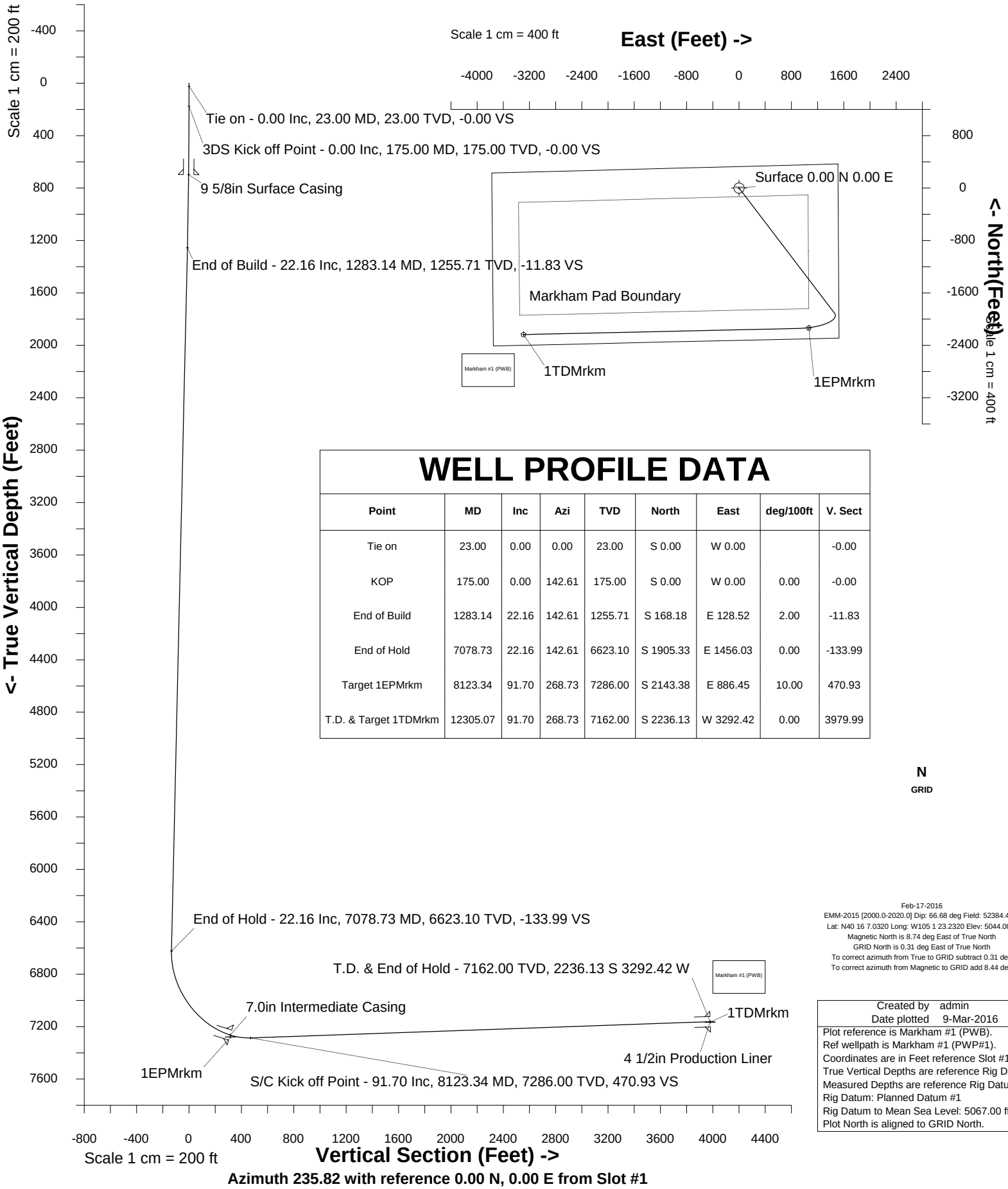
Cub Creek Energy, LLC

Location	**Weld County, CO**	**Slot**	**Slot #1**
Field	**WATTENBERG**	**Well**	**Markham #1**
Installation	**Markham Pad**	**Wellbore**	**Markham #1 (PWB)**



WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	23.00	0.00	0.00	23.00	S 0.00	W 0.00		-0.00
KOP	175.00	0.00	142.61	175.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1283.14	22.16	142.61	1255.71	S 168.18	E 128.52	2.00	-11.83
End of Hold	7078.73	22.16	142.61	6623.10	S 1905.33	E 1456.03	0.00	-133.99
Target 1EPMrkm	8123.34	91.70	268.73	7286.00	S 2143.38	E 886.45	10.00	470.93
T.D. & Target 1TDMrkm	12305.07	91.70	268.73	7162.00	S 2236.13	W 3292.42	0.00	3979.99

Feb-17-2016
EMM-2015 [2000.0-2020.0] Dip: 66.68 deg Field: 52384.4 nT
Lat: N40 16 7.0320 Long: W105 1 23.2320 Elev: 5044.00 ft
Magnetic North is 8.74 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 8.44 deg

Created by	admin
Date plotted	9-Mar-2016

Plot reference is Markham #1 (PWB).
Ref wellpath is Markham #1 (PWP#1).
Coordinates are in Feet reference Slot #1.
True Vertical Depths are reference Rig Datum
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 5067.00 ft.
Plot North is aligned to GRID North.

SYSDRILL
Well Design Combined Report
Wellbore: Markham #1 (PWB)

Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Slot #1	N40 16 7.0320	W105 1 23.2320	1341057.5349	3133072.7650	0.00N	0.00E	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	1341057.53	3133072.76
175.00	0.00	142.610	175.00	0.00N	0.00E	==>	0.00	1341057.53	3133072.76
1283.14	22.16	142.610	1255.71	168.18S	128.52E	2.00	-11.83	1340889.37	3133201.28
7078.73	22.16	142.610	6623.10	1905.33S	1456.03E	==>	-133.99	1339152.29	3134528.72
8123.34	91.70	268.730	7286.00	2143.38S	886.45E	10.00	470.93	1338914.25	3133959.18
12305.07	91.70	268.730	7162.00	2236.13S	3292.42W	==>	3979.99	1338821.51	3129780.49

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	0.50	142.610	200.00	0.09S	0.07E	2.00	-0.01	
300.00	2.50	142.610	299.96	2.17S	1.66E	2.00	-0.15	
400.00	4.50	142.610	399.77	7.02S	5.36E	2.00	-0.49	
500.00	6.50	142.610	499.30	14.63S	11.18E	2.00	-1.03	
600.00	8.50	142.610	598.44	25.00S	19.11E	2.00	-1.76	
700.00	10.50	142.610	697.07	38.12S	29.13E	2.00	-2.68	
800.00	12.50	142.610	795.05	53.96S	41.23E	2.00	-3.79	
900.00	14.50	142.610	892.29	72.50S	55.41E	2.00	-5.10	
1000.00	16.50	142.610	988.64	93.74S	71.63E	2.00	-6.59	
1100.00	18.50	142.610	1084.01	117.63S	89.89E	2.00	-8.27	
1200.00	20.50	142.610	1178.27	144.15S	110.16E	2.00	-10.14	
1300.00	22.16	142.610	1271.33	173.23S	132.38E	==>	-12.18	
1400.00	22.16	142.610	1363.94	203.21S	155.29E	==>	-14.29	
1500.00	22.16	142.610	1456.55	233.18S	178.19E	==>	-16.40	
1600.00	22.16	142.610	1549.16	263.15S	201.10E	==>	-18.51	
1700.00	22.16	142.610	1641.77	293.13S	224.00E	==>	-20.61	
1800.00	22.16	142.610	1734.38	323.10S	246.91E	==>	-22.72	
1900.00	22.16	142.610	1827.00	353.07S	269.81E	==>	-24.83	
2000.00	22.16	142.610	1919.61	383.05S	292.72E	==>	-26.94	
2100.00	22.16	142.610	2012.22	413.02S	315.62E	==>	-29.05	
2200.00	22.16	142.610	2104.83	443.00S	338.53E	==>	-31.15	
2300.00	22.16	142.610	2197.44	472.97S	361.44E	==>	-33.26	
2400.00	22.16	142.610	2290.05	502.94S	384.34E	==>	-35.37	
2500.00	22.16	142.610	2382.67	532.92S	407.25E	==>	-37.48	
2600.00	22.16	142.610	2475.28	562.89S	430.15E	==>	-39.58	
2700.00	22.16	142.610	2567.89	592.86S	453.06E	==>	-41.69	
2800.00	22.16	142.610	2660.50	622.84S	475.96E	==>	-43.80	
2900.00	22.16	142.610	2753.11	652.81S	498.87E	==>	-45.91	

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 5067.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 235.820 degrees
Bottom hole distance is 3979.99 Feet on azimuth 235.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 8-Mar-2016

SYSDRILL
Well Design Combined Report
Wellbore: Markham #1 (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	22.16	142.610	2845.72	682.79S	521.77E	==>	-48.02	
3100.00	22.16	142.610	2938.34	712.76S	544.68E	==>	-50.12	
3200.00	22.16	142.610	3030.95	742.73S	567.58E	==>	-52.23	
3300.00	22.16	142.610	3123.56	772.71S	590.49E	==>	-54.34	
3400.00	22.16	142.610	3216.17	802.68S	613.40E	==>	-56.45	
3500.00	22.16	142.610	3308.78	832.65S	636.30E	==>	-58.56	
3600.00	22.16	142.610	3401.39	862.63S	659.21E	==>	-60.66	
3700.00	22.16	142.610	3494.01	892.60S	682.11E	==>	-62.77	
3800.00	22.16	142.610	3586.62	922.58S	705.02E	==>	-64.88	
3900.00	22.16	142.610	3679.23	952.55S	727.92E	==>	-66.99	
4000.00	22.16	142.610	3771.84	982.52S	750.83E	==>	-69.09	
4100.00	22.16	142.610	3864.45	1012.50S	773.73E	==>	-71.20	
4200.00	22.16	142.610	3957.06	1042.47S	796.64E	==>	-73.31	
4300.00	22.16	142.610	4049.68	1072.44S	819.54E	==>	-75.42	
4400.00	22.16	142.610	4142.29	1102.42S	842.45E	==>	-77.53	
4500.00	22.16	142.610	4234.90	1132.39S	865.36E	==>	-79.63	
4600.00	22.16	142.610	4327.51	1162.37S	888.26E	==>	-81.74	
4700.00	22.16	142.610	4420.12	1192.34S	911.17E	==>	-83.85	
4800.00	22.16	142.610	4512.73	1222.31S	934.07E	==>	-85.96	
4900.00	22.16	142.610	4605.34	1252.29S	956.98E	==>	-88.07	
5000.00	22.16	142.610	4697.96	1282.26S	979.88E	==>	-90.17	
5100.00	22.16	142.610	4790.57	1312.23S	1002.79E	==>	-92.28	
5200.00	22.16	142.610	4883.18	1342.21S	1025.69E	==>	-94.39	
5300.00	22.16	142.610	4975.79	1372.18S	1048.60E	==>	-96.50	
5400.00	22.16	142.610	5068.40	1402.16S	1071.50E	==>	-98.60	
5500.00	22.16	142.610	5161.01	1432.13S	1094.41E	==>	-100.71	
5600.00	22.16	142.610	5253.63	1462.10S	1117.32E	==>	-102.82	
5700.00	22.16	142.610	5346.24	1492.08S	1140.22E	==>	-104.93	
5800.00	22.16	142.610	5438.85	1522.05S	1163.13E	==>	-107.04	
5900.00	22.16	142.610	5531.46	1552.02S	1186.03E	==>	-109.14	
6000.00	22.16	142.610	5624.07	1582.00S	1208.94E	==>	-111.25	
6100.00	22.16	142.610	5716.68	1611.97S	1231.84E	==>	-113.36	
6200.00	22.16	142.610	5809.30	1641.95S	1254.75E	==>	-115.47	
6300.00	22.16	142.610	5901.91	1671.92S	1277.65E	==>	-117.58	
6400.00	22.16	142.610	5994.52	1701.89S	1300.56E	==>	-119.68	
6500.00	22.16	142.610	6087.13	1731.87S	1323.46E	==>	-121.79	
6600.00	22.16	142.610	6179.74	1761.84S	1346.37E	==>	-123.90	
6700.00	22.16	142.610	6272.35	1791.81S	1369.28E	==>	-126.01	
6800.00	22.16	142.610	6364.97	1821.79S	1392.18E	==>	-128.11	
6900.00	22.16	142.610	6457.58	1851.76S	1415.09E	==>	-130.22	
7000.00	22.16	142.610	6550.19	1881.74S	1437.99E	==>	-132.33	
7100.00	21.06	147.550	6642.88	1911.75S	1460.51E	10.00	-134.10	
7200.00	18.34	176.440	6737.24	1942.69S	1471.16E	10.00	-125.52	
7300.00	20.56	206.070	6831.75	1974.25S	1464.40E	10.00	-102.20	
7400.00	26.49	226.480	6923.55	2005.45S	1440.46E	10.00	-64.86	
7500.00	34.26	239.050	7009.85	2035.36S	1400.05E	10.00	-14.62	
7600.00	42.87	247.250	7088.02	2063.06S	1344.40E	10.00	46.97	
7700.00	51.90	253.100	7155.69	2087.72S	1275.20E	10.00	118.07	
7800.00	61.16	257.650	7210.80	2108.57S	1194.56E	10.00	196.49	
7900.00	70.54	261.440	7251.68	2125.00S	1104.93E	10.00	279.87	
7940.00	74.32	262.830	7263.75	2130.21S	1067.17E	10.00	314.04	
7941.00	74.41	262.860	7264.02	2130.33S	1066.21E	10.00	314.90	
7942.00	74.51	262.890	7264.29	2130.45S	1065.25E	10.00	315.75	
7943.00	74.60	262.930	7264.56	2130.57S	1064.30E	10.00	316.61	
7944.00	74.70	262.960	7264.82	2130.69S	1063.34E	10.00	317.47	
7945.00	74.79	263.000	7265.08	2130.81S	1062.38E	10.00	318.33	
7946.00	74.89	263.030	7265.34	2130.92S	1061.42E	10.00	319.19	

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Vertical Section is from 0.00N 0.00E on azimuth 235.820 degrees
Bottom hole distance is 3979.99 Feet on azimuth 235.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 8-Mar-2016

SYSDRILL
Well Design Combined Report
Wellbore: Markham #1 (PWB)

IPT

Interpolated Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
7947.00	74.98	263.060	7265.60	2131.04S	1060.47E	10.00	320.05	
7948.00	75.07	263.100	7265.86	2131.16S	1059.51E	10.00	320.90	
7949.00	75.17	263.130	7266.12	2131.27S	1058.55E	10.00	321.76	
7950.00	75.26	263.160	7266.37	2131.39S	1057.59E	10.00	322.62	
8000.00	80.00	264.810	7277.08	2136.50S	1009.03E	10.00	365.66	
8100.00	89.48	267.990	7286.24	2142.71S	909.77E	10.00	451.26	
8200.00	91.70	268.730	7283.73	2145.08S	809.84E	==>	535.26	
8300.00	91.70	268.730	7280.76	2147.30S	709.91E	==>	619.18	
8400.00	91.70	268.730	7277.80	2149.51S	609.98E	==>	703.09	
8500.00	91.70	268.730	7274.83	2151.73S	510.04E	==>	787.00	
8600.00	91.70	268.730	7271.87	2153.95S	410.11E	==>	870.92	
8700.00	91.70	268.730	7268.90	2156.17S	310.18E	==>	954.83	
8800.00	91.70	268.730	7265.94	2158.39S	210.25E	==>	1038.75	
8900.00	91.70	268.730	7262.97	2160.60S	110.32E	==>	1122.66	
9000.00	91.70	268.730	7260.00	2162.82S	10.39E	==>	1206.57	
9100.00	91.70	268.730	7257.04	2165.04S	89.54W	==>	1290.49	
9200.00	91.70	268.730	7254.07	2167.26S	189.48W	==>	1374.40	
9300.00	91.70	268.730	7251.11	2169.48S	289.41W	==>	1458.31	
9400.00	91.70	268.730	7248.14	2171.69S	389.34W	==>	1542.23	
9500.00	91.70	268.730	7245.18	2173.91S	489.27W	==>	1626.14	
9600.00	91.70	268.730	7242.21	2176.13S	589.20W	==>	1710.06	
9700.00	91.70	268.730	7239.25	2178.35S	689.13W	==>	1793.97	
9800.00	91.70	268.730	7236.28	2180.57S	789.06W	==>	1877.88	
9900.00	91.70	268.730	7233.32	2182.78S	889.00W	==>	1961.80	
10000.00	91.70	268.730	7230.35	2185.00S	988.93W	==>	2045.71	
10100.00	91.70	268.730	7227.39	2187.22S	1088.86W	==>	2129.62	
10200.00	91.70	268.730	7224.42	2189.44S	1188.79W	==>	2213.54	
10300.00	91.70	268.730	7221.46	2191.66S	1288.72W	==>	2297.45	
10400.00	91.70	268.730	7218.49	2193.87S	1388.65W	==>	2381.37	
10500.00	91.70	268.730	7215.53	2196.09S	1488.58W	==>	2465.28	
10600.00	91.70	268.730	7212.56	2198.31S	1588.52W	==>	2549.19	
10700.00	91.70	268.730	7209.59	2200.53S	1688.45W	==>	2633.11	
10800.00	91.70	268.730	7206.63	2202.75S	1788.38W	==>	2717.02	
10900.00	91.70	268.730	7203.66	2204.96S	1888.31W	==>	2800.94	
11000.00	91.70	268.730	7200.70	2207.18S	1988.24W	==>	2884.85	
11100.00	91.70	268.730	7197.73	2209.40S	2088.17W	==>	2968.76	
11200.00	91.70	268.730	7194.77	2211.62S	2188.10W	==>	3052.68	
11300.00	91.70	268.730	7191.80	2213.83S	2288.04W	==>	3136.59	
11400.00	91.70	268.730	7188.84	2216.05S	2387.97W	==>	3220.50	
11500.00	91.70	268.730	7185.87	2218.27S	2487.90W	==>	3304.42	
11600.00	91.70	268.730	7182.91	2220.49S	2587.83W	==>	3388.33	
11700.00	91.70	268.730	7179.94	2222.71S	2687.76W	==>	3472.25	
11800.00	91.70	268.730	7176.98	2224.92S	2787.69W	==>	3556.16	
11900.00	91.70	268.730	7174.01	2227.14S	2887.62W	==>	3640.07	
12000.00	91.70	268.730	7171.05	2229.36S	2987.55W	==>	3723.99	
12100.00	91.70	268.730	7168.08	2231.58S	3087.49W	==>	3807.90	
12200.00	91.70	268.730	7165.12	2233.80S	3187.42W	==>	3891.81	
12300.00	91.70	268.730	7162.15	2236.01S	3287.35W	==>	3975.73	
12305.07	91.70	268.730	7162.00	2236.13S	3292.42W	==>	3979.99	

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Vertical Section is from 0.00N 0.00E on azimuth 235.820 degrees
Bottom hole distance is 3979.99 Feet on azimuth 235.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 8-Mar-2016

SYSDRILL
Well Design Combined Report
Wellbore: Markham #1 (PWB)

Hole Sections

Diameter [in]	Start MD[ft]	Start TVD[ft]	Start North[ft]	Start East[ft]	End MD[ft]	End TVD[ft]	End North[ft]	End East[ft]
12 1/2	23.00	23.00	0.00N	0.00E	700.00	697.07	38.12S	29.13E
8 3/4	700.00	697.07	38.12S	29.13E	7941.00	7264.02	2130.33S	1066.21E
6 1/2	7941.00	7264.02	2130.33S	1066.21E	12305.07	7162.00	2236.13S	3292.42W

Casings

Name	Top MD[ft]	Top TVD[ft]	Top North[ft]	Top East[ft]	Shoe MD[ft]	Shoe TVD[ft]	Shoe North[ft]	Shoe East[ft]
9 5/8in Surface Casing	23.00	23.00	0.00N	0.00E	700.00	697.07	38.12S	29.13E
7.0in Intermediate Casing	23.00	23.00	0.00N	0.00E	7941.00	7264.02	2130.33S	1066.21E
4 1/2in Production Liner	7080.00	6624.28	1905.72S	1456.31E	12305.07	7162.00	2236.13S	3292.42W

Targets

Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
1EPMrkm	2136.38S	1066.45E	7276.00	N40 15 45.8640	W105 1 9.6240	1338921.25	3134139.17
1TDMrkm	2236.13S	3292.42W	7162.00	N40 15 45.1080	W105 2 5.8560	1338821.51	3129780.49

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
445411	Planned	12305.07	7162.00	ISCWSA MWD	Rev 4 + SAG + FLT

Notes

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Bottom hole distance is 3979.99 Feet on azimuth 235.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 8-Mar-2016

SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Markham #1 (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 #1 (PWB)	Feb-22-2016	Mar-7-2016

Well

Name	Government ID	Last Revised
Markham #1		Feb-22-2016

Slot

Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
Slot #1	N40 16 7.0320	W105 1 23.2320	1341057.5349	3133072.7650	0.00N	0.00E

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 #2	18.22	175.00	12302.86	-146.61	12302.86	0.55	12302.86
Markham #3	32.91	175.00	7563.23	-22.97	12305.07	0.94	12305.07
Markham #4	47.44	175.00	12296.69	44.82	203.45	1.87	12305.07
Markham #5	65.63	175.00	12294.42	63.01	203.45	2.36	12305.07
Markham #33-32D	78.44	3172.61	9463.25	26.57	3172.61	1.51	3172.61
Markham #6	80.20	175.00	12293.87	77.58	203.45	2.80	12305.07
Markham #7	98.40	175.00	12288.31	95.78	203.45	3.73	12305.07
Markham #8	112.97	175.00	12286.04	110.35	203.45	4.22	12305.07
Markham #9	127.54	175.00	12285.49	124.92	203.45	4.67	12305.07
Markham #10	145.75	175.00	12279.87	143.13	203.45	5.61	12305.07
Markham #11	160.32	175.00	12277.66	157.70	203.45	6.08	12305.07
Markham #12	174.95	175.00	12277.11	172.35	203.45	6.54	12305.07
Markham #44-32D	264.43	5135.46	8159.48	193.75	5255.94	3.54	5469.19

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 5067.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 235.820 degrees
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 8-Mar-2016