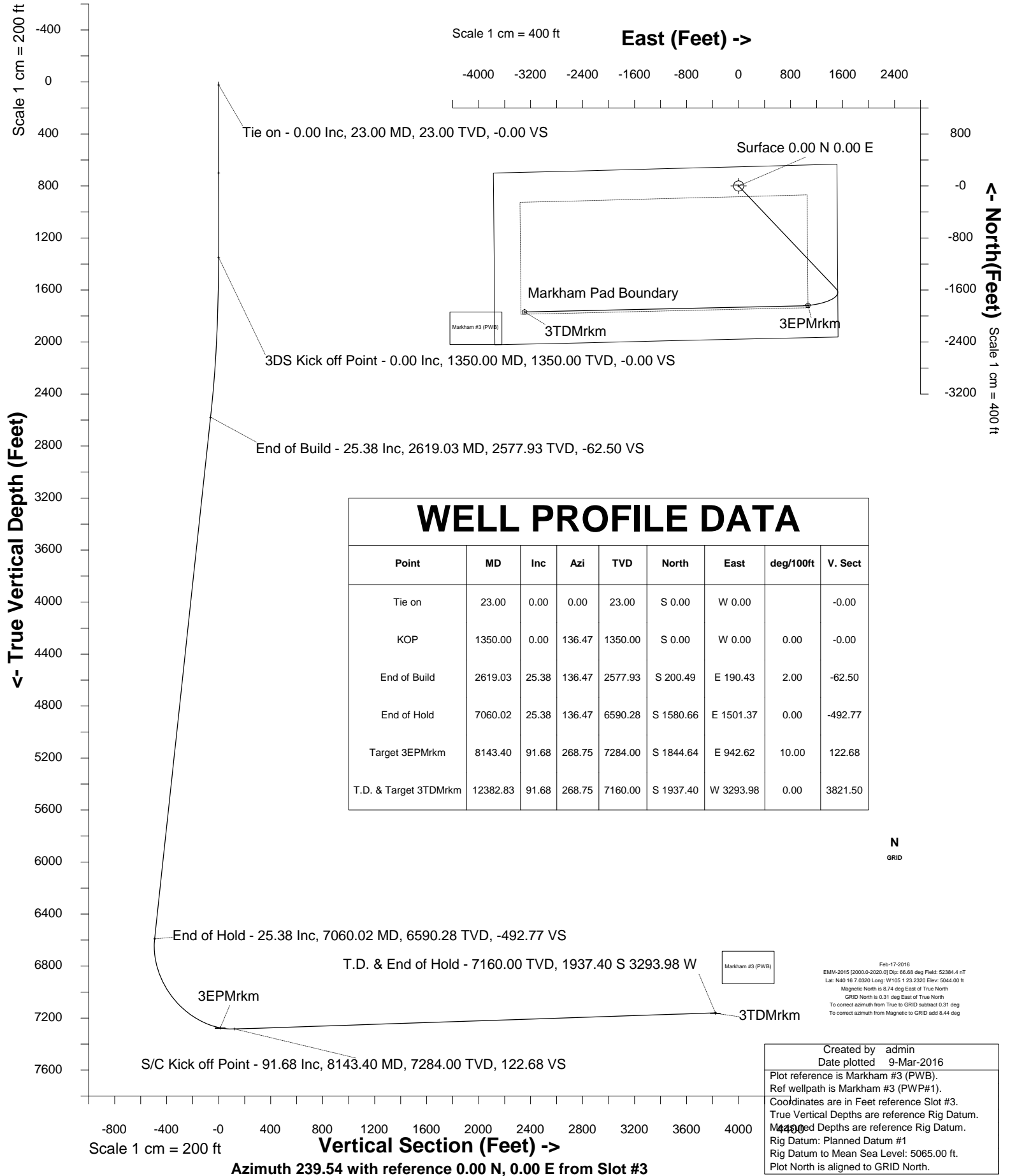


# Cub Creek Energy, LLC

Location	Weld County, CO	Slot	Slot #3
Field	WATTENBERG	Well	Markham #3
Installation	Markham Pad	Wellbore	Markham #3 (PWB)





SYSDRILL  
Well Design Combined Report  
Wellbore: Markham #3 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Slot #3	N40 16 7.3560	W105 1 23.2680	1341090.3053	3133069.7982	32.77N	2.97W	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	1341090.31	3133069.80
1350.00	0.00	136.470	1350.00	0.00N	0.00E	==>	0.00	1341090.31	3133069.80
2619.03	25.38	136.470	2577.93	200.49S	190.43E	2.00	-62.50	1340889.83	3133260.22
7060.02	25.38	136.470	6590.28	1580.66S	1501.37E	==>	-492.77	1339509.71	3134571.10
8143.40	91.68	268.750	7284.00	1844.64S	942.62E	10.00	122.68	1339245.75	3134012.38
12382.83	91.68	268.750	7160.00	1937.40S	3293.98W	==>	3821.50	1339152.99	3129775.96

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	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	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	
1400.00	1.00	136.470	1400.00	0.32S	0.30E	2.00	-0.10	
1500.00	3.00	136.470	1499.93	2.85S	2.70E	2.00	-0.89	
1600.00	5.00	136.470	1599.68	7.90S	7.51E	2.00	-2.46	
1700.00	7.00	136.470	1699.13	15.48S	14.71E	2.00	-4.83	
1800.00	9.00	136.470	1798.15	25.57S	24.29E	2.00	-7.97	
1900.00	11.00	136.470	1896.63	38.16S	36.25E	2.00	-11.90	
2000.00	13.00	136.470	1994.44	53.24S	50.57E	2.00	-16.60	
2100.00	15.00	136.470	2091.46	70.78S	67.23E	2.00	-22.06	
2200.00	17.00	136.470	2187.58	90.76S	86.21E	2.00	-28.29	
2300.00	19.00	136.470	2282.68	113.17S	107.49E	2.00	-35.28	
2400.00	21.00	136.470	2376.65	137.96S	131.04E	2.00	-43.01	
2500.00	23.00	136.470	2469.36	165.12S	156.84E	2.00	-51.48	
2600.00	25.00	136.470	2560.71	194.61S	184.85E	2.00	-60.67	
2700.00	25.38	136.470	2651.09	225.65S	214.33E	==>	-70.35	
2800.00	25.38	136.470	2741.44	256.73S	243.85E	==>	-80.03	
2900.00	25.38	136.470	2831.78	287.81S	273.37E	==>	-89.72	

All data is in Feet unless otherwise stated  
Coordinates are from Slot MD's are from Rig ( Planned Datum #1 5065.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 239.540 degrees  
Bottom hole distance is 3821.50 Feet on azimuth 239.54 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 #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
3000.00	25.38	136.470	2922.13	318.88S	302.89E	==>	-99.41	
3100.00	25.38	136.470	3012.48	349.96S	332.41E	==>	-109.10	
3200.00	25.38	136.470	3102.83	381.04S	361.92E	==>	-118.79	
3300.00	25.38	136.470	3193.18	412.12S	391.44E	==>	-128.48	
3400.00	25.38	136.470	3283.52	443.20S	420.96E	==>	-138.16	
3500.00	25.38	136.470	3373.87	474.27S	450.48E	==>	-147.85	
3600.00	25.38	136.470	3464.22	505.35S	480.00E	==>	-157.54	
3700.00	25.38	136.470	3554.57	536.43S	509.52E	==>	-167.23	
3800.00	25.38	136.470	3644.92	567.51S	539.04E	==>	-176.92	
3900.00	25.38	136.470	3735.26	598.59S	568.56E	==>	-186.61	
4000.00	25.38	136.470	3825.61	629.67S	598.08E	==>	-196.30	
4100.00	25.38	136.470	3915.96	660.74S	627.60E	==>	-205.98	
4200.00	25.38	136.470	4006.31	691.82S	657.12E	==>	-215.67	
4300.00	25.38	136.470	4096.66	722.90S	686.64E	==>	-225.36	
4400.00	25.38	136.470	4187.00	753.98S	716.15E	==>	-235.05	
4500.00	25.38	136.470	4277.35	785.06S	745.67E	==>	-244.74	
4600.00	25.38	136.470	4367.70	816.13S	775.19E	==>	-254.43	
4700.00	25.38	136.470	4458.05	847.21S	804.71E	==>	-264.12	
4800.00	25.38	136.470	4548.40	878.29S	834.23E	==>	-273.80	
4900.00	25.38	136.470	4638.74	909.37S	863.75E	==>	-283.49	
5000.00	25.38	136.470	4729.09	940.45S	893.27E	==>	-293.18	
5100.00	25.38	136.470	4819.44	971.53S	922.79E	==>	-302.87	
5200.00	25.38	136.470	4909.79	1002.60S	952.31E	==>	-312.56	
5300.00	25.38	136.470	5000.14	1033.68S	981.83E	==>	-322.25	
5400.00	25.38	136.470	5090.48	1064.76S	1011.35E	==>	-331.94	
5500.00	25.38	136.470	5180.83	1095.84S	1040.87E	==>	-341.62	
5600.00	25.38	136.470	5271.18	1126.92S	1070.38E	==>	-351.31	
5700.00	25.38	136.470	5361.53	1157.99S	1099.90E	==>	-361.00	
5800.00	25.38	136.470	5451.88	1189.07S	1129.42E	==>	-370.69	
5900.00	25.38	136.470	5542.22	1220.15S	1158.94E	==>	-380.38	
6000.00	25.38	136.470	5632.57	1251.23S	1188.46E	==>	-390.07	
6100.00	25.38	136.470	5722.92	1282.31S	1217.98E	==>	-399.75	
6200.00	25.38	136.470	5813.27	1313.39S	1247.50E	==>	-409.44	
6300.00	25.38	136.470	5903.62	1344.46S	1277.02E	==>	-419.13	
6400.00	25.38	136.470	5993.96	1375.54S	1306.54E	==>	-428.82	
6500.00	25.38	136.470	6084.31	1406.62S	1336.06E	==>	-438.51	
6600.00	25.38	136.470	6174.66	1437.70S	1365.58E	==>	-448.20	
6700.00	25.38	136.470	6265.01	1468.78S	1395.10E	==>	-457.89	
6800.00	25.38	136.470	6355.36	1499.85S	1424.61E	==>	-467.57	
6900.00	25.38	136.470	6445.70	1530.93S	1454.13E	==>	-477.26	
7000.00	25.38	136.470	6536.05	1562.01S	1483.65E	==>	-486.95	
7100.00	23.07	144.440	6626.75	1593.25S	1511.83E	10.00	-495.40	
7200.00	19.67	170.520	6720.06	1625.88S	1526.03E	10.00	-491.10	
7300.00	20.83	199.500	6814.12	1659.33S	1522.86E	10.00	-471.41	
7400.00	25.94	221.390	6906.05	1692.58S	1502.41E	10.00	-436.93	
7500.00	33.22	235.400	6993.06	1724.62S	1465.31E	10.00	-388.70	
7600.00	41.55	244.580	7072.51	1754.49S	1412.67E	10.00	-328.19	
7700.00	50.39	251.100	7141.98	1781.27S	1346.11E	10.00	-257.24	
7800.00	59.52	256.110	7199.37	1804.15S	1267.64E	10.00	-178.00	
7900.00	68.80	260.250	7242.93	1822.43S	1179.64E	10.00	-92.88	
8000.00	78.17	263.900	7271.33	1835.56S	1084.80E	10.00	-4.47	
8100.00	87.59	267.300	7283.72	1843.14S	985.99E	10.00	84.54	
8200.00	91.68	268.750	7282.34	1845.88S	886.06E	==>	172.06	
8300.00	91.68	268.750	7279.42	1848.07S	786.13E	==>	259.31	
8400.00	91.68	268.750	7276.49	1850.25S	686.19E	==>	346.56	
8500.00	91.68	268.750	7273.57	1852.44S	586.26E	==>	433.81	
8600.00	91.68	268.750	7270.64	1854.63S	486.33E	==>	521.05	

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Vertical Section is from 0.00N 0.00E on azimuth 239.540 degrees  
Bottom hole distance is 3821.50 Feet on azimuth 239.54 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 #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
8700.00	91.68	268.750	7267.72	1856.82S	386.39E	==>	608.30	
8800.00	91.68	268.750	7264.80	1859.01S	286.46E	==>	695.55	
8900.00	91.68	268.750	7261.87	1861.19S	186.53E	==>	782.80	
9000.00	91.68	268.750	7258.95	1863.38S	86.59E	==>	870.05	
9100.00	91.68	268.750	7256.02	1865.57S	13.34W	==>	957.29	
9200.00	91.68	268.750	7253.10	1867.76S	113.27W	==>	1044.54	
9300.00	91.68	268.750	7250.17	1869.95S	213.21W	==>	1131.79	
9400.00	91.68	268.750	7247.25	1872.13S	313.14W	==>	1219.04	
9500.00	91.68	268.750	7244.32	1874.32S	413.07W	==>	1306.29	
9600.00	91.68	268.750	7241.40	1876.51S	513.01W	==>	1393.53	
9700.00	91.68	268.750	7238.47	1878.70S	612.94W	==>	1480.78	
9800.00	91.68	268.750	7235.55	1880.89S	712.87W	==>	1568.03	
9900.00	91.68	268.750	7232.62	1883.08S	812.80W	==>	1655.28	
10000.00	91.68	268.750	7229.70	1885.26S	912.74W	==>	1742.52	
10100.00	91.68	268.750	7226.77	1887.45S	1012.67W	==>	1829.77	
10200.00	91.68	268.750	7223.85	1889.64S	1112.60W	==>	1917.02	
10300.00	91.68	268.750	7220.92	1891.83S	1212.54W	==>	2004.27	
10400.00	91.68	268.750	7218.00	1894.02S	1312.47W	==>	2091.52	
10500.00	91.68	268.750	7215.07	1896.20S	1412.40W	==>	2178.76	
10600.00	91.68	268.750	7212.15	1898.39S	1512.34W	==>	2266.01	
10700.00	91.68	268.750	7209.22	1900.58S	1612.27W	==>	2353.26	
10800.00	91.68	268.750	7206.30	1902.77S	1712.20W	==>	2440.51	
10900.00	91.68	268.750	7203.37	1904.96S	1812.14W	==>	2527.76	
11000.00	91.68	268.750	7200.45	1907.14S	1912.07W	==>	2615.00	
11100.00	91.68	268.750	7197.52	1909.33S	2012.00W	==>	2702.25	
11200.00	91.68	268.750	7194.60	1911.52S	2111.94W	==>	2789.50	
11300.00	91.68	268.750	7191.67	1913.71S	2211.87W	==>	2876.75	
11400.00	91.68	268.750	7188.75	1915.90S	2311.80W	==>	2964.00	
11500.00	91.68	268.750	7185.82	1918.08S	2411.74W	==>	3051.24	
11600.00	91.68	268.750	7182.90	1920.27S	2511.67W	==>	3138.49	
11700.00	91.68	268.750	7179.97	1922.46S	2611.60W	==>	3225.74	
11800.00	91.68	268.750	7177.05	1924.65S	2711.54W	==>	3312.99	
11900.00	91.68	268.750	7174.12	1926.84S	2811.47W	==>	3400.23	
12000.00	91.68	268.750	7171.20	1929.02S	2911.40W	==>	3487.48	
12100.00	91.68	268.750	7168.27	1931.21S	3011.34W	==>	3574.73	
12200.00	91.68	268.750	7165.35	1933.40S	3111.27W	==>	3661.98	
12300.00	91.68	268.750	7162.42	1935.59S	3211.20W	==>	3749.23	
12382.83	91.68	268.750	7160.00	1937.40S	3293.98W	==>	3821.50	

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Vertical Section is from 0.00N 0.00E on azimuth 239.540 degrees  
Bottom hole distance is 3821.50 Feet on azimuth 239.54 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
445453	Planned	12382.83	7160.00	ISCWSA MWD	Rev 4 + SAG + FLT



SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: Markham #3 (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 #3 (PWB)	Feb-22-2016	Mar-9-2016

Well		
Name	Government ID	Last Revised
Markham #3		Feb-22-2016

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
Slot #3	N40 16 7.3560	W105 1 23.2680	1341090.3053	3133069.7982	32.77N	2.97W

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 #4	10.88	985.24	12377.38	-29.69	12382.83	0.92	12377.38
Markham #2	14.84	1249.00	7277.03	-143.05	12382.83	0.56	12382.83
Markham #5	25.54	1193.45	12375.36	13.15	1204.10	1.41	12382.83
Markham #1	32.91	173.00	7700.17	-22.96	12382.83	0.94	12382.83
Markham #6	38.55	1350.00	12375.36	24.61	1368.14	1.84	12382.83
Markham #7	57.88	1171.29	12369.20	45.63	1200.00	2.76	12382.83
Markham #8	73.20	1286.12	12367.00	59.81	1318.93	3.24	12382.83
Markham #9	89.28	1368.14	12366.47	75.11	1400.95	3.68	12382.83
Markham #10	111.28	1089.27	12360.95	99.67	1154.89	4.62	12382.83
Markham #11	127.05	1105.68	12358.96	115.05	1204.10	5.08	12382.83
Markham #12	142.09	1072.87	12358.96	129.80	1253.31	5.53	12382.83
Markham #33-32D	155.99	3611.04	9544.29	100.50	3611.04	2.81	3611.04
Markham #44-32D	164.50	8239.14	8239.14	70.08	8257.91	1.72	8274.31