

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY: **Murfin Drilling Co., Inc.**

LEAD: **Theron #4-10**

FIELD: **Jones Cannon Southeast**

LOCATION: **1980751 & 660761**

SEC: **10** TWP: **1S** RGE: **37W**

COUNTY: **Cheyenne** STATE: **Kansas**

CONTRACTOR: **Murfin Drilling Co. Inc. #4-10**

SPUD: **3/23/2015** COMP: **3/31/2015**

RTD: **4/6/15** LTD: **4/6/22**

MUD UP: **3:25** TYPE MUD: **Chemical**

SAMPLES SAVED FROM: **3520'** TO: **TD**

DRILLING TIME KEPT FROM: **3520'** TO: **TD**

SAMPLES EXAMINED FROM: **3520'** TO: **TD**

GEOLOGICAL SUPERVISION FROM: **3612'**

GEOLOGIST ON WELL: **Robert D. Hendrix**

Density/Dip/Formation/Logging Service: **Density/Dip/Formation/Logging Service**

FORMER TOPS: **Robert D. Hendrix**

ELECTRIC LOG: **31201.571**

ANDBRITE: **31691.581**

TOPEKA: **30951.7281**

OWEN: **40881.861**

LANSING: **41731.916**

BK: **43931.166**

CHEROKEE: **45981.154**

RTD: **4601.1434**

ELEVATIONS: **K8 32927'**

DF: **3216'**

MEASUREMENTS ARE ALL FROM: **Kelly Busting**

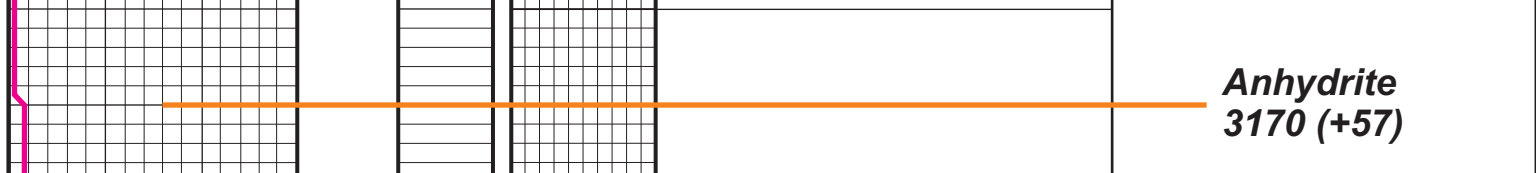
CASING: **CONDUCOR 8.51" @ 220'**

PRODUCTION: **5.12" @ 4755'**

REMARKS:

APR 15 02:23:21 422

LEGEND



DRILLING TIME IN MINUTES PER FOOT
Rate of Penetration Decreases

DEPTH	LITHOLOGY	SAMPLE DESCRIPTION	REMARKS
3150	Anhydrite		Anhydrite 3170 (+57)
3200	Anhydrite		Base Anhydrite 3202 (+25)
3250	Shale	Shale: red, v-sandy	bit trip at 3508' strap 2' short to board
3550	Sandstone	Sandstone: white/tan, vfn gr, well sorted, md, semi-frangible, calcareous, no vis por	
3600	Shale	Shale: red, gray, green, brown, silty	
3650	Shale	Shale: red, gray, silty, v-sandy	
3700	Shale	Shale: red, gray, green, brown, silty, sandy	
3750	Shale	Shale: red, gray, silty, v-sandy	
3800	Limestone	Limestone: white, fxn, sl chalky, granular, fossiliferous, fr interxn por, ns	Geologist on location 3612' at 1:45 pm 3/25/2015
3850	Shale	Shale: red, gray, green, waxy, silty	Neva 3621 (-394)
3900	Shale	Shale: red, brown, silty, sandy	
3950	Shale	Shale: red, brown, silty, sandy	
4000	Sandstone	Sandstone: gray to green, hard, biotitic, fngm, submd, mod sorted, calcareous, no vis por	
4050	Limestone	Limestone: white to tan, fxn, cherty (orange), fossiliferous, no vis por, ns	
4100	Shale	Shale: red, brown, gray, silty	
4150	Limestone	Limestone: tan to brown, f-mxn, sl cherty, oolitic, v-fossiliferous, fr interxn & foss por, dark sat stain, gdsfo, fr odor	
4200	Shale	Shale: gray, brown, silty, sandy	
4250	Limestone	Limestone: gray, mxn, v-fossiliferous, pr vug por, ns	8:00am, 3/26/2015 wt 9.1, vis. 60, lcm 8# Morgan Mud, Dave Lines
4300	Shale	Shale: gray, green, silty	
4350	Limestone	Limestone: tan to brown, fxn, oolitic, sl fossiliferous, no vis por	
4400	Dolomite	Dolomite: gray to tan, fxn, granular, no vis por, ns	DST #1 3700-3747 30-60-60-60 1st open: blow built to 3 1/4" no returns 2nd open: blow built to 3 3/4" no returns Rec: 37' free oil 29' mco 35/65 hydro: 1828-1786 psi lf: 16-25 psi ff: 42-49 psi sip: 1189-1171 psi bht: 123°F gravity: 28° api
4450	Shale	Shale: red, gray	
4500	Limestone	Limestone: white to lt gray, fxn, sl chalky, sl granular, v-fossiliferous, no vis por	
4550	Shale	Shale: red, gray, silty	
4600	Limestone	Limestone: tan, fxn, dense, granular, no vis por	
4650	Shale	Shale: red, gray, v-sandy	
4700	Limestone	Limestone: tan to white, fxn, sl chalky, oolitic, fossiliferous, no vis por	
4750	Shale	Shale: gray, red, silty	
4800	Limestone	Limestone: tan to white, fxn, sl chalky	
4850	Limestone	Limestone: white, mxn, oolitic, pr oolitic por, black sat stain, all glauconite, nfo, faint odor	
4900	Limestone	Limestone: white, m-ldn, v-fossiliferous, sl interxn por, pr spotty stain, nfo, no odor	
4950	Shale	Shale: gray, red	
5000	Limestone	Limestone: white, mxn, oolitic, fossiliferous, pr vug por, black spotty to sat dead oil stain, nfo, no odor	
5050	Shale	Shale: red, some gray	
5100	Limestone	Limestone: tan to white, f-mxn, shalky, v-fossiliferous, no vis por, ns	
5150	Shale	Shale: red, muddy clumps	
5200	Limestone	Limestone: tan to white, fxn, sl chalky, dense, sl fossiliferous, no vis por, ns	
5250	Limestone	Limestone: white to tan, f-mxn, chalky, fossiliferous, no vis por, ns	
5300	Shale	Shale: gray, red, silty	
5350	Limestone	Limestone: white to lt gray, fxn, chalky, dense, no vis por, ns	
5400	Shale	Shale: red, gray, silty	
5450	Limestone	Limestone: tan, fxn, dense, granular, no vis por	
5500	Shale	Shale: red, gray, brown black	8:00am, 3/27/2015
5550	Limestone	Limestone: white, f-mxn, chalky, oolitic in part, fossiliferous, sl pp to vug por, gd dark spotty to sat stain, prfo (heavy) mostly on break, fr odor	
5600	Limestone	Limestone: white, f-mxn, chalky, dense, fossiliferous, no vis por, pr, ns	
5650	Shale	Shale: gray, dark gray	
5700	Limestone	Limestone: tan, f-mxn, chalky, dense, no vis por, ns	
5750	Shale	Shale: red, silty	
5800	Sandstone	Sandstone: lt gray to white, opaque, fngm, well sorted, submd, calcareous, friable, no vis por, dark sat stain, glauconite, nfo, no odor	
5850	Shale	Shale: red, gray, dark gray	
5900	Limestone	Limestone: tan to white, fxn, dense, sl fossiliferous, no vis por, 5 pieces sl amt of surface stain, nfo, no odor	
5950	Limestone	Limestone: tan, fxn, sl chalky, dense, no vis por	
6000	Shale	Shale: gray, red	
6050	Shale	Shale: gray, red, black	
6100	Shale	Shale: red, sandy, silty	
6150	Shale	Shale: v-fossiliferous, sandy, silty	
6200	Limestone	Limestone: white, f-mxn, sl chalky, sl oolitic, fossiliferous, sl pyritic, fr interxn por, black sat stain, gdsfo, gd odor	8:00am, 3/28/2015 wt 9.2, vis. 58, lcm 12# Morgan Mud, Dave Lines
6250	Shale	Shale: gray, red, brown	
6300	Limestone	Limestone: tan to white, fxn, fossiliferous, no vis por	
6350	Shale	Shale: gray, dark gray, some red	
6400	Shale	Shale: red, gray, silty	
6450	Limestone	Limestone: white, fxn, sl chalky, oolitic in part, pyritic, fossiliferous, pr interxn por, 1% sample dark spotty to sat stain, nfo, fair odor	
6500	Shale	Shale: gray, red, brown	
6550	Limestone	Limestone: tan to gray, fxn, chalky, fossiliferous, no vis por	
6600	Shale	Shale: red, gray, silty	
6650	Limestone	Limestone: white to tan, fxn, sl chalky, fossiliferous, no vis por, few pieces sl amt of stain, nfo, no odor	
6700	Limestone	Limestone: white, fxn, sl chalky, dense, fossiliferous, no vis por	
6750	Shale	Shale: gray, red	
6800	Limestone	Limestone: white, f-mxn, fossiliferous, no vis por, 7 pieces lt spotty stain, nfo, no odor	
6850	Shale	Shale: red, gray	
6900	Limestone	Limestone: white, f-mxn, oolitic, fossiliferous, 1% sample scattered pr pp to vug por, lt to dark spotty stain, slfo on break, no odor	
6950	Shale	Shale: gray, light to dark	
7000	Shale	Shale: red, gray, silty	
7050	Limestone	Limestone: white, f-mxn, chalky, oolitic in part, fossiliferous, dense, no vis por, ns	
7100	Shale	Shale: gray, green, red, silty	
7150	Limestone	Limestone: white to lt gray, f-mxn, sl chalky, dense, fossiliferous, no vis por, ns	
7200	Shale	Shale: gray, red	
7250	Limestone	Limestone: white to tan, fxn, sl chalky, dense, fossiliferous, no vis por	
7300	Shale	Shale: red, gray, silty	
7350	Limestone	Limestone: white to lt gray, fxn, sl chalky, dense, fossiliferous, no vis por	
7400	Shale	Shale: red, brown, purple, silty	
7450	Shale	Shale: red, brown, gray, silty	
7500	Limestone	Limestone: white to gray, fxn, sl chalky, dense, granular, fossiliferous, no vis por	
7550	Limestone	Limestone: white to tan, fxn, chalky, oolitic, fossiliferous, pr interxn por	
7600	Siltstone	Siltstone: lt gray, fxn, dense, no vis por	
7650	Shale	Shale: gray, red, brown, silty	
7700	Limestone	Limestone: white, f-mxn, sl chalky, oolitic, fossiliferous, sl interxn por, 1% sample lt to dark sat stain, prsto, faint odor	
7750	Shale	Shale: red, gray	
7800	Limestone	Limestone: tan to gray, fxn, oolitic, fossiliferous, sl interxn por	8:00am, 3/30/2015 wt 9.3, vis. 57, lcm 10# Morgan Mud, Dave Lines
7850	Limestone	Limestone: tan to gray, fxn, dense, no vis por	
7900	Shale	Shale: black, gray	
7950	Shale	Shale: gray, blocky, silty, hard	
8000	Limestone	Limestone: white to gray, fxn, sl chalky, dense, sl fossiliferous, no vis por	
8050	Limestone	Limestone: tan to brown, fxn, dense, hard, sl fossiliferous, no vis por	
8100	Shale	Shale: gray/dark gray, red	
8150	Limestone	Limestone: white to tan, fxn, sl chalky, dense, sl fossiliferous, no vis por	
8200	Sandstone	Sandstone: gray, sl glauconitic, m-gm, sub md, mod sorted, calcareous, hard, compacted, no vis por, ns	
8250	Limestone	Limestone: white to tan, fxn, sl chalky, dense, hard, fossiliferous, no vis por	
8300	Shale	Shale: gray, red	
8350	Limestone	Limestone: tan to white, fxn, sandy, sl chalky, fossiliferous, no vis por	
8400	Shale	Shale: gray, red, yellow	
8450	Shale	Shale: gray, green, brown, red, sandy	
8500	Sandstone	Sandstone: white to brown to gray, lt, sl biotitic, fr-md gm, sub ang, poorly sorted, calcareous, no vis por, ns	
8550	Shale	Shale: red, gray, brown, sandy, silty	
8600	RTD		RTD 4761 (-1534) Geologist off location at 6:30pm, 3/31/2015