Max R. Lovely

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY Ritchie Exploration
LEASE #1 Edwards 17B
FIELD Wildcat
LOCATION S/2 N/2 NW
SEC 17 TWSP 15 RGE 35W
COUNTY Logan STATE KS
CONTRACTOR WW #8
SPUD 7-17-15 COMP 7-31-15
RTD 4910 LTD 4911
MUD UP 3364 TYPE MUD Chem

ELEVATIONS
KB 3271
DF
GL 3266
Measurements Are All From KB

CASING
SURFACE 8⅝" @ 220'
PRODUCTION 4½"

ELECTRICAL SURVEYS
Dual Ind, Micro
Comp N/D

FORMATION TOPS AND STRUCTURAL POSITION

FORMATION	SAMPLE TOP	ELECTRIC LOG TOP	SUB-SEA DATUM	STRUCTURAL POSITION		
				A	B	C
Anhydrite	2573	2570	701	705		
Base Anhydrite	2593	2591	680	687		
Heebner	4015	4018	-747	-732		
Lansing	4069	4069	-798	-785		
Muncie SH	4234	4233	-962	-951		
BKC	4405	4406	-1135	-1128		
Marmaton	4450	4452	-1181	-1175		
Altamont	4457	4459	-1188	-1184		
Pawnee	4537	4540	-1269	-1258		
Ft Scott	4591	4594	-1323	-1314		
Cherokee	4622	4622	-1351	-1343		
Johnson	4705	4704	-1433	-1427		
Morrow	4758	4756	-1486	-1477		
Mississippian	4845	4846	-1575	-1548		

REFERENCE WELLS FOR STRUCTURE

A K&B Norton Oil #1 Mollenkamp 1020' FSL, 490' FEL 7-15-35W
B
C

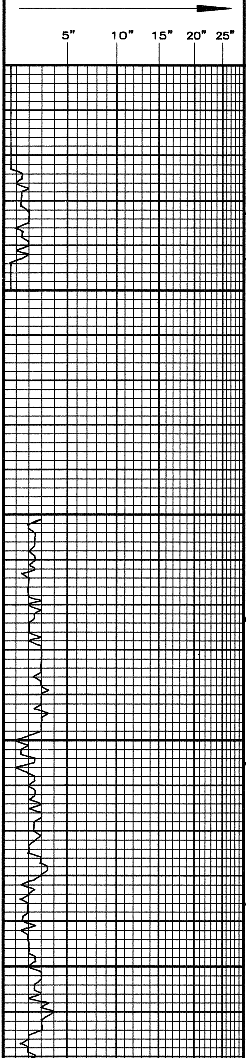
REMARKS Diamond Testing - Tim Venters
Nabors Logging
Mud Co → Reid Adkins

LEGEND

▥	▦	░	▤	■	▭	▣	△	▱
Anhydrite	Salt	Sandstone	Shale	Carb sh	Limestone	Ool.Lime	Chert	Dolomite

DRILLING TIME IN MINUTES PER FOOT Rate of Penetration Decreases		LITHOL		OIL SI	

LOG 7710



DEPTH

OGY

SAMPLE DESCRIPTIONS

SHOWS

REMARKS

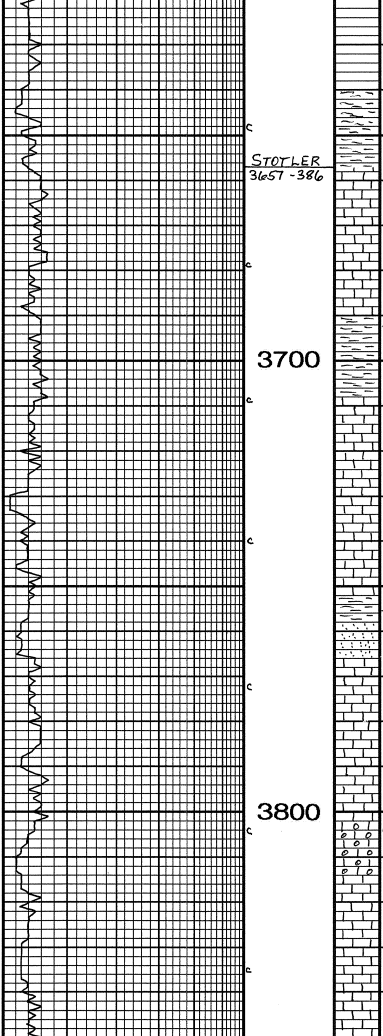
ANHYDRITE
2573 +698

BASE
2593 +678

2600

3500

3600



SH, GRY

GEO ON LOC
7-20-15

STOTLER
3657 -386

LS, CRM, F-M XTLN, M HRD,
SL ALGAL, G INTXTLN Ø, NS

LS, BUFF-TAN, F XTLN, HRD,
SL BRTTL, INCR SML FOSS,
P Ø, NS

SH, GRY-DK GRY

LS, TAN, GRY, F→LG XTLN,
SCT CRS XTLS W/N, SL FOSS,
M HRD, NO VIS Ø, NS

A.A.

LS, CRM, F→M XTLN, HRD,
PITTED Ø, FEW SCT VUGS, NS

LS, CRM, F XTLN, SL DNS, HRD
NO VIS Ø, NS

MUD CHECK
VIS: 54 WT: 8.9
CHLOR: 4,000 LCM: 1
FILT: 7.2

SH, DK GRY

SS, F GRNS, W SORT, SOFT,
GRY CMT, P CMT'D, G Ø, NS
NO ODOR

LS, CRM, VF XTLN, DNS, HRD,
SCT PEBBLS W/N, TITE, NS

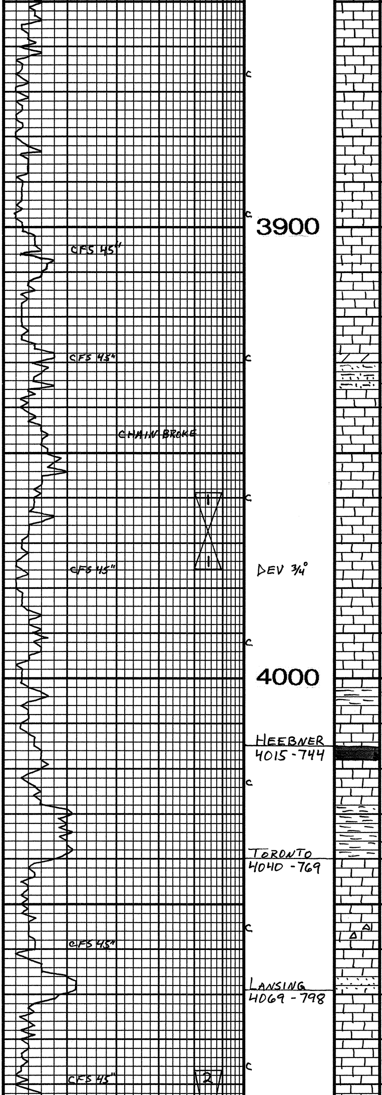
A.A.

CHALK

LS, WHT, CRM, F XTLN, PCS
V DNS, HRD, MOSTLY F XTLN W/
SML FOSS + P→F INT XTLN Ø,
NS

A.A.

LS, CRM, HRD, VF XTLN, DNS,
TITE, V FEW FOSS, NS



LS. TAN, F→M XTLN, SOFT, "MEALY", G XTLN Ø, NS

LS. GRY/BRN, F→CRS XTLN, M HRD, V FEW FOSS, NO APP Ø, NS, CHLKY PCS

LS. WHT/CRM, F XTLN, SOFT, CHLKY, F Ø. NS

LS. BUFF, M XTLN, BRTTL, GRNY TXT, F→G Ø, NS

LS. TAN, CRM, F XTLN, SOFT, ABUN FOSS + FRAGS, G Ø, NS

LS. CRMY TAN, F XTLN, V SOFT, FAIR PP Ø, NS

LS, AA, 1 PC BUFF DOLO - F-M XTLN, HRD, NO VIS Ø, NS

SH, RED, PCS SNDY

LS, WHT, CRM, TAN, F XTLN, HRD, ABUN SML FOSS, VW CMT'D, TITE, NS

LS, GRY/WHT, F XTLN, BRTTL, SL HRD, ABUN FOSS, VG FOSS Ø, G DK OIL FILL Ø, G SFO ON BRK, ? ENERGY, 4 sho PCS

20" 3 sho PCS, MOSTLY TITE w/ NS LS, TAN/GRY

45" LS, TAN, OOL, F CMT'D, F→G INT OOL Ø, F→G OIL FILL Ø w/ F→G SL GSY OIL ON BRK, ? FLUOR

LS. WHT, F XTLN, S→M HRD, PCS CHLKY, P XTLN Ø, NS

A.A.

SH, GRY, SL CARB, PYRITIC

LS. CRM, F XTLN, SL FOSS, HRD, NO APP Ø, NS

SH, BLK, CARB

LS, GRY, PCS V DK GRY→BLK, V HRD, DNS, TITE, NS

SH, GRY, GRN

SH, GRY, RED

LS, WHT/GRY, F XTLN, HRD, FEW W CMT'D SML OOLS W/N, SCT BLK PELS W/N, NO VIS Ø, NS

20" LS, WHT/CRM, F XTLN, HRD, SCT FOSS, SCT P XTLN Ø, P OIL STND Ø, VP FO ON BRK, V CHTY, NO FLUOR

45" LS, WHT, VF XTLN, M HRD, CHLKY PCS V FOSS, CHTY, NO VIS Ø, NS

SS, V LG CRR RND'D GRNS, VW CMT'D, V HRD, F→G GRNLR Ø

LS. WHT, CRM, GRY, HRD, V FOSS FAIR FOSS Ø, NS

20" LS, CRM, TAN, VF XTLN, PCS DNS + TITE, SCT PCS V FOSS W/ FAIR FOSS Ø, NS

45" A.A.

TR GAS
Bbls
NO ODOR

NO ODOR

OIL FILM
N CUP
NO ODOR

1 pc
NO ODOR

1 pc

2 pcs sho
RK FROM
DST #1

7:AM 7-21-15
DRLG @ 3855'

VIS: 60
WT: 9.1
Lcm: 1

VIS: 58
WT: 9.1

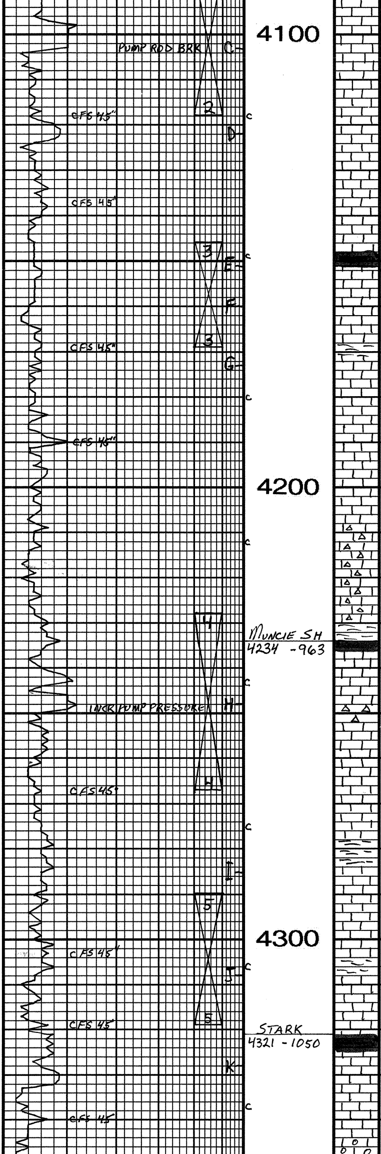
STRAP 3989.5
BOARD 3992.25
short 2.75

7:AM 7-22-15
GIH FROM DST #1
MUD CHECK 5:40AM
VIS: 49 WT: 9.3
CHLOR: 5,200 LCM: 1
FILT: 8.8

33 STND SHORT TRIP
@ DST #1

DST #1 3959-3976
30·45·30·45
IF: 1½" ISI: NR
FF: 1" FSI: NR
REC: 20' MCW - 67% W
60' HWCM - 41% W
TOOL: 37% W, 63% M, TR OIL
CHLOR: 56,000
FP: 21-42, 43-61
SIP: 1107-1091
HP: 1852-1848

DST #2 4087-4118
30·~~45~~ 45-45-60
IF: 1¼" ISI: NR
FF: ½" FSI: NR
REC: 75' SWCM - 13% W
60' M
CHLOR: 74,000
TOOL: 18% W, 82% M, TR OIL
FP: 52-73, 76-84
SIP: 1173-1152
HP: 1952-1902



LS, WHT, F XTLN, HRD, SCT FOSS, NO VIS Ø, NS

LS, WHT, CRM, VF XTLN, OOL, HRD, SCT SML VUG Ø, SCT Ø STNG, PSFO ON BRK, DK OIL — 2 pcs NO ODOR

20" LS, WHT, F XTLN, M HRD, G SML VUG Ø, G SHO STNG + FO ON BRK, — 4 pcs NO ODOR

45" LS, WHT, F XTLN W/ MED XTLS W/N, S→M HRD, BRTTL, G OIL STN'D INT XTLN Ø. LT→MED BRN OIL, F→G SFO ON BRK, TR GAS BBLS, G Sho OIL FILM N CUP — 15+ pcs ; ODOR

LS, WHT, CRM, F XTLN, M HRD, PcS CHLKY, SCT CHALK, VP PPØ, NS

LS, BUFF, TAN, VF XTLN, DNS, HRD, TITE, NS

LS, TAN, F XTLN, DNS, HRD, V FEW FOSS, TITE, NS

SH, BLK, CARB

LS, WHT/TAN, F XTLN, M HRD, VG OIL FILL VUG + XTLN Ø, F→G BLEED G FLUOR STNG + FO, SL SHO GAS — LT OIL STR ODOR ABUN SHO SCT FLUOR

20" LS, WHT, F→M XTLN, G XTLN Ø GSFO, DK BRN OIL, VSL SHO GAS

45" LS, WHT, F→M XTLN, M HRD, G XTLN Ø, FEW OIL COAT'D VUGS, GSFO ON BRK, BRN OIL, V SL BLEED — G ODOR

SH, GRN, GRY

LS, BRN, F XTLN, HRD, DNS, SCT DK FOSS, SCT PPØ, NS

20" LS, WHT, F→M XTLN, S→M HRD, G INT XTLN Ø, SCT MED XTLS + VUGS, G OIL FILL Ø, V DK OIL, SL EXPANSION BLEED, V CHLKY — 4 sho pcs FILM N CUP F→G ODOR

45" LS, AA. - 3 pcs

LS, TAN, GRY, WHT, F XTLN, HRD, FOSS, PØ, NS

LS, CRM - TAN, F→M XTLN, ABUN LG OOLS, M HRD, G OOL Ø, NS

LS, CRM, GRY, F XTLN, V HRD, CHTY - CRM, GRY, NS

LS, AA.

SH, BLK, CARB

LS, GRY, VF XTLN, V DNS, V HRD, TITE, NS

LS, CRM, F→M XTLN, SOFT, CHLKY, PØ, NS

CHT, CHINA WHT, SMOKE, TAN, FRESH, SHARP

LS, BUFF, WHT, F→M XTLN, MOSTLY HRD, FEW SOFT PcS, SCT STRKY PPØ W/ HVY OIL STNG, DK OIL, P FO ON BRK — LT ODOR 9 pcs

LS, AA., SL SOFTER, LT GRY CHT ON CONTACT PLANE, NO ENERGY — FAIR ODOR 8 pcs

SH, GRN, GRN/GRY

LS, TAN, BRN, GRY, F XTLN, HRD, TAN PcS W/ LG FOSS W/N, NO VIS Ø, NS

LS, GRY, F XTLN, V HRD, ABUN LG FOSS, FAIR SCT OIL CT'D FOSS Ø, P SFO ON BRK, NO FLUOR, V DK OIL — FLASH ODOR 2 pcs

LS, A.A., GRY, TAN — LT ODOR 7 pcs

SH, GRN

LS, CRM, F XTLN, HRD, STRKY PP Ø, SCT OIL FILL Ø, P SFO ON BRK — FAIR ODOR 6 pcs

45" LS, BRN, AA, FEW PcS W/ OIL FILM VUG Ø. WHT - G EVEN INT XTLN Ø, G STNG, M HRD, SL BRTTL, SSFO BLEED, G SFO ON BRK, 1 GAS BBL — G ODOR DK OIL

SH, BLK

LS, BRN, F XTLN, V HRD, LG XTLS W/N NO VIS Ø, NS

LS, CRM & TAN, F XTLN, HRD, SCT SML OIL FILL PITTED Ø, BLK OIL NO ENERGY — WISP ODOR 4 pcs

CHALK

4118' 45" CIRC: LS, BRN, OOL + FOSS, M HRD, VG FOSS Ø, G OIL FILL Ø, GSFO ON BRK 1 pc DULL FLUOR

7:AM 7-23-15
DST #2 @ 4118'

MUD CHECK
VIS: 58 WT: 9.4
CHLOR: 8000 LCM: 1
FILT: 10.4

DST #3 4146 - 4169
30·45·45·60
IF: 6" ISI: NR
FF: 6¾" FSI: NR
REC: 180' MCW - 72% W
60' SL MCW · 92% W
CHLOR: 128,000
TOOL: 71% W, 29% M, TR OIL
FP: 22-88, 89-128
SIP: 1057-989
HP: 1987-1973

7:AM 7-24-15
CONN @ 4212', DRLG AHEAD

JET #1
ADD PREMIX

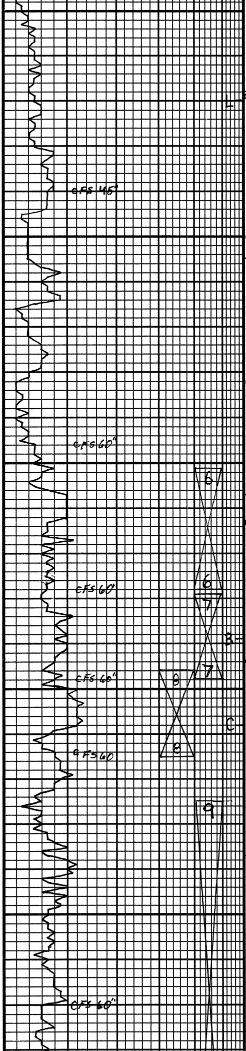
MUD CHECK
VIS: 69 WT: 9.1
CHLOR: 6,500 LCM: 1
FILT: 8.0

DST #4 4228-4267
30·45·45·60
IF: BOB 9" ISI: NR
FF: BOB 11" FSI: NR
REC: 285' HMCW - 55% W
125' MCW - 75% W
500' SMCW - 96% W
CHLOR: 132,000
TOOL: 100% M
FP: 35-231, 238-430
SIP: 1154-1124
HP: 2008-2007

7:AM 2-25-15
CFS @ 4319'

MUD CHECK
VIS: 50 WT: 9.2
CHLOR: 6,000 LCM: 1
FILT: 8.8

SHORT TRIP 15 STNDS
DST #5 4290 - 4319
30·30·30·30



HUSHPUCKNEY
L
c 4368 -1097

c 4400

BKC
4405 -1134

c

ALTAMONT
4457 -1186

c

c

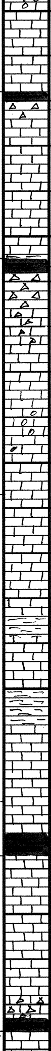
4500

c

PAWNEE
4537 -1266

c

MYRICK
4576 -1305



LS, CRM, F XTLN, HRD, ABUN SML FOSS + FRAGS, W CMT'D, SCT P XTLN Ø, NS

A.A.

SH, BLK

CHT, LT GRY, WHT - SL FOSS

LS, TAN, F → M XTLN, V LG Pbbls W/N, SL BRTTL, HRD, NO VIS Ø, NS

LS, GRY, TAN, VF XTLN, DNS, V HRD, TITE, NS

LS, DK BRN, VF XTLN, V DNS, V HRD TITE, NS

LS, WHT, F XTLN, SL HRD, SCT FOSS + CRM, F → G CMT'D FOSS, NO VIS Ø NS

SH, BLK, FISSLE, GRY

CHT, GRY, LT GRY, FRESH → SCT FOSS W/N

LS, BRN, CRM, F XTLN, V BRTTL, FOSS, NS, SCT CHT - TAN, GRY WHT, FOSS

LS, WHT, F XTLN, SOFT, Pcs W/ SCT FOSS, P Ø, NS

A.A. CHLKY, NS

LS, GRY, TAN, VF XTLN, DNS, HRD, TITE, NS

LS, REDISH BRN, F XTLN CMT'D FOSS + FRAGS, V HRD, TITE, NS

LS, WHT, CRM, S + BRTTL → W CMT'D FOSS + HRD, ALL SMPLS V FOSS, 3pcs W/ VG INT FOSS Ø, LG FOSS W FAIR EDGE STNG, FAIR FO · BRK

30" AA, SL BETTER FO ON BRK - MED BRN OIL - 10 pcs - NO ODOR

60" A.A. GSFO ON BRK, MED BRN OIL - 17 pcs

-DRLG SMPL - AA, SL CHLKY

SH, BRN / BURGANDY

LS, WHT, V OOL, M → LG OOLS, HRD, FAIR CMT'D, FAIR OOL Ø, SCT STNG, FAIR FO ON BRK

30" AA, W CMT'D OOLS, TITE, NS

60" M → LG OOL, HRD, FAIR CMT'D FAIR OOL Ø, MED BRN OIL · BRK

SH, BURG, GRY

LS, GRY, M XTLN, V HRD, SCT W CMT'D FOSS + FRAGS, VP Ø, NS

30" LS, TAN, M → CRS XTLN, SOFT, BRTTL, G XTLN Ø, F → G SFO ON BRK, LT EVEN STNG - 2 Ps

60" WHT, F XTLN, ABUN SML FOSS + FRAGS, G EVEN SAT STNG, P FO ON BRK, NO ODOR

LS, WHT, CRM, TAN, F → M XTLN, SCT FOSS, Pcs MOSTLY DNS + HRD, SCT XTLN Ø, NS

SH, BLK

LS, CRM, TAN, F → VF XTLN, DNS, HRD, V FEW FOSS, NO VIS Ø, NS

LS, BRN, F XTLN W/ MED XTLS W/N, HRD, V FOSS, NO APP Ø, NS

4pcs - BRN / GRY, V FOSS, M HRD, P Ø, FILMY STNG, FEW FO SPTS ON BRK

30" AA, 4pcs SHO - NO FLUOR ? ODOR

60" LS, BRN, F XTLN W/ MED XTLS W/N, HRD, FOSS, NO APP Ø, NS
1pc - SHO - AA NO ODOR

LS, GRY, V FOSS, V HRD, TITE, NS

CHT - DK BRN, FRESH

SH, BLK

LS, TAN, F XTLN, HRD, FEW FOSS TITE, NS

NO ODOR
8pcs
DK THICK OIL

NO ODOR

1-pc
NO ODOR

NO ODOR
P SFO
2pcs

2pcs
NO ODOR

BLK HVY OIL
4pcs

4pcs
LT ODOR
FO SPT
N CUP
1pc FLUOR

IF: INIT. SURGE, DEAD
FF: DEAD, FLUSH, DEAD
REC: 20' MW W/ TR OIL
TOOL: 100% M W/ TR OIL
FP: 21-34, 36-36
SIP: 1133-1071
HP: 2029-1926

DST #6 4451-4478
30·45·45·60
IF: 6" ISI: NR
FF: 7" FSI: 1/4"
REC: 5' CO - grav 30°
125' mCO - 94% OIL
60' G HOCM - 10% G, 44% O
TOOL: 44% OIL, 56% M
FP: 25-73, 79-97
SIP: 1236-1229
HP: 2173-2151

7:AM 7-26-15
DRLG @ 4457'

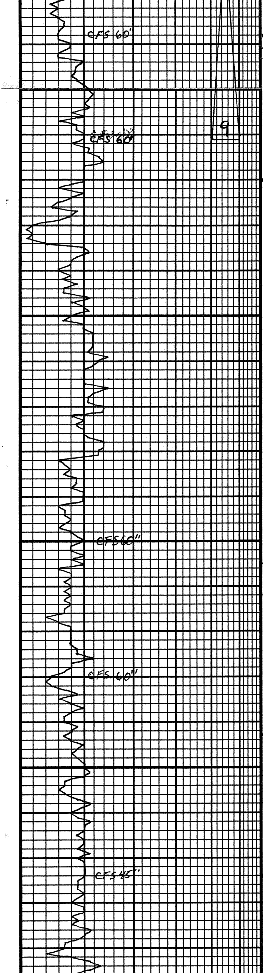
MUD CHECK
VIS: 67 WT: 9.2
CHLOR: 9.000 LCM: 1
FILT: 7.2

7:AM 7-27-15
COME OUT FOR DST #7
MUD CHECK
VIS: 52 WT: 9.1
CHLOR: 8.000 LCM: 1
FILT: 8.0

7:AM 7-28-15
G/H FROM DST #8

DST #7 4479-4498
30·45-30·45
IF: build to 1/2" ISI: NR
FF: surf blo, died, flush, died
REC: 10' SOCM · 2% OIL
TOOL: 5% OIL, 95% M
FP: 22-27, 29-33
SIP: 928-882
HP: 2151-2122
MUD CHECK
VIS: 61 WT: 9.2
CHLOR: 13,000 LCM: 1.5
FILT: 9.6

DST #8 4496-4515
30-45-45-60
IF: BOB 9 min ISI: NR
FF: BOB 14 min FSI: NR
REC: 290' M
125' WCM - 34% W



c
FT. SCOTT
4591 -1320

4600

c CHEROKEE
4622 -1351

c

c

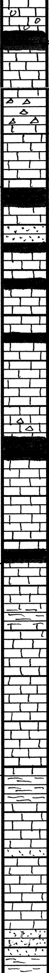
4700
JOHNSON
4705 - 1434

c

c

BASE
JOHNSON
4752 -1481
MORROW
4758 -1488

c



LS.CRM, F XTLN, M HRD, P PPØ, CHLKY, NS

SH, BLK, CARB

LS. GRY, F XTLN, HRD, FOSS, TITE

LS. BRN, VF XTLN, WCMT'D OOLS, TITE, V HRD, NS

CHT, WHT, ABUN MED GRY OOLS, CHT, SMOKE, FRESH

NS

LS, TAN, F XTLN, BRTTL, V FOSS, P Ø. NS

LS, AA

SH. GRY, GRY/GRN, BLK

SH, BLK, SNDY

LS. GRY, F XTLN, V HRD, DNS, TITE, NS

SS, SML CLR GRNS, W SORT, V W CMT'D, V HRD, VPØ, NS

SH, BLK, V HRD

LS. BRN, GRY, F XTLN, HRD, DNS, TITE, NS

SH, BLK

LS, CRM, BRN, F XTLN, V HRD, DNS, SCT FOSS, TITE, NS

SH, BLK

LS. CRM/TAN, VF XTLN, HRD, TITE, SCT FOSS, NS

LS. DK TAN, VF XTLN, DNS, V HRD, SCT STRKY PPØ, SPTTY EDGE STNG, LT SHO FO ON BRK, DK OIL

NO ODOR
3 pcs
2 SPTS
N CUP

LS, AA, CHTY - BRN, SMOKE, SCT FOSS, NS

SH, BLK/BRN, STRKY SH'S, LG SND Pbbls w/n

LS. TAN, VF XTLN, DNS, V HRD, TITE, NS

LS. BRN, F→M XTLN, V HRD, GRNY TXT, FEW SCT VUGS, MOSTLY TITE, NS

SH, BLK

LS. TAN, CONGL, HRD, Pcs BRTTL, F Ø. NS

LS, GRYish WHT, F XTLN, M HRD, BRTTL, SL EDGE Ø, MOSTLY DNS TITE

SH, BLK + GRN STRKS, FISSLE

LS. BRN, TAN, VF XTLN, M→LG W CMT'D XTLS w/n, TITE, NS

LS, TAN, CRM, F XTLN, LG XTLS w/n, CHLKY, NS

LS, TAN, F XTLN, SCT FOSS, HRD, P PPØ. NS

LS, TAN, F XTLN, M→LG XTLS w/n, SOFT, BRTTL, F→G Ø. NS

SH, GRN, GRY

LS, CRM, TAN, F XTLN, HRD, Pcs highly XTLN, NS

LS, WHT, F→M XTLN, BRTTL, V FOSS SOFT, NS

SS, VF CLR GRNS, WHT CMT, W SORT F CMT'D, SOFT→SL HRD, F Ø, NS

LS, WHT, F XTLN, M HRD, SCT BLK + TAN XTLS w/n, CHLKY, NS

LS. CRM, TAN, F XTLN, DNS, HRD, NO VIS Ø. NS

SS, VF GRNS, GRN CMT, W SORT, SOFT→SL FRIABLE, F→G Ø. NS

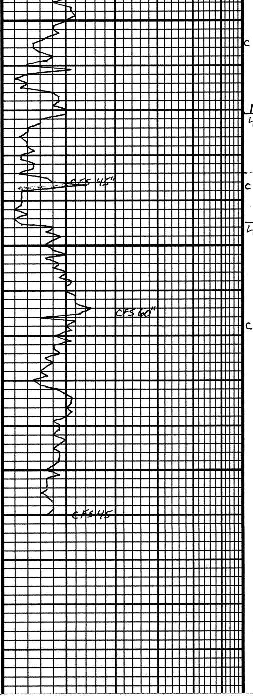
SH, LT GRN

185' MCW - 76% W
375' SMCW - 93% W
CHLOR: 78,000
TOOL: 98% W, 2% M, OIL spks
FP: 196-337, 344-473
SIP: 1027-958
HP: 2073-2061

SHORT TRIP 15 STNDS
7:AM 7-29-15
GIH FROM DST #9 @ 4611'

MUD CHECK
VIS: 58 WT: 9.1
CHLOR: 9,000 LCM: 1½
FILT: 10.4

DST #9 4525-4611
30-45-30-45
IF: WSB ¼" ISI: NR
FF: dead, flush, dead FSI: NR
REC: 125' M
TOOL: M w/ TR OIL SPTS
FP: 53-71, 76-83
SIP: 527-348
HP: 2164-2160



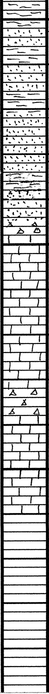
4800

MORROW SD
4821 -1550

MISS
4845 -1574

4900

DEV 1°



SS, WHT, CLR GRNS, W SORT, SML GRNS, P CMT'D, S → SL HRD, PCS FRIABLE, GØ, NS

SH, VARI COLOR - NO MUSTARD

SS. WHT, GRN, CLR GRNS, W SORT, MED GRNS, P CMT, FRIABLE, NS

SH, GRY-SNDY, GRN-PYR

SS, WHT, LT GRN, F → M GRNS, FAIR SORT, HARD, W CMT'D, F → P Ø, NS

SS, AA, GRY CMT

SH, VARI COLOR

SS, WHT, LT TAN, M → LG GRNS, P SORT, P CMT'D, SOFT, GØ, NS

CHT, BRN, GRY, FRESH

LS, BRN, F → M XTLN, SCT FOSS FRAGS, HRD, NO VIS Ø, NS

LS, BRN, F XTLN, W CMT'D OOLS, HRD, TITE, NS, DNS

LS, BRN, TAN, VF XTLN, HRD, TITE NS

LS, WHT, M XTLN, M HRD, VG XTLN Ø, NS

CHT, PEACHY BRN, FRESH, V SL SCT FOSS, NS

LS, BRN, F XTLN, ABUN LG XTLS W/N, P Ø, NS

LS, WHTish GRY, FINE GRNLR, SOFT, BRTTL, VP Ø, NS

7:AM 7-30-15,
DRLG @ 4847'
MUD CHECK
VIS: 57 LCM: 2
CHLOR: 8,000 WT: 9.3
FILT: 8.8

@TD: SHORT TRIP 25 STNDS
COND ≈ 1½ HRS
SURVEY