

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 3
Field	WATTENBERG	Well	W OLANDER 3
Installation	Olander Pad	Wellbore	W OLANDER 3 (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	600.00	0.00	280.93	600.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1850.48	25.01	280.93	1811.15	N 50.93	W 263.74	2.00	16.64
End of Hold	6844.21	25.01	280.93	6336.65	N 451.24	W 2336.64	0.00	147.41
Target OLANDER 3 EP	7791.71	90.00	179.63	6900.82	S 121.39	W 2591.08	10.00	765.47
T.D. & Target OLA...2mi	17463.45	90.00	179.63	6900.82	S 9792.93	W 2529.25	0.00	10114.28

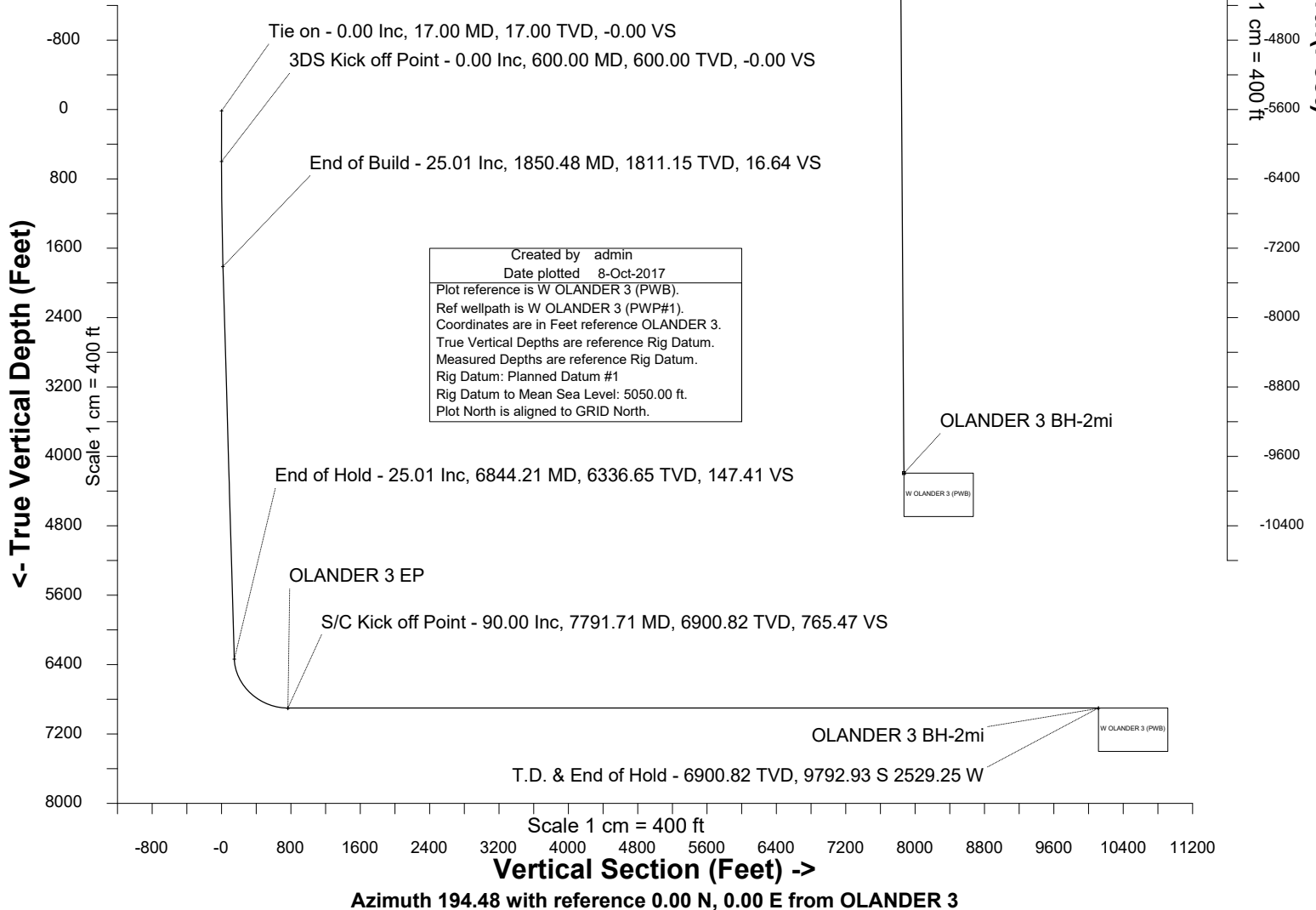
Jul-12-2017
EMM-2015 [2000.0-2020.0] Dip: 66.61 deg Field: 52203.1 nT
Lat: N40 12 10.3680 Long: W105 1 31.6200 Elev: 5033.00 ft
Magnetic North is 8.59 deg East of True North
GRID North is 0.31 deg East of True North
To correct azimuth from True to GRID subtract 0.31 deg
To correct azimuth from Magnetic to GRID add 8.28 deg

Surface 0.00 N 0.00 E

OLANDER 3 EP

<- North(Feet)

Scale 1 cm = 400 ft



Created by admin
Date plotted 8-Oct-2017
Plot reference is W OLANDER 3 (PWB).
Ref wellpath is W OLANDER 3 (PWP#1).
Coordinates are in Feet reference OLANDER 3.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 5050.00 ft.
Plot North is aligned to GRID North.



SYSDRILL
Well Design Combined Report
Wellbore: W OLANDER 3 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 3	40.20288000	-105.02535000	1317106.4230	3132578.6787	0.15N	27.93E	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	1317106.42	3132578.68
600.00	0.00	280.930	600.00	0.00N	0.00E	==>	0.00	1317106.42	3132578.68
1850.48	25.01	280.930	1811.15	50.93N	263.74W	2.00	16.64	1317157.35	3132314.95
6844.21	25.01	280.930	6336.65	451.24N	2336.64W	==>	147.41	1317557.64	3130242.15
7791.71	90.00	179.630	6900.82	121.39S	2591.08W	10.00	765.47	1316985.04	3129987.72
17463.45	90.00	179.630	6900.82	9792.93S	2529.25W	==>	10114.28	1307313.93	3130049.54

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	280.930	600.00	0.00N	0.00E	==>	0.00	
700.00	2.00	280.930	699.98	0.33N	1.71W	2.00	0.11	
800.00	4.00	280.930	799.84	1.32N	6.85W	2.00	0.43	
900.00	6.00	280.930	899.45	2.98N	15.41W	2.00	0.97	
1000.00	8.00	280.930	998.70	5.29N	27.37W	2.00	1.73	
1100.00	10.00	280.930	1097.47	8.25N	42.73W	2.00	2.70	
1200.00	12.00	280.930	1195.62	11.87N	61.47W	2.00	3.88	
1300.00	14.00	280.930	1293.06	16.14N	83.55W	2.00	5.27	
1400.00	16.00	280.930	1389.64	21.04N	108.96W	2.00	6.87	
1500.00	18.00	280.930	1485.27	26.59N	137.67W	2.00	8.69	
1517.00	18.34	280.930	1501.42	27.59N	142.87W	2.00	9.01	
1617.00	20.34	280.930	1595.77	33.87N	175.39W	2.00	11.06	
1717.00	22.34	280.930	1688.91	40.77N	211.12W	2.00	13.32	
1817.00	24.34	280.930	1780.72	48.28N	250.02W	2.00	15.77	
1917.00	25.01	280.930	1871.43	56.26N	291.35W	==>	18.38	
2017.00	25.01	280.930	1962.05	64.28N	332.86W	==>	21.00	
2117.00	25.01	280.930	2052.68	72.30N	374.37W	==>	23.62	
2217.00	25.01	280.930	2143.30	80.31N	415.88W	==>	26.24	
2317.00	25.01	280.930	2233.92	88.33N	457.39W	==>	28.86	
2417.00	25.01	280.930	2324.55	96.35N	498.90W	==>	31.47	
2517.00	25.01	280.930	2415.17	104.36N	540.41W	==>	34.09	
2617.00	25.01	280.930	2505.80	112.38N	581.92W	==>	36.71	
2717.00	25.01	280.930	2596.42	120.39N	623.43W	==>	39.33	
2817.00	25.01	280.930	2687.04	128.41N	664.94W	==>	41.95	
2917.00	25.01	280.930	2777.67	136.43N	706.45W	==>	44.57	
3017.00	25.01	280.930	2868.29	144.44N	747.96W	==>	47.19	

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Coordinates are from Slot MD's are from Rig (Planned Datum #1 5050.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 194.480 degrees
Bottom hole distance is 10114.28 Feet on azimuth 194.48 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 3 (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	25.01	280.930	2958.91	152.46N	789.47W	==>	49.81	
3217.00	25.01	280.930	3049.54	160.48N	830.98W	==>	52.42	
3317.00	25.01	280.930	3140.16	168.49N	872.49W	==>	55.04	
3417.00	25.01	280.930	3230.79	176.51N	914.00W	==>	57.66	
3517.00	25.01	280.930	3321.41	184.52N	955.51W	==>	60.28	
3617.00	25.01	280.930	3412.03	192.54N	997.02W	==>	62.90	
3717.00	25.01	280.930	3502.66	200.56N	1038.53W	==>	65.52	
3817.00	25.01	280.930	3593.28	208.57N	1080.04W	==>	68.14	
3917.00	25.01	280.930	3683.90	216.59N	1121.55W	==>	70.76	
4017.00	25.01	280.930	3774.53	224.61N	1163.06W	==>	73.37	
4117.00	25.01	280.930	3865.15	232.62N	1204.57W	==>	75.99	
4217.00	25.01	280.930	3955.78	240.64N	1246.08W	==>	78.61	
4317.00	25.01	280.930	4046.40	248.65N	1287.59W	==>	81.23	
4417.00	25.01	280.930	4137.02	256.67N	1329.10W	==>	83.85	
4517.00	25.01	280.930	4227.65	264.69N	1370.61W	==>	86.47	
4617.00	25.01	280.930	4318.27	272.70N	1412.12W	==>	89.09	
4717.00	25.01	280.930	4408.89	280.72N	1453.63W	==>	91.71	
4817.00	25.01	280.930	4499.52	288.74N	1495.14W	==>	94.32	
4917.00	25.01	280.930	4590.14	296.75N	1536.65W	==>	96.94	
5017.00	25.01	280.930	4680.77	304.77N	1578.16W	==>	99.56	
5117.00	25.01	280.930	4771.39	312.78N	1619.67W	==>	102.18	
5217.00	25.01	280.930	4862.01	320.80N	1661.18W	==>	104.80	
5317.00	25.01	280.930	4952.64	328.82N	1702.69W	==>	107.42	
5417.00	25.01	280.930	5043.26	336.83N	1744.20W	==>	110.04	
5517.00	25.01	280.930	5133.88	344.85N	1785.71W	==>	112.66	
5617.00	25.01	280.930	5224.51	352.87N	1827.22W	==>	115.27	
5717.00	25.01	280.930	5315.13	360.88N	1868.73W	==>	117.89	
5817.00	25.01	280.930	5405.76	368.90N	1910.24W	==>	120.51	
5917.00	25.01	280.930	5496.38	376.91N	1951.75W	==>	123.13	
6017.00	25.01	280.930	5587.00	384.93N	1993.26W	==>	125.75	
6117.00	25.01	280.930	5677.63	392.95N	2034.77W	==>	128.37	
6217.00	25.01	280.930	5768.25	400.96N	2076.28W	==>	130.99	
6317.00	25.01	280.930	5858.87	408.98N	2117.79W	==>	133.61	
6417.00	25.01	280.930	5949.50	417.00N	2159.30W	==>	136.22	
6517.00	25.01	280.930	6040.12	425.01N	2200.81W	==>	138.84	
6617.00	25.01	280.930	6130.74	433.03N	2242.32W	==>	141.46	
6717.00	25.01	280.930	6221.37	441.04N	2283.83W	==>	144.08	
6817.00	25.01	280.930	6311.99	449.06N	2325.34W	==>	146.70	
6917.00	24.70	263.570	6402.79	452.46N	2366.90W	10.00	153.80	
7017.00	27.41	241.520	6492.82	439.11N	2408.01W	10.00	177.01	
7117.00	32.86	224.720	6579.43	408.78N	2447.43W	10.00	216.23	
7217.00	39.94	212.750	6659.97	362.38N	2483.98W	10.00	270.29	
7317.00	47.92	204.030	6731.99	301.33N	2516.54W	10.00	337.54	
7417.00	56.41	197.320	6793.31	227.49N	2544.12W	10.00	415.94	
7517.00	65.20	191.840	6842.07	143.09N	2565.89W	10.00	503.10	
7617.00	74.16	187.090	6876.79	50.70N	2581.18W	10.00	596.38	
7717.00	83.21	182.760	6896.40	46.87S	2589.53W	10.00	692.94	
7817.00	90.00	179.630	6900.82	146.67S	2590.91W	==>	789.92	
7917.00	90.00	179.630	6900.82	246.67S	2590.27W	==>	886.58	
8017.00	90.00	179.630	6900.82	346.67S	2589.64W	==>	983.24	
8117.00	90.00	179.630	6900.82	446.67S	2589.00W	==>	1079.90	
8217.00	90.00	179.630	6900.82	546.66S	2588.36W	==>	1176.56	
8317.00	90.00	179.630	6900.82	646.66S	2587.72W	==>	1273.22	
8417.00	90.00	179.630	6900.82	746.66S	2587.08W	==>	1369.88	
8517.00	90.00	179.630	6900.82	846.66S	2586.44W	==>	1466.54	
8617.00	90.00	179.630	6900.82	946.66S	2585.80W	==>	1563.20	
8717.00	90.00	179.630	6900.82	1046.65S	2585.16W	==>	1659.87	
8817.00	90.00	179.630	6900.82	1146.65S	2584.52W	==>	1756.53	
8917.00	90.00	179.630	6900.82	1246.65S	2583.88W	==>	1853.19	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5050.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 194.480 degrees
Bottom hole distance is 10114.28 Feet on azimuth 194.48 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 3 (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	6900.82	1346.65S	2583.24W	==>	1949.85	
9117.00	90.00	179.630	6900.82	1446.65S	2582.60W	==>	2046.51	
9217.00	90.00	179.630	6900.82	1546.64S	2581.96W	==>	2143.17	
9317.00	90.00	179.630	6900.82	1646.64S	2581.33W	==>	2239.83	
9417.00	90.00	179.630	6900.82	1746.64S	2580.69W	==>	2336.49	
9517.00	90.00	179.630	6900.82	1846.64S	2580.05W	==>	2433.15	
9617.00	90.00	179.630	6900.82	1946.64S	2579.41W	==>	2529.81	
9717.00	90.00	179.630	6900.82	2046.63S	2578.77W	==>	2626.48	
9817.00	90.00	179.630	6900.82	2146.63S	2578.13W	==>	2723.14	
9917.00	90.00	179.630	6900.82	2246.63S	2577.49W	==>	2819.80	
10017.00	90.00	179.630	6900.82	2346.63S	2576.85W	==>	2916.46	
10117.00	90.00	179.630	6900.82	2446.63S	2576.21W	==>	3013.12	
10217.00	90.00	179.630	6900.82	2546.62S	2575.57W	==>	3109.78	
10317.00	90.00	179.630	6900.82	2646.62S	2574.93W	==>	3206.44	
10417.00	90.00	179.630	6900.82	2746.62S	2574.29W	==>	3303.10	
10517.00	90.00	179.630	6900.82	2846.62S	2573.65W	==>	3399.76	
10617.00	90.00	179.630	6900.82	2946.62S	2573.02W	==>	3496.42	
10717.00	90.00	179.630	6900.82	3046.61S	2572.38W	==>	3593.09	
10817.00	90.00	179.630	6900.82	3146.61S	2571.74W	==>	3689.75	
10917.00	90.00	179.630	6900.82	3246.61S	2571.10W	==>	3786.41	
11017.00	90.00	179.630	6900.82	3346.61S	2570.46W	==>	3883.07	
11117.00	90.00	179.630	6900.82	3446.61S	2569.82W	==>	3979.73	
11217.00	90.00	179.630	6900.82	3546.60S	2569.18W	==>	4076.39	
11317.00	90.00	179.630	6900.82	3646.60S	2568.54W	==>	4173.05	
11417.00	90.00	179.630	6900.82	3746.60S	2567.90W	==>	4269.71	
11517.00	90.00	179.630	6900.82	3846.60S	2567.26W	==>	4366.37	
11617.00	90.00	179.630	6900.82	3946.60S	2566.62W	==>	4463.03	
11717.00	90.00	179.630	6900.82	4046.59S	2565.98W	==>	4559.70	
11817.00	90.00	179.630	6900.82	4146.59S	2565.34W	==>	4656.36	
11917.00	90.00	179.630	6900.82	4246.59S	2564.71W	==>	4753.02	
12017.00	90.00	179.630	6900.82	4346.59S	2564.07W	==>	4849.68	
12117.00	90.00	179.630	6900.82	4446.58S	2563.43W	==>	4946.34	
12217.00	90.00	179.630	6900.82	4546.58S	2562.79W	==>	5043.00	
12317.00	90.00	179.630	6900.82	4646.58S	2562.15W	==>	5139.66	
12417.00	90.00	179.630	6900.82	4746.58S	2561.51W	==>	5236.32	
12517.00	90.00	179.630	6900.82	4846.58S	2560.87W	==>	5332.98	
12617.00	90.00	179.630	6900.82	4946.57S	2560.23W	==>	5429.64	
12717.00	90.00	179.630	6900.82	5046.57S	2559.59W	==>	5526.31	
12817.00	90.00	179.630	6900.82	5146.57S	2558.95W	==>	5622.97	
12917.00	90.00	179.630	6900.82	5246.57S	2558.31W	==>	5719.63	
13017.00	90.00	179.630	6900.82	5346.57S	2557.67W	==>	5816.29	
13117.00	90.00	179.630	6900.82	5446.56S	2557.03W	==>	5912.95	
13217.00	90.00	179.630	6900.82	5546.56S	2556.40W	==>	6009.61	
13317.00	90.00	179.630	6900.82	5646.56S	2555.76W	==>	6106.27	
13417.00	90.00	179.630	6900.82	5746.56S	2555.12W	==>	6202.93	
13517.00	90.00	179.630	6900.82	5846.56S	2554.48W	==>	6299.59	
13617.00	90.00	179.630	6900.82	5946.55S	2553.84W	==>	6396.25	
13717.00	90.00	179.630	6900.82	6046.55S	2553.20W	==>	6492.92	
13817.00	90.00	179.630	6900.82	6146.55S	2552.56W	==>	6589.58	
13917.00	90.00	179.630	6900.82	6246.55S	2551.92W	==>	6686.24	
14017.00	90.00	179.630	6900.82	6346.55S	2551.28W	==>	6782.90	
14117.00	90.00	179.630	6900.82	6446.54S	2550.64W	==>	6879.56	
14217.00	90.00	179.630	6900.82	6546.54S	2550.00W	==>	6976.22	
14317.00	90.00	179.630	6900.82	6646.54S	2549.36W	==>	7072.88	
14417.00	90.00	179.630	6900.82	6746.54S	2548.73W	==>	7169.54	
14517.00	90.00	179.630	6900.82	6846.54S	2548.09W	==>	7266.20	
14617.00	90.00	179.630	6900.82	6946.53S	2547.45W	==>	7362.87	
14717.00	90.00	179.630	6900.82	7046.53S	2546.81W	==>	7459.53	
14817.00	90.00	179.630	6900.82	7146.53S	2546.17W	==>	7556.19	

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Bottom hole distance is 10114.28 Feet on azimuth 194.48 degrees from Wellhead
Calculation method uses Minimum Curvature method
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Well Design Combined Report
Wellbore: W OLANDER 3 (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	6900.82	7246.53S	2545.53W	==>	7652.85	
15017.00	90.00	179.630	6900.82	7346.53S	2544.89W	==>	7749.51	
15117.00	90.00	179.630	6900.82	7446.52S	2544.25W	==>	7846.17	
15217.00	90.00	179.630	6900.82	7546.52S	2543.61W	==>	7942.83	
15317.00	90.00	179.630	6900.82	7646.52S	2542.97W	==>	8039.49	
15417.00	90.00	179.630	6900.82	7746.52S	2542.33W	==>	8136.15	
15517.00	90.00	179.630	6900.82	7846.52S	2541.69W	==>	8232.81	
15617.00	90.00	179.630	6900.82	7946.51S	2541.05W	==>	8329.48	
15717.00	90.00	179.630	6900.82	8046.51S	2540.42W	==>	8426.14	
15817.00	90.00	179.630	6900.82	8146.51S	2539.78W	==>	8522.80	
15917.00	90.00	179.630	6900.82	8246.51S	2539.14W	==>	8619.46	
16017.00	90.00	179.630	6900.82	8346.51S	2538.50W	==>	8716.12	
16117.00	90.00	179.630	6900.82	8446.50S	2537.86W	==>	8812.78	
16217.00	90.00	179.630	6900.82	8546.50S	2537.22W	==>	8909.44	
16317.00	90.00	179.630	6900.82	8646.50S	2536.58W	==>	9006.10	
16417.00	90.00	179.630	6900.82	8746.50S	2535.94W	==>	9102.76	
16517.00	90.00	179.630	6900.82	8846.50S	2535.30W	==>	9199.42	
16617.00	90.00	179.630	6900.82	8946.49S	2534.66W	==>	9296.09	
16717.00	90.00	179.630	6900.82	9046.49S	2534.02W	==>	9392.75	
16817.00	90.00	179.630	6900.82	9146.49S	2533.38W	==>	9489.41	
16917.00	90.00	179.630	6900.82	9246.49S	2532.74W	==>	9586.07	
17017.00	90.00	179.630	6900.82	9346.48S	2532.11W	==>	9682.73	
17117.00	90.00	179.630	6900.82	9446.48S	2531.47W	==>	9779.39	
17217.00	90.00	179.630	6900.82	9546.48S	2530.83W	==>	9876.05	
17317.00	90.00	179.630	6900.82	9646.48S	2530.19W	==>	9972.71	
17417.00	90.00	179.630	6900.82	9746.48S	2529.55W	==>	10069.37	
17463.45	90.00	179.630	6900.82	9792.93S	2529.25W	==>	10114.28	

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 5050.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 194.480 degrees
Bottom hole distance is 10114.28 Feet on azimuth 194.48 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 3 EP	121.39S	2591.08W	6900.82	40.20258450	-105.03462810	1316985.04	3129987.72
OLANDER 3 BH-2mi	9792.93S	2529.25W	6900.82	40.17603560	-105.03458850	1307313.93	3130049.54

Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
562158	Planned	1517.00	1501.42	WdW Rate Gyro	Standard
562157	Planned	17463.45	6900.82	ISCWSA MWD	Rev 4 + SAG + FLT

Notes