Cub Creek Energy, LLC

Location	**Weld County, CO**	**Slot**	**OLANDER 12**
Field	**WATTENBERG**	**Well**	**W OLANDER 12**
Installation	**Olander Pad**	**Wellbore**	**W OLANDER 12 (PWB)**

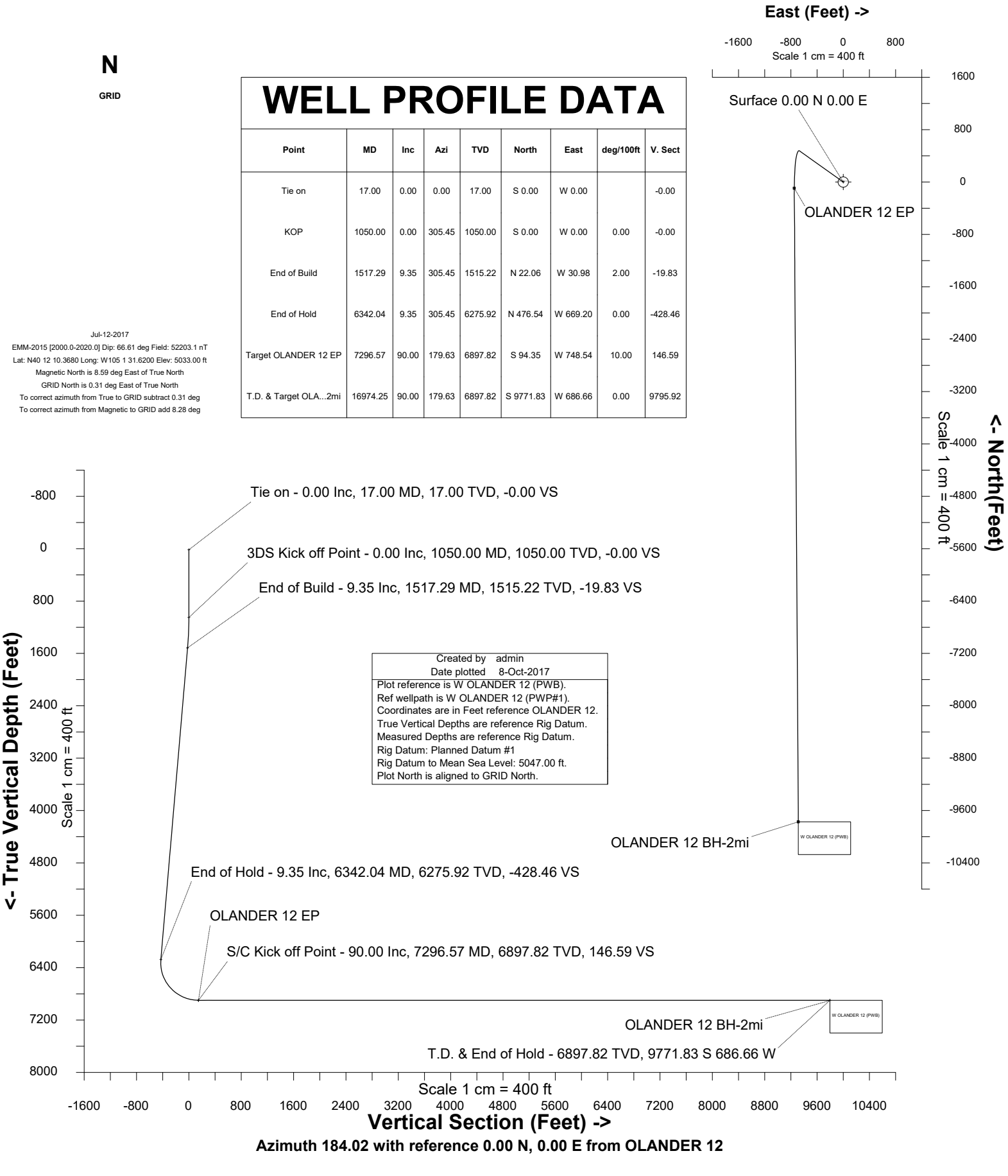
N

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	1050.00	0.00	305.45	1050.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1517.29	9.35	305.45	1515.22	N 22.06	W 30.98	2.00	-19.83
End of Hold	6342.04	9.35	305.45	6275.92	N 476.54	W 669.20	0.00	-428.46
Target OLANDER 12 EP	7296.57	90.00	179.63	6897.82	S 94.35	W 748.54	10.00	146.59
T.D. & Target OLA...2mi	16974.25	90.00	179.63	6897.82	S 9771.83	W 686.66	0.00	9795.92

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



Paradigm

SYSDRILL
Well Design Combined Report
Wellbore: W OLANDER 12 (PWB)

IPT

Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 12	40.20288000	-105.02486000	1317107.1560	3132715.5436	0.88N	164.80E	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	1317107.16	3132715.54
1050.00	0.00	305.450	1050.00	0.00N	0.00E	==>	0.00	1317107.16	3132715.54
1517.29	9.35	305.450	1515.22	22.06N	30.98W	2.00	-19.83	1317129.21	3132684.57
6342.04	9.35	305.450	6275.92	476.54N	669.20W	==>	-428.46	1317583.67	3132046.38
7296.57	90.00	179.630	6897.82	94.35S	748.54W	10.00	146.59	1317012.81	3131967.04
16974.25	90.00	179.630	6897.82	9771.83S	686.66W	==>	9795.92	1307335.77	3132028.91

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	1.00	305.450	1100.00	0.25N	0.36W	2.00	-0.23	
1200.00	3.00	305.450	1199.93	2.28N	3.20W	2.00	-2.05	
1300.00	5.00	305.450	1299.68	6.32N	8.88W	2.00	-5.69	
1400.00	7.00	305.450	1399.13	12.39N	17.39W	2.00	-11.14	
1500.00	9.00	305.450	1498.15	20.46N	28.73W	2.00	-18.39	
1517.00	9.34	305.450	1514.93	22.03N	30.94W	2.00	-19.81	
1617.00	9.35	305.450	1613.61	31.45N	44.17W	==>	-28.28	
1717.00	9.35	305.450	1712.28	40.87N	57.39W	==>	-36.75	
1817.00	9.35	305.450	1810.95	50.29N	70.62W	==>	-45.22	
1917.00	9.35	305.450	1909.62	59.71N	83.85W	==>	-53.68	
2017.00	9.35	305.450	2008.30	69.13N	97.08W	==>	-62.15	
2117.00	9.35	305.450	2106.97	78.55N	110.31W	==>	-70.62	
2217.00	9.35	305.450	2205.64	87.97N	123.53W	==>	-79.09	
2317.00	9.35	305.450	2304.32	97.39N	136.76W	==>	-87.56	
2417.00	9.35	305.450	2402.99	106.81N	149.99W	==>	-96.03	
2517.00	9.35	305.450	2501.66	116.23N	163.22W	==>	-104.50	
2617.00	9.35	305.450	2600.33	125.65N	176.45W	==>	-112.97	
2717.00	9.35	305.450	2699.01	135.07N	189.67W	==>	-121.44	
2817.00	9.35	305.450	2797.68	144.49N	202.90W	==>	-129.91	
2917.00	9.35	305.450	2896.35	153.91N	216.13W	==>	-138.38	
3017.00	9.35	305.450	2995.02	163.33N	229.36W	==>	-146.85	

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Vertical Section is from 0.00N 0.00E on azimuth 184.020 degrees
Bottom hole distance is 9795.92 Feet on azimuth 184.02 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 8-Oct-2017

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	9.35	305.450	3093.70	172.75N	242.59W	==>	-155.32	
3217.00	9.35	305.450	3192.37	182.17N	255.81W	==>	-163.79	
3317.00	9.35	305.450	3291.04	191.59N	269.04W	==>	-172.26	
3417.00	9.35	305.450	3389.71	201.01N	282.27W	==>	-180.72	
3517.00	9.35	305.450	3488.39	210.43N	295.50W	==>	-189.19	
3617.00	9.35	305.450	3587.06	219.84N	308.73W	==>	-197.66	
3717.00	9.35	305.450	3685.73	229.26N	321.95W	==>	-206.13	
3817.00	9.35	305.450	3784.40	238.68N	335.18W	==>	-214.60	
3917.00	9.35	305.450	3883.08	248.10N	348.41W	==>	-223.07	
4017.00	9.35	305.450	3981.75	257.52N	361.64W	==>	-231.54	
4117.00	9.35	305.450	4080.42	266.94N	374.87W	==>	-240.01	
4217.00	9.35	305.450	4179.10	276.36N	388.09W	==>	-248.48	
4317.00	9.35	305.450	4277.77	285.78N	401.32W	==>	-256.95	
4417.00	9.35	305.450	4376.44	295.20N	414.55W	==>	-265.42	
4517.00	9.35	305.450	4475.11	304.62N	427.78W	==>	-273.89	
4617.00	9.35	305.450	4573.79	314.04N	441.01W	==>	-282.36	
4717.00	9.35	305.450	4672.46	323.46N	454.24W	==>	-290.83	
4817.00	9.35	305.450	4771.13	332.88N	467.46W	==>	-299.29	
4917.00	9.35	305.450	4869.80	342.30N	480.69W	==>	-307.76	
5017.00	9.35	305.450	4968.48	351.72N	493.92W	==>	-316.23	
5117.00	9.35	305.450	5067.15	361.14N	507.15W	==>	-324.70	
5217.00	9.35	305.450	5165.82	370.56N	520.38W	==>	-333.17	
5317.00	9.35	305.450	5264.49	379.98N	533.60W	==>	-341.64	
5417.00	9.35	305.450	5363.17	389.40N	546.83W	==>	-350.11	
5517.00	9.35	305.450	5461.84	398.82N	560.06W	==>	-358.58	
5617.00	9.35	305.450	5560.51	408.24N	573.29W	==>	-367.05	
5717.00	9.35	305.450	5659.18	417.66N	586.52W	==>	-375.52	
5817.00	9.35	305.450	5757.86	427.08N	599.74W	==>	-383.99	
5917.00	9.35	305.450	5856.53	436.50N	612.97W	==>	-392.46	
6017.00	9.35	305.450	5955.20	445.92N	626.20W	==>	-400.93	
6117.00	9.35	305.450	6053.88	455.34N	639.43W	==>	-409.40	
6217.00	9.35	305.450	6152.55	464.76N	652.66W	==>	-417.87	
6317.00	9.35	305.450	6251.22	474.18N	665.88W	==>	-426.33	
6417.00	7.87	254.540	6350.14	478.70N	679.11W	10.00	-429.92	
6517.00	14.21	211.430	6448.39	466.37N	692.15W	10.00	-416.71	
6617.00	23.25	197.730	6543.04	437.02N	704.59W	10.00	-386.56	
6717.00	32.84	191.570	6631.21	391.54N	716.07W	10.00	-340.38	
6817.00	42.60	187.980	6710.23	331.31N	726.23W	10.00	-279.59	
6917.00	52.43	185.520	6777.69	258.16N	734.76W	10.00	-206.02	
7017.00	62.31	183.650	6831.55	174.31N	741.41W	10.00	-121.92	
7117.00	72.21	182.090	6870.16	82.32N	745.98W	10.00	-29.83	
7217.00	82.11	180.690	6892.36	15.03S	748.32W	10.00	67.44	
7317.00	90.00	179.630	6897.82	114.77S	748.41W	==>	166.95	
7417.00	90.00	179.630	6897.82	214.77S	747.77W	==>	266.66	
7517.00	90.00	179.630	6897.82	314.77S	747.13W	==>	366.37	
7617.00	90.00	179.630	6897.82	414.77S	746.49W	==>	466.07	
7717.00	90.00	179.630	6897.82	514.77S	745.85W	==>	565.78	
7817.00	90.00	179.630	6897.82	614.76S	745.21W	==>	665.49	
7917.00	90.00	179.630	6897.82	714.76S	744.57W	==>	765.20	
8017.00	90.00	179.630	6897.82	814.76S	743.93W	==>	864.90	
8117.00	90.00	179.630	6897.82	914.76S	743.29W	==>	964.61	
8217.00	90.00	179.630	6897.82	1014.75S	742.65W	==>	1064.32	
8317.00	90.00	179.630	6897.82	1114.75S	742.01W	==>	1164.02	
8417.00	90.00	179.630	6897.82	1214.75S	741.38W	==>	1263.73	
8517.00	90.00	179.630	6897.82	1314.75S	740.74W	==>	1363.44	
8617.00	90.00	179.630	6897.82	1414.75S	740.10W	==>	1463.15	
8717.00	90.00	179.630	6897.82	1514.74S	739.46W	==>	1562.85	
8817.00	90.00	179.630	6897.82	1614.74S	738.82W	==>	1662.56	
8917.00	90.00	179.630	6897.82	1714.74S	738.18W	==>	1762.27	

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Bottom hole distance is 9795.92 Feet on azimuth 184.02 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 8-Oct-2017

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	6897.82	1814.74S	737.54W	==>	1861.97	
9117.00	90.00	179.630	6897.82	1914.74S	736.90W	==>	1961.68	
9217.00	90.00	179.630	6897.82	2014.73S	736.26W	==>	2061.39	
9317.00	90.00	179.630	6897.82	2114.73S	735.62W	==>	2161.10	
9417.00	90.00	179.630	6897.82	2214.73S	734.98W	==>	2260.80	
9517.00	90.00	179.630	6897.82	2314.73S	734.34W	==>	2360.51	
9617.00	90.00	179.630	6897.82	2414.73S	733.70W	==>	2460.22	
9717.00	90.00	179.630	6897.82	2514.72S	733.06W	==>	2559.92	
9817.00	90.00	179.630	6897.82	2614.72S	732.42W	==>	2659.63	
9917.00	90.00	179.630	6897.82	2714.72S	731.78W	==>	2759.34	
10017.00	90.00	179.630	6897.82	2814.72S	731.15W	==>	2859.05	
10117.00	90.00	179.630	6897.82	2914.72S	730.51W	==>	2958.75	
10217.00	90.00	179.630	6897.82	3014.71S	729.87W	==>	3058.46	
10317.00	90.00	179.630	6897.82	3114.71S	729.23W	==>	3158.17	
10417.00	90.00	179.630	6897.82	3214.71S	728.59W	==>	3257.87	
10517.00	90.00	179.630	6897.82	3314.71S	727.95W	==>	3357.58	
10617.00	90.00	179.630	6897.82	3414.71S	727.31W	==>	3457.29	
10717.00	90.00	179.630	6897.82	3514.70S	726.67W	==>	3557.00	
10817.00	90.00	179.630	6897.82	3614.70S	726.03W	==>	3656.70	
10917.00	90.00	179.630	6897.82	3714.70S	725.39W	==>	3756.41	
11017.00	90.00	179.630	6897.82	3814.70S	724.75W	==>	3856.12	
11117.00	90.00	179.630	6897.82	3914.70S	724.11W	==>	3955.82	
11217.00	90.00	179.630	6897.82	4014.69S	723.47W	==>	4055.53	
11317.00	90.00	179.630	6897.82	4114.69S	722.83W	==>	4155.24	
11417.00	90.00	179.630	6897.82	4214.69S	722.19W	==>	4254.95	
11517.00	90.00	179.630	6897.82	4314.69S	721.56W	==>	4354.65	
11617.00	90.00	179.630	6897.82	4414.69S	720.92W	==>	4454.36	
11717.00	90.00	179.630	6897.82	4514.68S	720.28W	==>	4554.07	
11817.00	90.00	179.630	6897.82	4614.68S	719.64W	==>	4653.77	
11917.00	90.00	179.630	6897.82	4714.68S	719.00W	==>	4753.48	
12017.00	90.00	179.630	6897.82	4814.68S	718.36W	==>	4853.19	
12117.00	90.00	179.630	6897.82	4914.68S	717.72W	==>	4952.90	
12217.00	90.00	179.630	6897.82	5014.67S	717.08W	==>	5052.60	
12317.00	90.00	179.630	6897.82	5114.67S	716.44W	==>	5152.31	
12417.00	90.00	179.630	6897.82	5214.67S	715.80W	==>	5252.02	
12517.00	90.00	179.630	6897.82	5314.67S	715.16W	==>	5351.72	
12617.00	90.00	179.630	6897.82	5414.67S	714.52W	==>	5451.43	
12717.00	90.00	179.630	6897.82	5514.66S	713.88W	==>	5551.14	
12817.00	90.00	179.630	6897.82	5614.66S	713.24W	==>	5650.85	
12917.00	90.00	179.630	6897.82	5714.66S	712.60W	==>	5750.55	
13017.00	90.00	179.630	6897.82	5814.66S	711.97W	==>	5850.26	
13117.00	90.00	179.630	6897.82	5914.65S	711.33W	==>	5949.97	
13217.00	90.00	179.630	6897.82	6014.65S	710.69W	==>	6049.67	
13317.00	90.00	179.630	6897.82	6114.65S	710.05W	==>	6149.38	
13417.00	90.00	179.630	6897.82	6214.65S	709.41W	==>	6249.09	
13517.00	90.00	179.630	6897.82	6314.65S	708.77W	==>	6348.80	
13617.00	90.00	179.630	6897.82	6414.64S	708.13W	==>	6448.50	
13717.00	90.00	179.630	6897.82	6514.64S	707.49W	==>	6548.21	
13817.00	90.00	179.630	6897.82	6614.64S	706.85W	==>	6647.92	
13917.00	90.00	179.630	6897.82	6714.64S	706.21W	==>	6747.62	
14017.00	90.00	179.630	6897.82	6814.64S	705.57W	==>	6847.33	
14117.00	90.00	179.630	6897.82	6914.63S	704.93W	==>	6947.04	
14217.00	90.00	179.630	6897.82	7014.63S	704.29W	==>	7046.75	
14317.00	90.00	179.630	6897.82	7114.63S	703.65W	==>	7146.45	
14417.00	90.00	179.630	6897.82	7214.63S	703.01W	==>	7246.16	
14517.00	90.00	179.630	6897.82	7314.63S	702.38W	==>	7345.87	
14617.00	90.00	179.630	6897.82	7414.62S	701.74W	==>	7445.58	
14717.00	90.00	179.630	6897.82	7514.62S	701.10W	==>	7545.28	
14817.00	90.00	179.630	6897.82	7614.62S	700.46W	==>	7644.99	

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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	6897.82	7714.62S	699.82W	==>	7744.70	
15017.00	90.00	179.630	6897.82	7814.62S	699.18W	==>	7844.40	
15117.00	90.00	179.630	6897.82	7914.61S	698.54W	==>	7944.11	
15217.00	90.00	179.630	6897.82	8014.61S	697.90W	==>	8043.82	
15317.00	90.00	179.630	6897.82	8114.61S	697.26W	==>	8143.53	
15417.00	90.00	179.630	6897.82	8214.61S	696.62W	==>	8243.23	
15517.00	90.00	179.630	6897.82	8314.61S	695.98W	==>	8342.94	
15617.00	90.00	179.630	6897.82	8414.60S	695.34W	==>	8442.65	
15717.00	90.00	179.630	6897.82	8514.60S	694.70W	==>	8542.35	
15817.00	90.00	179.630	6897.82	8614.60S	694.06W	==>	8642.06	
15917.00	90.00	179.630	6897.82	8714.60S	693.42W	==>	8741.77	
16017.00	90.00	179.630	6897.82	8814.60S	692.79W	==>	8841.48	
16117.00	90.00	179.630	6897.82	8914.59S	692.15W	==>	8941.18	
16217.00	90.00	179.630	6897.82	9014.59S	691.51W	==>	9040.89	
16317.00	90.00	179.630	6897.82	9114.59S	690.87W	==>	9140.60	
16417.00	90.00	179.630	6897.82	9214.59S	690.23W	==>	9240.30	
16517.00	90.00	179.630	6897.82	9314.59S	689.59W	==>	9340.01	
16617.00	90.00	179.630	6897.82	9414.58S	688.95W	==>	9439.72	
16717.00	90.00	179.630	6897.82	9514.58S	688.31W	==>	9539.43	
16817.00	90.00	179.630	6897.82	9614.58S	687.67W	==>	9639.13	
16917.00	90.00	179.630	6897.82	9714.58S	687.03W	==>	9738.84	
16974.25	90.00	179.630	6897.82	9771.83S	686.66W	==>	9795.92	

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 5047.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 184.020 degrees
Bottom hole distance is 9795.92 Feet on azimuth 184.02 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 12 EP	94.35S	748.54W	6897.82	40.20263200	-105.02754150	1317012.81	3131967.04
OLANDER 12 BH-2mi	9771.83S	686.66W	6897.82	40.17606680	-105.02750460	1307335.77	3132028.91

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
562356	Planned	1517.00	1514.93	WdW Rate Gyro	Standard
562355	Planned	16974.25	6897.82	ISCWSA MWD	Rev 4 + SAG + FLT

Notes

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Bottom hole distance is 9795.92 Feet on azimuth 184.02 degrees from Wellhead
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