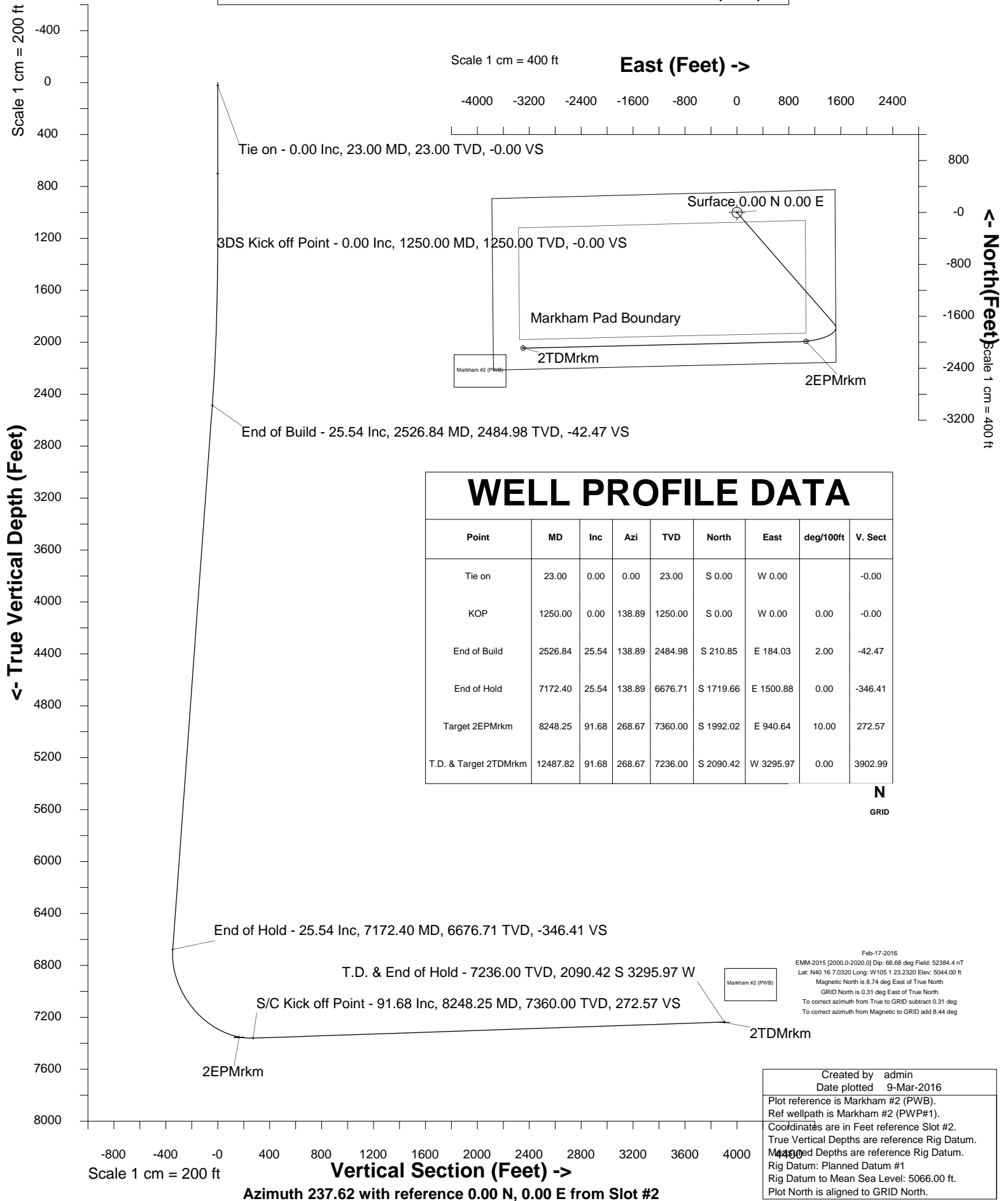


Cub Creek Energy, LLC

Location	Weld County, CO	Slot	Slot #2
Field	WATTENBERG	Well	Markham #2
Installation	Markham Pad	Wellbore	Markham #2 (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: Markham #2 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Slot #2	N40 16 7.2120	W105 1 23.2320	1341075.7490	3133072.6670	18.21N	0.10W	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	1341075.75	3133072.67
1250.00	0.00	138.890	1250.00	0.00N	0.00E	==>	0.00	1341075.75	3133072.67
2526.84	25.54	138.890	2484.98	210.85S	184.03E	2.00	-42.47	1340864.91	3133256.68
7172.40	25.54	138.890	6676.71	1719.66S	1500.88E	==>	-346.41	1339356.16	3134573.48
8248.25	91.68	268.670	7360.00	1992.02S	940.64E	10.00	272.57	1339083.82	3134013.27
12487.82	91.68	268.670	7236.00	2090.42S	3295.97W	==>	3902.99	1338985.42	3129776.84

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	1.00	138.890	1300.00	0.33S	0.29E	2.00	-0.07	
1400.00	3.00	138.890	1399.93	2.96S	2.58E	2.00	-0.60	
1500.00	5.00	138.890	1499.68	8.21S	7.17E	2.00	-1.65	
1600.00	7.00	138.890	1599.13	16.09S	14.04E	2.00	-3.24	
1700.00	9.00	138.890	1698.15	26.57S	23.19E	2.00	-5.35	
1800.00	11.00	138.890	1796.63	39.66S	34.61E	2.00	-7.99	
1900.00	13.00	138.890	1894.44	55.32S	48.28E	2.00	-11.14	
2000.00	15.00	138.890	1991.46	73.54S	64.19E	2.00	-14.81	
2100.00	17.00	138.890	2087.58	94.31S	82.31E	2.00	-19.00	
2200.00	19.00	138.890	2182.68	117.59S	102.63E	2.00	-23.69	
2300.00	21.00	138.890	2276.65	143.36S	125.12E	2.00	-28.88	
2400.00	23.00	138.890	2369.36	171.58S	149.75E	2.00	-34.56	
2500.00	25.00	138.890	2460.71	202.22S	176.49E	2.00	-40.74	
2600.00	25.54	138.890	2551.00	234.61S	204.76E	==>	-47.26	
2700.00	25.54	138.890	2641.23	267.09S	233.11E	==>	-53.80	
2800.00	25.54	138.890	2731.46	299.57S	261.46E	==>	-60.35	
2900.00	25.54	138.890	2821.69	332.05S	289.80E	==>	-66.89	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5066.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 237.620 degrees
Bottom hole distance is 3902.99 Feet on azimuth 237.62 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 #2 (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	25.54	138.890	2911.92	364.53S	318.15E	==>	-73.43	
3100.00	25.54	138.890	3002.15	397.01S	346.50E	==>	-79.97	
3200.00	25.54	138.890	3092.38	429.49S	374.84E	==>	-86.52	
3300.00	25.54	138.890	3182.61	461.96S	403.19E	==>	-93.06	
3400.00	25.54	138.890	3272.84	494.44S	431.54E	==>	-99.60	
3500.00	25.54	138.890	3363.08	526.92S	459.88E	==>	-106.14	
3600.00	25.54	138.890	3453.31	559.40S	488.23E	==>	-112.69	
3700.00	25.54	138.890	3543.54	591.88S	516.58E	==>	-119.23	
3800.00	25.54	138.890	3633.77	624.36S	544.92E	==>	-125.77	
3900.00	25.54	138.890	3724.00	656.84S	573.27E	==>	-132.31	
4000.00	25.54	138.890	3814.23	689.31S	601.62E	==>	-138.86	
4100.00	25.54	138.890	3904.46	721.79S	629.96E	==>	-145.40	
4200.00	25.54	138.890	3994.69	754.27S	658.31E	==>	-151.94	
4300.00	25.54	138.890	4084.92	786.75S	686.65E	==>	-158.48	
4400.00	25.54	138.890	4175.15	819.23S	715.00E	==>	-165.03	
4500.00	25.54	138.890	4265.38	851.71S	743.35E	==>	-171.57	
4600.00	25.54	138.890	4355.62	884.18S	771.69E	==>	-178.11	
4700.00	25.54	138.890	4445.85	916.66S	800.04E	==>	-184.65	
4800.00	25.54	138.890	4536.08	949.14S	828.39E	==>	-191.20	
4900.00	25.54	138.890	4626.31	981.62S	856.73E	==>	-197.74	
5000.00	25.54	138.890	4716.54	1014.10S	885.08E	==>	-204.28	
5100.00	25.54	138.890	4806.77	1046.58S	913.43E	==>	-210.82	
5200.00	25.54	138.890	4897.00	1079.06S	941.77E	==>	-217.37	
5300.00	25.54	138.890	4987.23	1111.53S	970.12E	==>	-223.91	
5400.00	25.54	138.890	5077.46	1144.01S	998.47E	==>	-230.45	
5500.00	25.54	138.890	5167.69	1176.49S	1026.81E	==>	-236.99	
5600.00	25.54	138.890	5257.92	1208.97S	1055.16E	==>	-243.54	
5700.00	25.54	138.890	5348.16	1241.45S	1083.51E	==>	-250.08	
5800.00	25.54	138.890	5438.39	1273.93S	1111.85E	==>	-256.62	
5900.00	25.54	138.890	5528.62	1306.41S	1140.20E	==>	-263.16	
6000.00	25.54	138.890	5618.85	1338.88S	1168.54E	==>	-269.71	
6100.00	25.54	138.890	5709.08	1371.36S	1196.89E	==>	-276.25	
6200.00	25.54	138.890	5799.31	1403.84S	1225.24E	==>	-282.79	
6300.00	25.54	138.890	5889.54	1436.32S	1253.58E	==>	-289.33	
6400.00	25.54	138.890	5979.77	1468.80S	1281.93E	==>	-295.88	
6500.00	25.54	138.890	6070.00	1501.28S	1310.28E	==>	-302.42	
6600.00	25.54	138.890	6160.23	1533.76S	1338.62E	==>	-308.96	
6700.00	25.54	138.890	6250.47	1566.23S	1366.97E	==>	-315.50	
6800.00	25.54	138.890	6340.70	1598.71S	1395.32E	==>	-322.05	
6900.00	25.54	138.890	6430.93	1631.19S	1423.66E	==>	-328.59	
7000.00	25.54	138.890	6521.16	1663.67S	1452.01E	==>	-335.13	
7100.00	25.54	138.890	6611.39	1696.15S	1480.36E	==>	-341.67	
7200.00	24.00	144.360	6701.78	1728.71S	1508.06E	10.00	-347.63	
7300.00	20.54	169.360	6794.51	1762.57S	1523.19E	10.00	-342.27	
7400.00	21.44	197.420	6888.11	1797.33S	1520.95E	10.00	-321.76	
7500.00	26.24	219.330	6979.73	1831.96S	1501.42E	10.00	-286.72	
7600.00	33.30	233.720	7066.59	1865.39S	1465.18E	10.00	-238.22	
7700.00	41.47	243.270	7146.04	1896.60S	1413.35E	10.00	-177.72	
7800.00	50.21	250.080	7215.68	1924.66S	1347.48E	10.00	-107.08	
7900.00	59.25	255.320	7273.39	1948.70S	1269.60E	10.00	-28.42	
8000.00	68.47	259.650	7317.41	1968.01S	1182.05E	10.00	55.84	
8100.00	77.79	263.450	7346.41	1981.98S	1087.51E	10.00	143.16	
8200.00	87.15	266.990	7359.51	1990.19S	988.84E	10.00	230.89	
8300.00	91.68	268.670	7358.49	1993.22S	888.93E	==>	316.88	
8400.00	91.68	268.670	7355.56	1995.54S	788.99E	==>	402.52	
8500.00	91.68	268.670	7352.64	1997.86S	689.06E	==>	488.15	
8600.00	91.68	268.670	7349.71	2000.18S	589.13E	==>	573.78	

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Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 14-Apr-2016



SYSDRILL
Well Design Combined Report
Wellbore: Markham #2 (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	7346.79	2002.50S	489.20E	==>	659.41	
8800.00	91.68	268.670	7343.86	2004.82S	389.27E	==>	745.04	
8900.00	91.68	268.670	7340.94	2007.14S	289.34E	==>	830.67	
9000.00	91.68	268.670	7338.01	2009.47S	189.41E	==>	916.31	
9100.00	91.68	268.670	7335.09	2011.79S	89.48E	==>	1001.94	
9200.00	91.68	268.670	7332.16	2014.11S	10.45W	==>	1087.57	
9300.00	91.68	268.670	7329.24	2016.43S	110.38W	==>	1173.20	
9400.00	91.68	268.670	7326.31	2018.75S	210.31W	==>	1258.83	
9500.00	91.68	268.670	7323.39	2021.07S	310.24W	==>	1344.46	
9600.00	91.68	268.670	7320.46	2023.39S	410.17W	==>	1430.10	
9700.00	91.68	268.670	7317.54	2025.71S	510.10W	==>	1515.73	
9800.00	91.68	268.670	7314.61	2028.03S	610.03W	==>	1601.36	
9900.00	91.68	268.670	7311.69	2030.36S	709.96W	==>	1686.99	
10000.00	91.68	268.670	7308.76	2032.68S	809.89W	==>	1772.62	
10100.00	91.68	268.670	7305.84	2035.00S	909.82W	==>	1858.26	
10200.00	91.68	268.670	7302.91	2037.32S	1009.75W	==>	1943.89	
10300.00	91.68	268.670	7299.99	2039.64S	1109.68W	==>	2029.52	
10400.00	91.68	268.670	7297.07	2041.96S	1209.61W	==>	2115.15	
10500.00	91.68	268.670	7294.14	2044.28S	1309.54W	==>	2200.78	
10600.00	91.68	268.670	7291.22	2046.60S	1409.47W	==>	2286.41	
10700.00	91.68	268.670	7288.29	2048.92S	1509.40W	==>	2372.05	
10800.00	91.68	268.670	7285.37	2051.25S	1609.33W	==>	2457.68	
10900.00	91.68	268.670	7282.44	2053.57S	1709.26W	==>	2543.31	
11000.00	91.68	268.670	7279.52	2055.89S	1809.19W	==>	2628.94	
11100.00	91.68	268.670	7276.59	2058.21S	1909.12W	==>	2714.57	
11200.00	91.68	268.670	7273.67	2060.53S	2009.05W	==>	2800.20	
11300.00	91.68	268.670	7270.74	2062.85S	2108.98W	==>	2885.84	
11400.00	91.68	268.670	7267.82	2065.17S	2208.91W	==>	2971.47	
11500.00	91.68	268.670	7264.89	2067.49S	2308.84W	==>	3057.10	
11600.00	91.68	268.670	7261.97	2069.81S	2408.77W	==>	3142.73	
11700.00	91.68	268.670	7259.04	2072.14S	2508.70W	==>	3228.36	
11800.00	91.68	268.670	7256.12	2074.46S	2608.63W	==>	3314.00	
11900.00	91.68	268.670	7253.19	2076.78S	2708.56W	==>	3399.63	
12000.00	91.68	268.670	7250.27	2079.10S	2808.49W	==>	3485.26	
12100.00	91.68	268.670	7247.34	2081.42S	2908.42W	==>	3570.89	
12200.00	91.68	268.670	7244.42	2083.74S	3008.36W	==>	3656.52	
12300.00	91.68	268.670	7241.49	2086.06S	3108.29W	==>	3742.15	
12400.00	91.68	268.670	7238.57	2088.38S	3208.22W	==>	3827.79	
12487.82	91.68	268.670	7236.00	2090.42S	3295.97W	==>	3902.99	

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Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
445432	Planned	12487.82	7236.00	ISCWSA MWD	Rev 4 + SAG + FLT



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Markham #2 (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 #2 (PWB)	Feb-22-2016	Feb-23-2016

Well		
Name	Government ID	Last Revised
Markham #2		Feb-22-2016

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
Slot #2	N40 16 7.2120	W105 1 23.2320	1341075.7490	3133072.6670	18.21N	0.10W

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	14.84	1253.31	7257.25	-143.06	12487.82	0.56	12487.82
Markham #1	18.22	174.00	12487.82	-146.59	12487.82	0.55	12487.82
Markham #4	19.90	1100.77	12481.11	8.47	1122.08	1.42	12487.82
Markham #5	35.17	1275.63	2680.48	21.96	1286.12	1.85	12487.82
Markham #6	50.16	1404.66	1404.66	35.60	1433.76	2.33	12487.82
Markham #7	69.42	1229.73	1229.73	56.57	1253.31	3.25	12487.82
Markham #8	85.77	1304.43	1304.43	72.18	1335.34	3.70	12487.82
Markham #33-32D	102.58	3564.85	9645.54	47.70	3564.85	1.87	3564.85
Markham #9	103.69	1335.34	1335.34	89.78	1368.14	4.17	12487.82
Markham #10	125.16	1126.92	1126.92	113.14	1187.70	5.10	12487.82
Markham #11	141.33	1144.80	1144.80	128.97	1236.91	5.55	12487.82
Markham #12	156.68	1123.00	12459.82	144.13	1253.31	6.01	12487.82
Markham #44-32D	326.82	8341.47	8341.47	232.68	8372.74	3.39	8421.95