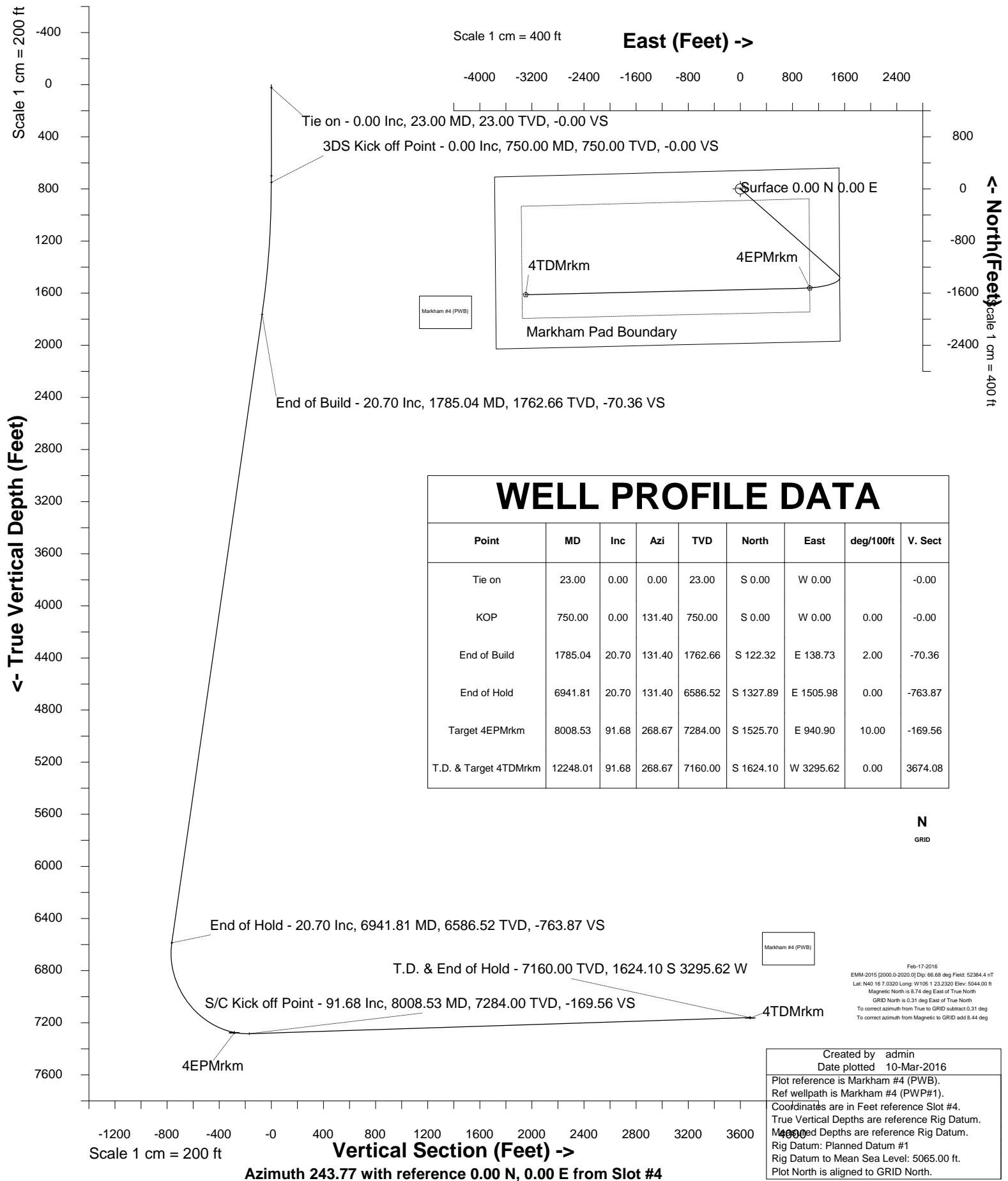


Cub Creek Energy, LLC			
Location	Weld County, CO	Slot	Slot #4
Field	WATTENBERG	Well	Markham #4
Installation	Markham Pad	Wellbore	Markham #4 (PWB)

Slot	Slot #4
1	1
2	2
3	3
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100	100

Well Markham #4

Wellbore Markham #4 (PWB)





SYSDRILL  
Well Design Combined Report  
Wellbore: Markham #4 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Slot #4	N40 16 7.5000	W105 1 23.2680	1341104.8766	3133069.7198	47.34N	3.05W	0.00

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

Installation Details						
Name	Installatio n Position (Latitude)	Installatio n Position (Longitud e)	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	1341104.88	3133069.72
750.00	0.00	131.400	750.00	0.00N	0.00E	==>	0.00	1341104.88	3133069.72
1785.04	20.70	131.400	1762.66	122.32S	138.73E	2.00	-70.36	1340982.56	3133208.44
6941.81	20.70	131.400	6586.52	1327.89S	1505.98E	==>	-763.87	1339777.04	3134575.63
8008.53	91.68	268.670	7284.00	1525.70S	940.90E	10.00	-169.56	1339579.25	3134010.58
12248.01	91.68	268.670	7160.00	1624.10S	3295.62W	==>	3674.08	1339480.84	3129774.24

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	131.400	800.00	0.29S	0.33E	2.00	-0.17	
900.00	3.00	131.400	899.93	2.60S	2.94E	2.00	-1.49	
1000.00	5.00	131.400	999.68	7.21S	8.18E	2.00	-4.15	
1100.00	7.00	131.400	1099.13	14.12S	16.02E	2.00	-8.12	
1200.00	9.00	131.400	1198.15	23.33S	26.45E	2.00	-13.42	
1300.00	11.00	131.400	1296.63	34.81S	39.48E	2.00	-20.02	
1400.00	13.00	131.400	1394.44	48.56S	55.07E	2.00	-27.93	
1500.00	15.00	131.400	1491.46	64.56S	73.22E	2.00	-37.14	
1600.00	17.00	131.400	1587.58	82.79S	93.89E	2.00	-47.62	
1700.00	19.00	131.400	1682.68	103.22S	117.07E	2.00	-59.38	
1800.00	20.70	131.400	1776.66	125.82S	142.69E	==>	-72.38	
1900.00	20.70	131.400	1870.21	149.20S	169.21E	==>	-85.83	
2000.00	20.70	131.400	1963.75	172.58S	195.72E	==>	-99.27	
2100.00	20.70	131.400	2057.29	195.95S	222.23E	==>	-112.72	
2200.00	20.70	131.400	2150.84	219.33S	248.75E	==>	-126.17	
2300.00	20.70	131.400	2244.38	242.71S	275.26E	==>	-139.62	
2400.00	20.70	131.400	2337.93	266.09S	301.78E	==>	-153.07	
2500.00	20.70	131.400	2431.47	289.47S	328.29E	==>	-166.52	
2600.00	20.70	131.400	2525.01	312.85S	354.80E	==>	-179.96	
2700.00	20.70	131.400	2618.56	336.23S	381.32E	==>	-193.41	
2800.00	20.70	131.400	2712.10	359.60S	407.83E	==>	-206.86	
2900.00	20.70	131.400	2805.65	382.98S	434.34E	==>	-220.31	

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Vertical Section is from 0.00N 0.00E on azimuth 243.770 degrees  
Bottom hole distance is 3674.08 Feet on azimuth 243.77 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 #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
3000.00	20.70	131.400	2899.19	406.36S	460.86E	==>	-233.76	
3100.00	20.70	131.400	2992.73	429.74S	487.37E	==>	-247.21	
3200.00	20.70	131.400	3086.28	453.12S	513.89E	==>	-260.65	
3300.00	20.70	131.400	3179.82	476.50S	540.40E	==>	-274.10	
3400.00	20.70	131.400	3273.37	499.87S	566.91E	==>	-287.55	
3500.00	20.70	131.400	3366.91	523.25S	593.43E	==>	-301.00	
3600.00	20.70	131.400	3460.45	546.63S	619.94E	==>	-314.45	
3700.00	20.70	131.400	3554.00	570.01S	646.45E	==>	-327.90	
3800.00	20.70	131.400	3647.54	593.39S	672.97E	==>	-341.34	
3900.00	20.70	131.400	3741.09	616.77S	699.48E	==>	-354.79	
4000.00	20.70	131.400	3834.63	640.14S	726.00E	==>	-368.24	
4100.00	20.70	131.400	3928.17	663.52S	752.51E	==>	-381.69	
4200.00	20.70	131.400	4021.72	686.90S	779.02E	==>	-395.14	
4300.00	20.70	131.400	4115.26	710.28S	805.54E	==>	-408.59	
4400.00	20.70	131.400	4208.81	733.66S	832.05E	==>	-422.03	
4500.00	20.70	131.400	4302.35	757.04S	858.56E	==>	-435.48	
4600.00	20.70	131.400	4395.89	780.41S	885.08E	==>	-448.93	
4700.00	20.70	131.400	4489.44	803.79S	911.59E	==>	-462.38	
4800.00	20.70	131.400	4582.98	827.17S	938.10E	==>	-475.83	
4900.00	20.70	131.400	4676.53	850.55S	964.62E	==>	-489.28	
5000.00	20.70	131.400	4770.07	873.93S	991.13E	==>	-502.72	
5100.00	20.70	131.400	4863.61	897.31S	1017.65E	==>	-516.17	
5200.00	20.70	131.400	4957.16	920.69S	1044.16E	==>	-529.62	
5300.00	20.70	131.400	5050.70	944.06S	1070.67E	==>	-543.07	
5400.00	20.70	131.400	5144.24	967.44S	1097.19E	==>	-556.52	
5500.00	20.70	131.400	5237.79	990.82S	1123.70E	==>	-569.97	
5600.00	20.70	131.400	5331.33	1014.20S	1150.21E	==>	-583.41	
5700.00	20.70	131.400	5424.88	1037.58S	1176.73E	==>	-596.86	
5800.00	20.70	131.400	5518.42	1060.96S	1203.24E	==>	-610.31	
5900.00	20.70	131.400	5611.96	1084.33S	1229.76E	==>	-623.76	
6000.00	20.70	131.400	5705.51	1107.71S	1256.27E	==>	-637.21	
6100.00	20.70	131.400	5799.05	1131.09S	1282.78E	==>	-650.66	
6200.00	20.70	131.400	5892.60	1154.47S	1309.30E	==>	-664.10	
6300.00	20.70	131.400	5986.14	1177.85S	1335.81E	==>	-677.55	
6400.00	20.70	131.400	6079.68	1201.23S	1362.32E	==>	-691.00	
6500.00	20.70	131.400	6173.23	1224.60S	1388.84E	==>	-704.45	
6600.00	20.70	131.400	6266.77	1247.98S	1415.35E	==>	-717.90	
6700.00	20.70	131.400	6360.32	1271.36S	1441.87E	==>	-731.35	
6800.00	20.70	131.400	6453.86	1294.74S	1468.38E	==>	-744.79	
6900.00	20.70	131.400	6547.40	1318.12S	1494.89E	==>	-758.24	
7000.00	17.07	145.560	6641.59	1341.75S	1518.54E	10.00	-769.00	
7100.00	14.52	181.740	6738.04	1366.45S	1526.48E	10.00	-765.21	
7200.00	18.05	215.750	6834.22	1391.62S	1517.02E	10.00	-745.60	
7300.00	25.23	234.960	6927.23	1416.50S	1490.45E	10.00	-710.77	
7400.00	33.80	245.520	7014.22	1440.32S	1447.57E	10.00	-661.78	
7500.00	42.94	252.110	7092.57	1462.37S	1389.69E	10.00	-600.11	
7600.00	52.35	256.730	7159.89	1481.97S	1318.56E	10.00	-527.65	
7700.00	61.89	260.300	7214.13	1498.53S	1236.36E	10.00	-446.59	
7800.00	71.51	263.280	7253.65	1511.55S	1145.56E	10.00	-359.39	
7900.00	81.17	265.930	7277.24	1520.62S	1048.94E	10.00	-268.71	
8000.00	90.85	268.460	7284.19	1525.49S	949.43E	10.00	-177.30	
8100.00	91.68	268.670	7281.32	1527.82S	849.50E	==>	-86.63	
8200.00	91.68	268.670	7278.40	1530.14S	749.57E	==>	4.04	
8300.00	91.68	268.670	7275.47	1532.47S	649.64E	==>	94.70	
8400.00	91.68	268.670	7272.55	1534.79S	549.71E	==>	185.36	
8500.00	91.68	268.670	7269.63	1537.11S	449.78E	==>	276.02	
8600.00	91.68	268.670	7266.70	1539.43S	349.84E	==>	366.69	

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Vertical Section is from 0.00N 0.00E on azimuth 243.770 degrees  
Bottom hole distance is 3674.08 Feet on azimuth 243.77 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 #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
8700.00	91.68	268.670	7263.78	1541.75S	249.91E	==>	457.35	
8800.00	91.68	268.670	7260.85	1544.07S	149.98E	==>	548.01	
8900.00	91.68	268.670	7257.93	1546.39S	50.05E	==>	638.68	
9000.00	91.68	268.670	7255.00	1548.71S	49.88W	==>	729.34	
9100.00	91.68	268.670	7252.08	1551.03S	149.81W	==>	820.00	
9200.00	91.68	268.670	7249.15	1553.36S	249.74W	==>	910.66	
9300.00	91.68	268.670	7246.23	1555.68S	349.67W	==>	1001.33	
9400.00	91.68	268.670	7243.30	1558.00S	449.60W	==>	1091.99	
9500.00	91.68	268.670	7240.38	1560.32S	549.53W	==>	1182.65	
9600.00	91.68	268.670	7237.45	1562.64S	649.46W	==>	1273.32	
9700.00	91.68	268.670	7234.53	1564.96S	749.39W	==>	1363.98	
9800.00	91.68	268.670	7231.60	1567.28S	849.32W	==>	1454.64	
9900.00	91.68	268.670	7228.68	1569.60S	949.25W	==>	1545.30	
10000.00	91.68	268.670	7225.75	1571.92S	1049.18W	==>	1635.97	
10100.00	91.68	268.670	7222.83	1574.25S	1149.11W	==>	1726.63	
10200.00	91.68	268.670	7219.90	1576.57S	1249.04W	==>	1817.29	
10300.00	91.68	268.670	7216.98	1578.89S	1348.97W	==>	1907.95	
10400.00	91.68	268.670	7214.05	1581.21S	1448.90W	==>	1998.62	
10500.00	91.68	268.670	7211.13	1583.53S	1548.83W	==>	2089.28	
10600.00	91.68	268.670	7208.20	1585.85S	1648.76W	==>	2179.94	
10700.00	91.68	268.670	7205.28	1588.17S	1748.69W	==>	2270.61	
10800.00	91.68	268.670	7202.35	1590.49S	1848.62W	==>	2361.27	
10900.00	91.68	268.670	7199.43	1592.82S	1948.55W	==>	2451.93	
11000.00	91.68	268.670	7196.50	1595.14S	2048.48W	==>	2542.59	
11100.00	91.68	268.670	7193.58	1597.46S	2148.41W	==>	2633.26	
11200.00	91.68	268.670	7190.65	1599.78S	2248.34W	==>	2723.92	
11300.00	91.68	268.670	7187.73	1602.10S	2348.27W	==>	2814.58	
11400.00	91.68	268.670	7184.80	1604.42S	2448.20W	==>	2905.25	
11500.00	91.68	268.670	7181.88	1606.74S	2548.13W	==>	2995.91	
11600.00	91.68	268.670	7178.95	1609.06S	2648.06W	==>	3086.57	
11700.00	91.68	268.670	7176.03	1611.38S	2747.99W	==>	3177.23	
11800.00	91.68	268.670	7173.10	1613.71S	2847.92W	==>	3267.90	
11900.00	91.68	268.670	7170.18	1616.03S	2947.85W	==>	3358.56	
12000.00	91.68	268.670	7167.25	1618.35S	3047.78W	==>	3449.22	
12100.00	91.68	268.670	7164.33	1620.67S	3147.71W	==>	3539.89	
12200.00	91.68	268.670	7161.40	1622.99S	3247.64W	==>	3630.55	
12248.01	91.68	268.670	7160.00	1624.10S	3295.62W	==>	3674.08	

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Vertical Section is from 0.00N 0.00E on azimuth 243.770 degrees  
Bottom hole distance is 3674.08 Feet on azimuth 243.77 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
445471	Planned	12248.01	7160.00	ISCWSA MWD	Rev 4 + SAG + FLT



SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: Markham #4 (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 #4 (PWB)	Feb-22-2016	Mar-10-2016

Well		
Name	Government ID	Last Revised
Markham #4		Feb-22-2016

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
Slot #4	N40 16 7.5000	W105 1 23.2680	1341104.8766	3133069.7198	47.34N	3.05W

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 #3	10.88	985.64	12248.01	-29.69	12248.01	0.92	12248.01
Markham #5	18.22	750.00	8000.00	-145.37	12248.01	0.56	12248.01
Markham #2	19.90	1100.99	12248.01	8.47	1105.68	1.42	12248.01
Markham #6	32.79	750.00	8002.08	-25.30	12248.01	0.93	12248.01
Markham #1	47.44	173.00	12248.01	44.78	223.00	1.87	12248.01
Markham #7	50.99	761.19	761.19	42.39	900.00	1.85	12248.01
Markham #8	65.57	750.00	750.00	57.43	794.00	2.34	12248.01
Markham #9	80.15	750.00	750.00	72.01	794.00	2.78	12248.01
Markham #10	98.36	750.00	750.00	90.17	800.00	3.71	12248.01
Markham #11	112.93	750.00	750.00	104.80	794.00	4.18	12248.01
Markham #12	127.54	750.00	12226.72	119.41	794.00	4.63	12248.01
Markham #44-32D	168.84	8110.27	8109.97	75.91	8093.87	1.81	8077.46
Markham #33-32D	196.31	3429.49	9413.38	142.01	3435.07	3.61	3435.07