Max R. Lovely

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY Ritchie Exploration Inc.
LEASE #1 Phillips-Ottley
FIELD Wildcat
LOCATION 1645' FSL, 165' FEL
SEC 18 TWSP 13 RGE 31W
COUNTY Gove STATE KS
CONTRACTOR Duke #2
SPUD 11-19-2012 COMP 11-29-2012
RTD 4725 LTD 4724
MUD UP 3390 TYPE MUD Chem

ELEVATIONS
KB 2943
DF
GL 2935
Measurements Are All From KB

CASING
SURFACE 8 5/8" @ 222'
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	2436	2434	509	510		
B/Anhydrite	2461	2459	484	488		
Stoller	3591	3591	-648			
Heebner	3936	3942	-999	-992		
Lansing	3980	3986	-1043	-1036		
Muncie	4124	4129	-1186	-1182		
Stark	4205	4214	-1271	-1266		
Altamont	4336	4330	-1387	-1397		
Pawnee	4413	4416	-1473	-1476		
Myric Station	4447	4450	-1507	-1508		
Cherokee SH	4498	4497	-1554	-1556		
Johnson	4540	4538	-1595	-1599		
Morrow	4570	4568	-1625	-1624		
Mississippi	4598	4580	-1637	-1660		

REFERENCE WELLS FOR STRUCTURE

A Shakespeare #1-17 KMB Bros. NE NW SW SW 17-13-31W
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

DEPTH	SAMPLE DESCRIPTIONS	OIL SHOWS	REMARKS
ANHYDRITE 2436 +507			
2450			
BASE ANHYDRITE 2461 +482			GEO ON LOC 3:30 PM 11-22-12
3500	LS, GRY, VF XTLN, M HRD		
	A.A.		
	LS, LT GRY, LT TAN, F XTLN, ROUGH TXT, NO APP Ø, NS		
	SH, GRY		
	A.A.		
	SS, CLR GRNS, GRY CMT, SOFT, SL FRIABLE, F→M GRNS, RND, G GRNLR Ø, NS		
STOTLER 3591 -648	LS, TAN, VF XTLN, VARI SIZE GRY FOSS W/N, W CMT'D FOSS, TITE, NS		
3600	SH, DK GRY→BLK		
	SH, INCR BLK		
	LS, CRM, F XTLN, M HRD, ABUN FOSS, NS		
	SH, RED, 'FLOOD'		
	LS, GRY/TAN, VF XTLN, V BRTTL, NO APP Ø, NS		
	LS, TAN, F XTLN, V FOSS, M HRD, NS		
	A.A.		
3700	SH, RED		
	LS, TAN, CRM, VF XTLN, DNS, HRD, TITE, NS		
	SH, LT GRY		
	LS, GRY, F XTLN, M HRD, DNS, NO APP Ø, NS		
	SH.		
	LS, TAN, CRM, BRN, F XTLN, SCT FOSS, SOFT, P Ø, NS		
	LS, CRM, V FOSS, M HRD, SL BRTTL, NS		
3800	LS, A.A.		
	CHT, WHT, V FOSS, SL FRESH		
KING HILL 3829 -886	SH, BLK, DK GRY, SL SNDY		
	LS, WHT/CRM, F XTLN, SCT FOSS, SCT FRESH CHT, NS		
	LS, WHT/CRM, F XTLN, V HRD, SCT FOSS, SCT △, TITE, NS		7:AM 11-23-12 DRLG @ 3863'
QUEEN HILL 3884 -941	SH, BLK		
	LS, WHT, LT GRY, F XTLN, BRTTL, SOFT, VP XTLN Ø, NS		
3900	LS, TAN, VF XTLN, DNS, HRD, BRTTL, TITE, NS		
	LS, WHT/CRM, F XTLN, M→V HRD, DNS, SCT CRM △, NS		
	LS, TAN, F XTLN, LG XTLS W/N, M HRD, P→TITE Ø, NS		
	LS, WHT, VF XTLN, V HRD, ALGAL, TITE, NS		MUD CHECK VIS 42 WT 9.4 CHLOR 5,000 LCM 1 FILT 9.6
HEEBNER 3936 -993	SH, BLK		
	SH, GRY, GRN		
	LS, TAN, VF XTLN, DNS, HRD, NO VIS FOSS, TITE, NS		
	SH, GRY		
TORONTO 3964 -1021	LS, WHT, VF XTLN, HRD, VW CMT'D OOLS, ABUN OOLS, M SIZE OOLS, NS, INCR FRAGS W/ DEPTH		
LANSING 3980 -1037	LS WHT, F XTLN, SOFT, CHLKY TEXT, ? Ø, NS		
	LS, WHT, VF XTLN, HRD, DNS, FEW SCT FOSS, NO Ø, NS		SHORT TRIP 28 STNDS
4000	LS, WHT/TAN, F XTLN, M XTLS W/N, M HRD, SL BRTTL, ? Ø, NS		DST#1 3997-4072 30·45·30·45 IF: BOB 20" ISI: NR FF: BOB 28" FSI: NR REC: 125' WCM -35% W 240' SMCW - 91% W 115° 31,500 CHLOR FP: 35-119, 123-194 SIP: 1085-1052 HP: 1965-1879
'C' 4014 -1071	LS, CRM, LT TAN, VF XTLN, PCS BRTTL @ FOSS, SCT FOSS, P FOSS Ø, NS		
'D' 4028 -1085	LS, TAN/GRY, F XTLN, S→M HRD, FEW SCT FOSS, MOSTLY VP Ø, NS		
	LS, WHT, CRM, VF XTLN, SOFT, CHLKY, VF MICRO Ø, NS		
	LS, BUFF, WHT, F XTLN, PCS SL OOL + FOSS		
	LS, WHT, CRM, LT TAN, VF XTLN, M→V HRD, FEW SCT FOSS, TITE		
'E' 4057 -1114	SH, GRY, GRN		
	LS, BUFF, V OOL, CLR CMT'D, TITE		STRAP 4089.27 BOARD 4090.01 SHORT .74
'F' 4064 -1121	SH, GRY, GRN		
	LS, CLR XTLN, LG XTLS, G XTLN FRAC Ø, NS		
'G' 4073 -1130	LS, WHT, VF XTLN, SOFT, CHLKY, NS		7:AM 11-24-12 DST#1 @ 4072
	LS, CRM→TAN, S→M HRD, F XTLN W/ M XTLS W/N, FEW PCS W/ ? BRN STNG, NO ODOR, NO FLUOR		REAM 250' AFTER DST#1, RED SH FLOOD
	LS, WHT, F→M XTLN, V GRNLR TXT, CRUMBLY, G XTLN Ø, NS, SL SCT FOSS		
4100	LS, TAN, F XTLN, SOFT W/ DNS HRD LG XTLS W/N, FOSS, G XTLN Ø, NS		
	A.A.		
MUNCIE 4124 -1181	SH, DK GRY		
	LS, WHT, VF XTLN, SOFT, CHLKY, DRY BRN + BLK DD O FLAKES, NO ODOR, MEALY-ROTTEN	DD OIL STNG	
'H' 4141 -1198	LS, TAN, BRN, F XTLN, FEW FOSS, HRD, VP XTLN → TITE Ø, NS		
	CHT, TAN, SHARP, FRESH, V FINE FOSS W/N		
	LS, CRM, TAN, WHT, F XTLN, M HRD, DNS, NO FOSS, NS		DST#2 4196-4237 30·45·45·60 IF: 5" ISI: NR FF: 5" FSI: NR REC: 30' WCM - 40% W 120' MCW - 85% W CHLOR: 28,500 FP: 22-50, 53-92 SIP: 1208-1133 HP: 2080-2036
'I' 4171 -1228	LS, TAN, VF XTLN, V DNS, V HRD, V FEW FOSS, TITE, NS		
	SH, GRN		
'J' 4185 -1242	LS, GRY, CRM, TAN, F XTLN, FEW PCS WHT W/ CMT'D OOLS W/ NO Ø		
	LS, CHLKY, A.A.		
4200			
STARK 4205 -1262	SH, BLK, BLK/GRN		7:AM 11-25-12 CIRC @ 4205'
	LS, WHT, VF XTLN, HRD, W CMT'D FOSS, G MULTI FRAC'S W/ G FLUOR STNG, MICRO FLUOR O SPTS ON BRK.	FLUOR O SPTS NO ODOR	
'K' 4214 -1271	LS, BRN, F XTLN, M HRD, G EVEN SAT FLUOR STNG, G ODOR, PCS FILMY DRY OIL, PCS V SML O SPTS ON BRK, NO VIS ENERGY	G ODOR FLUOR V LT OIL	
	LS, CRM/WHT, F XTLN, F FOSS, G FLUOR STNG, M HRD, F→G VARI SIZE FO ON BRK, STR ODOR, SWEET ODOR, V SL TR GAS/OIL SPTS, FO IN TRAY	LT BRN OIL STR ODOR RAINBOW	
HUSHPUCKNEY 4236 -1293	SH, BLK, CARB		-17 STAND SHORT TRIP
	LS, WHT/GRY, F XTLN, GRY→M XTLS, BRTTL, F→G XTLN Ø, NS		MUD CHECK VIS 50 WT 9.4 CHLOR 5,000 LCM 1 FILT 9.5
'L' 4248 -1305	LS, GRY/WHT, F XTLN, HRD, FOSS, P XTLN Ø, NS		
	A.A.		
BKC 4274 -1331	SH, GRN/GRY		
	CHALK		
	SLTSTN, GRY		7:AM 11-26-2012 DRLG @ 4290
4300			
MARMATON 4307 -1364	LS, CRM, F XTLN, M HRD, SCT FOSS, P Ø, NS		
	SH, GRY, BRN, BURG		MUD CHECK VIS 56 WT 9.5 CHLOR 11,000 LCM 1 FILT 8.0
	SH, GRY		
ALTAMONT 4336 -1393	LS, WHT, GRY, F XTLN, V DNS, V HRD, NO Ø, VW CMT'D FOSS, NS		
	LS, CRM, TAN, F XTLN, HRD, FEW FOSS, NO APP Ø, NS		
	SH, GRY, SLTY		
	SLTSTN, GRY		
	LS, WHT, VF XTLN, V HRD, DNS, TITE, NS		
	SH, GRY		
	SH, GRN		
	SH, BLK, WHT		
	LS, WHT, BUFF, VF XTLN, HRD, BRTTL, TITE, NS		
4400			
PAWNEE 4413 -1470	SH, BLK		
	LS, TAN, VF XTLN, CRYPTO, TITE, NS		
	LS, WHT, A.A., SL LESS HRD, REXTL'D FRACS, NS		45 STAND SHORTTRIP
	SH, DK GRY, CHOCO		DST#3 4436-4520 30·30·30·30 IF: 1/2", dead 25" ISI: NR FF: dead FSI: NR REC: 28' MUD 112° FP: 19-24, 25-27 SIP: 793-624 HP: 2201-2131
	SH, GRN, GRY		
MYRIC 4447 -1504	LS, DK BRN, DK GRY, VF XTLN, DNS, V HRD, TITE, NS		
	CHT, BRN, WHT, OPAQ, FRESH		
	SH, BLK		
FT SCOTT 4470 -1527	LS, CRM, F XTLN, SL CHLKY IN PCS, HRD, DNS, TITE, NS		
	LS, TAN, F XTLN, V DNS, V HRD, NO Ø, NS		
	LS, BRN/TAN, F XTLN W/ ABUN M→CRS XTLS W/N, REW, BRTTL, VP Ø, NS		
CHEROKEE SH 4498 -1555	SH, BLK		
4500	LS, WHT, F XTLN, V DNS, V HRD, TITE, NS		4520' CIRC LS, WHT, F XTLN, SOFT, CHLKY, SCT FLUOR STNG, V SL SFO ON BRK, NO ODOR, MICRO O SPTS
	SH, GRY		
	LS, BUFF, F XTLN, V OOL, W CMT'D OOLS		
	LS, CRM, F XTLN, M HRD, M XTLS W/N, SL SCT BRN STNG, NO ODOR, NFO	STNG FLUOR	7:AM 11-27-2012 DRLG @ 4518
	TRASHY SAMPLES		MUD CHECK VIS 51 WT 9.3 CHLOR 5,000 LCM 1 FILT 7.2
	TRASHY SAMPLES		
JOHNSON 4540 -1597	LS, BRN/GRY, F XTLN, M HRD, F XTL Ø, DK BRN O ON BRK, SL FO IN TRAY ? ENERGY	FO DK BRN OIL	
	LS, BRN, F→M XTLN, CRS TXT, VG XTLN + SL VUG Ø, O FILL Ø, HVY RNBOW IN CUP, G ODOR.	RAINBOW G ODOR	
BASE JOHNSON 4558 -1615	LS, WHT, CHLKY, DD O STNG		
	LS, CLR XTLN, VG O FILL XTLN Ø, G OIL ON BRK, LT ODOR	LT ODOR	
	SH, GRY		
	LS, BRN, F XTLN, HRD, TITE, NS		7:AM 11-28-2012 COMING OUT FOR DST4 @ 4563'
MORROW SH 4570 -1627	SH, GRY		MUD CHECK VIS 53 WT 9.4 CHLOR 4,500 LCM 1 FILT 6.4
	SS, CLR GRNS, ANG, MED GRNS, W SORT, VG Ø, NS		
	LS, WHT, GRNLR TXT, SOFT→MED HRD, G XTLN Ø, NS		
	SS, BRN + GRN CMT, CLR GRNS, MED GRNS, RND→SUB RND, HRD, VP GRNLR Ø, NS		DST#4 4519-4563 30·45·30·60
MISS 4600 4598 -1655	LS, WHT, F XTLN, HRD, V SL DNS, NS		IF: BOB 3" ISI: BOB 15" FF: BOB IMMED FSI: BOB 30"
	LS, TAN, VF XTLN, CRYPTO, V TITE, BLOCKY, NS		REC: 660' CGO 15% G, 85% O 240' GCMO 20% G, 50% O 1440' GIP 128° 29° API FP: 42-216, 229-358 SIP: 962-951 HP: 2229-2151
	LS, WHT, GRY, VF XTLN, SCT FOSS + SS GRNS W/N, HRD, SL LAM Ø, NS		
	A.A.		
	LS, WHT, GRY, AA		
	LS, TAN, OPAQ, M HRD, SCT TAN CHT, NO Ø, NS		
	LS, WHT, F→M XTLN, LG XTLS W/N, FEW SCT FOSS, F XTLN Ø, NS		
	A.A.		
	LS, TAN, F XTLN, M HRD, BRTTL, ABUN W CMT'D FOSS		
4700	DOLO, BRN, F GRNLR, HRD, NO APP Ø, NS		MUD CHECK VIS 55 WT 9.3 CHLOR 4,000 LCM 1 FILT 5.6
	LS, TAN, F XTLN, HRD, FOSS, FAIR XTLN Ø, NS		
	SH, GRN		7:AM 11-29-2012 CONN @ 4718'
RTD			

DRILLING TIME Minutes/Foot · Rate of Penetration Decreases · DEPTH · LITHOLOGY · SAMPLE DESCRIPTIONS · OIL SHOWS · REMARKS