

Cub Creek Energy, LLC

N

GRID

Location Weld County, CO
Field WATTENBERG
Installation Knight Pad

Slot KNIGHT 15
Well W KNIGHT 15
Wellbore W KNIGHT 15 (PWB)

East (Feet) ->

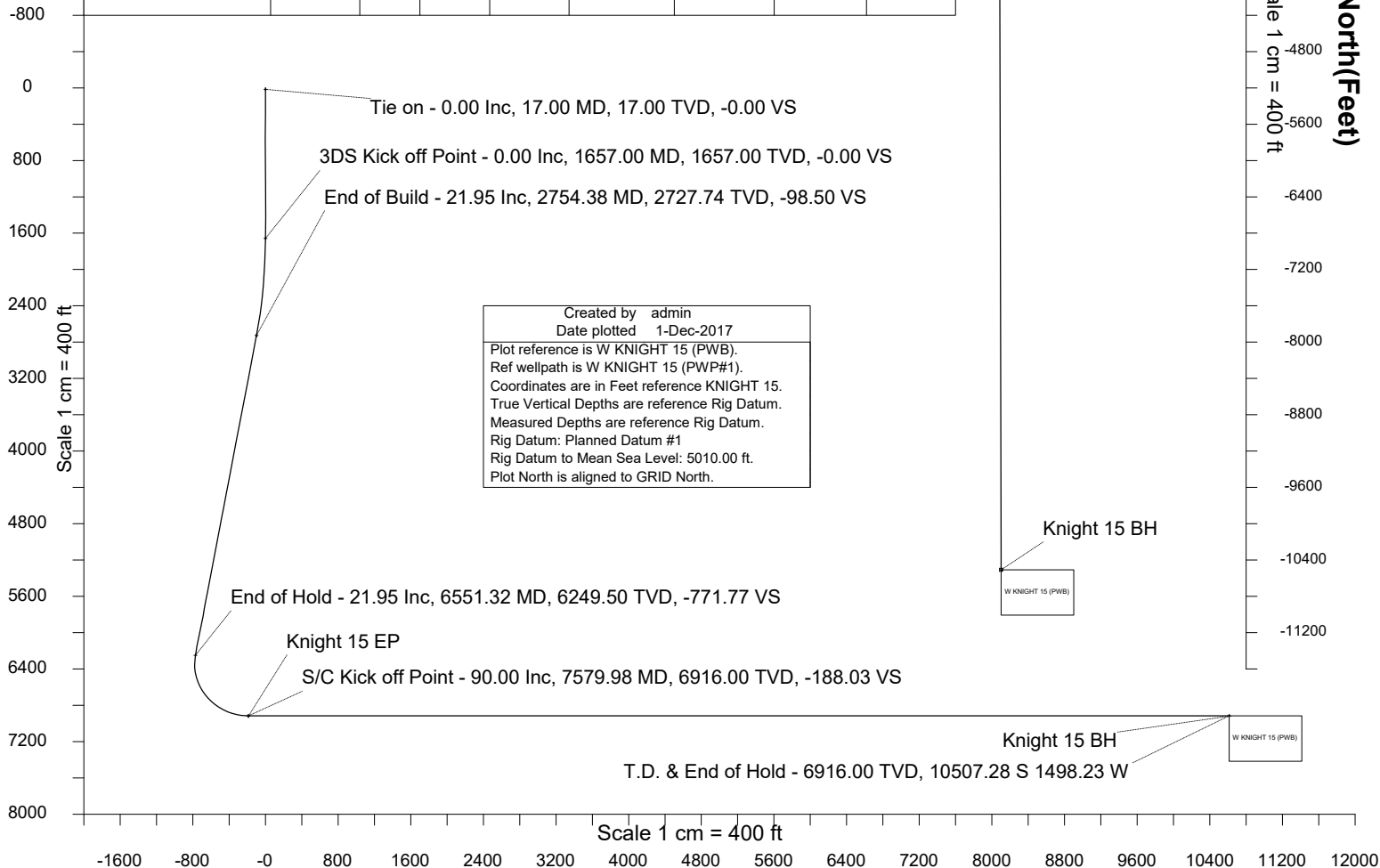
-2400 -1600 -800 0 800
Scale 1 cm = 400 ft

Nov-8-2017
ENR-2015 (2000-0-2000.0) Day 46.59 deg Field: 52154.0 xT
Lat: N40 11 52 3440 Long: W105 2 31 0920 Elev: 4993.00 ft
Magnetic North is 8.54 deg East of True North
GRID North is 0.30 deg East of True North
To correct azimuth from True to GRID subtract 0.30 deg
To correct azimuth from Magnetic to GRID add 8.25 deg

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	1657.00	0.00	306.44	1657.00	S 0.00	W 0.00	0.00	-0.00
End of Build	2754.38	21.95	306.44	2727.74	N 123.31	W 167.04	2.00	-98.50
End of Hold	6551.32	21.95	306.44	6249.50	N 966.19	W 1308.75	0.00	-771.77
Target Knight 15 EP	7579.98	90.00	179.87	6916.00	N 407.12	W 1523.18	10.00	-188.03
T.D. & Target Kni... BH	18494.40	90.00	179.87	6916.00	S 10507.28	W 1498.23	0.00	10613.55

<- True Vertical Depth (Feet)



Vertical Section (Feet) ->

Azimuth 188.12 with reference 0.00 N, 0.00 E from KNIGHT 15

<- North(Feet)

Scale 1 cm = 400 ft



SYSDRILL
Well Design Combined Report
Wellbore: W KNIGHT 15 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
KNIGHT 15	40.19767100	-105.04205500	1315184.3609	3127922.4996	134.55S	23.05W	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	1315184.36	3127922.50
1657.00	0.00	306.440	1657.00	0.00N	0.00E	==>	0.00	1315184.36	3127922.50
2754.38	21.95	306.440	2727.74	123.31N	167.04W	2.00	-98.50	1315307.67	3127755.47
6551.32	21.95	306.440	6249.50	966.19N	1308.75W	==>	-771.77	1316150.50	3126613.81
7579.98	90.00	179.870	6916.00	407.12N	1523.18W	10.00	-188.03	1315591.47	3126399.39
18494.40	90.00	179.870	6916.00	10507.28S	1498.23W	==>	10613.55	1304677.55	3126424.34

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	0.86	306.440	1700.00	0.19N	0.26W	2.00	-0.15	
1800.00	2.86	306.440	1799.94	2.12N	2.87W	2.00	-1.69	
1900.00	4.86	306.440	1899.71	6.12N	8.29W	2.00	-4.89	
2000.00	6.86	306.440	1999.18	12.18N	16.50W	2.00	-9.73	
2100.00	8.86	306.440	2098.24	20.30N	27.50W	2.00	-16.22	
2200.00	10.86	306.440	2196.75	30.47N	41.28W	2.00	-24.34	
2300.00	12.86	306.440	2294.61	42.68N	57.81W	2.00	-34.09	
2400.00	14.86	306.440	2391.70	56.91N	77.08W	2.00	-45.46	
2500.00	16.86	306.440	2487.89	73.14N	99.07W	2.00	-58.42	
2600.00	18.86	306.440	2583.06	91.35N	123.74W	2.00	-72.97	
2700.00	20.86	306.440	2677.11	111.53N	151.07W	2.00	-89.09	
2800.00	21.95	306.440	2770.05	133.44N	180.75W	==>	-106.59	
2900.00	21.95	306.440	2862.81	155.64N	210.82W	==>	-124.32	
3000.00	21.95	306.440	2955.56	177.84N	240.89W	==>	-142.05	
3100.00	21.95	306.440	3048.31	200.04N	270.96W	==>	-159.79	

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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 188.120 degrees
Bottom hole distance is 10613.55 Feet on azimuth 188.12 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 15 (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	21.95	306.440	3141.06	222.24N	301.03W	==>	-177.52	
3300.00	21.95	306.440	3233.82	244.44N	331.10W	==>	-195.25	
3400.00	21.95	306.440	3326.57	266.63N	361.17W	==>	-212.98	
3500.00	21.95	306.440	3419.32	288.83N	391.24W	==>	-230.71	
3600.00	21.95	306.440	3512.07	311.03N	421.31W	==>	-248.44	
3700.00	21.95	306.440	3604.83	333.23N	451.38W	==>	-266.18	
3800.00	21.95	306.440	3697.58	355.43N	481.45W	==>	-283.91	
3900.00	21.95	306.440	3790.33	377.63N	511.52W	==>	-301.64	
4000.00	21.95	306.440	3883.08	399.83N	541.59W	==>	-319.37	
4100.00	21.95	306.440	3975.84	422.03N	571.65W	==>	-337.10	
4200.00	21.95	306.440	4068.59	444.22N	601.72W	==>	-354.84	
4300.00	21.95	306.440	4161.34	466.42N	631.79W	==>	-372.57	
4400.00	21.95	306.440	4254.09	488.62N	661.86W	==>	-390.30	
4500.00	21.95	306.440	4346.85	510.82N	691.93W	==>	-408.03	
4600.00	21.95	306.440	4439.60	533.02N	722.00W	==>	-425.76	
4700.00	21.95	306.440	4532.35	555.22N	752.07W	==>	-443.49	
4800.00	21.95	306.440	4625.11	577.42N	782.14W	==>	-461.23	
4900.00	21.95	306.440	4717.86	599.62N	812.21W	==>	-478.96	
5000.00	21.95	306.440	4810.61	621.81N	842.28W	==>	-496.69	
5100.00	21.95	306.440	4903.36	644.01N	872.35W	==>	-514.42	
5200.00	21.95	306.440	4996.12	666.21N	902.42W	==>	-532.15	
5300.00	21.95	306.440	5088.87	688.41N	932.49W	==>	-549.89	
5400.00	21.95	306.440	5181.62	710.61N	962.56W	==>	-567.62	
5500.00	21.95	306.440	5274.37	732.81N	992.63W	==>	-585.35	
5600.00	21.95	306.440	5367.13	755.01N	1022.70W	==>	-603.08	
5700.00	21.95	306.440	5459.88	777.21N	1052.76W	==>	-620.81	
5800.00	21.95	306.440	5552.63	799.40N	1082.83W	==>	-638.54	
5900.00	21.95	306.440	5645.38	821.60N	1112.90W	==>	-656.28	
6000.00	21.95	306.440	5738.14	843.80N	1142.97W	==>	-674.01	
6100.00	21.95	306.440	5830.89	866.00N	1173.04W	==>	-691.74	
6200.00	21.95	306.440	5923.64	888.20N	1203.11W	==>	-709.47	
6300.00	21.95	306.440	6016.39	910.40N	1233.18W	==>	-727.20	
6400.00	21.95	306.440	6109.15	932.60N	1263.25W	==>	-744.94	
6500.00	21.95	306.440	6201.90	954.80N	1293.32W	==>	-762.67	
6600.00	19.58	294.400	6295.04	974.97N	1323.51W	10.00	-778.37	
6700.00	18.04	263.390	6389.93	980.12N	1354.23W	10.00	-779.14	
6800.00	21.47	235.250	6484.24	967.87N	1384.73W	10.00	-762.71	
6900.00	28.10	217.180	6575.11	938.60N	1414.07W	10.00	-729.59	
7000.00	36.21	206.100	6659.77	893.19N	1441.36W	10.00	-680.79	
7100.00	45.01	198.750	6735.65	833.03N	1465.79W	10.00	-617.78	
7200.00	54.15	193.390	6800.45	759.94N	1486.59W	10.00	-542.48	
7300.00	63.47	189.170	6852.20	676.14N	1503.15W	10.00	-457.18	
7400.00	72.90	185.580	6889.33	584.17N	1514.95W	10.00	-364.47	
7500.00	82.39	182.350	6910.70	486.84N	1521.65W	10.00	-267.17	
7600.00	90.00	179.870	6916.00	387.10N	1523.13W	==>	-168.22	
7700.00	90.00	179.870	6916.00	287.10N	1522.91W	==>	-69.25	
7800.00	90.00	179.870	6916.00	187.10N	1522.68W	==>	29.72	
7900.00	90.00	179.870	6916.00	87.10N	1522.45W	==>	128.68	
8000.00	90.00	179.870	6916.00	12.90S	1522.22W	==>	227.65	
8100.00	90.00	179.870	6916.00	112.90S	1521.99W	==>	326.61	
8200.00	90.00	179.870	6916.00	212.90S	1521.76W	==>	425.58	
8300.00	90.00	179.870	6916.00	312.90S	1521.53W	==>	524.55	
8400.00	90.00	179.870	6916.00	412.90S	1521.31W	==>	623.51	
8500.00	90.00	179.870	6916.00	512.90S	1521.08W	==>	722.48	
8600.00	90.00	179.870	6916.00	612.90S	1520.85W	==>	821.45	
8700.00	90.00	179.870	6916.00	712.90S	1520.62W	==>	920.41	
8800.00	90.00	179.870	6916.00	812.90S	1520.39W	==>	1019.38	
8900.00	90.00	179.870	6916.00	912.90S	1520.16W	==>	1118.34	
9000.00	90.00	179.870	6916.00	1012.90S	1519.93W	==>	1217.31	

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Vertical Section is from 0.00N 0.00E on azimuth 188.120 degrees
Bottom hole distance is 10613.55 Feet on azimuth 188.12 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 15 (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	179.870	6916.00	1112.90S	1519.70W	==>	1316.28	
9200.00	90.00	179.870	6916.00	1212.90S	1519.48W	==>	1415.24	
9300.00	90.00	179.870	6916.00	1312.90S	1519.25W	==>	1514.21	
9400.00	90.00	179.870	6916.00	1412.90S	1519.02W	==>	1613.17	
9500.00	90.00	179.870	6916.00	1512.89S	1518.79W	==>	1712.14	
9600.00	90.00	179.870	6916.00	1612.89S	1518.56W	==>	1811.11	
9700.00	90.00	179.870	6916.00	1712.89S	1518.33W	==>	1910.07	
9800.00	90.00	179.870	6916.00	1812.89S	1518.10W	==>	2009.04	
9900.00	90.00	179.870	6916.00	1912.89S	1517.88W	==>	2108.01	
10000.00	90.00	179.870	6916.00	2012.89S	1517.65W	==>	2206.97	
10100.00	90.00	179.870	6916.00	2112.89S	1517.42W	==>	2305.94	
10200.00	90.00	179.870	6916.00	2212.89S	1517.19W	==>	2404.90	
10300.00	90.00	179.870	6916.00	2312.89S	1516.96W	==>	2503.87	
10400.00	90.00	179.870	6916.00	2412.89S	1516.73W	==>	2602.84	
10500.00	90.00	179.870	6916.00	2512.89S	1516.50W	==>	2701.80	
10600.00	90.00	179.870	6916.00	2612.89S	1516.28W	==>	2800.77	
10700.00	90.00	179.870	6916.00	2712.89S	1516.05W	==>	2899.73	
10800.00	90.00	179.870	6916.00	2812.89S	1515.82W	==>	2998.70	
10900.00	90.00	179.870	6916.00	2912.89S	1515.59W	==>	3097.67	
11000.00	90.00	179.870	6916.00	3012.89S	1515.36W	==>	3196.63	
11100.00	90.00	179.870	6916.00	3112.89S	1515.13W	==>	3295.60	
11200.00	90.00	179.870	6916.00	3212.89S	1514.90W	==>	3394.56	
11300.00	90.00	179.870	6916.00	3312.89S	1514.68W	==>	3493.53	
11400.00	90.00	179.870	6916.00	3412.89S	1514.45W	==>	3592.50	
11500.00	90.00	179.870	6916.00	3512.89S	1514.22W	==>	3691.46	
11600.00	90.00	179.870	6916.00	3612.89S	1513.99W	==>	3790.43	
11700.00	90.00	179.870	6916.00	3712.89S	1513.76W	==>	3889.40	
11800.00	90.00	179.870	6916.00	3812.89S	1513.53W	==>	3988.36	
11900.00	90.00	179.870	6916.00	3912.89S	1513.30W	==>	4087.33	
12000.00	90.00	179.870	6916.00	4012.89S	1513.07W	==>	4186.29	
12100.00	90.00	179.870	6916.00	4112.89S	1512.85W	==>	4285.26	
12200.00	90.00	179.870	6916.00	4212.89S	1512.62W	==>	4384.23	
12300.00	90.00	179.870	6916.00	4312.89S	1512.39W	==>	4483.19	
12400.00	90.00	179.870	6916.00	4412.89S	1512.16W	==>	4582.16	
12500.00	90.00	179.870	6916.00	4512.89S	1511.93W	==>	4681.12	
12600.00	90.00	179.870	6916.00	4612.89S	1511.70W	==>	4780.09	
12700.00	90.00	179.870	6916.00	4712.89S	1511.47W	==>	4879.06	
12800.00	90.00	179.870	6916.00	4812.89S	1511.25W	==>	4978.02	
12900.00	90.00	179.870	6916.00	4912.89S	1511.02W	==>	5076.99	
13000.00	90.00	179.870	6916.00	5012.89S	1510.79W	==>	5175.95	
13100.00	90.00	179.870	6916.00	5112.89S	1510.56W	==>	5274.92	
13200.00	90.00	179.870	6916.00	5212.89S	1510.33W	==>	5373.89	
13300.00	90.00	179.870	6916.00	5312.89S	1510.10W	==>	5472.85	
13400.00	90.00	179.870	6916.00	5412.88S	1509.87W	==>	5571.82	
13500.00	90.00	179.870	6916.00	5512.88S	1509.65W	==>	5670.79	
13600.00	90.00	179.870	6916.00	5612.88S	1509.42W	==>	5769.75	
13700.00	90.00	179.870	6916.00	5712.88S	1509.19W	==>	5868.72	
13800.00	90.00	179.870	6916.00	5812.88S	1508.96W	==>	5967.68	
13900.00	90.00	179.870	6916.00	5912.88S	1508.73W	==>	6066.65	
14000.00	90.00	179.870	6916.00	6012.88S	1508.50W	==>	6165.62	
14100.00	90.00	179.870	6916.00	6112.88S	1508.27W	==>	6264.58	
14200.00	90.00	179.870	6916.00	6212.88S	1508.04W	==>	6363.55	
14300.00	90.00	179.870	6916.00	6312.88S	1507.82W	==>	6462.51	
14400.00	90.00	179.870	6916.00	6412.88S	1507.59W	==>	6561.48	
14500.00	90.00	179.870	6916.00	6512.88S	1507.36W	==>	6660.45	
14600.00	90.00	179.870	6916.00	6612.88S	1507.13W	==>	6759.41	
14700.00	90.00	179.870	6916.00	6712.88S	1506.90W	==>	6858.38	
14800.00	90.00	179.870	6916.00	6812.88S	1506.67W	==>	6957.35	
14900.00	90.00	179.870	6916.00	6912.88S	1506.44W	==>	7056.31	

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Interpolated Wellpath								
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15000.00	90.00	179.870	6916.00	7012.88S	1506.22W	==>	7155.28	
15100.00	90.00	179.870	6916.00	7112.88S	1505.99W	==>	7254.24	
15200.00	90.00	179.870	6916.00	7212.88S	1505.76W	==>	7353.21	
15300.00	90.00	179.870	6916.00	7312.88S	1505.53W	==>	7452.18	
15400.00	90.00	179.870	6916.00	7412.88S	1505.30W	==>	7551.14	
15500.00	90.00	179.870	6916.00	7512.88S	1505.07W	==>	7650.11	
15600.00	90.00	179.870	6916.00	7612.88S	1504.84W	==>	7749.07	
15700.00	90.00	179.870	6916.00	7712.88S	1504.62W	==>	7848.04	
15800.00	90.00	179.870	6916.00	7812.88S	1504.39W	==>	7947.01	
15900.00	90.00	179.870	6916.00	7912.88S	1504.16W	==>	8045.97	
16000.00	90.00	179.870	6916.00	8012.88S	1503.93W	==>	8144.94	
16100.00	90.00	179.870	6916.00	8112.88S	1503.70W	==>	8243.90	
16200.00	90.00	179.870	6916.00	8212.88S	1503.47W	==>	8342.87	
16300.00	90.00	179.870	6916.00	8312.88S	1503.24W	==>	8441.84	
16400.00	90.00	179.870	6916.00	8412.88S	1503.02W	==>	8540.80	
16500.00	90.00	179.870	6916.00	8512.88S	1502.79W	==>	8639.77	
16600.00	90.00	179.870	6916.00	8612.88S	1502.56W	==>	8738.74	
16700.00	90.00	179.870	6916.00	8712.88S	1502.33W	==>	8837.70	
16800.00	90.00	179.870	6916.00	8812.88S	1502.10W	==>	8936.67	
16900.00	90.00	179.870	6916.00	8912.88S	1501.87W	==>	9035.63	
17000.00	90.00	179.870	6916.00	9012.88S	1501.64W	==>	9134.60	
17100.00	90.00	179.870	6916.00	9112.88S	1501.41W	==>	9233.57	
17200.00	90.00	179.870	6916.00	9212.87S	1501.19W	==>	9332.53	
17300.00	90.00	179.870	6916.00	9312.87S	1500.96W	==>	9431.50	
17400.00	90.00	179.870	6916.00	9412.87S	1500.73W	==>	9530.46	
17500.00	90.00	179.870	6916.00	9512.87S	1500.50W	==>	9629.43	
17600.00	90.00	179.870	6916.00	9612.87S	1500.27W	==>	9728.40	
17700.00	90.00	179.870	6916.00	9712.87S	1500.04W	==>	9827.36	
17800.00	90.00	179.870	6916.00	9812.87S	1499.81W	==>	9926.33	
17900.00	90.00	179.870	6916.00	9912.87S	1499.59W	==>	10025.30	
18000.00	90.00	179.870	6916.00	10012.87S	1499.36W	==>	10124.26	
18100.00	90.00	179.870	6916.00	10112.87S	1499.13W	==>	10223.23	
18200.00	90.00	179.870	6916.00	10212.87S	1498.90W	==>	10322.19	
18300.00	90.00	179.870	6916.00	10312.87S	1498.67W	==>	10421.16	
18400.00	90.00	179.870	6916.00	10412.87S	1498.44W	==>	10520.13	
18494.40	90.00	179.870	6916.00	10507.28S	1498.23W	==>	10613.55	

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 188.120 degrees
Bottom hole distance is 10613.55 Feet on azimuth 188.12 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 15 EP	407.12N	1523.18W	6916.00	40.19881000	-105.04750000	1315591.47	3126399.39
Knight 15 BH	10507.28S	1498.23W	6916.00	40.16885000	-105.04761000	1304677.55	3126424.34

Notes