

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 4
Field	WATTENBERG	Well	W OLANDER 4
Installation	Olander Pad	Wellbore	W OLANDER 4 (PWB)

East (Feet) ->

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

N

GRID

WELL PROFILE DATA

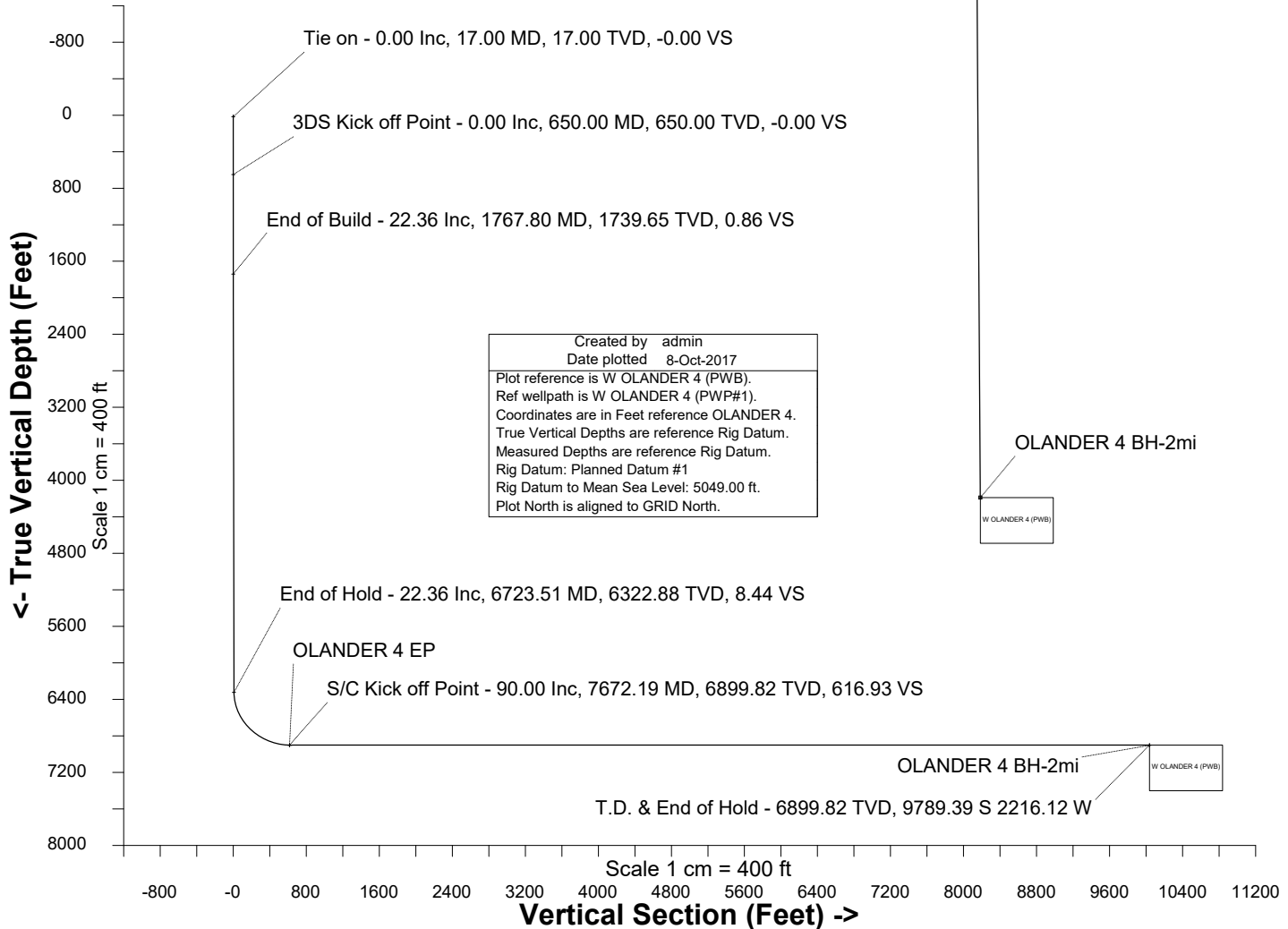
Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	17.00	0.00	0.00	17.00	S 0.00	W 0.00		-0.00
KOP	650.00	0.00	282.53	650.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1767.80	22.36	282.53	1739.65	N 46.70	W 210.20	2.00	0.86
End of Hold	6723.51	22.36	282.53	6322.88	N 455.49	W 2050.29	0.00	8.44
Target OLANDER 4 EP	7672.19	90.00	179.63	6899.82	S 116.86	W 2277.93	10.00	616.93
T.D. & Target OLA...2mi	17344.91	90.00	179.63	6899.82	S 9789.39	W 2216.12	0.00	10037.10

Jul-12-2017
EMM-2015 (2000 0-2000 ft) Day 46.61 deg Field: 52203.1 wT
Lat: N40 12 10.3880 Long: W105 1 31.6205 Elev: 5033.00 ft
Magnetic North is 8.59 deg East of True North
GRID North is 0.31 deg East of True North
To correct azimuth from True to GRID subtract 0.31 deg
To correct azimuth from Magnetic to GRID add 8.28 deg

Surface 0.00 N 0.00 E

OLANDER 4 EP

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



Created by	admin
Date plotted	8-Oct-2017
Plot reference is W OLANDER 4 (PWB).	
Ref wellpath is W OLANDER 4 (PWP#1).	
Coordinates are in Feet reference OLANDER 4.	
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.	

Azimuth 192.76 with reference 0.00 N, 0.00 E from OLANDER 4



SYSDRILL
Well Design Combined Report
Wellbore: W OLANDER 4 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 4	40.20288000	-105.02529000	1317106.5128	3132595.4377	0.24N	44.69E	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	1317106.51	3132595.44
650.00	0.00	282.530	650.00	0.00N	0.00E	==>	0.00	1317106.51	3132595.44
1767.80	22.36	282.530	1739.65	46.70N	210.20W	2.00	0.86	1317153.21	3132385.25
6723.51	22.36	282.530	6322.88	455.49N	2050.29W	==>	8.44	1317561.99	3130545.24
7672.19	90.00	179.630	6899.82	116.86S	2277.93W	10.00	616.93	1316989.65	3130317.61
17344.91	90.00	179.630	6899.82	9789.39S	2216.12W	==>	10037.10	1307317.56	3130379.42

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	1.00	282.530	700.00	0.09N	0.43W	2.00	0.00	
800.00	3.00	282.530	799.93	0.85N	3.83W	2.00	0.02	
900.00	5.00	282.530	899.68	2.36N	10.64W	2.00	0.04	
1000.00	7.00	282.530	999.13	4.63N	20.85W	2.00	0.09	
1100.00	9.00	282.530	1098.15	7.65N	34.43W	2.00	0.14	
1200.00	11.00	282.530	1196.63	11.41N	51.38W	2.00	0.21	
1300.00	13.00	282.530	1294.44	15.92N	71.68W	2.00	0.29	
1400.00	15.00	282.530	1391.46	21.17N	95.29W	2.00	0.39	
1500.00	17.00	282.530	1487.58	27.15N	122.20W	2.00	0.50	
1517.00	17.34	282.530	1503.83	28.24N	127.10W	2.00	0.52	
1617.00	19.34	282.530	1598.74	35.06N	157.81W	2.00	0.65	
1717.00	21.34	282.530	1692.50	42.60N	191.74W	2.00	0.79	
1817.00	22.36	282.530	1785.15	50.76N	228.47W	==>	0.94	
1917.00	22.36	282.530	1877.64	59.01N	265.60W	==>	1.09	
2017.00	22.36	282.530	1970.12	67.25N	302.73W	==>	1.25	
2117.00	22.36	282.530	2062.61	75.50N	339.86W	==>	1.40	
2217.00	22.36	282.530	2155.09	83.75N	376.99W	==>	1.55	
2317.00	22.36	282.530	2247.57	92.00N	414.12W	==>	1.70	
2417.00	22.36	282.530	2340.06	100.25N	451.25W	==>	1.86	
2517.00	22.36	282.530	2432.54	108.50N	488.38W	==>	2.01	
2617.00	22.36	282.530	2525.02	116.75N	525.51W	==>	2.16	
2717.00	22.36	282.530	2617.51	125.00N	562.64W	==>	2.31	
2817.00	22.36	282.530	2709.99	133.25N	599.77W	==>	2.47	
2917.00	22.36	282.530	2802.48	141.50N	636.90W	==>	2.62	
3017.00	22.36	282.530	2894.96	149.74N	674.03W	==>	2.77	

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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 192.760 degrees
Bottom hole distance is 10037.10 Feet on azimuth 192.76 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 4 (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	22.36	282.530	2987.44	157.99N	711.17W	==>	2.93	
3217.00	22.36	282.530	3079.93	166.24N	748.30W	==>	3.08	
3317.00	22.36	282.530	3172.41	174.49N	785.43W	==>	3.23	
3417.00	22.36	282.530	3264.90	182.74N	822.56W	==>	3.38	
3517.00	22.36	282.530	3357.38	190.99N	859.69W	==>	3.54	
3617.00	22.36	282.530	3449.86	199.24N	896.82W	==>	3.69	
3717.00	22.36	282.530	3542.35	207.49N	933.95W	==>	3.84	
3817.00	22.36	282.530	3634.83	215.74N	971.08W	==>	4.00	
3917.00	22.36	282.530	3727.31	223.98N	1008.21W	==>	4.15	
4017.00	22.36	282.530	3819.80	232.23N	1045.34W	==>	4.30	
4117.00	22.36	282.530	3912.28	240.48N	1082.47W	==>	4.45	
4217.00	22.36	282.530	4004.77	248.73N	1119.60W	==>	4.61	
4317.00	22.36	282.530	4097.25	256.98N	1156.73W	==>	4.76	
4417.00	22.36	282.530	4189.73	265.23N	1193.86W	==>	4.91	
4517.00	22.36	282.530	4282.22	273.48N	1231.00W	==>	5.06	
4617.00	22.36	282.530	4374.70	281.73N	1268.13W	==>	5.22	
4717.00	22.36	282.530	4467.19	289.98N	1305.26W	==>	5.37	
4817.00	22.36	282.530	4559.67	298.23N	1342.39W	==>	5.52	
4917.00	22.36	282.530	4652.15	306.47N	1379.52W	==>	5.68	
5017.00	22.36	282.530	4744.64	314.72N	1416.65W	==>	5.83	
5117.00	22.36	282.530	4837.12	322.97N	1453.78W	==>	5.98	
5217.00	22.36	282.530	4929.61	331.22N	1490.91W	==>	6.13	
5317.00	22.36	282.530	5022.09	339.47N	1528.04W	==>	6.29	
5417.00	22.36	282.530	5114.57	347.72N	1565.17W	==>	6.44	
5517.00	22.36	282.530	5207.06	355.97N	1602.30W	==>	6.59	
5617.00	22.36	282.530	5299.54	364.22N	1639.43W	==>	6.75	
5717.00	22.36	282.530	5392.02	372.47N	1676.56W	==>	6.90	
5817.00	22.36	282.530	5484.51	380.72N	1713.69W	==>	7.05	
5917.00	22.36	282.530	5576.99	388.96N	1750.83W	==>	7.20	
6017.00	22.36	282.530	5669.48	397.21N	1787.96W	==>	7.36	
6117.00	22.36	282.530	5761.96	405.46N	1825.09W	==>	7.51	
6217.00	22.36	282.530	5854.44	413.71N	1862.22W	==>	7.66	
6317.00	22.36	282.530	5946.93	421.96N	1899.35W	==>	7.81	
6417.00	22.36	282.530	6039.41	430.21N	1936.48W	==>	7.97	
6517.00	22.36	282.530	6131.90	438.46N	1973.61W	==>	8.12	
6617.00	22.36	282.530	6224.38	446.71N	2010.74W	==>	8.27	
6717.00	22.36	282.530	6316.86	454.96N	2047.87W	==>	8.43	
6817.00	22.28	257.740	6409.56	455.59N	2085.04W	10.00	16.02	
6917.00	26.01	234.870	6501.00	438.90N	2121.59W	10.00	40.36	
7017.00	32.36	218.890	6588.39	405.37N	2156.41W	10.00	80.75	
7117.00	40.08	208.080	6669.09	356.01N	2188.45W	10.00	135.97	
7217.00	48.53	200.390	6740.64	292.33N	2216.73W	10.00	204.32	
7317.00	57.37	194.510	6800.87	216.25N	2240.39W	10.00	283.74	
7417.00	66.43	189.710	6847.94	130.10N	2258.71W	10.00	371.82	
7517.00	75.62	185.530	6880.44	36.48N	2271.14W	10.00	465.87	
7617.00	84.88	181.690	6897.36	61.76S	2277.30W	10.00	563.04	
7717.00	90.00	179.630	6899.82	161.67S	2277.65W	==>	660.57	
7817.00	90.00	179.630	6899.82	261.67S	2277.01W	==>	757.96	
7917.00	90.00	179.630	6899.82	361.67S	2276.37W	==>	855.35	
8017.00	90.00	179.630	6899.82	461.67S	2275.73W	==>	952.74	
8117.00	90.00	179.630	6899.82	561.67S	2275.09W	==>	1050.13	
8217.00	90.00	179.630	6899.82	661.66S	2274.45W	==>	1147.52	
8317.00	90.00	179.630	6899.82	761.66S	2273.81W	==>	1244.91	
8417.00	90.00	179.630	6899.82	861.66S	2273.17W	==>	1342.29	
8517.00	90.00	179.630	6899.82	961.66S	2272.53W	==>	1439.68	
8617.00	90.00	179.630	6899.82	1061.66S	2271.90W	==>	1537.07	
8717.00	90.00	179.630	6899.82	1161.65S	2271.26W	==>	1634.46	
8817.00	90.00	179.630	6899.82	1261.65S	2270.62W	==>	1731.85	
8917.00	90.00	179.630	6899.82	1361.65S	2269.98W	==>	1829.24	

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Vertical Section is from 0.00N 0.00E on azimuth 192.760 degrees
Bottom hole distance is 10037.10 Feet on azimuth 192.76 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 4 (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	6899.82	1461.65S	2269.34W	==>	1926.63	
9117.00	90.00	179.630	6899.82	1561.65S	2268.70W	==>	2024.02	
9217.00	90.00	179.630	6899.82	1661.64S	2268.06W	==>	2121.41	
9317.00	90.00	179.630	6899.82	1761.64S	2267.42W	==>	2218.80	
9417.00	90.00	179.630	6899.82	1861.64S	2266.78W	==>	2316.18	
9517.00	90.00	179.630	6899.82	1961.64S	2266.14W	==>	2413.57	
9617.00	90.00	179.630	6899.82	2061.64S	2265.50W	==>	2510.96	
9717.00	90.00	179.630	6899.82	2161.63S	2264.86W	==>	2608.35	
9817.00	90.00	179.630	6899.82	2261.63S	2264.23W	==>	2705.74	
9917.00	90.00	179.630	6899.82	2361.63S	2263.59W	==>	2803.13	
10017.00	90.00	179.630	6899.82	2461.63S	2262.95W	==>	2900.52	
10117.00	90.00	179.630	6899.82	2561.63S	2262.31W	==>	2997.91	
10217.00	90.00	179.630	6899.82	2661.62S	2261.67W	==>	3095.30	
10317.00	90.00	179.630	6899.82	2761.62S	2261.03W	==>	3192.69	
10417.00	90.00	179.630	6899.82	2861.62S	2260.39W	==>	3290.07	
10517.00	90.00	179.630	6899.82	2961.62S	2259.75W	==>	3387.46	
10617.00	90.00	179.630	6899.82	3061.62S	2259.11W	==>	3484.85	
10717.00	90.00	179.630	6899.82	3161.61S	2258.47W	==>	3582.24	
10817.00	90.00	179.630	6899.82	3261.61S	2257.83W	==>	3679.63	
10917.00	90.00	179.630	6899.82	3361.61S	2257.20W	==>	3777.02	
11017.00	90.00	179.630	6899.82	3461.61S	2256.56W	==>	3874.41	
11117.00	90.00	179.630	6899.82	3561.61S	2255.92W	==>	3971.80	
11217.00	90.00	179.630	6899.82	3661.60S	2255.28W	==>	4069.19	
11317.00	90.00	179.630	6899.82	3761.60S	2254.64W	==>	4166.58	
11417.00	90.00	179.630	6899.82	3861.60S	2254.00W	==>	4263.96	
11517.00	90.00	179.630	6899.82	3961.60S	2253.36W	==>	4361.35	
11617.00	90.00	179.630	6899.82	4061.59S	2252.72W	==>	4458.74	
11717.00	90.00	179.630	6899.82	4161.59S	2252.08W	==>	4556.13	
11817.00	90.00	179.630	6899.82	4261.59S	2251.44W	==>	4653.52	
11917.00	90.00	179.630	6899.82	4361.59S	2250.80W	==>	4750.91	
12017.00	90.00	179.630	6899.82	4461.59S	2250.17W	==>	4848.30	
12117.00	90.00	179.630	6899.82	4561.58S	2249.53W	==>	4945.69	
12217.00	90.00	179.630	6899.82	4661.58S	2248.89W	==>	5043.08	
12317.00	90.00	179.630	6899.82	4761.58S	2248.25W	==>	5140.46	
12417.00	90.00	179.630	6899.82	4861.58S	2247.61W	==>	5237.85	
12517.00	90.00	179.630	6899.82	4961.58S	2246.97W	==>	5335.24	
12617.00	90.00	179.630	6899.82	5061.57S	2246.33W	==>	5432.63	
12717.00	90.00	179.630	6899.82	5161.57S	2245.69W	==>	5530.02	
12817.00	90.00	179.630	6899.82	5261.57S	2245.05W	==>	5627.41	
12917.00	90.00	179.630	6899.82	5361.57S	2244.41W	==>	5724.80	
13017.00	90.00	179.630	6899.82	5461.57S	2243.77W	==>	5822.19	
13117.00	90.00	179.630	6899.82	5561.56S	2243.14W	==>	5919.58	
13217.00	90.00	179.630	6899.82	5661.56S	2242.50W	==>	6016.97	
13317.00	90.00	179.630	6899.82	5761.56S	2241.86W	==>	6114.35	
13417.00	90.00	179.630	6899.82	5861.56S	2241.22W	==>	6211.74	
13517.00	90.00	179.630	6899.82	5961.56S	2240.58W	==>	6309.13	
13617.00	90.00	179.630	6899.82	6061.55S	2239.94W	==>	6406.52	
13717.00	90.00	179.630	6899.82	6161.55S	2239.30W	==>	6503.91	
13817.00	90.00	179.630	6899.82	6261.55S	2238.66W	==>	6601.30	
13917.00	90.00	179.630	6899.82	6361.55S	2238.02W	==>	6698.69	
14017.00	90.00	179.630	6899.82	6461.55S	2237.38W	==>	6796.08	
14117.00	90.00	179.630	6899.82	6561.54S	2236.74W	==>	6893.47	
14217.00	90.00	179.630	6899.82	6661.54S	2236.11W	==>	6990.86	
14317.00	90.00	179.630	6899.82	6761.54S	2235.47W	==>	7088.24	
14417.00	90.00	179.630	6899.82	6861.54S	2234.83W	==>	7185.63	
14517.00	90.00	179.630	6899.82	6961.54S	2234.19W	==>	7283.02	
14617.00	90.00	179.630	6899.82	7061.53S	2233.55W	==>	7380.41	
14717.00	90.00	179.630	6899.82	7161.53S	2232.91W	==>	7477.80	
14817.00	90.00	179.630	6899.82	7261.53S	2232.27W	==>	7575.19	

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Well Design Combined Report
Wellbore: W OLANDER 4 (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	6899.82	7361.53S	2231.63W	==>	7672.58	
15017.00	90.00	179.630	6899.82	7461.53S	2230.99W	==>	7769.97	
15117.00	90.00	179.630	6899.82	7561.52S	2230.35W	==>	7867.36	
15217.00	90.00	179.630	6899.82	7661.52S	2229.71W	==>	7964.75	
15317.00	90.00	179.630	6899.82	7761.52S	2229.08W	==>	8062.13	
15417.00	90.00	179.630	6899.82	7861.52S	2228.44W	==>	8159.52	
15517.00	90.00	179.630	6899.82	7961.52S	2227.80W	==>	8256.91	
15617.00	90.00	179.630	6899.82	8061.51S	2227.16W	==>	8354.30	
15717.00	90.00	179.630	6899.82	8161.51S	2226.52W	==>	8451.69	
15817.00	90.00	179.630	6899.82	8261.51S	2225.88W	==>	8549.08	
15917.00	90.00	179.630	6899.82	8361.51S	2225.24W	==>	8646.47	
16017.00	90.00	179.630	6899.82	8461.50S	2224.60W	==>	8743.86	
16117.00	90.00	179.630	6899.82	8561.50S	2223.96W	==>	8841.25	
16217.00	90.00	179.630	6899.82	8661.50S	2223.32W	==>	8938.64	
16317.00	90.00	179.630	6899.82	8761.50S	2222.68W	==>	9036.02	
16417.00	90.00	179.630	6899.82	8861.50S	2222.05W	==>	9133.41	
16517.00	90.00	179.630	6899.82	8961.49S	2221.41W	==>	9230.80	
16617.00	90.00	179.630	6899.82	9061.49S	2220.77W	==>	9328.19	
16717.00	90.00	179.630	6899.82	9161.49S	2220.13W	==>	9425.58	
16817.00	90.00	179.630	6899.82	9261.49S	2219.49W	==>	9522.97	
16917.00	90.00	179.630	6899.82	9361.49S	2218.85W	==>	9620.36	
17017.00	90.00	179.630	6899.82	9461.48S	2218.21W	==>	9717.75	
17117.00	90.00	179.630	6899.82	9561.48S	2217.57W	==>	9815.14	
17217.00	90.00	179.630	6899.82	9661.48S	2216.93W	==>	9912.53	
17317.00	90.00	179.630	6899.82	9761.48S	2216.29W	==>	10009.91	
17344.91	90.00	179.630	6899.82	9789.39S	2216.12W	==>	10037.10	

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 192.760 degrees
Bottom hole distance is 10037.10 Feet on azimuth 192.76 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 4 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 4 EP	116.86S	2277.93W	6899.82	40.20259240	-105.03344700	1316989.65	3130317.61
OLANDER 4 BH-2mi	9789.39S	2216.12W	6899.82	40.17604080	-105.03340790	1307317.56	3130379.42

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562180	Planned	1517.00	1503.83	WdW Rate Gyro	Standard	
562179	Planned	17344.91	6899.82	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes