

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT DRILLING TIME AND SAMPLE LOG

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

LEASE: **Panchni #1-7**

FIELD: **Brummi**

LOCATION: **33078, 8, 19807el**

SEC: **7** TWP: **2** RGE: **36**

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

CONTRACTOR: **Murfin Drilling Co. Inc. #2**

SPUD: **12/29/2014** COM: **12/12/2014**

RTD: **5080'** LUD: **5081'**

MUD UP: **3487'** TYPE MUD: **Chemical**

SAMPLES SAVED FROM: **3650' TO TD**

DRILLING TIME KEPT FROM: **3650' TO TD**

SAMPLES EXAMINED FROM: **3650' TO TD**

GEOLOGICAL SUPERVISION FROM: **3760'**

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

FORMATION TOPS: **3271 (L110)** **3267 (L114)**

NEVA: **3752 (371)** **4085 (704)**

TOPEKA: **4090 (709)** **4281 (340)**

OREAD: **4291 (839)** **4303 (922)**

LANSG: **4324 (922)** **4525 (1144)**

STARK: **4524 (1143)** **4574 (1183)**

BKC: **4575 (1194)** **4784 (1403)**

CHEROKEE SHALE: **4729 (1388)** **5014 (1633)**

MISSISSIPPIAN: **5014 (1633)** **5014 (1633)**

ELEVATIONS: **KG 3381'**

DF: **GL 3370'**

Measurements are All From **Kelly Bushing**

CASING: **CONDUCTOR SURFACE: 8.50" @ 252'**

PRODUCTION: **5.112'**

ELECTRICAL SURVEYS

Drilling/Production/Logging/Service

Thomas Weather Services

REMARKS:

API# 15-153-21083

7

5014 (1633)

5014 (1633)

5014 (1633)

5014 (1633)

5014 (1633)

5014 (1633)

5014 (1633)

5014 (1633)

5014 (1633)

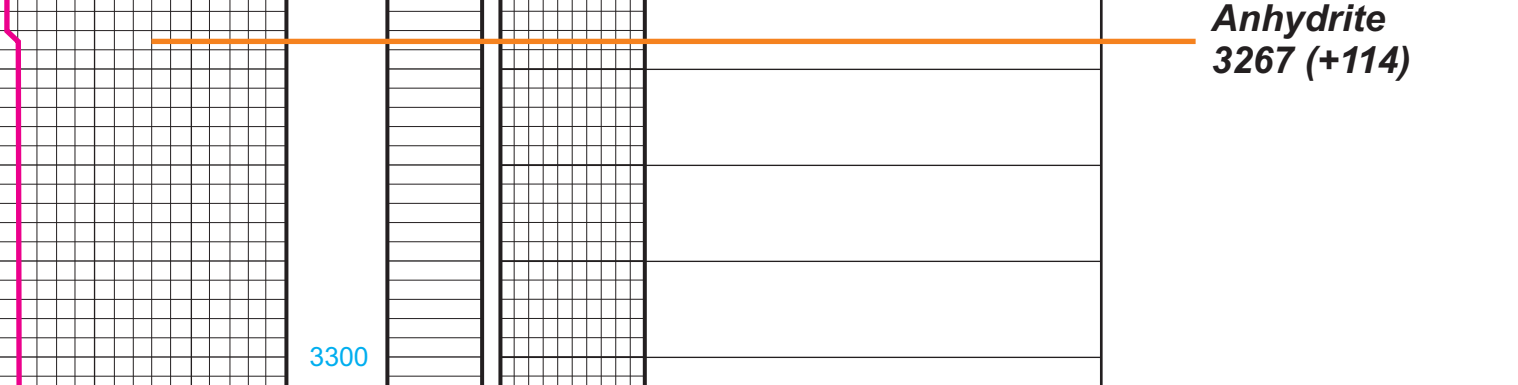
5014 (1633)

5014 (1633)

5014 (1633)

5014 (1633)

LEGEND



DEPTH	LITHOLOGY	SAMPLE DESCRIPTION	REMARKS
3200	Anhydrite		Anhydrite 3267 (+114)
3300	Anhydrite		Base Anhydrite 3307 (+74)
3600	Shale: red, brown, gray	Shale: red, brown, gray	Bit trip at 3567' change from PDC to biton Strap was 1.7' short to board
3700	Shale: red, brown, gray	Shale/sandstone: red, some gray, silty, v-sandy, vfn-fn gr. prly sorted, subang, friable, calcareously cemented, no vis por	
3800	Sandstone: white to lt gray, vfn-fn gr. prly sorted, subang, semi-friable, calcareously cemented, no vis por	Shale: red, brown, gray	
3900	Shale: red, gray, brown, silty, v-sandy, limy in part	Shale: red, brown, gray, silty	
4000	Shale: red, gray, brown, silty, v-sandy	Shale: red, brown, silty, sandy	
4100	Limestone: white, mxln, sl chalky, oolitic, fossiliferous, fr interxn por, ns	Shale: red, gray, green, waxy, silty	Neva 3752 (-371) Geologist on location 3760' at 4:26 pm 12/4/2014
4200	Shale: red, brown, silty, sandy	Sandstone: gray to white, biotitic, frgm, submd, mod sorted, calcareous, no vis por	
4300	Limestone: tan, fxdn, granular, chalky, sl fossiliferous, no vis por, ns	Shale: red, brown, silty, sandy	
4400	Shale: red, brown, gray, silty	Limestone: tan, fxdn, granular, chalky, sl fossiliferous, no vis por, ns	
4500	Shale: red, gray, green, silty	Shale: red, brown, gray, silty	
4600	Limestone: gray, fxdn, granular, fossiliferous, 3 pieces pr interxn por, dark sat stain, glsionite, no odor	Limestone: tan to white, fxdn, sl chalky, granular, fossiliferous, no vis por	
4700	Shale: red, gray, green, silty	Shale: gray, red, black	
4800	Shale: gray, red, black	Limestone: tan to white, fxdn, sl chalky, granular, no vis por	
4900	Shale: gray, brown, red	Shale: gray, dark gray, silty	
5000	Shale: red, gray	Limestone: gray to brown, fxdn, sl fossiliferous, no vis por	
5100	Limestone: tan to white, fxdn, sl chalky, fossiliferous, no vis por	Shale: red, gray, silty	
5200	Shale: gray, dark gray, silty	Limestone: white to tan, f-mxdn, fossiliferous, sl interxn por, fr dark stain, nfo, no odor	Stotler 4015 (-634)
5300	Limestone: white, mxln, sl chalky, oolitic, fossiliferous, fr interxn por, ns	Shale: gray, green, red	
5400	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
5500	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
5600	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, oolitic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/5/2014
5700	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
5800	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
5900	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
6000	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/7/2014 wt 9.3, vis. 60, lcm 6# Morgan Mud, Troy VanPelt
6100	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
6200	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
6300	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
6400	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/9/2014 wt 9.2, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
6500	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
6600	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
6700	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
6800	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/9/2014 wt 9.0, vis. 58, lcm 6# Morgan Mud, Troy VanPelt
6900	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
7000	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
7100	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
7200	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
7300	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
7400	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
7500	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
7600	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
7700	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
7800	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
7900	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
8000	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
8100	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
8200	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
8300	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
8400	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
8500	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
8600	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
8700	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
8800	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
8900	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
9000	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
9100	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
9200	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
9300	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
9400	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
9500	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
9600	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
9700	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
9800	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
9900	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
10000	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
10100	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
10200	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
10300	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
10400	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
10500	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
10600	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
10700	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
10800	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
10900	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
11000	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
11100	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
11200	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
11300	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
11400	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
11500	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
11600	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
11700	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
11800	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
11900	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
12000	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
12100	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
12200	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
12300	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
12400	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
12500	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
12600	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
12700	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
12800	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
12900	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
13000	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
13100	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
13200	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
13300	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
13400	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
13500	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
13600	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.2, vis. 62, lcm 16# Morgan Mud, Troy VanPelt
13700	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
13800	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
13900	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
14000	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	8:00am, 12/11/2014 wt 9.1, vis. 61, lcm 6# Morgan Mud, Troy VanPelt
14100	Limestone: white, mxln, sl chalky, pyritic, oolitic in part, v-fossiliferous, pr interxn por, gd fr to dark sat stain, prsfo (heavy), no odor	Shale: gray, red, black, silty	
14200	Shale: gray, red, black, silty	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	
14300	Limestone: white, f-mxdn, v-fossiliferous, no vis por, ns	Shale: gray, red, black, silty	
14400	Shale: gray, red, black, silty	Limestone: white, mxln, sl chalky, pyritic, oolitic in part,	