

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY **Murfin Drilling Co. Inc.**

LEASE **Mary Ann 'A' #1-7**

FIELD **Wildcat**

LOCATION **1980' fml & 2140' fwl**

SEC **7** TWPSP **1s** RGE **35w**

COUNTY **Rawlins** STATE **Kansas**

CONTRACTOR **Murfin Drilling Co. Rig #2**

SPUD **11/16/2015** COMP **11/27/2015**

RTD **4:57⁶** LTD **4:57⁸**

MUD UP **3391'** TYPE MUD **Chemical**

SAMPLES SAVED FROM **3870'** TO **TD**

DRILLING TIME KEPT FROM **3870'** TO **TD**

SAMPLES EXAMINED FROM **3870'** TO **TD**

GEOLOGICAL SUPERVISION FROM **3784'**

GEOLOGIST ON WELL **Robert D. Hendrix**

ELEVATIONS

KB **3251'**

DF _____

GL **3240'**

Measurements Are All From **Kelly Bushing**

CASING

CONDUCTOR _____

SURFACE **8-5/8" at 264'**

PRODUCTION _____

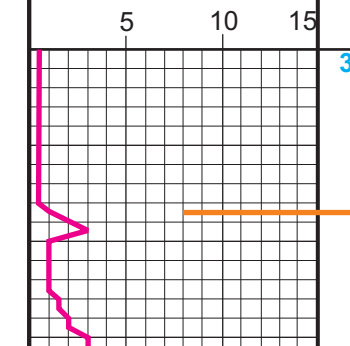
ELECTRICAL SURVEYS

FORMATION TOPS

ELECTRIC LOG

SAMPLE

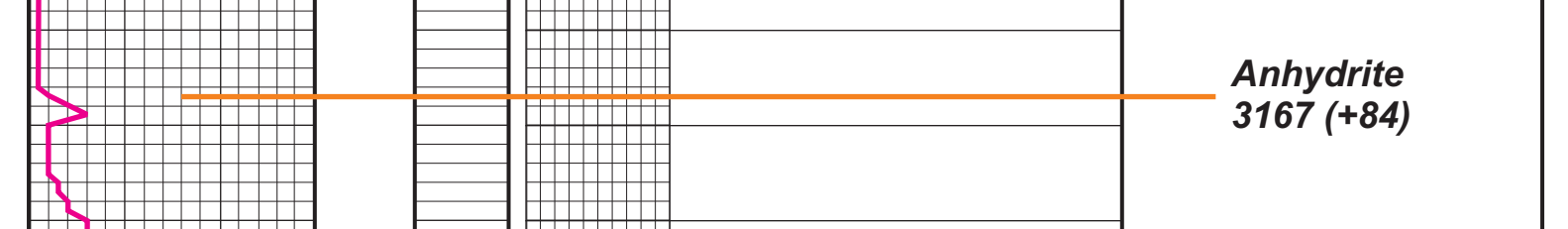
Anhydrite	3169 (+82)	3167 (-84)
Topeka	3986 (-735)	3987 (-736)
Oread	4100 (-850)	4100 (-849)
Lansing	4209 (-958)	4210 (-959)
Stark Shale	4427 (-1176)	4426 (-1175)
BKC	4476 (-1225)	4476 (-1225)



REMARKS:

11/16/2015, MIRT, spud at 4:00pm
 11/17/2016, set surface casing then drained up rig due to winter storm
 11/18/2015, off heavy snow
 11/19/2015, off due to snow
 11/20/2015, started up at 7:00am, drilling resumed as normal

LEGEND



DEPTH	LITHOLOGY	SAMPLE DESCRIPTION	REMARKS
3150	Anhydrite		Anhydrite 3167 (+84)
3200	Anhydrite		Base Anhydrite 2630 (+49)
3870	Shale: red, silty		Geologist on location at 3784' 5:30 am 11/22/2015 8:00am, 11/22/2015 @ 3845'
3900	Limestone: tan to white, f-mxn, sl chalky, v-fossiliferous, no vis por, 2 pieces sl spotty stain, nfo, no odor		wt 9.0, vis. 51, lcm 8# Morgan Mud, Cade Lines
50	Shale: red, gray, silty		
4000	Limestone: white to red, mxln, granular, fossiliferous, no vis por		Topeka 3987 (-736)
50	Limestone: white, f-mxn, oolitic, fossiliferous, no vis por		
50	Shale: gray, red		
50	Limestone: white to gray, v-fxn, dense, sl fossiliferous, no vis por		
50	Limestone: white to gray, v-fxn, dense, sl fossiliferous, no vis por		
50	Shale: red, gray, silty		
50	Limestone: tan to brown / red tinged, mxln, oolitic, fossiliferous, no vis por		
50	Shale: red, silty		
50	Shale: red, gray, green, silty		
4100	Limestone: white, f-mxn, chalky, oolitic, granular, fossiliferous, pr interxln por, spotty black flakey gilsonite stain, nfo, no odor		Oread 4100 (-849)
50	Limestone: white, fxn, chalky, oolitic, fossiliferous, no vis por, ns		
50	Limestone: white, fxn, chalky, dense, sl fossiliferous, no vis por		
50	Limestone: gray, fxn, sl cherty, granular, no vis por		
50	Shale: gray, red, black, sl pyritic		
50	Shale: black, dark gray		
50	Limestone: brown, v-fxn, dense, fossiliferous, no vis por		8:00am, 11/23/2015
50	Sandstone: white to lt green, opaque, fr-gr, mod sorted, md, soft/frangible no vis por		wt 9.1, vis. 62, lcm 16# Morgan Mud, Cade Lines
50	Shale: mostly red, gray, silty		
4200	Limestone: tan, fxn, sl chalky, fossiliferous, 5% sample fr pp to vug por, gd dark sat stain, frsfo (some slow bleeding), gd odor		Lansing 4210 (-959)
50	Sandstone: white, biotitic, lt, fr-md gr, mod sorted, sub-rnd, fr intergran por, ns		DST #1 4171-4275 30-60-30-60 1st open: blow built to 3" 2nd open: blow built to 2" no returns Rec: 130' mud w oil spots 2/98 hydro: 2098-2027 psi lf: 25-48 psi ff: 53-90 psi sip: 1226-1213 psi bht: 125°F
50	Shale: red, sandy		
50	Shale: red, gray silty, sandy		
50	Limestone: white, fxn, dense, sl oolitic, sl fossiliferous, no vis por, ns		
50	Shale: red, gray silty, sandy		
50	Limestone: tan, f-mxn, fossiliferous, pyritic, 25% sample fr interxln to gd vug por, black sat stain, gdsfo, fr odor		8:00am, 11/24/2015 wt 9.1, vis. 70, lcm 13# Morgan Mud, Cade Lines pipe Trap: 1.33' long to board
50	Limestone: white, v-fxn, dense, sl oolitic, fossiliferous, pyritic, no vis por, ns		
50	Shale: gray, red		
50	Limestone: tan to white, fxn, chalky, sl fossiliferous, no vis por, ns		
50	Shale: red, gray, brown		
50	Shale: gray, red		
50	Limestone: white, f-mxn, oolitic, fossiliferous, gd interxln to vug por, ex lt to dark sat stain, exsfo, strong odor		
50	Limestone: white, f-xln, v-fossiliferous, fr vug por, gd dark sat stain, gdsfo, gd odor		
50	Shale: gray, red		
50	Limestone: gray to tan, fxn, chalky, dense, no vis por		
50	Shale: gray, black		
50	Limestone: tan to brown, fxn, dense, fossiliferous, no vis por, trace gilsonite, nfo, no odor		
50	Limestone: tan to white, fxn, chalky, oolitic, fossiliferous, no vis por,		8:00am, 11/25/2015 wt 9.2, vis. 55, lcm 11# Morgan Mud, Cade Lines
50	Shale: red, gray, silty		
50	Limestone: white to tan to green, f-mxn, sl chalky, v-fossiliferous, no vis por,		
50	Shale: red, gray, silty		
50	Limestone: white, f-mxn, oolitic, pr oolitic to vug por, 5% sample lt spotty to sat stain, slsfo more on break, faint odor		DST #3 4332 - 4427 30-60-60-90 1st open: blow built to 1" 2nd open: blow started 11 min built to just over 1" no returns Rec: 105' oil spotted mud 3/97 hydro: 2134-2068 psi lf: 21-40 psi ff: 43-69 psi sip: 1059-913 psi bht: 124°F
50	Shale: gray, red		Stark 4426 (-1175)
50	Shale: red, gray, silty		
50	Limestone: white, mxln, chalky, granular, oolitic in part, fossiliferous, no vis por		
50	Shale: gray, red		
50	Limestone: tan to brown, fxn, granular in part, fossiliferous, no vis por		8:00am, 11/26/2015 wt 9.1, vis. 56, lcm 8# Morgan Mud, Cade Lines
50	Limestone: white, fxn, chalky, dense, fossiliferous, no vis por		BKC 4476 (-1225)
50	Shale: red, brown, gray, v-sandy, silty		
50	Shale: red, gray, muddy		
50	Limestone: tan to brown, fxn, cl chalky, dense, no vis por		
50	Shale: red, gray, brown, silty		
50	Shale: red, gray, muddy		
50	Limestone: gray, fxn, granular, silty, fossiliferous, no vis por		
50	Shale: gray, brown, red, silty		
50	Limestone: tan to gray, f-mxn, granular, fossiliferous, no vis por		RTD 4576 (-1325) Geologist off location at 2:30am, 11/27/2015

Murfin Drilling Co Inc
 Mary Ann 'A' #1-7
 1980' fml & 2140' fwl
 sec.7-1s-30w, Rawlins County, Kansas
 KB=3251', GL=2847'
 API: 15-153-21173