



Mendell Finisterre II, LLC
SYSDRILL
Well Design Combined Report
Wellbore: AFTON 12-16H-5 (PWB)



Wellhead Details							
Name	Northing	Easting	Latitude	Longitude	North	East	Elevation Above Inst.
Slot #5	1233743.7137	3156372.1485	39.97365969	-104.94204604	25.03N	47.99E	-0.00

Declination			
Date	Source	Time	
8-Jul-2013	IGRF Model [1900.0-2015.0]	08:51	

Site Details				
Name	Northing	Easting	Coord System Name	North Alignment
AFTON	1233718.6871	3156324.1575	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
25.00	0.00	0.000	25.00	0.00N	0.00E		0.00	1233743.71	3156372.15
12642.93	90.27	359.780	8028.00	4170.64N	479.86E	==>	4198.16	1237914.22	3156851.99

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	
25.00	0.00	0.000	25.00	0.00N	0.00E	==>	0.00	
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	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	
1500.00	0.00	0.000	1500.00	0.00N	0.00E	==>	0.00	
1600.00	0.00	0.000	1600.00	0.00N	0.00E	==>	0.00	
1700.00	1.00	143.910	1700.00	0.35S	0.26E	2.00	-0.32	
1800.00	3.00	143.910	1799.93	3.17S	2.31E	2.00	-2.89	
1900.00	5.00	143.910	1899.68	8.81S	6.42E	2.00	-8.02	
2000.00	7.00	143.910	1999.13	17.26S	12.58E	2.00	-15.71	
2100.00	7.76	143.910	2098.25	27.97S	20.39E	==>	-25.46	
2200.00	7.76	143.910	2197.33	38.89S	28.34E	==>	-35.39	
2300.00	7.76	143.910	2296.41	49.81S	36.30E	==>	-45.33	
2400.00	7.76	143.910	2395.50	60.72S	44.26E	==>	-55.27	
2500.00	7.76	143.910	2494.58	71.64S	52.22E	==>	-65.20	
2600.00	7.76	143.910	2593.66	82.56S	60.18E	==>	-75.14	
2700.00	7.76	143.910	2692.75	93.48S	68.13E	==>	-85.08	
2800.00	7.76	143.910	2791.83	104.40S	76.09E	==>	-95.01	
2900.00	7.76	143.910	2890.91	115.31S	84.05E	==>	-104.95	
3000.00	7.76	143.910	2989.99	126.23S	92.01E	==>	-114.89	
3100.00	7.76	143.910	3089.08	137.15S	99.96E	==>	-124.82	
3200.00	7.76	143.910	3188.16	148.07S	107.92E	==>	-134.76	
3300.00	7.76	143.910	3287.24	158.99S	115.88E	==>	-144.70	
3400.00	7.76	143.910	3386.33	169.90S	123.84E	==>	-154.63	
3500.00	7.76	143.910	3485.41	180.82S	131.80E	==>	-164.57	
3600.00	7.76	143.910	3584.49	191.74S	139.75E	==>	-174.51	
3700.00	7.76	143.910	3683.58	202.66S	147.71E	==>	-184.45	
3800.00	7.76	143.910	3782.66	213.58S	155.67E	==>	-194.38	
3900.00	7.76	143.910	3881.74	224.49S	163.63E	==>	-204.32	

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 5178.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 6.560 degrees
Bottom hole distance is 4198.16 Feet on azimuth 6.56 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 23-Feb-2015



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SYSDRILL
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Wellbore: AFTON 12-16H-5 (PWB)



Interpolated Wellpath							
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
4000.00	7.76	143.910	3980.83	235.41S	171.58E	==>	-214.26
4100.00	7.76	143.910	4079.91	246.33S	179.54E	==>	-224.19
4200.00	7.76	143.910	4178.99	257.25S	187.50E	==>	-234.13
4300.00	7.76	143.910	4278.08	268.17S	195.46E	==>	-244.07
4400.00	7.76	143.910	4377.16	279.08S	203.42E	==>	-254.00
4500.00	7.76	143.910	4476.24	290.00S	211.37E	==>	-263.94
4600.00	7.76	143.910	4575.33	300.92S	219.33E	==>	-273.88
4700.00	7.76	143.910	4674.41	311.84S	227.29E	==>	-283.81
4800.00	7.76	143.910	4773.49	322.76S	235.25E	==>	-293.75
4900.00	7.76	143.910	4872.57	333.67S	243.20E	==>	-303.69
5000.00	7.76	143.910	4971.66	344.59S	251.16E	==>	-313.62
5100.00	7.76	143.910	5070.74	355.51S	259.12E	==>	-323.56
5200.00	7.76	143.910	5169.82	366.43S	267.08E	==>	-333.50
5300.00	7.76	143.910	5268.91	377.34S	275.04E	==>	-343.43
5400.00	7.76	143.910	5367.99	388.26S	282.99E	==>	-353.37
5500.00	7.76	143.910	5467.07	399.18S	290.95E	==>	-363.31
5600.00	7.76	143.910	5566.16	410.10S	298.91E	==>	-373.24
5700.00	7.76	143.910	5665.24	421.02S	306.87E	==>	-383.18
5800.00	7.76	143.910	5764.32	431.93S	314.82E	==>	-393.12
5900.00	7.76	143.910	5863.41	442.85S	322.78E	==>	-403.06
6000.00	7.76	143.910	5962.49	453.77S	330.74E	==>	-412.99
6100.00	7.76	143.910	6061.57	464.69S	338.70E	==>	-422.93
6200.00	7.76	143.910	6160.66	475.61S	346.66E	==>	-432.87
6300.00	7.76	143.910	6259.74	486.52S	354.61E	==>	-442.80
6400.00	7.76	143.910	6358.82	497.44S	362.57E	==>	-452.74
6500.00	7.76	143.910	6457.91	508.36S	370.53E	==>	-462.68
6600.00	7.76	143.910	6556.99	519.28S	378.49E	==>	-472.61
6700.00	7.76	143.910	6656.07	530.20S	386.44E	==>	-482.55
6800.00	7.76	143.910	6755.15	541.11S	394.40E	==>	-492.49
6900.00	7.76	143.910	6854.24	552.03S	402.36E	==>	-502.42
7000.00	7.76	143.910	6953.32	562.95S	410.32E	==>	-512.36
7100.00	7.76	143.910	7052.40	573.87S	418.28E	==>	-522.30
7200.00	7.76	143.910	7151.49	584.79S	426.23E	==>	-532.23
7300.00	7.76	143.910	7250.57	595.70S	434.19E	==>	-542.17
7400.00	7.76	143.910	7349.65	606.62S	442.15E	==>	-552.11
7500.00	5.37	121.470	7448.83	616.49S	450.11E	10.00	-561.00
7600.00	8.51	32.090	7548.31	612.66S	458.05E	10.00	-566.29
7700.00	17.77	14.250	7645.63	591.55S	465.75E	10.00	-534.43
7800.00	27.54	8.620	7737.81	553.81S	472.99E	10.00	-496.12
7900.00	37.43	5.800	7822.07	500.59S	479.54E	10.00	-442.49
8000.00	47.35	4.020	7895.83	433.50S	485.21E	10.00	-375.20
8100.00	57.30	2.740	7956.87	354.58S	489.81E	10.00	-296.27
8200.00	67.26	1.720	8003.33	266.24S	493.22E	10.00	-208.11
8300.00	77.23	0.840	8033.78	171.14S	495.33E	10.00	-113.40
8400.00	87.19	0.030	8047.32	72.19S	496.07E	10.00	-15.02
8500.00	90.27	359.780	8047.67	27.79N	495.75E	==>	84.28
8600.00	90.27	359.780	8047.20	127.79N	495.37E	==>	183.58
8700.00	90.27	359.780	8046.72	227.79N	494.98E	==>	282.87
8800.00	90.27	359.780	8046.25	327.79N	494.60E	==>	382.17
8900.00	90.27	359.780	8045.77	427.79N	494.22E	==>	481.47
9000.00	90.27	359.780	8045.30	527.78N	493.83E	==>	580.77
9100.00	90.27	359.780	8044.82	627.78N	493.45E	==>	680.07
9200.00	90.27	359.780	8044.35	727.78N	493.07E	==>	779.37
9300.00	90.27	359.780	8043.87	827.78N	492.68E	==>	878.67
9400.00	90.27	359.780	8043.40	927.78N	492.30E	==>	977.97
9500.00	90.27	359.780	8042.92	1027.77N	491.92E	==>	1077.27
9600.00	90.27	359.780	8042.45	1127.77N	491.53E	==>	1176.56
9700.00	90.27	359.780	8041.97	1227.77N	491.15E	==>	1275.86
9800.00	90.27	359.780	8041.50	1327.77N	490.77E	==>	1375.16
9900.00	90.27	359.780	8041.02	1427.77N	490.38E	==>	1474.46

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Interpolated Wellpath							
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
10000.00	90.27	359.780	8040.55	1527.77N	490.00E	==>	1573.76
10100.00	90.27	359.780	8040.07	1627.76N	489.61E	==>	1673.06
10200.00	90.27	359.780	8039.60	1727.76N	489.23E	==>	1772.36
10300.00	90.27	359.780	8039.12	1827.76N	488.85E	==>	1871.66
10400.00	90.27	359.780	8038.65	1927.76N	488.46E	==>	1970.96
10500.00	90.27	359.780	8038.18	2027.76N	488.08E	==>	2070.26
10600.00	90.27	359.780	8037.70	2127.75N	487.70E	==>	2169.55
10700.00	90.27	359.780	8037.23	2227.75N	487.31E	==>	2268.85
10800.00	90.27	359.780	8036.75	2327.75N	486.93E	==>	2368.15
10900.00	90.27	359.780	8036.28	2427.75N	486.55E	==>	2467.45
11000.00	90.27	359.780	8035.80	2527.75N	486.16E	==>	2566.75
11100.00	90.27	359.780	8035.33	2627.74N	485.78E	==>	2666.05
11200.00	90.27	359.780	8034.85	2727.74N	485.40E	==>	2765.35
11300.00	90.27	359.780	8034.38	2827.74N	485.01E	==>	2864.65
11400.00	90.27	359.780	8033.90	2927.74N	484.63E	==>	2963.95
11500.00	90.27	359.780	8033.43	3027.74N	484.25E	==>	3063.24
11600.00	90.27	359.780	8032.95	3127.74N	483.86E	==>	3162.54
11700.00	90.27	359.780	8032.48	3227.73N	483.48E	==>	3261.84
11800.00	90.27	359.780	8032.00	3327.73N	483.09E	==>	3361.14
11900.00	90.27	359.780	8031.53	3427.73N	482.71E	==>	3460.44
12000.00	90.27	359.780	8031.05	3527.73N	482.33E	==>	3559.74
12100.00	90.27	359.780	8030.58	3627.73N	481.94E	==>	3659.04
12200.00	90.27	359.780	8030.10	3727.72N	481.56E	==>	3758.34
12300.00	90.27	359.780	8029.63	3827.72N	481.18E	==>	3857.64
12400.00	90.27	359.780	8029.15	3927.72N	480.79E	==>	3956.93
12500.00	90.27	359.780	8028.68	4027.72N	480.41E	==>	4056.23
12600.00	90.27	359.780	8028.20	4127.72N	480.03E	==>	4155.53
12642.93	90.27	359.780	8028.00	4170.64N	479.86E	==>	4198.16

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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]
13 1/2	25.00	25.00	0.00N	0.00E	1250.00	1250.00	0.00N	0.00E
8 3/4	1262.00	1262.00	0.00N	0.00E	8309.00	8035.70	162.35S	495.45E
6 1/8	8309.00	8035.70	162.35S	495.45E	12642.93	8028.00	4170.64N	479.86E

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	25.00	25.00	0.00N	0.00E	1250.00	1250.00	0.00N	0.00E
7.0in Intermediate Casing	25.00	25.00	0.00N	0.00E	8309.00	8035.70	162.35S	495.45E
4 1/2in Production Liner	7530.00	7478.72	617.17S	452.50E	12642.93	8028.00	4170.64N	479.86E

Targets								
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting	Last Revised
AFTON 12-16H-5 Rev BH	4170.64N	479.86E	8028.00	39.98510000	-104.94024000	1237914.22	3156851.99	3-Mar-2014
AFTON 12-16H-5 T1	164.34S	496.02E	8028.00	39.97320000	-104.94028000	1233579.38	3156868.15	3-Mar-2014

Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
172423	Planned	12642.93	8028.00	WdW Rate Gyro	Standard

Notes



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: AFTON 12-16H-5 (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
Proximities beyond 2500.00ft with expansion rate of 0.00ft/1000ft are not reported
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
AFTON 12-16H-5 (PWB)	28-Feb-2014	23-Feb-2015

Well		
Name	Government ID	Last Revised
AFTON 12-16H-5		28-Feb-2014

Slot						
Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
Slot #5	1233743.7137	3156372.1485	39.97365969	-104.94204604	25.03N	47.99E

Installation				
Name	Easting	Northing	Coord System Name	North Alignment
AFTON	3156324.1575	1233718.6871	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Field				
Name	Easting	Northing	Coord System Name	North Alignment
SPINDLE	3156324.1590	1233718.6871	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]
AFTON 12-16H-6	15.31	1780.25	12642.93	11.83	1796.65	4.31	1878.67
AFTON #12-16H-4	25.03	25.00	11885.24	23.88	74.21	3.87	12492.19
AFTON #12-16H-4	25.03	25.00	9070.61	23.88	74.21	6.20	2223.16
AFTON #12-16H-3	29.83	1412.00	12642.93	26.91	1238.91	10.20	1452.17
AFTON 12-16H-7	32.02	1534.19	12642.93	28.91	1566.99	5.36	12642.93
AFTON 12-16H-2	40.71	1312.00	12642.93	37.79	1238.91	13.95	1238.91
AFTON 12-16H-8	48.00	1438.00	12642.93	45.07	1452.17	9.89	12642.93
AFTON 12-16H-1	54.13	1262.00	1262.00	51.21	1238.91	18.55	1238.91
PULIS #12-8	121.91	1650.00	1650.00	117.62	1665.42	27.45	1845.87
DARLOW UNIT #12-16B	255.93	1650.00	8518.41	242.10	1665.42	17.73	1944.29
SAUVAGE #11-7	712.55	12331.41	12331.41	650.62	12344.55	11.41	12410.17
ELMS #2	787.50	11411.51	11411.51	733.38	11411.51	14.54	11442.32
BARKER #12-9	913.06	9806.14	9806.14	891.70	9806.14	42.39	9900.33
BROKEN BOW II #7-1	987.24	5298.95	5298.95	976.51	5298.95	91.58	5389.17
WIERMAN #7-3	1076.23	8907.63	8907.63	1060.84	8916.08	61.72	9408.20
N COLORADO 41-13 #7	1180.28	7488.91	7488.91	1145.37	7488.91	33.73	7554.53
W MORRISON #16-1	1279.25	12642.93	12642.93	1224.76	12642.93	23.48	12642.93
MALLO #1	1340.30	1650.00	1650.00	1336.00	1665.42	169.05	5307.15
ALICIA 12-15H-3N	1359.47	1911.48	7432.40	1355.69	1911.48	20.36	12642.93
ALICIA 12-15H-4C	1376.73	1780.25	1780.25	1373.22	1796.65	20.90	12642.93



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Closest Approach + Clearance Factor Summary Report
Wellbore: AFTON 12-16H-5 (PWB)



Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
Ruby #1	1380.05	1650.00	8467.23	1375.05	1665.42	127.13	9358.99
Ruby #2	1380.22	33.00	9844.75	1379.14	74.21	35.10	10162.80
ALICIA 12-15H-2N	1391.56	1650.00	1650.00	1388.28	1665.42	24.57	12642.93
ALICIA 12-15H-1N	1405.65	1566.99	1566.99	1402.52	1566.99	32.89	12642.93
ALICIA 12-15H-1N	1405.65	1566.99	1566.99	1402.52	1566.99	33.07	12642.93
ALICIA 12-15H-1N	1405.65	1517.78	8627.65	1399.39	1534.19	17.26	12642.93
ALICIA 12-15H-6C	1419.85	1517.78	1517.78	1416.79	1525.00	150.83	7357.68
DARLOW #12-2	1422.87	1650.00	1650.00	1411.87	1665.42	87.93	5175.92
ALICIA 12-15H-5N	1434.08	1415.00	1415.00	1431.16	1238.91	28.85	12642.93
BELLINGER #12-7	1924.39	1650.00	1650.00	1920.08	1650.00	259.03	5339.96
TUDEX REINHOLT #NC4	1939.49	12198.14	12198.14	1898.12	12213.32	45.75	12525.00
TUDEX BRINK #S-2	2390.16	205.45	205.45	2388.15	1156.89	502.21	2600.46
W MORRISON #9-1	2408.40	12642.93	12642.93	2365.39	12642.93	55.99	12642.93
MORRISON #9-1	2408.40	12642.93	12642.93	2365.34	12642.93	55.93	12642.93
W MORRISON #15-1	2418.74	12642.93	12642.93	2358.51	12642.93	40.16	12642.93