

# Robert L. Milford

PETROLEUM GEOLOGIST  
Wichita, Kansas

## GEOLOGISTS' REPORT

DRILLING TIME AND SAMPLE LOGS

OPERATOR: **Murfin Drilling Company, Inc.**

LEASE: **Murfin #1-23**

LOC. SPOT: **C SE SE NW**

LOC FOOTAGE: **2,310' FNL 2,310' FWL**

SEC: **23** TWP: **2S** RANG: **36W**

COUNTY: **Rawlins** STATE: **KANSAS**

APR: **15-153 20912-00-00**

CONTRACTOR: **Murfin Drilling Co., Inc.** REG. NO. **14**

DRILLING STARTED: **11/19/2012** COMPLETED: **11/30/2012**

DRILLING TIME: **3:303** MINUTE TYPE: **GENERAL**

DRILLING TIME PER HOUR: **3:57/0** TO: **R/D**

SAMPLER EXAMINED FROM: **3:57/0** TO: **R/D**

SAFETY EXAMINED FROM: **3:57/0** TO: **R/D**

GEOLOGICAL SUPERVISION FROM: **3:52/5** TO: **R/D**

FORMATION NAME: **TOP** DATE/TIME: **TOP** DATE/TIME: **TOP**

LOGS: **LOGS** SAMPLES: **SAMPLES**

FORMATION NAME: **TOP** DATE/TIME: **TOP** DATE/TIME: **TOP**

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**ELEVATIONS**  
KB **3,305'**  
GL **3,295'**

**CASINO RECORD**  
Surface: **8.5/8" @ 91'**  
Production: **5.1/2" @ 497'**  
Production: **5.1/2" @ 497'**

**ELECTRICAL SURVEYS**  
Cable: **100'**  
Polarity: **Inductive**  
DUC: **Compressed**

**Porosity Log**  
Microresistivity Log  
Borehole Compensated

Base Stone Corral	3194'	+111	3195'	+110
Foraker	4002'	-697	4006'	-701
Topkapi	4119'	-814	4123'	-818
Oread	4214'	-909	4218'	-913
Loring	4488'	-1183	4492'	-1187
B/KC	4613'	-1308	4617'	-1312
Pawnee	4686'	-1381	4690'	-1385
Cherokee	4990'	-1585	4994'	-1589
Total Depth	4986'	-1681	4990'	-1685

DATE	7:00 AM DEPTH	REMARKS
11-19-12	0'	Spud @ 5:45 pm. Plug down @ 1:30 am on 11-20-12. Dev. 0.5' @ 394'
11-20-12	394'	Cut 394' in last 24 hrs. Drilling out plug @ 9:30 am w/ PDC bit. Dev. 0.5' @ 1209'
11-21-12	2,575'	Cut 2,181' in last 24 hrs; 20.5 hrs drlg. Bit trip @ 3525' (took off PDC). Dev. 0.5' @ 3525'
11-22-12	3,660'	Cut 1,085' in last 24 hrs; 18.25 hrs drlg. DST #1 @ 3975'
11-23-12	3,975'	Cut 315' in last 24 hrs; 15.25 hrs drlg. DST #2 @ 4040'
11-24-12	4,040'	Cut 65' in last 24 hrs; 3.5 hrs drlg. DST #3 @ 4147'
11-25-12	4,160'	Cut 120' in last 24 hrs; 6.25 hrs drlg. DST #4 @ 4245'
11-26-12	4,318'	Cut 158' in last 24 hrs; 9 hrs drlg. DST #5 @ 4318', DST #6 @ 4345'
11-27-12	4,345'	Cut 27' in last 24 hrs; 1.5 hrs drlg. DST #7 @ 4443'
11-28-12	4,443'	Cut 98' in last 24 hrs; 6 hrs drlg. DST #8 @ 4665'
11-29-12	4,665'	Cut 222' in last 24 hrs; 12.5 hrs drlg. RTD 4990' @ 10:47 am
11-30-12	4,920'	Cut 255' in last 24 hrs; 13.5 hrs drlg. RTD 4990' @ 10:47 am
12-1-12	4,990'	Cut 70' in last 24 hrs; 3.75 hrs drlg. Ran production casing.

**Remarks**

The electric log measurements correlate from 1' to 4' higher to the drilling measurements.

Formation tops and lithology on this report have been connected to the electric log.

The drilling samples were deposited at the Kansas Geological Survey office in Wichita.

Respectfully submitted,

Robert L. Milford

