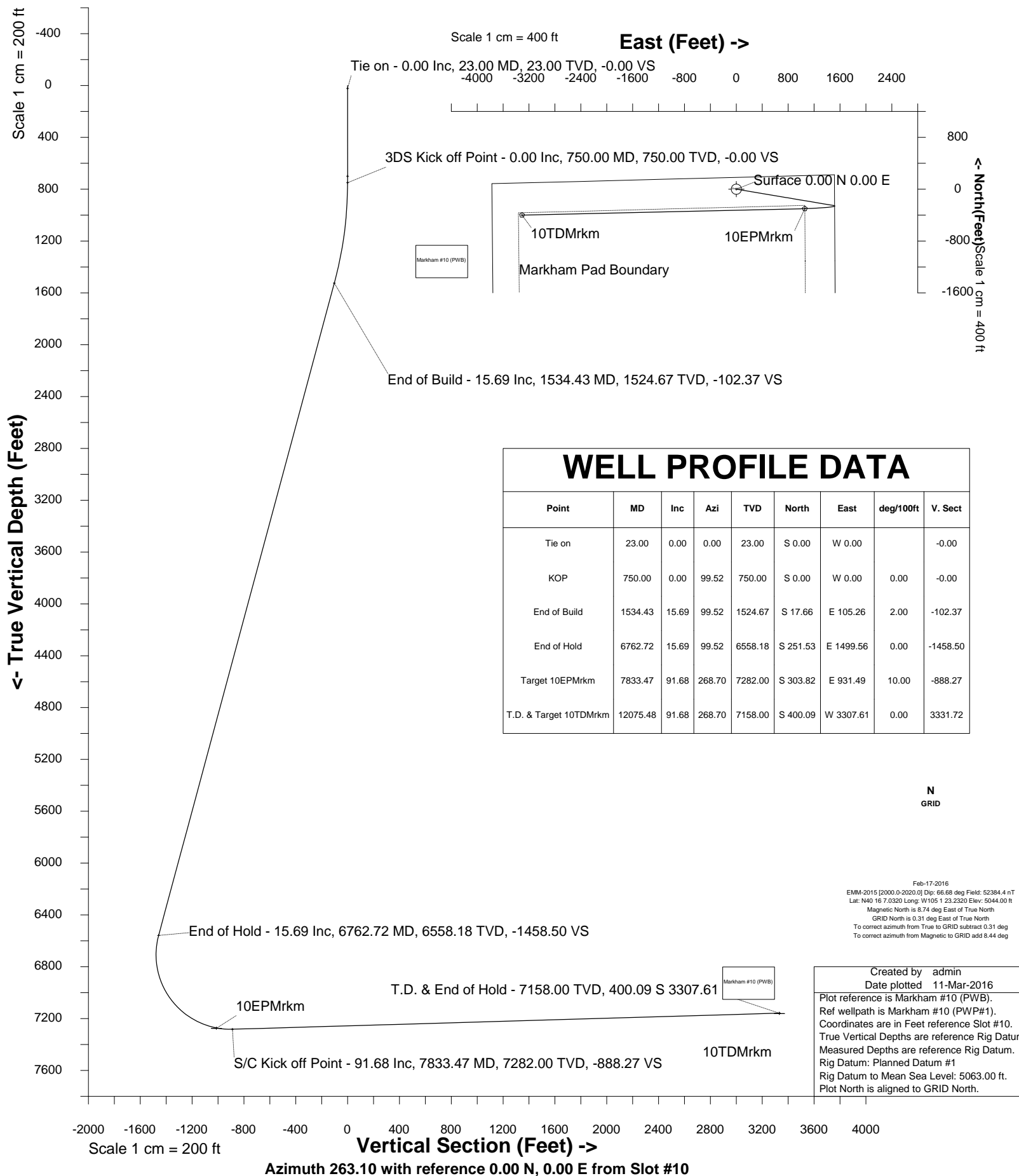


Cub Creek Energy, LLC			
Location	Weld County, CO	Slot	Slot #10
Field	WATTENBERG	Well	Markham #10
Installation	Markham Pad	Wellbore	Markham #10 (PWB)

Slot	Slot #10
1	1
2	2
3	3
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100	100

Well Markham #10

Wellbore Markham #10 (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: Markham #10 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Slot #10	N40 16 8.4720	W105 1 23.2680	1341203.2328	3133069.1909	145.70N	3.57W	0.00

Declination		
Date	Source	Time
Feb-17-2016	EMM-2015 [2000.0-2020.0]	11:55

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Markham Pad	N40 16 7.0320	W105 1 23.2320	1341057.5349	3133072.7650	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
23.00	0.00	0.000	23.00	0.00N	0.00E		0.00	1341203.23	3133069.19
750.00	0.00	99.520	750.00	0.00N	0.00E	==>	0.00	1341203.23	3133069.19
1534.43	15.69	99.520	1524.67	17.66S	105.26E	2.00	-102.37	1341185.58	3133174.44
6762.72	15.69	99.520	6558.18	251.53S	1499.56E	==>	-1458.50	1340951.71	3134568.68
7833.47	91.68	268.700	7282.00	303.82S	931.49E	10.00	-888.27	1340899.43	3134000.64
12075.48	91.68	268.700	7158.00	400.09S	3307.61W	==>	3331.72	1340803.16	3129761.73

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
23.00	0.00	0.000	23.00	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	1.00	99.520	800.00	0.07S	0.43E	2.00	-0.42	
900.00	3.00	99.520	899.93	0.65S	3.87E	2.00	-3.77	
1000.00	5.00	99.520	999.68	1.80S	10.75E	2.00	-10.46	
1100.00	7.00	99.520	1099.13	3.53S	21.06E	2.00	-20.48	
1200.00	9.00	99.520	1198.15	5.83S	34.78E	2.00	-33.83	
1300.00	11.00	99.520	1296.63	8.71S	51.91E	2.00	-50.49	
1400.00	13.00	99.520	1394.44	12.15S	72.41E	2.00	-70.43	
1500.00	15.00	99.520	1491.46	16.15S	96.27E	2.00	-93.63	
1600.00	15.69	99.520	1587.79	20.59S	122.74E	==>	-119.38	
1700.00	15.69	99.520	1684.07	25.06S	149.41E	==>	-145.32	
1800.00	15.69	99.520	1780.34	29.54S	176.08E	==>	-171.26	
1900.00	15.69	99.520	1876.62	34.01S	202.75E	==>	-197.20	
2000.00	15.69	99.520	1972.89	38.48S	229.42E	==>	-223.13	
2100.00	15.69	99.520	2069.16	42.96S	256.08E	==>	-249.07	
2200.00	15.69	99.520	2165.44	47.43S	282.75E	==>	-275.01	
2300.00	15.69	99.520	2261.71	51.90S	309.42E	==>	-300.95	
2400.00	15.69	99.520	2357.99	56.38S	336.09E	==>	-326.89	
2500.00	15.69	99.520	2454.26	60.85S	362.76E	==>	-352.83	
2600.00	15.69	99.520	2550.54	65.32S	389.43E	==>	-378.76	
2700.00	15.69	99.520	2646.81	69.79S	416.09E	==>	-404.70	
2800.00	15.69	99.520	2743.09	74.27S	442.76E	==>	-430.64	
2900.00	15.69	99.520	2839.36	78.74S	469.43E	==>	-456.58	

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Coordinates are from Slot MD's are from Rig (Planned Datum #1 5063.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 263.100 degrees
Bottom hole distance is 3331.72 Feet on azimuth 263.10 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 14-Apr-2016



SYSDRILL
Well Design Combined Report
Wellbore: Markham #10 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3000.00	15.69	99.520	2935.64	83.21S	496.10E	==>	-482.52	
3100.00	15.69	99.520	3031.91	87.69S	522.77E	==>	-508.45	
3200.00	15.69	99.520	3128.18	92.16S	549.44E	==>	-534.39	
3300.00	15.69	99.520	3224.46	96.63S	576.10E	==>	-560.33	
3400.00	15.69	99.520	3320.73	101.11S	602.77E	==>	-586.27	
3500.00	15.69	99.520	3417.01	105.58S	629.44E	==>	-612.21	
3600.00	15.69	99.520	3513.28	110.05S	656.11E	==>	-638.15	
3700.00	15.69	99.520	3609.56	114.53S	682.78E	==>	-664.08	
3800.00	15.69	99.520	3705.83	119.00S	709.45E	==>	-690.02	
3900.00	15.69	99.520	3802.11	123.47S	736.11E	==>	-715.96	
4000.00	15.69	99.520	3898.38	127.95S	762.78E	==>	-741.90	
4100.00	15.69	99.520	3994.66	132.42S	789.45E	==>	-767.84	
4200.00	15.69	99.520	4090.93	136.89S	816.12E	==>	-793.77	
4300.00	15.69	99.520	4187.20	141.37S	842.79E	==>	-819.71	
4400.00	15.69	99.520	4283.48	145.84S	869.46E	==>	-845.65	
4500.00	15.69	99.520	4379.75	150.31S	896.12E	==>	-871.59	
4600.00	15.69	99.520	4476.03	154.79S	922.79E	==>	-897.53	
4700.00	15.69	99.520	4572.30	159.26S	949.46E	==>	-923.47	
4800.00	15.69	99.520	4668.58	163.73S	976.13E	==>	-949.40	
4900.00	15.69	99.520	4764.85	168.21S	1002.80E	==>	-975.34	
5000.00	15.69	99.520	4861.13	172.68S	1029.47E	==>	-1001.28	
5100.00	15.69	99.520	4957.40	177.15S	1056.13E	==>	-1027.22	
5200.00	15.69	99.520	5053.68	181.63S	1082.80E	==>	-1053.16	
5300.00	15.69	99.520	5149.95	186.10S	1109.47E	==>	-1079.09	
5400.00	15.69	99.520	5246.22	190.57S	1136.14E	==>	-1105.03	
5500.00	15.69	99.520	5342.50	195.05S	1162.81E	==>	-1130.97	
5600.00	15.69	99.520	5438.77	199.52S	1189.48E	==>	-1156.91	
5700.00	15.69	99.520	5535.05	203.99S	1216.14E	==>	-1182.85	
5800.00	15.69	99.520	5631.32	208.47S	1242.81E	==>	-1208.79	
5900.00	15.69	99.520	5727.60	212.94S	1269.48E	==>	-1234.72	
6000.00	15.69	99.520	5823.87	217.41S	1296.15E	==>	-1260.66	
6100.00	15.69	99.520	5920.15	221.89S	1322.82E	==>	-1286.60	
6200.00	15.69	99.520	6016.42	226.36S	1349.49E	==>	-1312.54	
6300.00	15.69	99.520	6112.70	230.83S	1376.16E	==>	-1338.48	
6400.00	15.69	99.520	6208.97	235.31S	1402.82E	==>	-1364.42	
6500.00	15.69	99.520	6305.24	239.78S	1429.49E	==>	-1390.35	
6600.00	15.69	99.520	6401.52	244.25S	1456.16E	==>	-1416.29	
6700.00	15.69	99.520	6497.79	248.73S	1482.83E	==>	-1442.23	
6800.00	12.06	103.030	6594.36	253.24S	1508.32E	10.00	-1467.00	
6900.00	3.47	149.840	6693.42	258.23S	1520.05E	10.00	-1478.04	
7000.00	8.86	248.680	6792.99	263.66S	1514.38E	10.00	-1471.75	
7100.00	18.57	259.500	6890.03	269.38S	1491.48E	10.00	-1448.34	
7200.00	28.48	262.990	6981.61	275.21S	1452.06E	10.00	-1408.50	
7300.00	38.43	264.770	7064.94	280.97S	1397.31E	10.00	-1353.45	
7400.00	48.40	265.900	7137.48	286.49S	1328.89E	10.00	-1284.87	
7500.00	58.38	266.730	7197.04	291.60S	1248.88E	10.00	-1204.83	
7600.00	68.36	267.400	7241.81	296.14S	1159.72E	10.00	-1115.76	
7700.00	78.35	267.980	7270.42	299.98S	1064.11E	10.00	-1020.38	
7800.00	88.33	268.520	7282.00	303.00S	964.95E	10.00	-921.58	
7900.00	91.68	268.700	7280.06	305.33S	865.01E	==>	-822.09	
8000.00	91.68	268.700	7277.13	307.59S	765.08E	==>	-722.61	
8100.00	91.68	268.700	7274.21	309.86S	665.15E	==>	-623.13	
8200.00	91.68	268.700	7271.29	312.13S	565.22E	==>	-523.65	
8300.00	91.68	268.700	7268.36	314.40S	465.29E	==>	-424.16	
8400.00	91.68	268.700	7265.44	316.67S	365.36E	==>	-324.68	
8500.00	91.68	268.700	7262.52	318.94S	265.42E	==>	-225.20	
8600.00	91.68	268.700	7259.59	321.21S	165.49E	==>	-125.72	

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Vertical Section is from 0.00N 0.00E on azimuth 263.100 degrees
Bottom hole distance is 3331.72 Feet on azimuth 263.10 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 14-Apr-2016



SYSDRILL
Well Design Combined Report
Wellbore: Markham #10 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
8700.00	91.68	268.700	7256.67	323.48S	65.56E	==>	-26.24	
8800.00	91.68	268.700	7253.75	325.75S	34.37W	==>	73.24	
8900.00	91.68	268.700	7250.82	328.02S	134.30W	==>	172.72	
9000.00	91.68	268.700	7247.90	330.29S	234.23W	==>	272.20	
9100.00	91.68	268.700	7244.98	332.56S	334.16W	==>	371.68	
9200.00	91.68	268.700	7242.05	334.83S	434.10W	==>	471.16	
9300.00	91.68	268.700	7239.13	337.10S	534.03W	==>	570.64	
9400.00	91.68	268.700	7236.21	339.37S	633.96W	==>	670.13	
9500.00	91.68	268.700	7233.29	341.64S	733.89W	==>	769.61	
9600.00	91.68	268.700	7230.36	343.91S	833.82W	==>	869.09	
9700.00	91.68	268.700	7227.44	346.18S	933.75W	==>	968.57	
9800.00	91.68	268.700	7224.52	348.45S	1033.69W	==>	1068.05	
9900.00	91.68	268.700	7221.59	350.72S	1133.62W	==>	1167.53	
10000.00	91.68	268.700	7218.67	352.99S	1233.55W	==>	1267.01	
10100.00	91.68	268.700	7215.75	355.26S	1333.48W	==>	1366.49	
10200.00	91.68	268.700	7212.82	357.53S	1433.41W	==>	1465.97	
10300.00	91.68	268.700	7209.90	359.80S	1533.34W	==>	1565.45	
10400.00	91.68	268.700	7206.98	362.06S	1633.27W	==>	1664.93	
10500.00	91.68	268.700	7204.05	364.33S	1733.21W	==>	1764.41	
10600.00	91.68	268.700	7201.13	366.60S	1833.14W	==>	1863.90	
10700.00	91.68	268.700	7198.21	368.87S	1933.07W	==>	1963.38	
10800.00	91.68	268.700	7195.28	371.14S	2033.00W	==>	2062.86	
10900.00	91.68	268.700	7192.36	373.41S	2132.93W	==>	2162.34	
11000.00	91.68	268.700	7189.44	375.68S	2232.86W	==>	2261.82	
11100.00	91.68	268.700	7186.51	377.95S	2332.79W	==>	2361.30	
11200.00	91.68	268.700	7183.59	380.22S	2432.73W	==>	2460.78	
11300.00	91.68	268.700	7180.67	382.49S	2532.66W	==>	2560.26	
11400.00	91.68	268.700	7177.75	384.76S	2632.59W	==>	2659.74	
11500.00	91.68	268.700	7174.82	387.03S	2732.52W	==>	2759.22	
11600.00	91.68	268.700	7171.90	389.30S	2832.45W	==>	2858.70	
11700.00	91.68	268.700	7168.98	391.57S	2932.38W	==>	2958.19	
11800.00	91.68	268.700	7166.05	393.84S	3032.32W	==>	3057.67	
11900.00	91.68	268.700	7163.13	396.11S	3132.25W	==>	3157.15	
12000.00	91.68	268.700	7160.21	398.38S	3232.18W	==>	3256.63	
12075.48	91.68	268.700	7158.00	400.09S	3307.61W	==>	3331.72	

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Vertical Section is from 0.00N 0.00E on azimuth 263.100 degrees
Bottom hole distance is 3331.72 Feet on azimuth 263.10 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 14-Apr-2016

Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
445568	Planned	12075.48	7158.00	ISCWSA MWD	Rev 4 + SAG + FLT



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Markham #10 (PWB)



Ellipse separations are reported ONLY if BOTH wells have uncertainty data
Only Depth and Magnetic Reference Field error terms are correlated across tie points
Scan limit is calculated on CENTRE to CENTRE distance
Summary data uses Closest Approach clearance calculation for all minima
Hole size/Casings ARE included
Hole size/Casings are NOT subtracted from Centre-Centre distance
Confidence limit of 95.00% / 2.80 SD.

Wellbore		
Name	Created	Last Revised
Markham #10 (PWB)	Feb-22-2016	Mar-11-2016

Well		
Name	Government ID	Last Revised
Markham #10		Feb-22-2016

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
Slot #10	N40 16 8.4720	W105 1 23.2680	1341203.2328	3133069.1909	145.70N	3.57W

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Markham Pad	N40 16 7.0320	W105 1 23.2320	3133072.7650	1341057.5349	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
Markham #11	14.57	750.00	12073.22	-145.21	12073.22	0.55	12073.22
Markham #9	17.95	883.25	12075.48	-24.89	12075.48	0.93	12075.48
Markham #12	29.28	750.00	12072.55	-28.58	12075.48	0.92	12075.48
Markham #8	32.47	885.67	12075.48	22.85	958.04	1.42	12075.48
Markham #7	47.36	750.00	723.00	39.00	859.61	1.86	12075.48
Markham #6	64.73	976.96	12075.48	54.42	1023.66	2.78	12075.48
Markham #5	79.80	886.05	12075.48	70.35	925.23	3.26	12075.48
Markham #4	98.36	748.00	748.00	90.19	823.00	3.72	12075.48
Markham #3	111.28	1089.27	12075.48	99.68	1154.89	4.63	12075.48
Markham #2	125.16	1125.04	1125.04	113.14	1187.70	5.11	12075.48
Markham #1	145.75	171.00	12075.48	143.10	223.00	5.63	12075.48
Markham #33-32D	164.75	9258.94	9258.94	21.25	9258.56	1.15	9258.56
Markham #44-32D	1408.24	3569.19	7954.77	1365.61	3664.73	15.70	8300.00