

Max R. Loveley

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY Richie Exploration, Inc.
 LEASE # #1 Wray 18A
 FIELD Antelope Ridge Northwest
 LOCATION SW SE NE
 SEC 18 TWP 13 RGE 31W
 COUNTY Gove STATE KS
 CONTRACTOR WW Drilling #6
 SPUD 1-12-2013 COMP 1-20-2013
 RTD 4720 LTD 4725
 MUD UP 3447 TYPE MUD Chem

ELEVATIONS
 KB 2935
 DF 2930
 GL 2930
 Measurements Are All From KB

CASING
 SURFACE 8 7/8" @ 219'
 PRODUCTION 4 1/2"

ELECTRICAL SURVEYS
 Dual IND
 Comp N/D

FORMATION TOPS AND STRUCTURAL POSITION



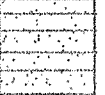



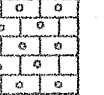
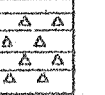

FORMATION	SAMPLE TOP	ELECTRIC LOG TOP	SUB-SEA DATUM	STRUCTURAL POSITION		
				A	B	C
Anhydrite	2434	2436	499	509		
Base Anhydrite	2460	2461	474	484		
Stoller	3589	3582	-647	-648		
Heebner	3940	3943	-1008	-999		
Lansing	3986	3987	-1052	-1043		
Muncie SH	4124	4133	-1198	-1186		
Stark	4214	4218	-1283	-1271		
Altamont	4327	4330	-1395	-1387		
Pawnee	4417	4420	-1485	-1473		
Myric	4449	4454	-1519	-1507		
Cherokee SH	4497	4502	-1567	-1554		
Johnson	4539	4546	-1611	-1595		
Morrow SH	4585	4570	-1635	-1625		
Mississippi	4598	4622	-1687	-1637		

REFERENCE WELLS FOR STRUCTURE

- A Richie #1 Phillips-Quier 1645; FSL 165; FEL 18-13-31W
- B _____
- C _____

REMARKS

LEGEND

								
Anhydrite	Salt	Sandstone	Shale	Carb sh	Limestone	Ool.Lime	Chert	Dolomite

DRILLING TIME IN MINUTES PER FOOT
Rate of Penetration Decreases

5" 10" 15" 20" 25"

DEPTH

LITHOLOGY

SAMPLE DESCRIPTIONS

OIL SHOWS

REMARKS

ANHYDRITE
2434 +501

2450

ANHYDRITE
2460 +475

3500

SH, GRY, LT GRY, RED

A.A.

LS, TAN, V FXTLN, DNS, FEW
MICRO FOSS, T, TE, NS

SLT STN, V F SMD GRNS, GRY,
GRY/GRN, V FRIABLE, NS

SLT STN / SS, GRY, GRY/GRN,
V FRIABLE, SS GRN SL

STOTLER
3589-654

3600

LGR THAN ABOVE
LS, GRY/WHT, F→M XTLN,
MHRD, ? XTLN Ø, NS

LS, TAN, F XTLN, SL HRD, BRITL,
NO Ø, NS

LS, CRM / TAN / BLK XTLN, F→M
XTLN, HRD, V SL XTLN Ø, NS

LS, GRY, F XTLN, DNS, M HRD,
TITE, NS

SH, DK GRY

LS, WHT, CRM, V CHLKY, SOFT, A
SL HRD, NS

DOLO, TAN, SUCR, M HRD, NS

SS, CLR+CRM GRMS, W SDRT, SCT
MICA, FRIABLE, F→P CMT'D, VG Ø
NS

SH, GRY

LS, GRY, V F XTLN, DNS, HRD, NO Ø
NS

3700

SH, GRY

LS, CRM, F XTLN, SOFT, BRITL,
FEW FOSS, VP Ø, NS

LS, GRY / WHT, V F XTLN, HRD, SCT
CHT (WHT), NS

LS, CRM, BUFF, V F XTLN, SDFT,
CHLKY, NS

LS, GRY, F XTLN, DK GRY XTLN
M HRD, V SL FOSS, NO Ø, NS

LS, WHT / BUFF, V F XTLN, BRITL,
SL FOSS, NO APP Ø, NS

3800

SH, GRY

LS, BUFF, TAN, V FXTLN, ALGAL, SCT M FOSS FRAGS, VW CMT'D, NO VIS Ø. NS

SLTSTN, GRY

A.A.

CHALK

CHALK

LS, BUFF, TAN, F → M XTLN, M HRD, FOSS, P XTLN Ø. NS

A.A.

SH, LT GRY

LS, WHT, F XTLN, SCT TAN CHT W/M, HRD, TITE, NS

SH

LS, CRM, FXTLN, HRD, V FOSS, TITE, NS

SH, BLK, RED

LS, TAN, CRM, V F XTLN, DAS, FOSS, M HRD, NO APP Ø. NS

SH, GRY

3900

HEEBNER
3940-1005

SH, BLK

LS, TAN, CRM, F XTLN, SCT FOSS, W CMT'D FOSS, HRD, NS

SH, GRY, DK GRY

TORONTO
3964-1029

LS, TAN, F XTLN CMT'D OOLS, SOFT, P CMT'D OOLS, G INT OOL Ø, NS

LS, AA, INCR CMT'D OOLS, FAIR OOL Ø. NS

LANSING
3986-1051

CHALK

4000

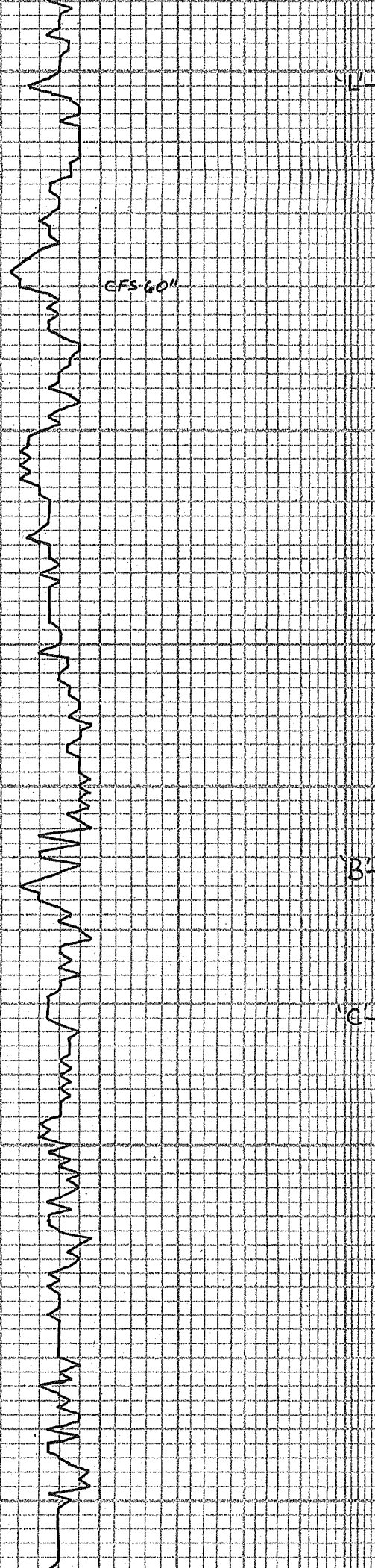
LS, BUFF, F XTLN CMT'D OOLS, P → W CMT'D OOLS, VARI SIZE, G → TITE Ø. NS

LS, WHT, V FXTLN, HRD, VW CMT'D

DST#1 4120-4186
30.45.45.60

IF: BOB 14 MIN 151:4' BB
FF: BOB 14 MIN FS: 2' BB

REC: 480' GIP
60' G.COM 15% G, 25% O
180' G.COM 15% G, 40% O



HUSHPUCKNEY
4248 - 1313

BKC
4278 - 1343

4300

MARMATON
4308 - 1373

ALTAMONT
4327 - 1392

4400

PAWNEE
4417 - 1482

MYRIC
4449 - 1514

VG FLUOR BLEED

LS, WHT, F XTLN, SCT WHT CHT,
P₀, NS
SH, BLK

CHALK, SH STRKS W/N
CHT, WHT, V FOSS

LS, TAN / GRN, F XTLN, HRD, P₀S
BRTL, NO APP₀, NS

LS, LT TAN, F XTLN, SL SUCR DOLD,
HRD, NO V IS P₀NS

SH, GRN, SET SMD GRAS

SH, GRN, GRN

SH, GRN, STICKY

LS, WHT, F XTLN, V LG XTLN W/N,
V BRTL, P XTLN₀, NS

LS, TAN, A.A.

SH, GRN, GRN, BURG, BLK

LS, LT WHT → TAN, V F XTLN,
VW CMT'D FOSS, TITE, NS

LS, WHT, CRM, TAN, V F XTLN,
DNS, HRD, TITE, NS

SH, BURG, GRN

LS, TAN, CRM, V F XTLN, DNS, NS

LS, WHT, V F XTLN, DNS, HRD,
V FEW SML FOSS, NS

SH, GRN

LS, LT GRN, V F XTLN, DNS
NS

SH, GRN, DK GRN

LS, CRM, V F XTLN, DNS, M HRD
TITE, NS

LS, BRN, V F XTLN, DNS, V FOSS,
BRTL, NS

SH, BLK

SH, GRN

LS, BRN, CRM, V F XTLN, HRD,
V FEW FOSS, NS

LS, WHT, V F XTLN, SOFT → M HRD,
NO APP₀, NS

BLEED
V L TOIL

VIS 51 WT 9.3
CHLOR 6,000 LCM 1
FILT 6.4

DST #2 4211-4233
30.45.45.60

IF: 7" ISI: NR
FF: 8" FSI: NR

REC: 210' MW 10% M 90' W
CHLOR 54,000

FP: 42-111, 114-162
SIP: 1198-1140
HP: 2106-2088

SH FLOOD

7:AM 1-18-2013
DRLG @ 4351

MUD CHECK
VIS 62 WT 9.2
CHLOR 1,000 LCM 2

Ft. Scott

SH, BLK

4466-1531

LS, BRN/TAN, V FXTLN, V HRD,
V FOSS, TITE, NS

LS, CRM, V FXTLN, CMT'D OOLS,
FOSS, TITE, NS

A.A.

CHEROKEE

4500

4497-1562

SH, BLK, ABUN CARB
LS, TAN, V FXTLN, DNS, TITE, HRD,
LS, CRM/TAN, FXTLN, G VARI SIZE
PP → LG OIL FILL VUG, FEW SCT
G.A.S. BLS, ? EMERG, V FEW FR
ON BRK

1 pc
BLK O
COAT
VUG &
F ODR

SH, BLK
LS, BUFF, TAN, V FXTLN, DNS,
V HRD, PCS W/FINE FOSS W/N,
PCS W/REXTLN FRAC'S, TITE NS

JOHNSON

c. 4539-1604

SH, GRY
LS, BRN, VARI SIZE XTLN, HRD, G OIL
FILL PP, SLD OIL BLEED, SL GAS +
OIL ON BRK
LS, TAN, V SOFT, V G OIL FILL VUG

LT BRN
OIL
VLT ODR

BASE

JOHNSON

4557-1622

LS, DK BRN, V FXTLN, V DNS, V G, SWIL
OIL FILL VUG, STRKS ON EDGE,
G BLEED, NO VIS GAS
LS, CRM, V FXTLN, M HRD, DNS,
CHLKY, NO APP, CHLKY PCS W/DB
OIL STRKS

FO IN
CUP
WCR
ODR

MORROW SH

c. 4565-1630

SH, GRY, GRN W/BLK STRKS

SH, VARI COLOR

SS, CLR, SUB ANG → SUB RND GRAS,
P SORT, MGRNS, GRYCMT, HRD,
P NS

LS, GRY, V FXTLN, V DNS, V HRD,
FEW SCT FOSS, NO, NS

MORROW SD

4590-1655

SH, GRY
LS, TAN, BRN, V FXTLN, V HRD, V PCS
SOFT, PP, STRKS W/N, G, PP, XTLN
O FILL

FO IN TRAY
DP O STN

SS, WHT, G SORT, F GRNS, DD OIL STNG
SS, GRN, BRN, CLR GRN, W SORT NS

MISS

4600

c. 4598-1663

LS, GRY, WHT, V FXTLN, DNS,
HRD, TITE, NS

LS, WHT, TAN, V FXTLN, HRD,
SL BRTL, NO APP, NS

LS, CRM, TAN, FXTLN, SET PCS W/
M XTLN W/N, M HRD, BRTL,
P XTLN, NS

LS, CRM, F → M XTLN, SOFT, GRNLR
TXT, SL CHLKY, F → G, NS

LS, TAN, CRM, F → M XTLN, V FOSS
S → M HRD, ? NS

LS, WHT, FXTLN, HRD, SL F
GRNLR TXT, NO APP, NS

LS, TAN, BUFF, V FXTLN, V HRD,
DNS, TITE, NS

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

DOLD, TAN, FXTLN, HRD,
SL F → M XTLN, V FOSS, NS

20 STAND SHORT TRIP
DST #3 4518-4564
30.45.45.60
IF: BOB 19 1/2 MIN ISI: 1 1/2"
FF: BOB 17 MIN FSI: 3"
REC: 90' GIP
330' G MO
20% G, 55% O, 25% M
OIL TOO THICK FOR GRAVITY
FP: 60-128, 135-181
SIP: 1125-1025
HP: 2279-2258

7:AM 1-19-2013 V1554
DST #3 @ 4664 WT 9.3
MUD CHECK
VIS 46 WT 9.3
CHLOR 5000 LCM 2
FILT 6.4

LS, TAN, FXTLN, "Pumice"
TEXTURE & G OIL FILL,
SAT'D, TR GAS ON BRK, SOFT
SD GRNS, LG, CLR, SUB RND,
UN CONSOL, SL GRN STNG
IN SURF PITTING

7:AM 1-20-2013
CF@ 4620'

MUD CHECK
VIS 56 WT 9.6
CHLOR 8,000 LCM 2
FILT 6.4

DST #4 4554-4599
30.45.45.60
IF: 5" ISI: No BB
FF: 4" FSI: No BB
REC: 90' M
120' MW · 30% M, 70% W
FP: 55-113, 114-144
SIP: 1167-1122
HP: 2279-2258

