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GEOLOGIC REPORT LOG

COMPANY MURFIN DRILLING CO.

WELL JONES 'B' #1-9

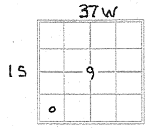
FIELD

LOCATION 710' FSL , 710' FWL

SEC 9 TWSP 1S RGE 37W

COUNTY CHEYENNE

STATE KANSAS



PRODUCTION:

ELEVATION:
KB 3253
DF
GL 3240

DRILLING MEASURED FROM

MUD COMPANY MORGAN MUD INC.
CONTRACTOR MURFIN DRLG CO. RIG #25
COMMENCED 13 DEC 2013 COMPLETED 2 JAN 2014

CASING RECORD:
SURFACE 8 5/8 @ 228' PRODUCTION
TOTAL DEPTH DRLS. 4835'
TOTAL DEPTH LOG 4833'

SAMPLES SAVED FROM 10' - 3560' TO RTD
DRILLING TIME KEPT FROM 1' - 3560' TO RTD
SAMPLES EXAMINED FROM 3560' TO RTD
GEOLOGICAL SUPERVISION FROM 3400' TO TOTAL DEPTH
DRILL STEM TESTS TRILOBITE TESTING
ELECTRICAL SURVEYS PIONEER LOGGING
DIL - ML
CNL - CDL
SONIC

FORMATION TOPS & STRUCTURAL POSITION

FORMATION	SAMPLE TOP	ELECTRIC LOG TOP	SUB-SEA DATUM	STRUCTURAL POSITION
ANHYDRITE - TOP	3212	3208	+45	+6
ANHYDRITE - BASE	3245	3240	+13	+6
NEVA	3665	3658	-405	+6
RED EAGLE	3729	3721	-468	+7
FORAKER	3776	3769	-516	+6
TOPEKA	3999	3995	-742	+3
OREAD	4133	4127	-874	+8
LANSING	4211	4213	-960	-1
STARK	4433	4428	-1175	+5
BKC	4488	4481	-1228	+8
MARMATON	4531	4523	-1270	+7
PAWNEE	4607	4604	-1351	+3
CHEROKEE SH	4698	4689	-1436	+7
TOTAL DEPTH	4835	4833	-1580	

REFERENCE WELL FOR STRUCTURE MURFIN DRLG CO. JONES 'A' #1-17
1050' FNL, 2310' FEL, SEC 17-1S-37W, CHEYENNE CTY, KS

DRILL STEM TESTS

No.	Interval	IFP/Time	ISIP/Time	FFP/Time	FSIP/Time	IHH-FHH	Recovery
1	3738-3790	18#-18# 30"	993# 60"	19#-19# 30"	887# 60"	1869#- 1772#	5' MCO (30% M, 70% O)
2	4164-4289	21#-25#	863#	24#-27#	816#	2193#- 2031#	10' MUD, NO SHOW
3	4302-4400	19#-23# 30"	1327# 60"	22#-30# 30"	1306# 60"	2220#- 2163#	26' SMCO (5% M, 95% OIL)
4	4388-4440	18#-21# 30"	397# 60"	19#-19# 30"	123# 60"	2279#- 2197#	7' MUD, NO SHOW
5	4590-4633	33-83 30"	986 60"	90-168 60"	930 90"	2331- 2258	1034' GIP 30' GCO (15% G, 85% O) 282' GCO (25% G, 75% O) 94' GCOM (15% G, 25% O, 60%

BIT RECORD

NO	SIZE	MAKE	TYPE	DEPTH OUT	FEET	HOURS
1	12 1/4	HTC	JMS	228	228	3
2	7 7/8	HTC	DP506F	3400	3172	37 3/4
3	7 7/8	HTC	GX20C	4835	1435	69 1/2

PIPE STRAPS & DEV. SURVEYS

PIPE STRAPS:
@ 3790' : 0.23 SHORT

DEVIATION SURVEYS
@ 3790' : 1.3°
@ 4289' : 1.2°
@ 4633' : 1.5°

DAILY PENETRATION / MUD RECORD

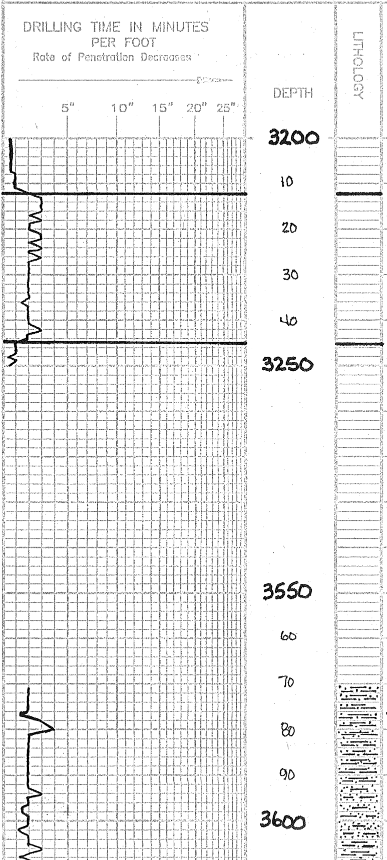
MUD TYPE: PUMP SIZE: DPS:

DATE	DEPTH	NO	DATE	DEPTH	ACTIVITY	WT	VIS	WL	YP	PH	CS	LCM	CHL
12-13	MIRT												
12-14 & 15	SHUT DOWN	3	12-26	3400'	Prep to TIH	8.6	62	5.6	20	12.0		8#	800
12-16	SPUD	4	12-27	3790'	CFS	8.9	62	6.0	20	10.5		12#	800
12-17	475'	5			N/A								
12-18	2475'	6	12-28	3914'	DRLG	9.1	40	11.2	14	7.5		8#	600
12-19	3400'	7	12-29	4289'	CFS	9.3	67	6.6	26	9.5		6#	700
12-20/25	SHUT DOWN	8	12-30	4400'	DST #3	9.6	90	6.4	27	80		6#	600
12-26	3400	9	12-31	4440'	DST #4	9.5	112	6.8	35	8.5		8#	700
12-27	3640' · DRLG	10	1-1	4633'	DST #5	9.3	59	6.0	19	10.0		9#	700
12-28	3826' · CFS												
12-29	4239' · DRLG												
12-30	4385' · DRLG												
12-31	4440' · DST #4												
1-1	4633' · DST #5	→	1-2	4835'	LOGGING								

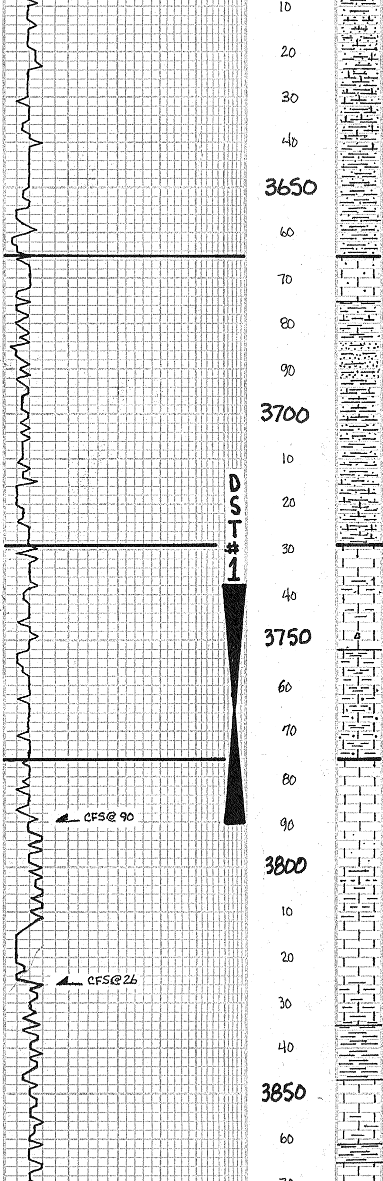
LCG 7710

LEGEND

▥	▦	▒	▤	░	▦	▦	▦	▨
Anhydrite	Salt	Sandstone	Shale	Carb sh	Limestone	Ool.Lime	Chert	Dolomite



SAMPLE DESCRIPTIONS	OIL SHOWS	REMARKS
		ANHYDRITE-TOP 3212 (+41)
		ANHYDRITE-BASE 3245 (+8)
ss: red, red-brown, orange, v.fngrnd v.shaley → sh: sandy.		
sh: red, red-brown, v. sandy. to ss: v. shaley, red, brown, orange		
ss: sh. as above w/ few pcs wh, lt. grey, v. fn grained ss. firm to friable, no vis ø, no show		
sh, ss: as above, inc in gry dk. grey, green shale		



red shaley ss, siltstone → sdy silty red sh; grey, grey-greensh calc in part

as above w/ grey, dk.grey sh pyritic in part; few pcs tan, fnxtln, dense ls & wh fnxtln chalky ls

red, sandy shale, dk grey sh sli. pyritic, few pcs brown, tan micro-fnxtln, dense ls no ø NS

sh: red, rust, brown, silty-sdy sh: grey, some green

shale: red, rust, silty, sandy → v.fn grnd ss, red shale matrix friable, no vis ø

as above w/ grey, dk.grey sh

ls: offwh, tan, fn-tr. medxtln, sli sandy in part, ls: lt. grey, v fnxtln dense: no vis ø, no show

ls: as above w/ few pcs ls: grey detrital, calcite cement, no vis ø N.S.

wh fnxtln chalky ls.

shale: red, sandy, silty → red sltstn few clusters, grey, v. fn grained ss, shaley, calc in part.

sh, siltstone: as above, few pcs ls: grey, v. fnxtln, dense

sh: lt. grey-green, silty to sli sdy few clusters ss: lt. grey, v. fn. grnd shaley: sh: red, silty, sandy

as above w/ grey, green-greysh few pcs green, green-grey, waxy calc in part

as above w/ some purple sandy, silty shale

ls: offwh, tan, fnxtln, sli. sandy tr. foss, no vis ø, no show: few pcs ls: fnxtln, purple, sli. shaley

ls: tan, lt. grey, v.fn-medxtln, sli. foss. no vis ø, no show. shale grey, dk. grey, firm, cpl pcs Δ brown fresh opaque

ls: as above w/ shale: red, brown, sandy → silty. some w/ ls inclusions

ls: off wh, fnxtln, interbedded ls, sh: red, brown, purple-brown, sandy, silty, calc w/ ls inclusions

as above

ls: lt. grey, offwh, fn-medxtln, some recemented, pr-scat fr interxtln & vuggy ø. pr-fr cut (50-50), lt. spotty stain to v. dk full stain w/ gd sat. several pcs w/ sli to fr SFO on brk w/ heavy dk oil in vugs, poss ft odor only on break

ls: grey, lt. grey, v. fn-medxtln, few pcs sli. sandy, no vis ø, no show

ls: as above w/ shale: grey, few pcs green, calc shale

ls: lt. grey, grey, v. fn - some medxtln, sli. foss, app pr- some fr interxtln & vuggy ø, 2 pcs w/ spotty pr stain, no show FO, no cut, no odor. some wh fnxtln, chalky ls.

ls: grey, grey-brown, fn-some medxtln, dense w/ shale, grey, dk gry

sh: mostly, brown, reddish brown tr orange, sli silty sandy

sh: as above w/ considerable grey, grey-green sh, calc in part w/ ls inclusions

ls: off wh, tan, medxtln, v sli sdy tr pr vuggy ø, no show. ls: grey, fn-medxtln, sh lamination in pt

ls: grey, vfn-fnxtln, dense w/ shale: grey, dk. grey, some brn-red

PIPE
STRAPE
3790:
0.23 sh

DEV.
SURVEY
1.3°

NEVA

3665 (-412)

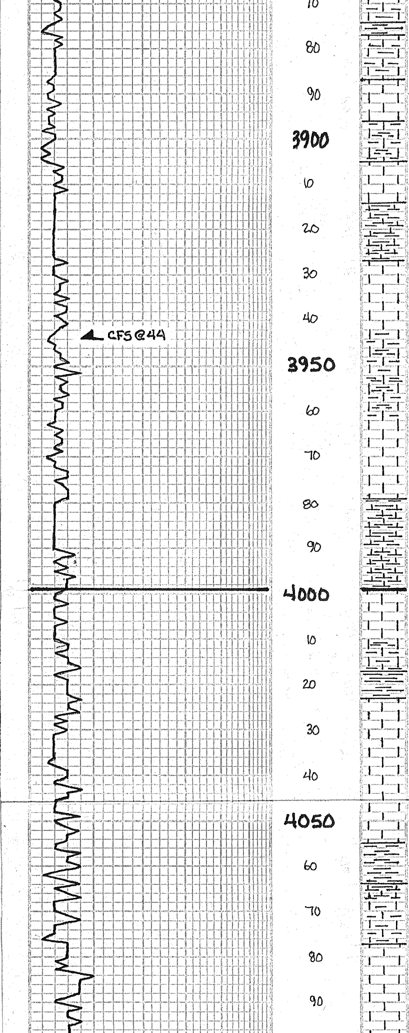
RED EAGLE

3729 (-476)

FORAKER

3776 (-523)

DST #1
(3738 - 3790)
30"-60"-30"-60"
IFP: WK SURF BLOW
DIED IN 21 MIN
FFP: NO BLOW
RECOVERED:
5' MCO
(30% MUD, 70% OIL)
HSP: 1869# - 1772#
FP: 18#-18#/ 19#-19#
SIP: 993# - 887#
BHT: 102° F



ls: grey → brwn, fn-med xtln, dense

ls: pink, fnxtln, chalky, very shaley-red to very calc brwn-red sh

ls: grey, brown, fnxtln, dense w/ ls: 'dirty' pink, fnxtln, soft, chalky to calc, sandy brwn-red shale

ls: offwh, fn-medxtln, some w/ interbedded, green sh; sh: brown, reddish-brown, silty

ls: offwh, grey, fn-medxtln, sli foss (fusil), shaley in part, dense

ls: grey, v. fn- fnxtln, dense

sh: grey, dk. grey, calc in part; ls: pink (red sh matrix, fnxtln, dense

sh: brown, red. brown, v. sli silty sli calc in part.

ls: wh, grey, tan, fn-medxtln, v. sli. foss, app pr interxtln & vuggy ø, considerable dd oil stain, w/ scat black, tarry, inert oil. fr slow cut,

no show free oil, dd & tarry stain, no odor.

ls: lt. brown, grey, fn-medxtln, dense

ls: tan, lt. grey, fn-medxtln, some w/ shale inclusions; shale: grey, green, calc in part

ls: wh, detrital, recemented w/ calcite & red shale matrix

ls: as above w/ ls: offwh, tan, fn-med xtln, v. sli. oolitic, no vis ø no show

sh: brown, red, silty, sli sandy scat ls: inclusions: few pcs ls: lt. green (shale) v. fnxtln, sli. chalky

sh: rust red, v. sli. silty

TOPEKA

3999 (-746)

ls: offwh, tan, lt. grey, fn-med xtln, v. sli. foss, dense, no vis ø no show

ls: as above, w/ shale: rust, brown,

sh: rust, brown, silty → sandy

ls: wh, offwh, fnxtln, tr foss, sli chalky, no vis ø, no show; w/ Δ wh, v. lt. grey.. fresh, opaque

ls: offwh, lt. grey, fn-some med xtln, v. sli ool, tr foss, no vis ø no show

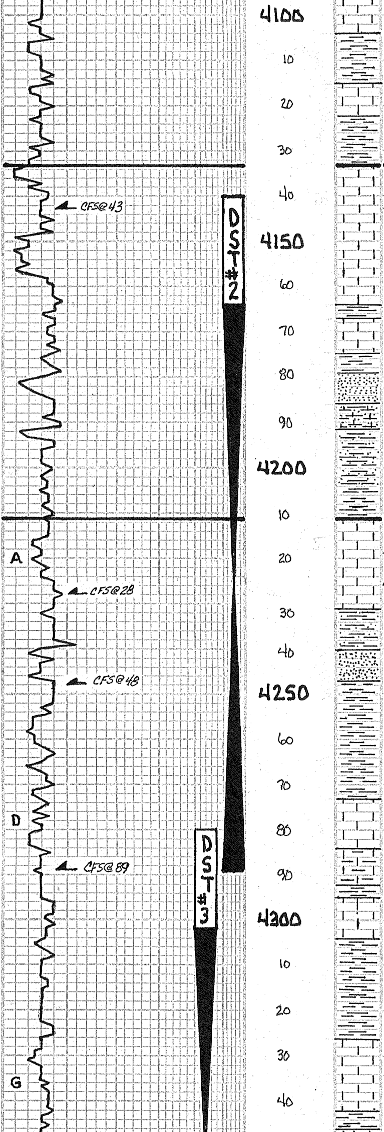
ls: offwh, tan, v.fn-fnxtln, no vis ø, no show

sh: brown, rust, sandy, silty

ls: offwh, tan, lt. grey, v. fn-med xtln, some w/ interbedded redsh no vis ø, no show

ls: grey, lt. grey, micro - some med xtln, dense, no show. few pcs wh fnxtln chalky

ls: tan, lt. grey, vfn-fnxtln, sli. foss dense, no vis ø, no show



ls: as above, w/ grey, microxtln, dense ls; sh: purple, rust brown sli. silty in part

ls: tan, grey, micro-fnxtln, dense, cpl pcs tan, brown, fnxtln, pr vuggy. ϕ, sli ool & ooc w/ pr-v. pr ooc ϕ, no show FO, no stain, cut or odor

ls: off wh, grey, fn-medxtln, dense w/ considerable shale; rust, brown, some grey, dk. grey

ls: off wh, lt. grey, fn-some medxtln, scat pr interxtln & vuggy ϕ, scat dd oil stain, cpl pcs w/ hvy black inert tarry stain w/ pr slow cut, no show FO, no live stain, no odor. ls: brown, fnxtln very finely ool, scat pr ooc ϕ. No show FO, no stain, cut or odor

ls: off wh, lt. grey, fn-medxtln, fr interxtln ϕ & pr-fr vuggy ϕ, sli. ool & ooc w/ pr ooc ϕ, scat dd → dk brown inert oilstain, no show FO, tr. v. pr cut, no live oil st, no odor

ls: off. wh, tan, lt. grey, micro-fn xtln, dense

sh: grey, some green

siltstone → v. fn. grained, ss: lt. grey greenish grey, v. fn. grained, no vis ϕ, scat dd oilstain, no cut, NSFO

sh: rust, reddish brown, sli sdy to silty, calc in part

sh: rust, reddish brown, v. sli. silty to tr sandy, some grey. grnsh

sh: rust, red, brown, some grey greenish-grey

ls: wh, off wh, lt. grey, vfn-fnxtln, scat pr ppt & vuggy ϕ, SSFO on brk, few pcs bleeding few ppts FO after brk scat brown/dk brown st, spotty pr sat. pr-fr fr slow cut, no odor

ls: lt. grey, grey, micro-fnxtln dense

shale: rust, red-brwn, brown, sli. silty/sandy

ss: v. fn grained, lt. grey, clear some interbedded green shale, firm-friable, no vis ϕ, no cut, NS

shale: rust, brown, sli. silty to sandy, some grey, lt. grey sh

shale: as above w/ inc in grey, green-grey shale, calc

ls: off. wh, tan, fn-some medxtln pr-tr fr vugg ϕ, scat pr interxtln ϕ fr show hvy oil, fr show FO on break scat brown/dk brown stain w/ sat fr cut, no odor

ls: grey, fn-medxtln, some w/ interbedded shale no vis ϕ NS

ls: tan, lt brown, lt. grey, fn-med xtln, sli. chalky, no vis ϕ N.S.

ls: as above, w/ shale: rust brown, sli silty in part; sh: grey, green-grey

sh: as above w/ grey, calc sh few pcs ls: lt. grey, grey, w/ interbedded shale

sh: brown, rust, silty; w/ sh: grey, green, calc in part

ls: off. wh, tan, lt. grey, fnxtln, chalky in part, pr-tr fr ppt vuggy ϕ VSSFO on break, pr-fr show hvy inert oil, pr cut, spotty dk st, few pcs w/ large isolated vugs, oil filled, gd dk st w/ sat, pr cut, no odor

D.S.@
4289'
1.5°

OREAD

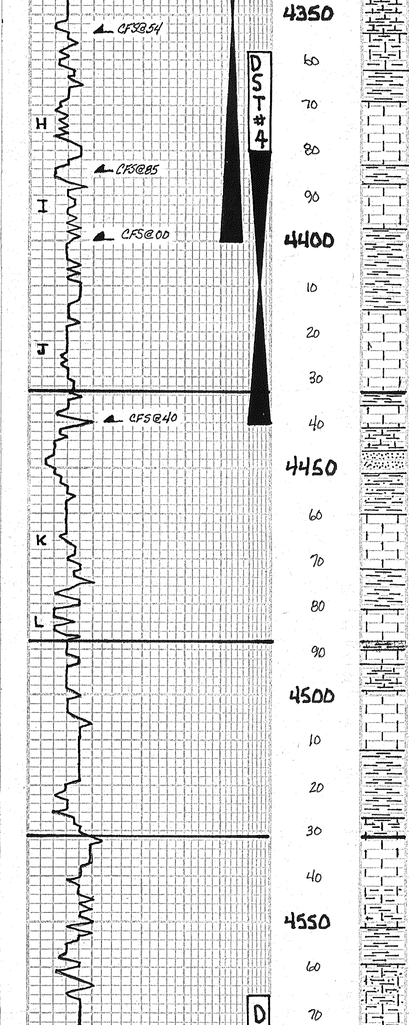
4133 (-880)

LANSING

4211 (-958)

DST # 2
(4164-4289)
30"-60"-30"-60"
IFP: WK SURF BLOW BUILT TO 3/4", DIED IN 25"
FFP: NO BLOW
RECOVERED:
10' MUD NO SHOW
HSP: 2193#-2031#
FP: 21#-25#/24#-27#
SIP: 863#-816#
BHT: 127° F

DST # 3
(4203 -4400)
30"-60"-30"-60"
IFP: WK SURF BLOW BUILT TO 1"
FFP: WK SURF BLOW DIED IN 3"
RECOVERED:
25' SMCO
(5% MUD, 95% OIL)
HSP: 2220#-2163#
FP: 19#-23#/22#-30#
SIP: 1327#-1306#
BHT: 130° F



sh: rust, brown, sli silty to tr sandy. sh: grey, green-grey calc

ls: lt. grey, grey, fn- some medxtln w/ interbedded green sh. sh: grey, calc

sh: rust, brown, silty, sh: grey, green

ls: tan, lt. grey, fn-scat medxtln, sli. foss, mostly dense, tr. pr ppt vuggy ø, few pcs w/ pr interxtln ø-

few pcs w/ cpl ppts, FO in calcite streaks, tr live stain, no odor

ls: off-wh, tan, lt. grey, fnxtln, sli. foss, chalky in part, no vis ø, N.S.

sh: reddish-brown, brown, some grey, calc, few pcs grey, mottled ls w/ green sh inclusions

ls: off-wh, lt. grey, fn-medxtln, few pcs sli. ool, tr foss, scat pr interxtln ø, VSSFO on break, pr dk stain, wk slow cut, no odor

ls: as above w/ dec in show w/ ls: off-wh, fnxtln, sli. chalky, tr pr vuggy ø, tr dk black stain, NSFO, NO

sh: brown, grey, some green, calc w/ imbedded ls grains
ss: grey, vfn grained, hard, calc, no vis ø, no show
sh: grey, grey-green, some brown; ss: grey, clear, v.fn-grained calc, hard, no vis ø, no show

ls: off-wh, lt. grey, grey, fn-med xtln, mottled, sli foss, dense, no vis ø, no show

sh: brown, rust, grey

ls: tan, lt. brown, micro-fnxtln, dense. fw pcs wh fnxtln ls, chalky in part

sh: grey, grey-green, some brown w/ ls: tan, lt. grey, micro-fnxtln dense

ls: lt. grey, grey, fn-medxtln, sli foss, cpl pcs w/ pr vuggy ø, NS
ls: brown, microxtln, dense

sh: brown, purplish-brown, grey, green, mica

sh: as above, rust sh, sli. silty

ls: tan, grey, medxtln, sli. foss mottled, no vis ø, no show; ls: tan, grey, micro-fnxtln, dense

ls: lt. grey, fn-medxtln, with considerable interbedded, red sh, brown-reddish brown sh w/ inbedded ls particles/grains
sh: brown, lt. grey, grey, some green

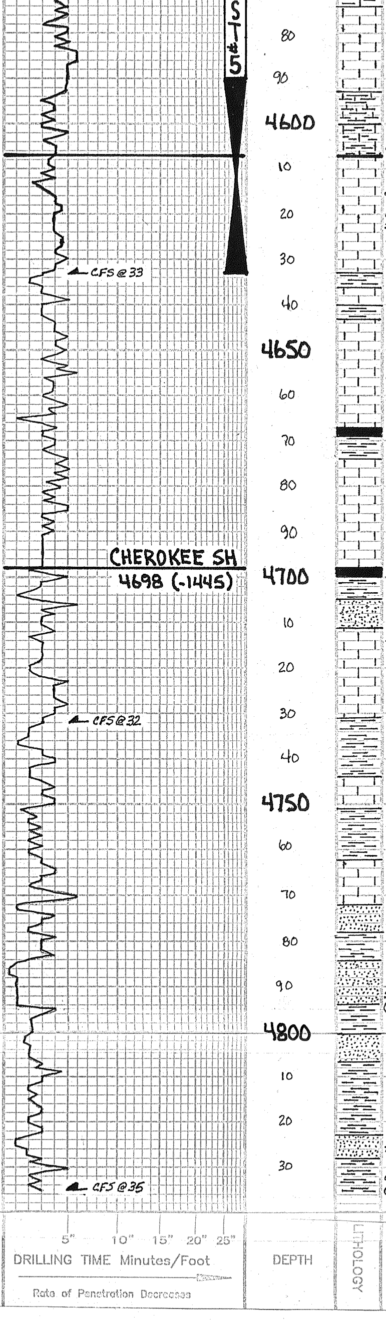
ls: tan, lt. grey, micro to fnxtln, dense, some interbedded brownish
sh: brown, rust, silty-sli. sandy

DST #4
(4380 - 4440)
30"-60"-30"-60"
IFP: WK BLOW BUILT TO 3/4"
FFP: WK BLOW DIED IN 15"
RECOVERED:
7' MUD NO SHOW
HSP: 2279# - 2197#
FP: 18#-21# / 19#-19#
SIP: 397# - 123#
BHT: 128° F

STARK
4433 (-1180)

BKC
4488 (-1235)

MARMATON
4531 (-1278)



ls: tan, brown, grey, micro-some medxtln, trace foss, dense

ls: tan, lt. grey. grey. micro-v. fnxtln, dense

sh: grey, green, w/ some included ls: grains

sh: lt. grey, grey, calc, ls: grey, dk. grey, medxtln, dense

ls: tan, ool, w/ calcite cement, sli. foss (fusilinids), pr.-fr interool ø, pr.-fr fr vuggy ø, s.-FSFO on break w/ a few gas bubbles, fr slow streaming cut, pr.-fr golden/med brown st, pr.-some fr sat, no odor

ls: grey, lt. grey. tan, micro-fn xtln, dense. no vis ø, no show

sh: brown-purple, brown. grey green w/ ls: tan, grey, fnxtln, dnse

ls: tan, brown, grey, v. fn-fnxtln, dense, no vis ø, no show

ls: tan, fn-med xtln, sli oolitic, foss in part, rare tr. pr interxtln ø, no show few pcs granular w/ calcite cement, no vis ø, no show. Δ tan, brown, red, fresh, semi-translucent

few pcs blk, carb., sh, w/ shale, brown, grey, green-grey, some calc.

ls: tan, fn-medxtln. calcitic in part, sli. foss, no vis ø, no show; ls: tan, brown, fnxtln, dense

ls: tan, brown, fn-medxtln, sli foss, tr. ool., calcitic in part, no vis ø, no show

ls: tan, brown, fnxtln, few pcs medxtln, sli foss, dense, no vis ø no show

few pcs blk carb sh

sh: grey, dk grey, some green

ss: clear, lt. grey, v.fn.-fn. grained, sub round, well sorted calc, tr glauc. firm-friable, no vis ø, NS. w/ ss: clear, grey, v. fn grained, calc, v. hard, no vis ø, no show

ls: tan, brown, fn-medxtln, tr. foss, dense, no vis ø, no show: still carrying considerable ss: as above

ls: off-wh, tan, v. lt. grey, fn-medxtln no vis ø, no show. ls: wh, fnxtln chalky in part, no vis ø, no show

sh: rust, brown, silty → sandy, w/ some grey, lt. grey shale

sh: as above, sandy

ls: off wh, lt. grey, some tan, fn-med xtln, sli chalky, no vis ø no show

sh: grey, green-grey, some yellow few large sub round loose sd grains no show

ls: lt grey, v. fn.-fnxtln, dense, some wh. fnxtln ls, chalky in part

ss: clear, fn. grnd, rded, fr sorting calc, glauc., firm-hard, no vis ø, no show

sh: brown, reddish-brown, silty-sandy; ls: grey, lt. grey, vfnxtln, dnse

ls: off-wh, fnxtln, chalky in part, sli. glauc, no vis ø, no show

ss: considerable, large, loose sand grains, clear, lt. grey, yellow (weathered Δ?), sub rnd → sub ∠'lar

sh: brown, purple, tr yellow

ss: clear, green (glauc), v. fn.-fn grained rnded, fair sorting. firm-hard, no vis ø, no show

shale, varicolored, sli. calc in pt considerable large loose quartz grains as above.

sh: varicolored; sh: brown, silty to sandy → fn grained ss w/ brown shale matrix; few clusters ss: clear, v. fn-fn grained, well sorted calc, no vis ø, no show

D.S.@
4633'
1.5°

PAWNEE

4607 (-1354)

DST #5
(4590 - 4633)
30"-60"-60"-90"
IFP: BOB IN 6"
ISIP: WK BLOW INC TO 2½" IN 30", DIED IN 50 MIN
FFP: BOB IN 10 MIN
FSIP: BOB IN 28 MIN
RECOVERED:
1034' GIP
30' GCO - 38° Gr
(15% G, 85% O)
282' GCO
(25% G, 75% O)
94' G&OCM
(15% G, 25% O, 60% M)
HSP: 2331# - 2258#
FP: 33#-83# / 90#-168#
SIP: 986# - 930#
BHT: 145°F

SAMPLE DESCRIPTIONS

OIL SHOWS

REMARKS