg. @ 2325' 7-19 Drlg. @ 3670' 7-20 Drlg. @ 3830' post DST No. 1 7-21 DST No. 2 @ 4170'



7-22 TIHWB post DST No. 3 @ 4200'
7-23 TIHWB post DST No. 4 @ 4320'
7-24 Drlg. @ 4450'
7-25 RTD @ 4470', logging completed, decision made to run casing

Sh: red soft to firm and silty; scatt. lt gray med grnd Sst, N.S.

Bit trip at 3619' pulled PDC
Deviation 1 deg.
Geologist on location

Sh: AA

Sh: AA

60' spl - flood Sst: offwhite, lt gray vvfg, silty, vsl dolomitic with dead black gilsonite specks, milky cut, no odor, nfo

70' spl - flood Ls: mix lt gray vf-cryptoxln; tan mic-fnxln with poor pp por. and offwhite mic-vfxln dense, subchalky, N.S.

Red Eagle 3658' (-477)

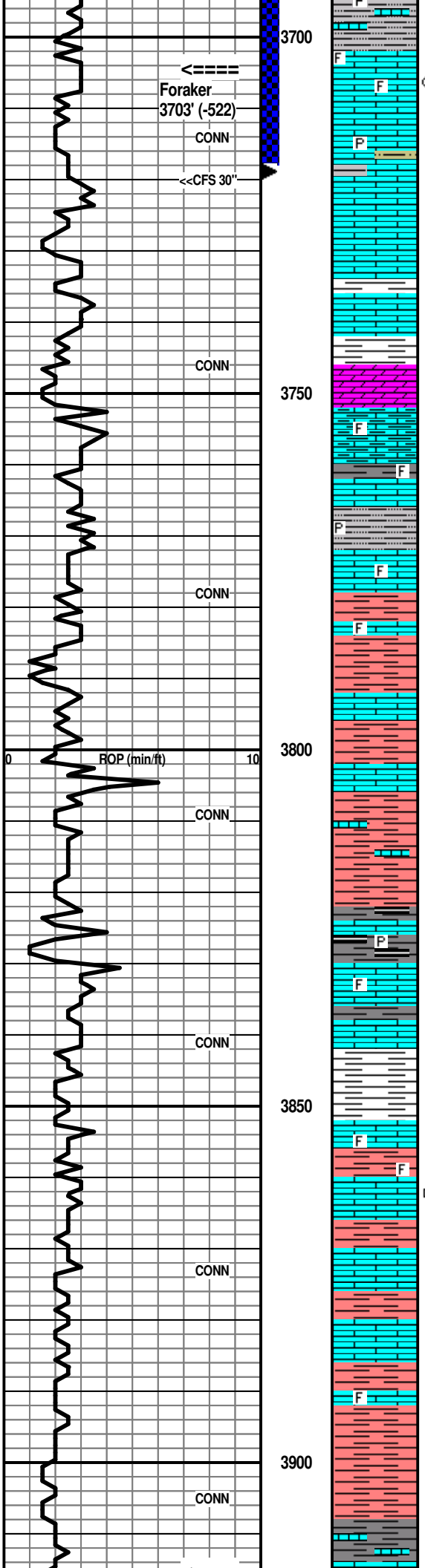
80' spl - Ls: predom. lt gray, tan vf-cryptoxln and tan mic-fnxln with pp por., scatt. crinoid fragments

7:00 AM at 3670' on 7-19-2013

90' spl - decr. Ls % AA; influx Sh: lt to med gray, silty and red-brn silty; sl influx Siltst: lt gray, offwhite finely micac.; scatt. silty pyrite

DST No. 1 Foraker
Interval: 3672'-3720'
Times: 30-60-60-90
IFP: tool slid 5'; blow bldg. to 5 1/4"
ISIP: no return blow
FFP: weak blow bldg. to 6 3/4"
FSIP: no return blow
Recovery: 210' OCM (5o, 95m); 180' WCM (40w, 60m), chl. 36,000, system 500
FP: 36-91/98-212 SIP: 1114-1070

3700' spl - flood Siltst: offwhite, lt gray finely micac., N.S.



10' spl - predom. Siltst AA, some finely pyritic; Ls: sl influx tan, cream, lt brn vfxln dense, N.S.

20' spl - Ls: various dense AA with good influx tan., lt brn granular, very foss. with poor inter-particle por. with vsl odor, vsl sfo, patchy to sat. med to dark brn live stain; some offwhite chalky with dead black stain

CFS 3720' 15" spl - Ls: flood tan, lt brn with shows AA; vsl influx gray shaly pyrite and pyrite; 30" spl - Ls: decr. shows AA; more tan, lt brn vfxln dense; influx Sh: lt gray with lt gray, offwhite Siltst, N.S.

30' spl - trashy; Sh: gray and red-brn; Ls: tan, lt gray mic-vfxln dense; lesser offwhite chalky, soft; 40' spl - Ls: flood lt gray, lt brn predom. vfxln, NVP; lesser lt gray, tan fn-vfxln with some poor interxln por., N.S.

50' spl - Ls: various gray, tan, lt brn AA

60' spl - Ls: mix AA with influx lt brn, gray-brn vf-cryptoxln; Dolo: sl influx tan, lt brn vfxln with interxln and some vug. por., N.S.; some gray shale

70' spl - Ls: good influx med gray foss. and shaly, NVP, N.S.; Sh: med to dark gray foss.

80' spl - Ls: good influx tan fn granular and lt to med brn vf-cryptoxln; Sh: some lt to med gray; some offwhite Siltst; scatt. pyrite

90' spl - Ls: tan, lt brn fn-vfxln foss. IP, poor to NVP; offwhite mic-vfxln dense, subchalky IP; Sh: fair influx soft lt to med red

3800' spl - Sh: lt to med red, lt to med gray; beds of Ls: tan, offwhite, lt gray foss. IP, N.S.

10' spl - Sh: flood red-brn; thin Ls beds AA

20' spl - predom. red-brn shale AA; Ls: incr. offwhite, lt gray vf-cryptoxln

30' spl - Sh: very predom. red-brn; beds dense Ls

40' spl - Sh: red-brn AA with some med to dark gray, trace black fissile; Ls: thin lt gray cryptoxln; scatt. pyrite

50' spl - Sh: good influx med to dark gray; Ls: tan, med brn, gray vf-cryptoxln, foss. IP, N.S.

60' spl - Sh: red-brn, brick red, med gray, trace maroon; Ls: tan, gray, yellow-brn vf-cryptoxln

70' spl - Ls: good influx sl mottled tan, lt brn granular, foss. IP, gen. poor to NVP, N.S.; much decr. shale %

80' spl - Ls: sl mottled AA; some tan, lt brn, lt gray vf-cryptoxln, NVP; some tan, offwhite mic-fnxln with dead black gilsonite flecks, no odor, nfo,

90' spl - Ls: predom. tan, lt brn granular, NVP; lesser vf-cryptoxln; Sh: sreaks red-brn and brick red

3900' spl - Ls: influx lt to med brn cryptoxln, lt gray sl granular, and offwhite, tan mic-vfxln dense, subchalky IP; decr. shale %

10' spl - Ls: predom. tan, offwhite granular, foss. IP, poor to NVP; with med to dark gray and red-brn shales

20' spl - flood Sh: red-brn

30' spl - Sh: predom. red-brn with sl influx med gray; Ls: sl incr. % of tan, lt brn, lt gray granular

FP: 36-91/98-212 SIP: 1114-1079
HP: 1757-1735 BHT: 125 deg. F

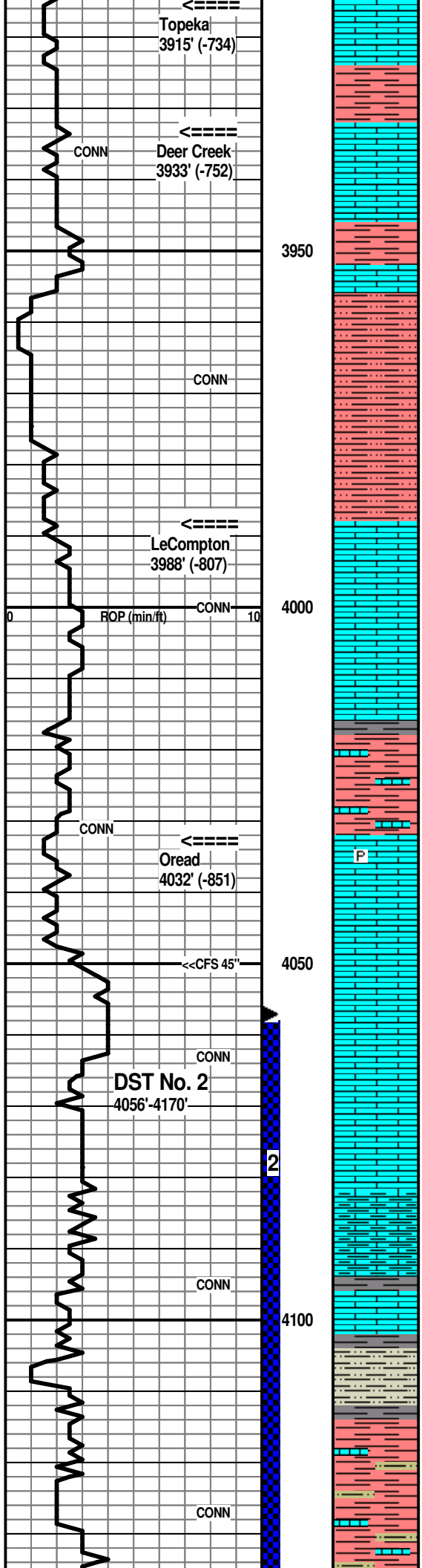
Foraker 3703' (-522)

Morgan Mud Check at 3720'
12:05 PM on 7-19-2013

wt	vis	wl	pH	chl
8.8	60	5.2	10.5	500

PV	YP	GelS	lcm	solids
20	24	6/20	4#	3.6%

7:00 AM at 3830' on 7-20-2013



40' spl - Ls: influx lt to med brn, lt gray smooth cryptoxln, some tinted with yellow or red; some lt gray granular, tinted with yellow, N.S.

50' spl - Ls: decr. various cryptoxln AA; some offwhite mic-vfxln dense, subchalky; Sh: good influx red-brn, brick red

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

70' spl - Ls: mix AA; incr. Sh: red-brn with good influx lt red-maroon

80' spl - decr. shale %; Ls: sl to fair influx tan granular and offwhite subchalky to chalky, N.S.

90' spl - flood Sh: red-brn silty to vvfg sandy IP; some lt gray and tan cryptoxln Ls

4000' spl - very predom. Sh: red-brn silty and vvfg sandy IP; minor Ls

10' spl - Ls: good influx red and pink tinted vfxln and very calcar. red and pink shale

20' spl - red and pink tinted Ls AA with red-brn shales; scatt. lt gray and tan cryptoxln Ls

30' spl - decr. tinted Ls's and shales AA; influx lt gray, lt brn cryptoxln Ls

40' spl - lt to med red shale with Ls: incr. lt gray, lt to med brn, occ red-brn cryptoxln

50' spl - Sh: AA; Ls: good influx tan, offwhite, gray granular with tarry stain, no odor, nfo, pyritic IP; trace tan granular with good inter-particle and vug. por. with spotty brn stain, sfo

CFS 4050' 20" spl - Ls: flood tan mic-fnxln with pp por., and tan, lt gray cryptoxln; some white chalky, N.S.; 45" Ls: flood tan, lt gray cryptoxln and tan, offwhite with pp por.; occ white chalky, N.S.

60' spl - Ls: tan, lt gray cryptoxln; lesser offwhite mic-vfxln dense

70' spl - Ls: cryptoxln AA; good influx offwhite, lt gray mic-vfxln dense, subchalky IP

80' spl - Ls: good influx lt to med gray, gray-brn cryptoxln; trace brn opq chert

90' spl - Ls: lt to med gray, med brn, gray-brn with lesser offwhite, lt gray mic-vfxln dense

4100' spl - Ls: lt to med gray vf-cryptoxln, gen. shaly; Sh: med gray very calcar.

10' spl shaly Ls and calcar. gray shale AA; sl influx Ls: med to dark brn and gray-brn cryptoxln with sl influx lt gray, offwhite mic-vfxln dense

20' spl - Ls: lt to med gray, lt to med brn vf-cryptoxln, shaly IP; lesser offwhite, lt gray mic-vfxln dense

30' spl - much decr. Ls%; Siltst: good influx offwhite, lt gray vvfg sandy and calcar.; Sh: some med to dark gray

40' spl - flood Sh: red-brn, minor gray; much decr. Siltst AA; scatt. med gray cryptoxln Ls

50' spl - Sh: AA still common; Ls: med brn and gray cryptoxln, NVP, N.S,; fair influx med brn cryptoxln with vug. por. with dark brn stain, vsl sfo, no to poss. ft odor

Topeka 3915' (-734)

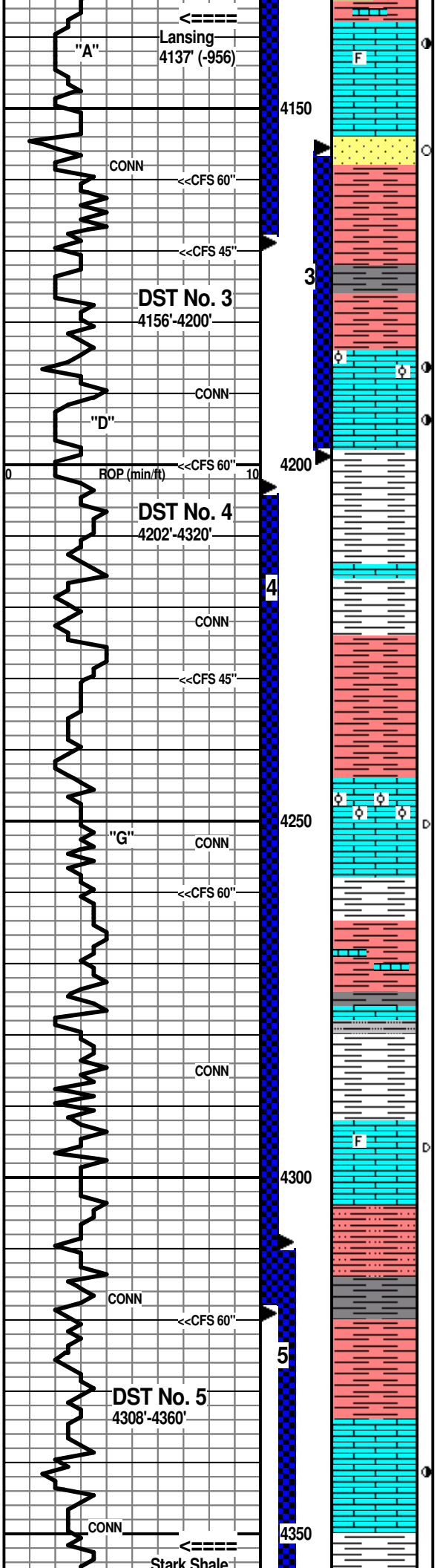
Morgan Mud Check at 3925'
10:15 AM on 7-20-2013

wt	vis	wl	pH	chl
9.0	48	6.4	9.5	800
PV	YP	GelS	lcm	solids
14	22	5/18	4#	5.0%

Oread 4032' (-851)

DST No. 2 Lansing "A"
Interval: 4056'-4170'
Times: 30-60-30-60
IFP: slid 8', 2" blow, died back to 3/4"
ISIP: no return blow
FFP: weak surface blow
FSIP: no return blow
Recovery: 180' mud with oil spots
FP: 45-79/83-106 SIP: 1071-995
HP: 1993-1910 BHT: 127 deg. F

Lansing 4127' (-956)



60' spl - Ls: flood lt brn cryptoxln, NVP, N.S.; lesser offwhite mic-vfxln dense, subchalky IP

CFS 4160' 30" spl - Ls: abund. various cryptoxln AA; incr. offwhite dense, subchalky; scatt. tan, lt brn cryptoxln with good vug. and fossil moldic por. with lt brn stain, fair-gd sfo, some irreg. shaped and listless, vsl sg; Sst: sl influx lt gray, tan vvfg, N.S.; 60" spl - predom. Ls: lt to med brn cryptoxln; lesser offwhite dense AA; Sst: occ offwhite, lt gray, tan vvfg with trace lt brn oily scum; Sh: vsl influx red-brn; occ pyrite

70' spl - various Ls's AA

CFS 4170' 20" spl - flood Sh: red-brn soft, gummy; rare Sst AA; occ cryptoxln Ls; 45" spl - flood shale AA

80'/90' spls - Sh: red-brn, more firm with influx dark gray and gray-green

4200' spl - shaly AA; Ls: very sl influx offwhite, tan granular, sl oolitic with some inter-particle and vug. por. with pp brn stain, even fluor., fair-gd sfo on break, sl sg

CFS 4200' 30" spl - very shaly AA; Ls: tan, offwhite with shows AA; very common offwhite subchalky to chalky, N.S.; 60" spl - Ls: shows AA; common offwhite subchalky and tan, lt gray vf-cryptoxln, NVP, N.S.; Sh: red-brn with more med gray

10' spl - trashy; Sh: gray and red-brn; offwhite soft, gummy, clayey; Ls: some tan, lt gray, offwhite vf-cryptoxln; 20' spl - Sh: lt to med red-brn, lt to med gray, some gray-green; minor Ls: lt to med gray vfxln dense, shaly IP

30' spl - influx Ls: lt gray, lt brn predom. cryptoxln, occ sl granular; lesser offwhite micxln, foss. IP, NVP, N.S.; shales AA

CFS 4230' 20" spl - flood Sh: red-brn, lesser med gray, gray-green; very minor Ls: tan, gray vf-cryptoxln; trace med brn micro oolitic with spar matrix; 45" spl - Sh: red-brn soft, gummy to firm

40'/50' spls - Sh: flood red-brn soft, gummy to firm

60' spl - Ls: good influx tan, lt gray vf-cryptoxln, NVP; lesser offwhite mic-vfxln dense with dead black stain; some tan, lt brn oolitic, tight with poor inter-oolitic por. with pp brn stain, sl sfo on break, sat. stain in dry spls, no odor

CFS 4260' spls >>>>

70' spl - decr. Ls %; Sh: good influx red-brn, lt to med gray, gray-green

80' spl - flood Sh: lt to med red-brn, soft and gummy to firm; lesser med gray; Ls: lt gray vfxln dense and red tinted, shaly

90' spl - Sh: various red-brn AA, lt brn, med to dark gray; occ lt gray siltst; Ls: common lt gray, tan, brn mottled granular, NVP

4300' spl - shaly AA; Ls: some tan, lt brn vf-cryptoxln, poor to NVP with patchy to subsat. dead black stain, no odor, nfo; offwhite mic-vfxln with dead black stain

CFS 4300' spls >>>>

10' spl - very predom. Ls: lt gray, tan vf-cryptoxln; lesser tan, lt gray granular with scatt. dead stain

20' spl - very predom. Ls: various tan, lt gray, offwhite granular, gen. poor to NVP; Sh: sl influx red-brn, some med gray

CFS 4320' spls >>>>

30' spl - trashy; 40' spl - flood Sh: very predom. red-brn, soft, gummy to firm, scatt. hard limy shale to red-brn shaly Ls

50' spl - Ls: good influx offwhite, tan predom. cryptoxln with scatt. to common vug. por. with shows lt brn fo, sl sg, spotty to subsat. stain, no odor; Sh: common red-brn AA, decr. %

60' spl - flood Ls: offwhite mic-vfxln dense, subchalky IP, occ white chalky; lesser tan cryptoxln, NVP, N.S.

CFS 4360' 30" spl - Ls: influx lt to med gray vf-cryptoxln, NVP, shaly IP; Sh: med gray calcar., brick red, red-brn;

Lansing 4137' (-956)

DST No. 3 Lansing "D"
Interval: 4156'-4200'
Times: 30-60-90-120
IFP: strong blow, B.O.B. in 1 minute
ISIP: 1/4" return blow, died in 40 minutes
FFP: strong blow, B.O.B. in 2 1/2 minutes, died back to 10" blow
FSIP: no return blow
Recovery: 130' O&WCM (20o,10w, 70m); 475' O&WCM (5o, 45w, 50m); 1045' O&MCW (5o, 20m, 75w); 950' W, chl 20,000
FP: 530-1112/1128-1187 SIP: 1183-1188
HP: 2049-2028 BHT: 134 deg. F

7:00 AM at 4170' on 7-21-2013

Morgan Mud Check at 4170'
7:00 AM on 7-21-2013

wt	vis	wl	pH	chl
9.1	62	6.0	10.5	800

PV	YP	GelS	lcm	solids
19	21	9/21	4#	5.7%

7:00 AM at 4200' on 7-22-2013

Morgan Mud Check at 4200'
7:30 AM on 7-22-2013

wt	vis	wl	pH	chl
9.2	69	6.4	10.0	1,200

PV	YP	GelS	lcm	solids
20	24	10/29	4#	6.4%

DST No. 4 Lansing "G"-"H"-"I"
Interval: 4202'-4320'
Times: 30-90-30-60 (tester error on ISIP)
IFP: tool slid 10', 1/2" blow, died back to weak surface blow
ISIP: no return blow
FFP: no blow
FSIP: no return blow
Recovery: 5' mud
FP: 17-19/22-20 SIP: 88-35
HP: 2054-2036 BHT: 127 deg. F

DST No. 5 Lansing "J"
Interval: 4308'-4360'
Times: 30-60-30-60
IFP: weak surface blow, died in 20 minutes
ISIP: no return blow
FFP: no blow
FSIP: no return blow
Recovery: 5' mud with oil spots
FP: 15-19/26-23 SIP: 129-64
HP: 2143-2139 BHT: 127 deg. F

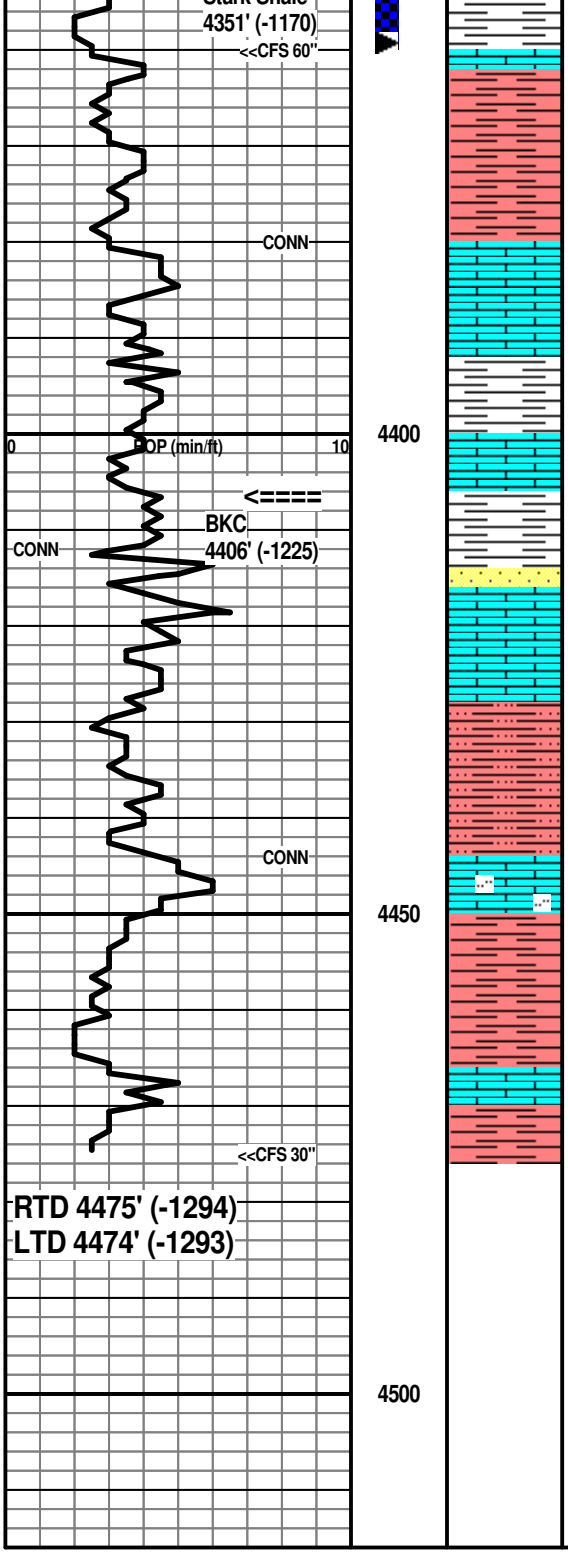
7:00 AM at 4320' on 7-23-2013

Morgan Mud Check at 4320'
7:15 AM on 7-23-2013

wt	vis	wl	pH	chl
9.1	62	6.0	11.0	1,200

PV	YP	GelS	lcm	solids
19	20	8/25	4#	5.7%

Stark Shale 4351' (-1170)



CFS 4500' spls >>>>

70' spl - trashy; predom. Sh: vc gray, red-brn, gray-green; minor lt gray cryptoxln Ls

80' spl - flood Sh: red-brn soft to firm, lesser med gray

90' spl - still very shaly AA; influx Ls: lt gray, offwhite vf-cryptoxln, NVP, N.S.

4400' spl - flood Ls: tan, lt gray cryptoxln and offwhite mic-vfxln dense, subchalky to chalky, N.S.

10' spl - Ls: lt gray, offwhite, tan cryptoxln, some mottled with maroon tint; Sh: red-brn, vc gray

20' spl - predom. Ls: tan, lt gray cryptoxln to sl granular, NVP, N.S.; decr. shale %

30' spl - Ls: tan, lt gray vf-cryptoxln, sl granular IP; vsl influx Sst: lt gray, lt red-brn vfg, very calcar., N.S.

40' spl - Ls: predom. lt gray, offwhite mic-vfxln dense, sl foss. IP, NVP, N.S.; Sh: influx red-brn, some med gray

50' spl - flood Sh: red-brn silty; very minor dense Ls

60' spl - flood Ls: predom. lt to med gray vf-cryptoxln, silty IP; lesser tan, lt brn fn granular, tinted with red-brn, NVP, N.S.

70' spl - flood Sh: various red-brn; much decr. Ls %

CFS 4475' spls - flood Sh: various red-brn, brn, some lt gray; scatt. dense Ls's, N.S.

After review of samples, DST results and open hole log evaluations, the decision was made to run pipe for further testing.

Respectfully submitted,

Wesley D. Hansen
Petroleum Geologist
Kansas License No. 418

60" spl - Sh: med to dark gray, red-brn, red-maroon; Ls: common offwhite, lt gray mic-vfxln dense; some gray dense, shaly; occ med gray, med brn cryptoxln

BKC 4406' (-1225)

7:00 AM at 4450' on 7-24-2013

Morgan Mud Check at 4464'
7:15 AM on 7-24-2013

wt	vis	wl	pH	chl
9.2	78	6.0	11.5	1,100
PV	YP	GelS	lcm	solids
20	29	12/30	4#	6.4%

RTD of 4475' was reached at 7:50 AM on 7-24-2013 - CFS 30" - short trip - CTCH 1.5 hours - TOFL