

Robert D. Hendrix

Petroleum Geologist

GEOLOGIST'S REPORT DRILLING TIME AND SAMPLE LOG

COMPANY **Cobalt Energy LLC**

LEASE **Good Earth Ranch 'A' #1-36**

FIELD **GER**

LOCATION **335° 1st & 2305° fwl**

SEC **36** TWP **22** RGE **23w**

COUNTY **Hodgeman** STATE **Kansas**

CONTRACTOR **Murfin Drilling Co. Rig 16**

SPUD **9/15/2015** COMP **9/21/2015**

RTD **4:45^{PM}** LTD **4:45^{PM}**

MUD UP **3:35^{PM}** TYPE MUD **Chemical**

SAMPLES SAVED FROM **3600' TO RTD**

DRILLING TIME KEPT FROM **3600' TO RTD**

SAMPLES EXAMINED FROM **3600' TO RTD**

GEOLOGICAL SUPERVISION FROM **3650'**

GEOLOGIST ON WELL **Robert D. Hendrix**

FORMATION TOPS

ANHYDRITE **1356' (±853)**

HEEBNER **3731' (±1517)**

LANSING **3800' (±1586)**

STARK SHALE **4065' (±1851)**

PAWNEE **4281' (±2067)**

FT SCOTT **4364' (±2130)**

CHEROKEE SHALE **4368' (±2154)**

MISSISSIPPIAN **4421' (±2205)**

ELEVATIONS
KB **2214'**

DF _____

GL **2209'**

Measurements Are All From **Kelly Bushing**

CASING CONDUCTOR _____

SURFACE **8-5/8" at 217'**

PRODUCTION **none**

ELECTRICAL SURVEYS

Pioneer Wireline

Range Log

AP# **15-083-21917**

REMARKS:

LEGEND

	Anhydrite		Sandstone		Limestone		Shale		Carb Sh		Cherty LS		Chert		Dolomite
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DEPTH	LITHOLOGY	SAMPLE DESCRIPTION	REMARKS
1350	Anhydrite		Anhydrite 1361 (+853)
1393	Anhydrite		Base Anhydrite 1393 (+821)
3600	Limestone	Limestone: white to tan, f-mxn, sl chalky, granular, fossiliferous, no vis por	
	Shale	Shale: gray, black	
	Limestone	Limestone: tan, f-mxn, fossiliferous, no vis por	
3700	Limestone	Limestone: white to tan, f-mxn, chalky, granular, fossiliferous, no vis por	
	Shale	Shale: gray, red, green, silty	
	Limestone	Limestone: white, fxn, v-chalky, sl fossiliferous, no vis por	
3731	Limestone	Limestone: white to tan, f-mxn, chalky, granular, fossiliferous, no vis por	Heebner 3731 (-1517)
	Shale	Shale: red, gray, dark gray	
	Limestone	Limestone: tan to brown, fxn, dense, sl fossiliferous, no vis por	
	Shale	Shale: red, dark gray, black	
	Shale	Shale: gray, green, red	down 20 min had to mix mud and increase volume due 80 bbls loss
3800	Limestone	Limestone: tan, fxn, sl chalky, sl fossiliferous, no vis por	Lansing 3800 (-1586)
	Shale	Shale: gray to lt gray	8:00am, 9/19/2015
	Limestone	Limestone: tan to white, f-mxn, sl chalky, fossiliferous, no vis por	
	Limestone	Limestone: tan, fxn, sl chalky, sl cherty, fossiliferous, no vis por	
	Shale	Shale: gray, red	
	Limestone	Limestone: tan, fxn, sl chalky, sl cherty, fossiliferous, no vis por	
	Shale	Shale: gray, black	
	Limestone	Limestone: tan, f-mxn, oolitic, fossiliferous, no vis por	
	Limestone	Limestone: tan to white, fxn, sl chalky, sl cherty, fossiliferous, no vis por	
	Shale	Shale: gray, green, dark red	
	Limestone	Limestone: tan to white, f-mxn, sl chalky, sl cherty, oolitic, fossiliferous, no vis por	
	Shale	Shale: gray, black	
	Limestone	Limestone: tan to gray, f-mxn, sl chalky, granular, fossiliferous, no vis por	
	Shale	Shale: gray, green, red, black	
	Limestone	Limestone: tan, fxn, chalky, fossiliferous, no vis por	
	Limestone	Limestone: tan to brown, mxln, chalky, oolitic, sl fossiliferous, pr oolitic por	
	Limestone	Limestone: tan, mxln, chalky, oolitic, sl fossiliferous, gd oolitic por, ns	
	Shale	Shale: black carbonaceous	
	Shale	Shale: gray, black, red	
	Limestone	Limestone: tan to brown, f-mxn, oolitic, sl fossiliferous, fr to gd oolitic to vug por, ns	
	Limestone	Limestone: tan to white, fxn, sl chalky, fossiliferous, pr vug por	
	Shale	Shale: gray, black, red	
	Limestone	Limestone: tan to white, mxln, chalky, granular, fossiliferous, no vis por	
	Shale	Shale: gray, dark gray	
	Limestone	Limestone: tan to pink, fxn, some optical, hard, brittle, no vis por	
	Limestone	Limestone: tan to brown, f-mxn, oolitic in part, sl fossiliferous, no vis por	
	Shale	Shale: gray, red	
	Limestone	Limestone: tan, fxn, sl chalky, oolitic in part, sl fossiliferous, a few pieces have gd oolitic por, ns	
	Shale	Shale: gray, red	
	Limestone	Limestone: tan, fxn, sl chalky, mostly dense, no vis por	
	Shale	Shale: gray	
	Limestone	Limestone: tan, fxn, dense, fossiliferous, no vis por	8:00am, 9/20/2015
	Shale	Shale: gray, red	
	Limestone	Limestone: tan, fxn, dense, cherty, sl fossiliferous, no vis por	
	Limestone	Limestone: tan to white, fxn, granular, sl cherty, no vis por	
	Shale	Shale: gray, green, red	
	Limestone	Limestone: tan, fxn, dense, sl cherty, no vis por	
	Shale	Shale: gray, dark gray, red	
	Limestone	Limestone: tan, fxn, dense, clear calcite replacement, sl fossiliferous, no calcite por	
	Shale	Shale: gray, red, black	
	Limestone	Limestone: tan to white, fxn, chalky, clear calcite fill, sl fossiliferous, no vis por	
	Limestone	Limestone: tan to brown, v-fxn, dense, sl fossiliferous, no vis por	
	Limestone	Limestone: tan, fxn, dense, sl cherty, sl fossiliferous, no vis por	
	Shale	Shale: gray, red, black	
	Shale	Shale: black, carbonaceous	
	Shale	Shale: gray, red, black	
	Limestone	Limestone: tan to brown, fxn, mostly dense, fossiliferous, 2 pieces fr pp por, slsfo, no odor	wt 9.6, vis. 69, lcm 3# Mud-Co, Rick Hughes
	Shale	Shale: black, carbonaceous	
	Limestone	Limestone: tan to brown, v-fxn, mostly dense, fossiliferous, abundant calcite fill, no vis por	
	Shale	Shale: gray, dark gray	Short trip 30 stands
	Limestone	Limestone: tan, brown, gray, fxn, fossiliferous, no vis por	
	Shale	Shale: gray, green	
	Limestone	Limestone: tan, fxn, pyritic, fossiliferous, no vis por	
	Shale	Shale: gray, brown, red, black	
	Limestone	Limestone: tan, brown, gray, fxn, cherty, fossiliferous, 5 pieces fr pp por, slsfo, faint odor	
	Dolomite	Dolomite: brown, gray, f-mxn, cherty (green, gray), 1% sample fr op por, slsfo, dull yellow fluorescence, faint odor	
	Sandstone	Sandstone: clear, md-grn, sub-angular, mod sorted, pr intergranular por, gdsfo.	
	Dolomite	Dolomite: tan to brown, f-mxn, cherty (green, gray), 1% sample pr interxn por, slsfo, bright yellow fluorescence, good odor	
	Dolomite	Dolomite: tan to brown, fxn, sacrosic, glauconitic, chert fresh (white, gray, yellow), 3% sample fr interxn por, gd sat stain, slsfo, bright yellow fluorescence, good odor	
	DST #2	4395-4448 STRADDLE 15-5 1st open: v-wk blow 1/8" Rec: 5' mud hydro: 2176-2138 psi lf: 32-39 psi ff: none sip: 510-none psi bht: 124°F Cedar Hills started flowing water at test opening test was stopped due to heavy increase in flow and no build on 1st open blow.	
	DST #1	4451-4459 30-60-60-90 1st open: bob 4 min 1st shut: 1/8" return 2nd open: bob 3 min 2nd shut in: 1/4" return Rec: 60' co 465' hocw 20/80 125' ocw 5/5/90 1425' water 280' gip hydro: 2251-2161 psi lf: 138-496 psi ff: 495-984 psi sip: 1407-1403 psi bht: 131°F gravity: 38° api chl: 44,000 ppm rw: 0.15 @ 75°F	
			Geologist off location at 7:30pm, 9/21/2015