

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY **Murfin Drilling Company Inc.**

LEASE **Hamit Unit #2-20**

FIELD **Wildcat**

LOCATION **330' fsl & 1330' fwl**

SEC **20** TWP **6S** RGE **19W**

COUNTY **Rooks** STATE **Kansas**

CONTRACTOR **Murfin Drilling Co. Inc. Rig #3**

SPUD **11/7/2017** COMP **11/14/2017**

RTD **3686** LTD **3687**

MUD UP **2800** TYPE MUD **Chemical**

SAMPLES SAVED FROM **3020** TOTD

DRILLING TIME KEPT FROM **3020** TOTD

SAMPLES EXAMINED FROM **3020** TOTD

GEOLOGICAL SUPERVISION FROM **2880**

GEOLOGIST ON WELL **Robert D. Hendrix**

FORMATION TOPS

ELECTRIC LOG

SAMPLE

Base Anhydrite **1702 (+428)** **1705 (+425)**

Heebner **1736 (+394)** **1737 (+393)**

Topoka **3124 (-994)** **3122 (-992)**

Toronto **3320 (-1190)** **3322 (-1192)**

Lansing **3342 (-1212)** **3341 (-1211)**

Stark Sh **3356 (-1226)** **3357 (-1227)**

Mound City **3537 (-1407)** **3540 (-1410)**

Reagan Sand **3572 (-1442)** **3573 (-1443)**

Reagan Sand **3630 (-1500)** **3632 (-1502)**

ELEVATIONS

KB **2130'**

DF

GL **2125'**

Measurements Are All From **Kelly Busting**

CASING

CONDUCTOR

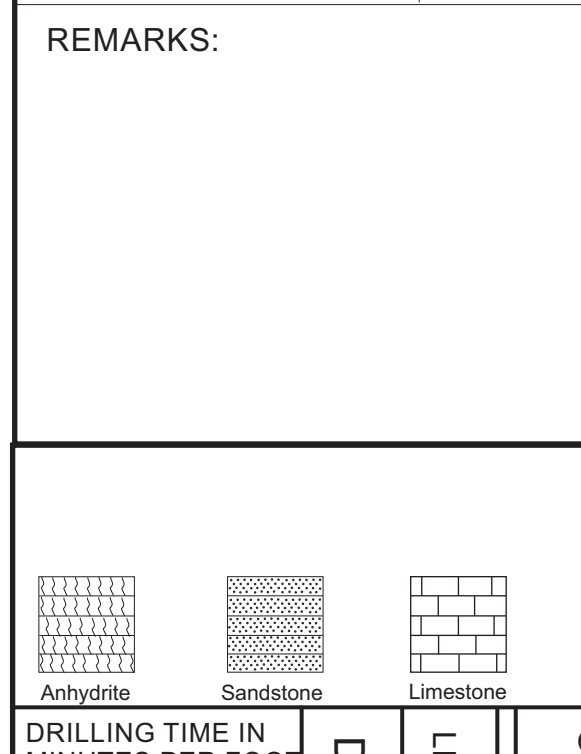
SURFACE **8 5/8" at 218'**

PRODUCTION **5 1/2" at 3680'**

ELECTRICAL SURVEYS

Pioneer Wellbore, Compensated Porosity, Dual Induction, Macrolog, Sonic

APi# 15-163-24349



REMARKS:

DEPTH	LITHOLOGY	GAS UNITS	SAMPLE DESCRIPTION	REMARKS
1700	Anhydrite			Anhydrite 1705 (+425)
1737	Base Anhydrite			Base Anhydrite 1737 (+393)
3122	Topoka		Limestone: lt gray, fxl, soft, silty, granular, no vis por Shale: gray, red, silty Limestone: gray to tan, fxl, chalky, fossiliferous, no vis por Shale: red, gray, muddy Limestone: white to gray, fxl, v- chalky, soft, silty, granular, no vis por Shale: gray, red, silty, soft muddy Limestone: gray, fxl, chalky, fossiliferous, small amt of gilsonite, nfo, no odor, no vis por Shale: gray, silty, sandy, biotitic	Geologist on location 2880' at 6:00 am 11/10/2017 Mud Check at 2975' wt 8.6, vis. 69, lcm 1# Morgan Mud, Dave Lines
3322	Heebner		Limestone: lt brown, tan to gray, f-mxl, fossiliferous, no vis por, 5% sample fr amt of brown stain, nfo, no odor Shale: red, gray Limestone: tan to brown, v-fxl, dense, fossiliferous, no vis por Shale: red, gray Limestone: gray to tan, f-mxl, fossiliferous, no vis por Limestone: gray to tan, fxl, chalky, fossiliferous, no vis por Limestone: tan, f-mxl, granular, chalky, fossiliferous, no vis por Shale: gray, black Shale: black, carbonaceous Shale: gray, red Limestone: tan to gray, f-mxl, pyritic, cherty, pelletaloid, fossiliferous, no vis por Shale: gray, red Limestone: tan, f-mxl, sl chalky, fossiliferous, no vis por Shale: gray, green silty Shale: black, carbonaceous Shale: gray, brown, red Limestone: tan to gray, fxl, cherty, oolitic in part, fossiliferous, no vis por	Topoka 3122 (-992)
3341	Toronto		Limestone: tan to gray, fxl, sl chalky, sl cherty, fossiliferous, no vis por Shale: gray, red Limestone: tan to gray, fxl, sl chalky, sl cherty, fossiliferous, no vis por Shale: gray, red Shale: black, carbonaceous Limestone: tan to white, fxl, dense, cherty, fossiliferous, no vis por, 1 piece dark spotty stain, nfo, no odor Shale: gray, green, red	Heebner 3322 (-1192) Toronto 3341 (-1211)
3357	Lansing		Limestone: tan, f-mxl, chalky, cherty, oolitic, fossiliferous, 1% sample pr interxln por, spotty to sat stain, slsfo mostly on break, no odor Limestone: tan, fxl, chalky, cherty, fossiliferous, dense, no vis por, faint odor Shale: gray, green, red Limestone: white to tan, fxl, sl chalky, fossiliferous, 3 piece's fr interxln por, lt sat stain, slsfo on break, no odor Shale: gray, green, red Limestone: tan to white, f-mxl, sl chalky, fossiliferous, 5% of sample sl interxln por, lt sat stain, slsfo on break, no odor Shale: gray, red, black Limestone: tan, m-blk, sl chalky, oolitic, fossiliferous, 2% sample, pr interxln por, lt spotty to sat stain, slsfo, no odor Shale: gray, red, black Limestone: tan to brown, fxl, oolitic in part, fossiliferous, 2 piece's pr interxln por, dark spotty stain, slsfo on break, no odor Shale: gray, green, red, black Limestone: tan to white, fxl, sl chalky, dense, sl, fossiliferous, no vis por, ns	Lansing 3357 (-1227)
3540	Stark Sh		Limestone: tan, fxl, chalky, cherty, fossiliferous, dense, no vis por, faint odor Shale: gray, green, red Limestone: white to tan, fxl, sl chalky, fossiliferous, 3 piece's fr interxln por, lt sat stain, slsfo on break, no odor Shale: gray, green, red Limestone: tan to white, fxl, sl chalky, dense, sl, fossiliferous, no vis por, ns Shale: dark gray, red Limestone: tan, fxl, sl chalky, dense, 5% sample, no vis por, dark surface to sat stain, slsfo on break, no odor Shale: red, gray Limestone: white, f-mxl, hard, oolitic in part, fossiliferous, pyritic, 20 % sample sl pp to vug por, gd dark sat stain, frsfo (light), fr odor Shale: black carbonaceous Shale: gray, green, red	Stark Sh. 3540 (-1410)
3573	Mound City		Limestone: white to tan, fxl, sl chalky, dense, no vis por, ns Shale: gray, red, brown, black Limestone: tan to lt gray, f-mxl, sl chalky, oolitic, fossiliferous, no vis por, ns Shale: gray, green, red Limestone: tan, f-mxl, sl chalky, oolitic, fossiliferous, no vis por, ns Shale: gray, green, red Limestone: tan, f-mxl, sl chalky, v-fossiliferous, no vis por, ns Shale: gray, green, red, black Limestone: white to lt gray, fxl, sl chalky, fossiliferous, no vis por, ns Shale: gray, green, red, v-sandy, calcareous	8:00am, 11/11/2017 wt 9.0, vis. 49, lcm 0.5# Morgan Mud, Dave Lines
3632	Reagan Sand		Sandstone: clear to lt gray, tl, fr-crse grained, subangular, poorly sorted, calcareous, fr intergranular por, gdsfo (bleeding), dark stain, gd odor, pr fluorescence, gd steaming cut Granite Wash: quartz, feldspar (K-spar), biotite, black gilsonite, few pieces dull yellow fluorescence, v-pr streaming cut Granite: quartz, feldspar (K-spar), abundant amount of biotite. The amount of conchoidal fracture here did not increase as anticipated. The drill time reflecting abnormal cutting times as compared to past experiences when cutting this zone. This could be due to prior weathering or compositional make up but it was very unexpected when compared to past experiences.	Mound City 3573 (-1443)
3686	RTD			Reagan Sand 3632 (-1502)
3687	RTD			8:00am, 11/13/2017 wt 9.0, vis. 51, lcm 2# Morgan Mud, Dave Lines
3686	RTD			RTD 3686 (-1556)

Murfin Drilling Company Inc.
Hamit Unit #2-20
330'fsl & 1330'fwi
20-6s-19w, Rooks County, Kansas
KB=2130', GL=2125'
API: 15-163-24349

Geologist off location at 10:00 am 11/14/2017