

# Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 5
Field	WATTENBERG	Well	W OLANDER 5
Installation	Olander Pad	Wellbore	W OLANDER 5 (PWB)

East (Feet) ->

-3200 -2400 -1600 -800 -0 800  
Scale 1 cm = 400 ft

N  
GRID

## 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	700.00	0.00	283.41	700.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1718.95	20.38	283.41	1697.60	N 41.58	W 174.42	2.00	-4.67
End of Hold	6872.26	20.38	283.41	6528.36	N 457.71	W 1920.04	0.00	-51.46
Target OLANDER 5 EP	7819.82	90.00	179.63	7112.00	S 114.61	W 2126.96	10.00	551.25
T.D. & Target OLA...2mi	17493.06	90.00	179.63	7112.00	S 9787.65	W 2065.11	0.00	10003.14

Surface 0.00 N 0.00 E

OLANDER 5 EP

<- North(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, 700.00 MD, 700.00 TVD, -0.00 VS

End of Build - 20.38 Inc, 1718.95 MD, 1697.60 TVD, -4.67 VS

Created by admin  
Date plotted 8-Oct-2017  
Plot reference is W OLANDER 5 (PWB).  
Ref wellpath is W OLANDER 5 (PWP#1).  
Coordinates are in Feet reference OLANDER 5.  
True Vertical Depths are reference Rig Datum.  
Measured Depths are reference Rig Datum.  
Rig Datum: Planned Datum #1  
Rig Datum to Mean Sea Level: 5049.00 ft.  
Plot North is aligned to GRID North.

OLANDER 5 BH-2mi

End of Hold - 20.38 Inc, 6872.26 MD, 6528.36 TVD, -51.46 VS

OLANDER 5 EP

S/C Kick off Point - 90.00 Inc, 7819.82 MD, 7112.00 TVD, 551.25 VS

OLANDER 5 BH-2mi

T.D. & End of Hold - 7112.00 TVD, 9787.65 S 2065.11 W

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

Scale 1 cm = 400 ft

Vertical Section (Feet) ->

Azimuth 191.91 with reference 0.00 N, 0.00 E from OLANDER 5



SYSDRILL  
Well Design Combined Report  
Wellbore: W OLANDER 5 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 5	40.20288000	-105.02524000	1317106.5875	3132609.4035	0.31N	58.66E	0.00

Declination		
Date	Source	Time
Jul-12-2017	EMM-2015 [2000.0-2020.0]	14:01

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Olander Pad	40.20288000	-105.02545000	1317106.2735	3132550.7471	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	1317106.59	3132609.40
700.00	0.00	283.410	700.00	0.00N	0.00E	==>	0.00	1317106.59	3132609.40
1718.95	20.38	283.410	1697.60	41.58N	174.42W	2.00	-4.67	1317148.16	3132434.99
6872.26	20.38	283.410	6528.36	457.71N	1920.04W	==>	-51.46	1317564.27	3130689.45
7819.82	90.00	179.630	7112.00	114.61S	2126.96W	10.00	551.25	1316991.98	3130482.54
17493.06	90.00	179.630	7112.00	9787.65S	2065.11W	==>	10003.14	1307319.38	3130544.39

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	283.410	700.00	0.00N	0.00E	==>	0.00	
800.00	2.00	283.410	799.98	0.40N	1.70W	2.00	-0.05	
900.00	4.00	283.410	899.84	1.62N	6.79W	2.00	-0.18	
1000.00	6.00	283.410	999.45	3.64N	15.27W	2.00	-0.41	
1100.00	8.00	283.410	1098.70	6.46N	27.12W	2.00	-0.73	
1200.00	10.00	283.410	1197.47	10.09N	42.34W	2.00	-1.13	
1300.00	12.00	283.410	1295.62	14.52N	60.90W	2.00	-1.63	
1400.00	14.00	283.410	1393.06	19.73N	82.78W	2.00	-2.22	
1500.00	16.00	283.410	1489.64	25.73N	107.95W	2.00	-2.89	
1517.00	16.34	283.410	1505.97	26.83N	112.56W	2.00	-3.02	
1617.00	18.34	283.410	1601.42	33.74N	141.55W	2.00	-3.79	
1717.00	20.34	283.410	1695.77	41.42N	173.76W	2.00	-4.66	
1817.00	20.38	283.410	1789.51	49.50N	207.63W	==>	-5.57	
1917.00	20.38	283.410	1883.26	57.57N	241.51W	==>	-6.47	
2017.00	20.38	283.410	1977.00	65.65N	275.38W	==>	-7.38	
2117.00	20.38	283.410	2070.74	73.72N	309.26W	==>	-8.29	
2217.00	20.38	283.410	2164.48	81.80N	343.13W	==>	-9.20	
2317.00	20.38	283.410	2258.22	89.87N	377.00W	==>	-10.10	
2417.00	20.38	283.410	2351.96	97.95N	410.88W	==>	-11.01	
2517.00	20.38	283.410	2445.70	106.02N	444.75W	==>	-11.92	
2617.00	20.38	283.410	2539.44	114.10N	478.62W	==>	-12.83	
2717.00	20.38	283.410	2633.18	122.17N	512.50W	==>	-13.74	
2817.00	20.38	283.410	2726.92	130.25N	546.37W	==>	-14.64	
2917.00	20.38	283.410	2820.66	138.32N	580.25W	==>	-15.55	
3017.00	20.38	283.410	2914.41	146.40N	614.12W	==>	-16.46	

All data is in Feet unless otherwise stated  
Coordinates are from Slot MD's are from Rig ( Planned Datum #1 5049.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 191.910 degrees  
Bottom hole distance is 10003.14 Feet on azimuth 191.91 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Microsoft  
Date Printed: 8-Oct-2017



SYS DRILL  
Well Design Combined Report  
Wellbore: W OLANDER 5 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3117.00	20.38	283.410	3008.15	154.47N	647.99W	==>	-17.37	
3217.00	20.38	283.410	3101.89	162.55N	681.87W	==>	-18.28	
3317.00	20.38	283.410	3195.63	170.62N	715.74W	==>	-19.18	
3417.00	20.38	283.410	3289.37	178.70N	749.61W	==>	-20.09	
3517.00	20.38	283.410	3383.11	186.77N	783.49W	==>	-21.00	
3617.00	20.38	283.410	3476.85	194.85N	817.36W	==>	-21.91	
3717.00	20.38	283.410	3570.59	202.92N	851.24W	==>	-22.82	
3817.00	20.38	283.410	3664.33	211.00N	885.11W	==>	-23.72	
3917.00	20.38	283.410	3758.07	219.07N	918.98W	==>	-24.63	
4017.00	20.38	283.410	3851.81	227.15N	952.86W	==>	-25.54	
4117.00	20.38	283.410	3945.56	235.22N	986.73W	==>	-26.45	
4217.00	20.38	283.410	4039.30	243.30N	1020.61W	==>	-27.35	
4317.00	20.38	283.410	4133.04	251.37N	1054.48W	==>	-28.26	
4417.00	20.38	283.410	4226.78	259.45N	1088.35W	==>	-29.17	
4517.00	20.38	283.410	4320.52	267.52N	1122.23W	==>	-30.08	
4617.00	20.38	283.410	4414.26	275.60N	1156.10W	==>	-30.99	
4717.00	20.38	283.410	4508.00	283.67N	1189.97W	==>	-31.89	
4817.00	20.38	283.410	4601.74	291.75N	1223.85W	==>	-32.80	
4917.00	20.38	283.410	4695.48	299.82N	1257.72W	==>	-33.71	
5017.00	20.38	283.410	4789.22	307.90N	1291.60W	==>	-34.62	
5117.00	20.38	283.410	4882.96	315.97N	1325.47W	==>	-35.53	
5217.00	20.38	283.410	4976.71	324.05N	1359.34W	==>	-36.43	
5317.00	20.38	283.410	5070.45	332.12N	1393.22W	==>	-37.34	
5417.00	20.38	283.410	5164.19	340.19N	1427.09W	==>	-38.25	
5517.00	20.38	283.410	5257.93	348.27N	1460.96W	==>	-39.16	
5617.00	20.38	283.410	5351.67	356.34N	1494.84W	==>	-40.07	
5717.00	20.38	283.410	5445.41	364.42N	1528.71W	==>	-40.97	
5817.00	20.38	283.410	5539.15	372.49N	1562.59W	==>	-41.88	
5917.00	20.38	283.410	5632.89	380.57N	1596.46W	==>	-42.79	
6017.00	20.38	283.410	5726.63	388.64N	1630.33W	==>	-43.70	
6117.00	20.38	283.410	5820.37	396.72N	1664.21W	==>	-44.60	
6217.00	20.38	283.410	5914.11	404.79N	1698.08W	==>	-45.51	
6317.00	20.38	283.410	6007.86	412.87N	1731.96W	==>	-46.42	
6417.00	20.38	283.410	6101.60	420.94N	1765.83W	==>	-47.33	
6517.00	20.38	283.410	6195.34	429.02N	1799.70W	==>	-48.24	
6617.00	20.38	283.410	6289.08	437.09N	1833.58W	==>	-49.14	
6717.00	20.38	283.410	6382.82	445.17N	1867.45W	==>	-50.05	
6817.00	20.38	283.410	6476.56	453.24N	1901.32W	==>	-50.96	
6917.00	19.84	270.460	6570.39	459.58N	1935.22W	10.00	-50.16	
7017.00	22.01	242.860	6664.02	451.15N	1968.95W	10.00	-34.95	
7117.00	27.69	223.070	6754.88	425.56N	2001.57W	10.00	-3.18	
7217.00	35.22	210.370	6840.22	383.60N	2032.09W	10.00	44.18	
7317.00	43.65	201.860	6917.44	326.55N	2059.59W	10.00	105.68	
7417.00	52.54	195.680	6984.20	256.12N	2083.22W	10.00	179.47	
7517.00	61.68	190.840	7038.46	174.47N	2102.28W	10.00	263.30	
7617.00	70.97	186.780	7078.58	84.07N	2116.18W	10.00	354.62	
7717.00	80.33	183.160	7103.34	12.33S	2124.49W	10.00	450.65	
7817.00	89.73	179.730	7111.99	111.79S	2126.98W	10.00	548.49	
7917.00	90.00	179.630	7112.00	211.79S	2126.34W	==>	646.20	
8017.00	90.00	179.630	7112.00	311.79S	2125.70W	==>	743.91	
8117.00	90.00	179.630	7112.00	411.79S	2125.06W	==>	841.63	
8217.00	90.00	179.630	7112.00	511.78S	2124.42W	==>	939.34	
8317.00	90.00	179.630	7112.00	611.78S	2123.78W	==>	1037.05	
8417.00	90.00	179.630	7112.00	711.78S	2123.14W	==>	1134.76	
8517.00	90.00	179.630	7112.00	811.78S	2122.50W	==>	1232.47	
8617.00	90.00	179.630	7112.00	911.78S	2121.87W	==>	1330.18	
8717.00	90.00	179.630	7112.00	1011.77S	2121.23W	==>	1427.90	
8817.00	90.00	179.630	7112.00	1111.77S	2120.59W	==>	1525.61	
8917.00	90.00	179.630	7112.00	1211.77S	2119.95W	==>	1623.32	

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Vertical Section is from 0.00N 0.00E on azimuth 191.910 degrees  
Bottom hole distance is 10003.14 Feet on azimuth 191.91 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Microsoft  
Date Printed: 8-Oct-2017



SYSDRILL  
Well Design Combined Report  
Wellbore: W OLANDER 5 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9017.00	90.00	179.630	7112.00	1311.77S	2119.31W	==>	1721.03	
9117.00	90.00	179.630	7112.00	1411.77S	2118.67W	==>	1818.74	
9217.00	90.00	179.630	7112.00	1511.76S	2118.03W	==>	1916.46	
9317.00	90.00	179.630	7112.00	1611.76S	2117.39W	==>	2014.17	
9417.00	90.00	179.630	7112.00	1711.76S	2116.75W	==>	2111.88	
9517.00	90.00	179.630	7112.00	1811.76S	2116.11W	==>	2209.59	
9617.00	90.00	179.630	7112.00	1911.76S	2115.47W	==>	2307.30	
9717.00	90.00	179.630	7112.00	2011.75S	2114.83W	==>	2405.01	
9817.00	90.00	179.630	7112.00	2111.75S	2114.19W	==>	2502.73	
9917.00	90.00	179.630	7112.00	2211.75S	2113.55W	==>	2600.44	
10017.00	90.00	179.630	7112.00	2311.75S	2112.91W	==>	2698.15	
10117.00	90.00	179.630	7112.00	2411.75S	2112.27W	==>	2795.86	
10217.00	90.00	179.630	7112.00	2511.74S	2111.63W	==>	2893.57	
10317.00	90.00	179.630	7112.00	2611.74S	2110.99W	==>	2991.28	
10417.00	90.00	179.630	7112.00	2711.74S	2110.35W	==>	3089.00	
10517.00	90.00	179.630	7112.00	2811.74S	2109.72W	==>	3186.71	
10617.00	90.00	179.630	7112.00	2911.73S	2109.08W	==>	3284.42	
10717.00	90.00	179.630	7112.00	3011.73S	2108.44W	==>	3382.13	
10817.00	90.00	179.630	7112.00	3111.73S	2107.80W	==>	3479.84	
10917.00	90.00	179.630	7112.00	3211.73S	2107.16W	==>	3577.56	
11017.00	90.00	179.630	7112.00	3311.73S	2106.52W	==>	3675.27	
11117.00	90.00	179.630	7112.00	3411.72S	2105.88W	==>	3772.98	
11217.00	90.00	179.630	7112.00	3511.72S	2105.24W	==>	3870.69	
11317.00	90.00	179.630	7112.00	3611.72S	2104.60W	==>	3968.40	
11417.00	90.00	179.630	7112.00	3711.72S	2103.96W	==>	4066.11	
11517.00	90.00	179.630	7112.00	3811.72S	2103.32W	==>	4163.83	
11617.00	90.00	179.630	7112.00	3911.71S	2102.68W	==>	4261.54	
11717.00	90.00	179.630	7112.00	4011.71S	2102.04W	==>	4359.25	
11817.00	90.00	179.630	7112.00	4111.71S	2101.40W	==>	4456.96	
11917.00	90.00	179.630	7112.00	4211.71S	2100.76W	==>	4554.67	
12017.00	90.00	179.630	7112.00	4311.71S	2100.12W	==>	4652.39	
12117.00	90.00	179.630	7112.00	4411.70S	2099.48W	==>	4750.10	
12217.00	90.00	179.630	7112.00	4511.70S	2098.84W	==>	4847.81	
12317.00	90.00	179.630	7112.00	4611.70S	2098.21W	==>	4945.52	
12417.00	90.00	179.630	7112.00	4711.70S	2097.57W	==>	5043.23	
12517.00	90.00	179.630	7112.00	4811.70S	2096.93W	==>	5140.94	
12617.00	90.00	179.630	7112.00	4911.69S	2096.29W	==>	5238.66	
12717.00	90.00	179.630	7112.00	5011.69S	2095.65W	==>	5336.37	
12817.00	90.00	179.630	7112.00	5111.69S	2095.01W	==>	5434.08	
12917.00	90.00	179.630	7112.00	5211.69S	2094.37W	==>	5531.79	
13017.00	90.00	179.630	7112.00	5311.69S	2093.73W	==>	5629.50	
13117.00	90.00	179.630	7112.00	5411.68S	2093.09W	==>	5727.21	
13217.00	90.00	179.630	7112.00	5511.68S	2092.45W	==>	5824.93	
13317.00	90.00	179.630	7112.00	5611.68S	2091.81W	==>	5922.64	
13417.00	90.00	179.630	7112.00	5711.68S	2091.17W	==>	6020.35	
13517.00	90.00	179.630	7112.00	5811.68S	2090.53W	==>	6118.06	
13617.00	90.00	179.630	7112.00	5911.67S	2089.89W	==>	6215.77	
13717.00	90.00	179.630	7112.00	6011.67S	2089.25W	==>	6313.49	
13817.00	90.00	179.630	7112.00	6111.67S	2088.61W	==>	6411.20	
13917.00	90.00	179.630	7112.00	6211.67S	2087.97W	==>	6508.91	
14017.00	90.00	179.630	7112.00	6311.67S	2087.33W	==>	6606.62	
14117.00	90.00	179.630	7112.00	6411.66S	2086.69W	==>	6704.33	
14217.00	90.00	179.630	7112.00	6511.66S	2086.06W	==>	6802.04	
14317.00	90.00	179.630	7112.00	6611.66S	2085.42W	==>	6899.76	
14417.00	90.00	179.630	7112.00	6711.66S	2084.78W	==>	6997.47	
14517.00	90.00	179.630	7112.00	6811.66S	2084.14W	==>	7095.18	
14617.00	90.00	179.630	7112.00	6911.65S	2083.50W	==>	7192.89	
14717.00	90.00	179.630	7112.00	7011.65S	2082.86W	==>	7290.60	
14817.00	90.00	179.630	7112.00	7111.65S	2082.22W	==>	7388.32	

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Vertical Section is from 0.00N 0.00E on azimuth 191.910 degrees  
Bottom hole distance is 10003.14 Feet on azimuth 191.91 degrees from Wellhead  
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SYS DRILL  
Well Design Combined Report  
Wellbore: W OLANDER 5 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
14917.00	90.00	179.630	7112.00	7211.65S	2081.58W	==>	7486.03	
15017.00	90.00	179.630	7112.00	7311.64S	2080.94W	==>	7583.74	
15117.00	90.00	179.630	7112.00	7411.64S	2080.30W	==>	7681.45	
15217.00	90.00	179.630	7112.00	7511.64S	2079.66W	==>	7779.16	
15317.00	90.00	179.630	7112.00	7611.64S	2079.02W	==>	7876.87	
15417.00	90.00	179.630	7112.00	7711.64S	2078.38W	==>	7974.59	
15517.00	90.00	179.630	7112.00	7811.63S	2077.74W	==>	8072.30	
15617.00	90.00	179.630	7112.00	7911.63S	2077.10W	==>	8170.01	
15717.00	90.00	179.630	7112.00	8011.63S	2076.46W	==>	8267.72	
15817.00	90.00	179.630	7112.00	8111.63S	2075.82W	==>	8365.43	
15917.00	90.00	179.630	7112.00	8211.63S	2075.18W	==>	8463.15	
16017.00	90.00	179.630	7112.00	8311.62S	2074.54W	==>	8560.86	
16117.00	90.00	179.630	7112.00	8411.62S	2073.91W	==>	8658.57	
16217.00	90.00	179.630	7112.00	8511.62S	2073.27W	==>	8756.28	
16317.00	90.00	179.630	7112.00	8611.62S	2072.63W	==>	8853.99	
16417.00	90.00	179.630	7112.00	8711.62S	2071.99W	==>	8951.70	
16517.00	90.00	179.630	7112.00	8811.61S	2071.35W	==>	9049.42	
16617.00	90.00	179.630	7112.00	8911.61S	2070.71W	==>	9147.13	
16717.00	90.00	179.630	7112.00	9011.61S	2070.07W	==>	9244.84	
16817.00	90.00	179.630	7112.00	9111.61S	2069.43W	==>	9342.55	
16917.00	90.00	179.630	7112.00	9211.61S	2068.79W	==>	9440.26	
17017.00	90.00	179.630	7112.00	9311.60S	2068.15W	==>	9537.97	
17117.00	90.00	179.630	7112.00	9411.60S	2067.51W	==>	9635.69	
17217.00	90.00	179.630	7112.00	9511.60S	2066.87W	==>	9733.40	
17317.00	90.00	179.630	7112.00	9611.60S	2066.23W	==>	9831.11	
17417.00	90.00	179.630	7112.00	9711.60S	2065.59W	==>	9928.82	
17493.06	90.00	179.630	7112.00	9787.65S	2065.11W	==>	10003.14	

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 5049.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 191.910 degrees  
Bottom hole distance is 10003.14 Feet on azimuth 191.91 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Microsoft  
Date Printed: 8-Oct-2017



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 5 EP	114.61S	2126.96W	7112.00	40.20259640	-105.03285650	1316991.98	3130482.54
OLANDER 5 BH-2mi	9787.65S	2065.11W	7112.00	40.17604340	-105.03281750	1307319.38	3130544.39

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562202	Planned	1517.00	1505.97	WdW Rate Gyro	Standard	
562201	Planned	17493.06	7112.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes