

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	KNIGHT 13
Field	WATTENBERG	Well	W KNIGHT 13
Installation	Knight Pad	Wellbore	W KNIGHT 13 (PWB)

N
GRID

East (Feet) ->

-2400 -1600 -800 0 800
Scale 1 cm = 400 ft

WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	17.00	0.00	0.00	17.00	S 0.00	W 0.00		-0.00
KOP	1677.00	0.00	314.31	1677.00	S 0.00	W 0.00	0.00	-0.00
End of Build	2643.63	19.33	314.31	2625.39	N 112.85	W 115.58	2.00	-99.32
End of Hold	6464.08	19.33	314.31	6230.41	N 996.40	W 1020.54	0.00	-876.98
Target Knight 13 EP	7498.08	90.00	179.88	6915.00	N 438.69	W 1190.91	10.00	-303.81
T.D. & Target Kni... BH	18401.59	90.00	179.88	6915.00	S 10464.79	W 1168.66	0.00	10529.84

Knight 13 EP

Surface 0.00 N 0.00 E

<- North(Feet)
Scale 1 cm = 400 ft

<- True Vertical Depth (Feet)
Scale 1 cm = 400 ft

Tie on - 0.00 Inc, 17.00 MD, 17.00 TVD, -0.00 VS

3DS Kick off Point - 0.00 Inc, 1677.00 MD, 1677.00 TVD, -0.00 VS

End of Build - 19.33 Inc, 2643.63 MD, 2625.39 TVD, -99.32 VS

End of Hold - 19.33 Inc, 6464.08 MD, 6230.41 TVD, -876.98 VS

Knight 13 EP

S/C Kick off Point - 90.00 Inc, 7498.08 MD, 6915.00 TVD, -303.81 VS

Knight 13 BH

Knight 13 BH

T.D. & End of Hold - 6915.00 TVD, 10464.79 S 1168.66 W

Created by admin
Date plotted 1-Dec-2017
Plot reference is W KNIGHT 13 (PWB).
Ref wellpath is W KNIGHT 13 (PWP#1).
Coordinates are in Feet reference KNIGHT 13.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 5010.00 ft.
Plot North is aligned to GRID North.

Scale 1 cm = 400 ft

Vertical Section (Feet) ->

Azimuth 186.37 with reference 0.00 N, 0.00 E from KNIGHT 13



SYSDRILL
Well Design Combined Report
Wellbore: W KNIGHT 13 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
KNIGHT 13	40.19758900	-105.04205500	1315154.4901	3127922.6538	164.42S	22.90W	0.00

Declination		
Date	Source	Time
Nov-6-2017	EMM-2015 [2000.0-2020.0]	14:52

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Knight Pad	40.19804000	-105.04197000	1315318.9022	3127945.5490	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
17.00	0.00	0.000	17.00	0.00N	0.00E		0.00	1315154.49	3127922.65
1677.00	0.00	314.310	1677.00	0.00N	0.00E	==>	0.00	1315154.49	3127922.65
2643.63	19.33	314.310	2625.39	112.85N	115.58W	2.00	-99.32	1315267.33	3127807.08
6464.08	19.33	314.310	6230.41	996.40N	1020.54W	==>	-876.98	1316150.85	3126902.16
7498.08	90.00	179.880	6915.00	438.69N	1190.91W	10.00	-303.81	1315593.16	3126731.79
18401.59	90.00	179.880	6915.00	10464.79S	1168.66W	==>	10529.84	1304690.17	3126754.04

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	Rig Datum
17.00	0.00	0.000	17.00	0.00N	0.00E	==>	0.00	Slot Datum
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	
1500.00	0.00	0.000	1500.00	0.00N	0.00E	==>	0.00	
1600.00	0.00	0.000	1600.00	0.00N	0.00E	==>	0.00	
1700.00	0.46	314.310	1700.00	0.06N	0.07W	2.00	-0.06	
1800.00	2.46	314.310	1799.96	1.84N	1.89W	2.00	-1.62	
1900.00	4.46	314.310	1899.77	6.06N	6.21W	2.00	-5.33	
2000.00	6.46	314.310	1999.32	12.71N	13.01W	2.00	-11.18	
2100.00	8.46	314.310	2098.46	21.78N	22.30W	2.00	-19.17	
2200.00	10.46	314.310	2197.10	33.26N	34.06W	2.00	-29.27	
2300.00	12.46	314.310	2295.10	47.14N	48.28W	2.00	-41.49	
2400.00	14.46	314.310	2392.35	63.40N	64.93W	2.00	-55.80	
2500.00	16.46	314.310	2488.73	82.02N	84.01W	2.00	-72.19	
2600.00	18.46	314.310	2584.11	102.98N	105.47W	2.00	-90.64	
2700.00	19.33	314.310	2678.58	125.89N	128.94W	==>	-110.80	
2800.00	19.33	314.310	2772.95	149.01N	152.62W	==>	-131.15	
2900.00	19.33	314.310	2867.31	172.14N	176.31W	==>	-151.51	
3000.00	19.33	314.310	2961.67	195.27N	200.00W	==>	-171.86	
3100.00	19.33	314.310	3056.03	218.39N	223.68W	==>	-192.22	

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig (Planned Datum #1 5010.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 186.370 degrees
Bottom hole distance is 10529.84 Feet on azimuth 186.37 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 1-Dec-2017



SYSDRILL
Well Design Combined Report
Wellbore: W KNIGHT 13 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3200.00	19.33	314.310	3150.39	241.52N	247.37W	==>	-212.57	
3300.00	19.33	314.310	3244.75	264.65N	271.06W	==>	-232.93	
3400.00	19.33	314.310	3339.11	287.77N	294.75W	==>	-253.28	
3500.00	19.33	314.310	3433.47	310.90N	318.43W	==>	-273.64	
3600.00	19.33	314.310	3527.84	334.03N	342.12W	==>	-293.99	
3700.00	19.33	314.310	3622.20	357.16N	365.81W	==>	-314.35	
3800.00	19.33	314.310	3716.56	380.28N	389.50W	==>	-334.70	
3900.00	19.33	314.310	3810.92	403.41N	413.18W	==>	-355.06	
4000.00	19.33	314.310	3905.28	426.54N	436.87W	==>	-375.41	
4100.00	19.33	314.310	3999.64	449.66N	460.56W	==>	-395.77	
4200.00	19.33	314.310	4094.00	472.79N	484.25W	==>	-416.12	
4300.00	19.33	314.310	4188.36	495.92N	507.93W	==>	-436.48	
4400.00	19.33	314.310	4282.73	519.04N	531.62W	==>	-456.83	
4500.00	19.33	314.310	4377.09	542.17N	555.31W	==>	-477.19	
4600.00	19.33	314.310	4471.45	565.30N	578.99W	==>	-497.55	
4700.00	19.33	314.310	4565.81	588.42N	602.68W	==>	-517.90	
4800.00	19.33	314.310	4660.17	611.55N	626.37W	==>	-538.26	
4900.00	19.33	314.310	4754.53	634.68N	650.06W	==>	-558.61	
5000.00	19.33	314.310	4848.89	657.81N	673.74W	==>	-578.97	
5100.00	19.33	314.310	4943.26	680.93N	697.43W	==>	-599.32	
5200.00	19.33	314.310	5037.62	704.06N	721.12W	==>	-619.68	
5300.00	19.33	314.310	5131.98	727.19N	744.81W	==>	-640.03	
5400.00	19.33	314.310	5226.34	750.31N	768.49W	==>	-660.39	
5500.00	19.33	314.310	5320.70	773.44N	792.18W	==>	-680.74	
5600.00	19.33	314.310	5415.06	796.57N	815.87W	==>	-701.10	
5700.00	19.33	314.310	5509.42	819.69N	839.55W	==>	-721.45	
5800.00	19.33	314.310	5603.78	842.82N	863.24W	==>	-741.81	
5900.00	19.33	314.310	5698.15	865.95N	886.93W	==>	-762.16	
6000.00	19.33	314.310	5792.51	889.07N	910.62W	==>	-782.52	
6100.00	19.33	314.310	5886.87	912.20N	934.30W	==>	-802.87	
6200.00	19.33	314.310	5981.23	935.33N	957.99W	==>	-823.23	
6300.00	19.33	314.310	6075.59	958.46N	981.68W	==>	-843.58	
6400.00	19.33	314.310	6169.95	981.58N	1005.37W	==>	-863.94	
6500.00	17.09	305.310	6264.54	1003.61N	1029.11W	10.00	-883.19	
6600.00	14.07	269.090	6361.08	1011.93N	1053.31W	10.00	-888.78	
6700.00	17.31	233.390	6457.56	1002.84N	1077.46W	10.00	-877.06	
6800.00	24.44	213.340	6551.06	976.62N	1100.83W	10.00	-848.41	
6900.00	33.03	202.550	6638.72	934.07N	1122.71W	10.00	-803.69	
7000.00	42.18	195.930	6717.89	876.47N	1142.43W	10.00	-744.26	
7100.00	51.61	191.330	6786.17	805.57N	1159.39W	10.00	-671.92	
7200.00	61.17	187.810	6841.47	723.54N	1173.07W	10.00	-588.88	
7300.00	70.81	184.890	6882.12	632.87N	1183.07W	10.00	-497.65	
7400.00	80.49	182.290	6906.88	536.30N	1189.08W	10.00	-401.01	
7500.00	90.00	179.880	6915.00	436.77N	1190.91W	==>	-301.90	
7600.00	90.00	179.880	6915.00	336.77N	1190.71W	==>	-202.54	
7700.00	90.00	179.880	6915.00	236.77N	1190.50W	==>	-103.18	
7800.00	90.00	179.880	6915.00	136.77N	1190.30W	==>	-3.82	
7900.00	90.00	179.880	6915.00	36.77N	1190.09W	==>	95.54	
8000.00	90.00	179.880	6915.00	63.23S	1189.89W	==>	194.90	
8100.00	90.00	179.880	6915.00	163.23S	1189.68W	==>	294.26	
8200.00	90.00	179.880	6915.00	263.23S	1189.48W	==>	393.62	
8300.00	90.00	179.880	6915.00	363.23S	1189.28W	==>	492.98	
8400.00	90.00	179.880	6915.00	463.23S	1189.07W	==>	592.33	
8500.00	90.00	179.880	6915.00	563.23S	1188.87W	==>	691.69	
8600.00	90.00	179.880	6915.00	663.23S	1188.66W	==>	791.05	
8700.00	90.00	179.880	6915.00	763.23S	1188.46W	==>	890.41	
8800.00	90.00	179.880	6915.00	863.23S	1188.26W	==>	989.77	
8900.00	90.00	179.880	6915.00	963.23S	1188.05W	==>	1089.13	
9000.00	90.00	179.880	6915.00	1063.23S	1187.85W	==>	1188.49	

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Bottom hole distance is 10529.84 Feet on azimuth 186.37 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 1-Dec-2017



SYSDRILL
Well Design Combined Report
Wellbore: W KNIGHT 13 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9100.00	90.00	179.880	6915.00	1163.22S	1187.64W	==>	1287.85	
9200.00	90.00	179.880	6915.00	1263.22S	1187.44W	==>	1387.21	
9300.00	90.00	179.880	6915.00	1363.22S	1187.24W	==>	1486.57	
9400.00	90.00	179.880	6915.00	1463.22S	1187.03W	==>	1585.93	
9500.00	90.00	179.880	6915.00	1563.22S	1186.83W	==>	1685.29	
9600.00	90.00	179.880	6915.00	1663.22S	1186.62W	==>	1784.65	
9700.00	90.00	179.880	6915.00	1763.22S	1186.42W	==>	1884.01	
9800.00	90.00	179.880	6915.00	1863.22S	1186.22W	==>	1983.37	
9900.00	90.00	179.880	6915.00	1963.22S	1186.01W	==>	2082.72	
10000.00	90.00	179.880	6915.00	2063.22S	1185.81W	==>	2182.08	
10100.00	90.00	179.880	6915.00	2163.22S	1185.60W	==>	2281.44	
10200.00	90.00	179.880	6915.00	2263.22S	1185.40W	==>	2380.80	
10300.00	90.00	179.880	6915.00	2363.22S	1185.20W	==>	2480.16	
10400.00	90.00	179.880	6915.00	2463.22S	1184.99W	==>	2579.52	
10500.00	90.00	179.880	6915.00	2563.22S	1184.79W	==>	2678.88	
10600.00	90.00	179.880	6915.00	2663.22S	1184.58W	==>	2778.24	
10700.00	90.00	179.880	6915.00	2763.22S	1184.38W	==>	2877.60	
10800.00	90.00	179.880	6915.00	2863.22S	1184.18W	==>	2976.96	
10900.00	90.00	179.880	6915.00	2963.22S	1183.97W	==>	3076.32	
11000.00	90.00	179.880	6915.00	3063.22S	1183.77W	==>	3175.68	
11100.00	90.00	179.880	6915.00	3163.22S	1183.56W	==>	3275.04	
11200.00	90.00	179.880	6915.00	3263.22S	1183.36W	==>	3374.40	
11300.00	90.00	179.880	6915.00	3363.22S	1183.15W	==>	3473.76	
11400.00	90.00	179.880	6915.00	3463.22S	1182.95W	==>	3573.12	
11500.00	90.00	179.880	6915.00	3563.22S	1182.75W	==>	3672.47	
11600.00	90.00	179.880	6915.00	3663.22S	1182.54W	==>	3771.83	
11700.00	90.00	179.880	6915.00	3763.22S	1182.34W	==>	3871.19	
11800.00	90.00	179.880	6915.00	3863.22S	1182.13W	==>	3970.55	
11900.00	90.00	179.880	6915.00	3963.22S	1181.93W	==>	4069.91	
12000.00	90.00	179.880	6915.00	4063.22S	1181.73W	==>	4169.27	
12100.00	90.00	179.880	6915.00	4163.22S	1181.52W	==>	4268.63	
12200.00	90.00	179.880	6915.00	4263.22S	1181.32W	==>	4367.99	
12300.00	90.00	179.880	6915.00	4363.22S	1181.11W	==>	4467.35	
12400.00	90.00	179.880	6915.00	4463.22S	1180.91W	==>	4566.71	
12500.00	90.00	179.880	6915.00	4563.22S	1180.71W	==>	4666.07	
12600.00	90.00	179.880	6915.00	4663.22S	1180.50W	==>	4765.43	
12700.00	90.00	179.880	6915.00	4763.22S	1180.30W	==>	4864.79	
12800.00	90.00	179.880	6915.00	4863.22S	1180.09W	==>	4964.15	
12900.00	90.00	179.880	6915.00	4963.22S	1179.89W	==>	5063.51	
13000.00	90.00	179.880	6915.00	5063.22S	1179.69W	==>	5162.86	
13100.00	90.00	179.880	6915.00	5163.22S	1179.48W	==>	5262.22	
13200.00	90.00	179.880	6915.00	5263.22S	1179.28W	==>	5361.58	
13300.00	90.00	179.880	6915.00	5363.22S	1179.07W	==>	5460.94	
13400.00	90.00	179.880	6915.00	5463.22S	1178.87W	==>	5560.30	
13500.00	90.00	179.880	6915.00	5563.22S	1178.67W	==>	5659.66	
13600.00	90.00	179.880	6915.00	5663.22S	1178.46W	==>	5759.02	
13700.00	90.00	179.880	6915.00	5763.22S	1178.26W	==>	5858.38	
13800.00	90.00	179.880	6915.00	5863.22S	1178.05W	==>	5957.74	
13900.00	90.00	179.880	6915.00	5963.21S	1177.85W	==>	6057.10	
14000.00	90.00	179.880	6915.00	6063.21S	1177.65W	==>	6156.46	
14100.00	90.00	179.880	6915.00	6163.21S	1177.44W	==>	6255.82	
14200.00	90.00	179.880	6915.00	6263.21S	1177.24W	==>	6355.18	
14300.00	90.00	179.880	6915.00	6363.21S	1177.03W	==>	6454.54	
14400.00	90.00	179.880	6915.00	6463.21S	1176.83W	==>	6553.90	
14500.00	90.00	179.880	6915.00	6563.21S	1176.63W	==>	6653.25	
14600.00	90.00	179.880	6915.00	6663.21S	1176.42W	==>	6752.61	
14700.00	90.00	179.880	6915.00	6763.21S	1176.22W	==>	6851.97	
14800.00	90.00	179.880	6915.00	6863.21S	1176.01W	==>	6951.33	
14900.00	90.00	179.880	6915.00	6963.21S	1175.81W	==>	7050.69	

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Vertical Section is from 0.00N 0.00E on azimuth 186.370 degrees
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Wellbore: W KNIGHT 13 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
15000.00	90.00	179.880	6915.00	7063.21S	1175.60W	==>	7150.05	
15100.00	90.00	179.880	6915.00	7163.21S	1175.40W	==>	7249.41	
15200.00	90.00	179.880	6915.00	7263.21S	1175.20W	==>	7348.77	
15300.00	90.00	179.880	6915.00	7363.21S	1174.99W	==>	7448.13	
15400.00	90.00	179.880	6915.00	7463.21S	1174.79W	==>	7547.49	
15500.00	90.00	179.880	6915.00	7563.21S	1174.58W	==>	7646.85	
15600.00	90.00	179.880	6915.00	7663.21S	1174.38W	==>	7746.21	
15700.00	90.00	179.880	6915.00	7763.21S	1174.18W	==>	7845.57	
15800.00	90.00	179.880	6915.00	7863.21S	1173.97W	==>	7944.93	
15900.00	90.00	179.880	6915.00	7963.21S	1173.77W	==>	8044.29	
16000.00	90.00	179.880	6915.00	8063.21S	1173.56W	==>	8143.64	
16100.00	90.00	179.880	6915.00	8163.21S	1173.36W	==>	8243.00	
16200.00	90.00	179.880	6915.00	8263.21S	1173.16W	==>	8342.36	
16300.00	90.00	179.880	6915.00	8363.21S	1172.95W	==>	8441.72	
16400.00	90.00	179.880	6915.00	8463.21S	1172.75W	==>	8541.08	
16500.00	90.00	179.880	6915.00	8563.21S	1172.54W	==>	8640.44	
16600.00	90.00	179.880	6915.00	8663.21S	1172.34W	==>	8739.80	
16700.00	90.00	179.880	6915.00	8763.21S	1172.14W	==>	8839.16	
16800.00	90.00	179.880	6915.00	8863.21S	1171.93W	==>	8938.52	
16900.00	90.00	179.880	6915.00	8963.21S	1171.73W	==>	9037.88	
17000.00	90.00	179.880	6915.00	9063.21S	1171.52W	==>	9137.24	
17100.00	90.00	179.880	6915.00	9163.21S	1171.32W	==>	9236.60	
17200.00	90.00	179.880	6915.00	9263.21S	1171.12W	==>	9335.96	
17300.00	90.00	179.880	6915.00	9363.21S	1170.91W	==>	9435.32	
17400.00	90.00	179.880	6915.00	9463.21S	1170.71W	==>	9534.68	
17500.00	90.00	179.880	6915.00	9563.21S	1170.50W	==>	9634.04	
17600.00	90.00	179.880	6915.00	9663.21S	1170.30W	==>	9733.39	
17700.00	90.00	179.880	6915.00	9763.21S	1170.10W	==>	9832.75	
17800.00	90.00	179.880	6915.00	9863.21S	1169.89W	==>	9932.11	
17900.00	90.00	179.880	6915.00	9963.21S	1169.69W	==>	10031.47	
18000.00	90.00	179.880	6915.00	10063.21S	1169.48W	==>	10130.83	
18100.00	90.00	179.880	6915.00	10163.21S	1169.28W	==>	10230.19	
18200.00	90.00	179.880	6915.00	10263.21S	1169.08W	==>	10329.55	
18300.00	90.00	179.880	6915.00	10363.21S	1168.87W	==>	10428.91	
18400.00	90.00	179.880	6915.00	10463.21S	1168.67W	==>	10528.27	
18401.59	90.00	179.880	6915.00	10464.79S	1168.66W	==>	10529.84	

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5010.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 186.370 degrees
Bottom hole distance is 10529.84 Feet on azimuth 186.37 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 1-Dec-2017



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
Knight 13 EP	438.69N	1190.91W	6915.00	40.19881000	-105.04631000	1315593.16	3126731.79
Knight 13 BH	10464.79S	1168.66W	6915.00	40.16888000	-105.04643000	1304690.17	3126754.04

Notes