

# GEOLOGIST'S REPORT

OPERATOR **MURFIN DRILLING CO INC.**  
 LEASE **#2-30 Smith**  
 ELEVATIONS  
 KB **3087'**

LOCATION **910' FSL 410' FWL**  
 SEC. **30** TWPSP **12S** RGE **32W**  
 COUNTY **LOGAN** STATE **KANSAS**  
 FIELD **FLUNKY TOWN**

CONTRACTOR **MURFIN DRILLING CO** RIG NO. **22**  
 COMMENCED **JULY 22 2013** COMPLETED **AUGUST 1, 2013**  
 MUD DISPLACED **3700'** MUD TYPE **CHEMICAL**  
 DRILLING TIME KEPT FROM **3650'** TO **4780'**  
 SAMPLES SAVED FROM **3650'** TO **4780'**

SAMPLES EXAMINED FROM **3650'** TO **4780'**  
 GEOLOGICAL SUPERVISION FROM **3650'** TO **4780'**  
 GEOLOGIST ON WELL **STEPHEN J MILLER**

FORMATION NAME LOG TOP DATUM TOP DATUM SAMPLE  
 ANHYDRITE 2589 +518 2589 +519  
 B/ANHYDRITE 2594 +493 2594 +496  
 TOPEKA 3822 -735 3815 -728  
 HEBNER 4020 -933 4015 -928  
 LANING 4090 -973 4057 -970  
 STARK SHALE 4296 -1209 4282 -1205  
 B/KANSAS CITY 4366 -1279 4362 -1275  
 CHEROKEE 4788 -1489 4572 -1485  
 MISSISSIPPIAN 4676 -1589 4780 -1583  
 TOTAL DEPTH 4788 -1681 4780 -1673

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STARK SHALE	4296 -1209	4282 -1205
B/KANSAS CITY	4366 -1279	4362 -1275
CHEROKEE	4788 -1489	4572 -1485
MISSISSIPPIAN	4676 -1589	4780 -1583
TOTAL DEPTH	4788 -1681	4780 -1673

REMARKS  
 API 15-109-21196  
 Drilling Fluids: MORGAN MUD  
 Drill Stem Testing: TRILOBITE  
 Gas Traller: NONE  
 Reserve Pit Chlorides: 11,900 PPM

DEPTH	DRILL TIME (MIN/FT)	SAMPLE DESCRIPTIONS	REMARKS
2589			<b>ANHYDRITE</b> 2568 +519
2594			<b>B/ANHYDRITE</b> 2591 +496
3822			<b>TOPEKA LIME</b> 3815 -728
4020			<b>HEBNER SHALE</b> 4015 -928
4090			<b>LANING LIME</b> 4057 -970
4296			<b>STARK SHALE</b> 4292 -1205
4366			<b>B/ KANSAS CITY</b> 4362 -1275
4676			<b>MARMATON LIME</b> 4408 -1321
4788			<b>PAWNEE LIME</b> 4486 -1399
			<b>FORT SCOTT</b> 4542 -1455
			<b>CHEROKEE SHALE</b> 4572 -1485
			<b>JOHNSON ZONE</b> 4615 -1528
			<b>B/PENN LIME</b> 4641 -1554
			<b>MISSISSIPPIAN</b> 4670 -1583
			RTD 4760

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