

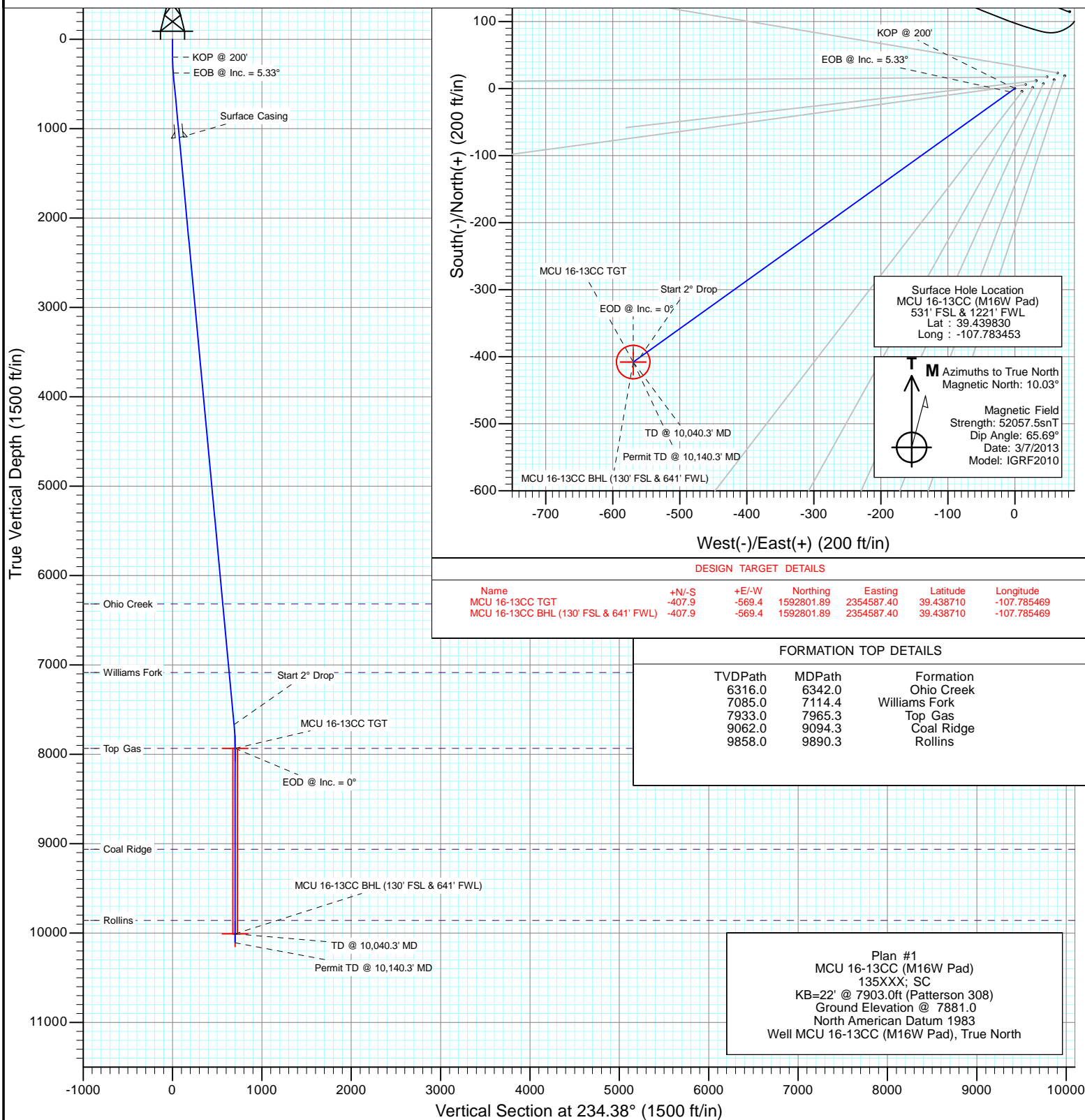


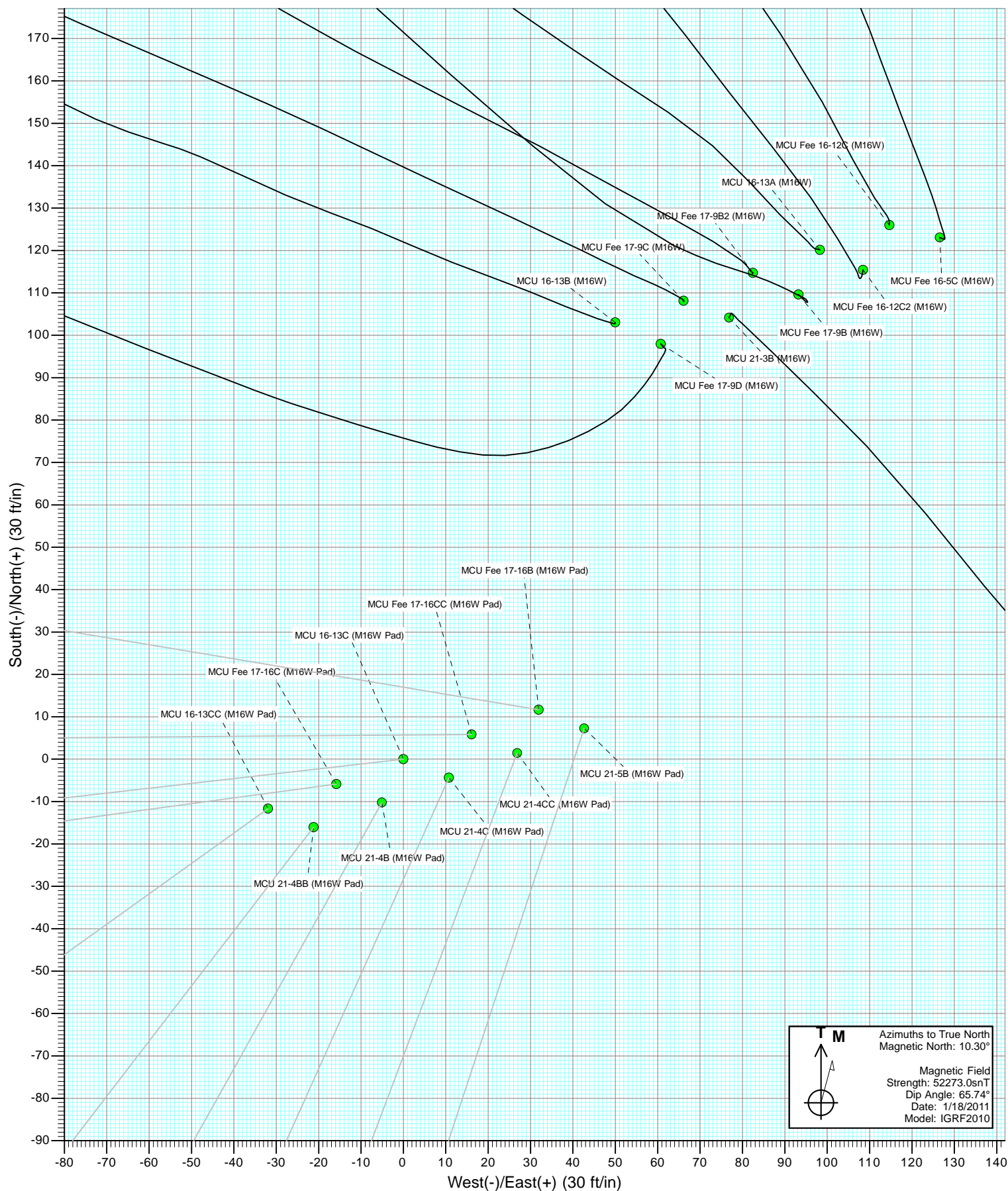
Project: Mamm Creek
Site: M16W Pad (SWSW S16-T7S-R93W)
Well: MCU 16-13CC (M16W Pad)
Wellbore: DD
Design: Plan #1

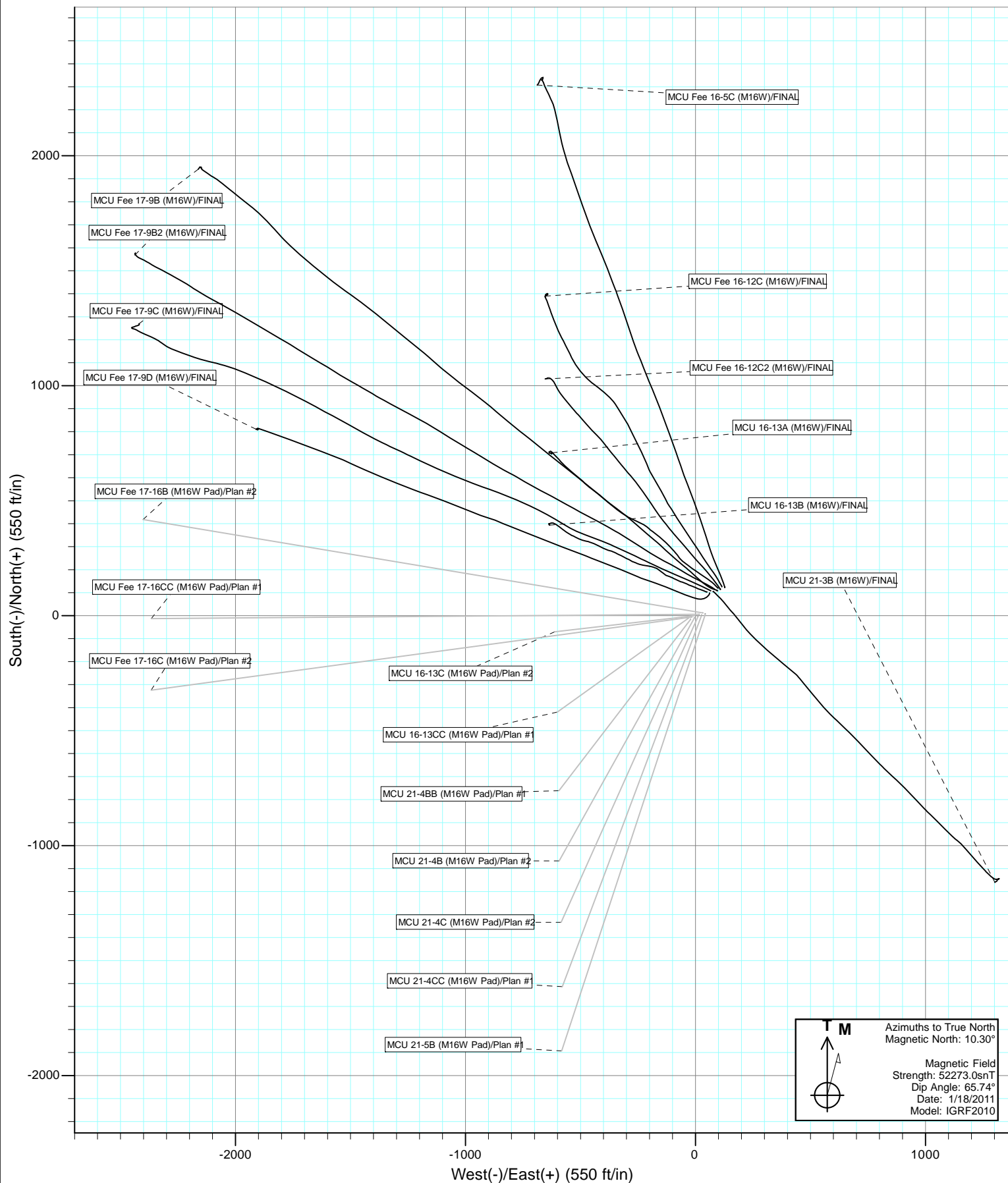


SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	377.6	5.33	234.38	377.3	-4.8	-6.7	3.00	234.38	8.3	
4	7698.9	5.33	234.38	7667.0	-400.7	-559.3	0.00	0.00	688.0	
5	7965.3	0.00	0.00	7933.0	-407.9	-569.4	2.00	180.00	700.4	MCU 16-13CC TGT
6	10040.3	0.00	0.00	10008.0	-407.9	-569.4	0.00	0.00	700.4	MCU 16-13CC BHL (130' FSL & 641' FWL)
7	10140.3	0.00	0.00	10108.0	-407.9	-569.4	0.00	0.00	700.4	

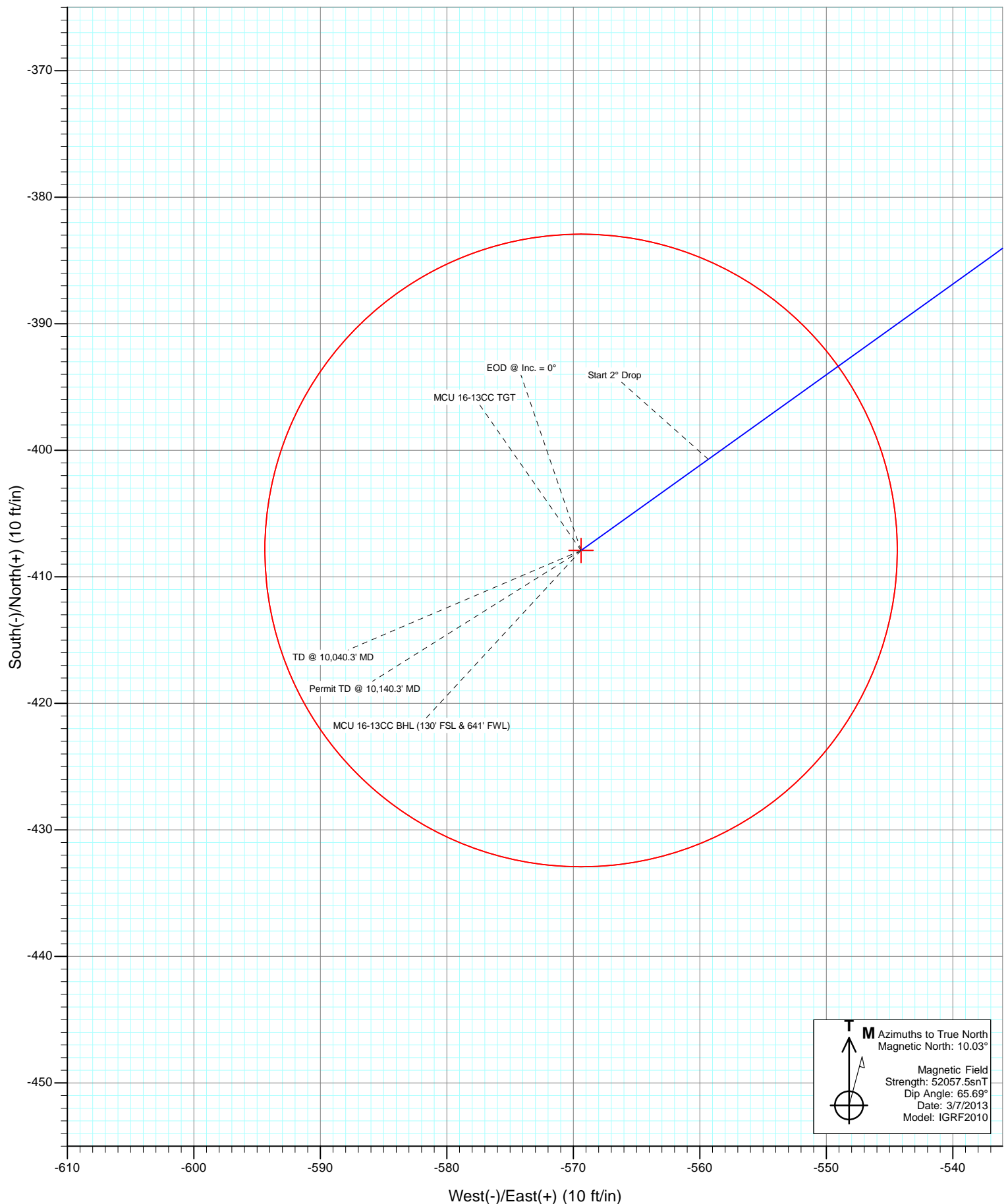








Project: Mamm Creek
Site: M16W Pad (SWSW S16-T7S-R93W)
Well: MCU 16-13CC (M16W Pad)
Wellbore: DD
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well MCU 16-13CC (M16W Pad)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7903.0ft (Patterson 308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7903.0ft (Patterson 308)
Site:	M16W Pad (SWSW S16-T7S-R93W)	North Reference:	True
Well:	MCU 16-13CC (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project	Mamm Creek		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		M16W Pad (SWSW S16-T7S-R93W)			
Site Position:		Northing:	1,593,196.15 ft	Latitude:	39.439834
From:	Lat/Long	Easting:	2,355,193.71 ft	Longitude:	-107.783358
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.44 °

Well	MCU 16-13CC (M16W Pad)					
Well Position	+N/-S	0.0 ft	Northing:	1,593,195.37 ft	Latitude:	39.439830
	+E/-W	0.0 ft	Easting:	2,355,166.85 ft	Longitude:	-107.783453
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,881.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/7/2013	10.03	65.69	52,057

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	234.38

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
377.6	5.33	234.38	377.3	-4.8	-6.7	3.00	3.00	0.00	234.38	
7,698.9	5.33	234.38	7,667.0	-400.7	-559.3	0.00	0.00	0.00	0.00	
7,965.3	0.00	0.00	7,933.0	-407.9	-569.4	2.00	-2.00	0.00	180.00	MCU 16-13CC TGT
10,040.3	0.00	0.00	10,008.0	-407.9	-569.4	0.00	0.00	0.00	0.00	MCU 16-13CC BHL (°)
10,140.3	0.00	0.00	10,108.0	-407.9	-569.4	0.00	0.00	0.00	0.00	

Cathedral Energy Services

Planning Report

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Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7903.0ft (Patterson 308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7903.0ft (Patterson 308)
Site:	M16W Pad (SWSW S16-T7S-R93W)	North Reference:	True
Well:	MCU 16-13CC (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200'
300.0	3.00	234.38	300.0	-1.5	-2.1	2.6	3.00	3.00	
377.6	5.33	234.38	377.3	-4.8	-6.7	8.3	3.00	3.00	EOB @ Inc. = 5.33°
400.0	5.33	234.38	399.6	-6.0	-8.4	10.3	0.00	0.00	
500.0	5.33	234.38	499.2	-11.4	-15.9	19.6	0.00	0.00	
600.0	5.33	234.38	598.8	-16.8	-23.5	28.9	0.00	0.00	
700.0	5.33	234.38	698.4	-22.2	-31.0	38.2	0.00	0.00	
800.0	5.33	234.38	797.9	-27.6	-38.6	47.5	0.00	0.00	
900.0	5.33	234.38	897.5	-33.1	-46.1	56.8	0.00	0.00	
1,000.0	5.33	234.38	997.1	-38.5	-53.7	66.0	0.00	0.00	
1,100.0	5.33	234.38	1,096.6	-43.9	-61.2	75.3	0.00	0.00	
1,103.4	5.33	234.38	1,100.0	-44.1	-61.5	75.6	0.00	0.00	Surface Casing
1,200.0	5.33	234.38	1,196.2	-49.3	-68.8	84.6	0.00	0.00	
1,300.0	5.33	234.38	1,295.8	-54.7	-76.3	93.9	0.00	0.00	
1,400.0	5.33	234.38	1,395.3	-60.1	-83.9	103.2	0.00	0.00	
1,500.0	5.33	234.38	1,494.9	-65.5	-91.4	112.5	0.00	0.00	
1,600.0	5.33	234.38	1,594.5	-70.9	-99.0	121.8	0.00	0.00	
1,700.0	5.33	234.38	1,694.0	-76.3	-106.5	131.0	0.00	0.00	
1,800.0	5.33	234.38	1,793.6	-81.7	-114.1	140.3	0.00	0.00	
1,900.0	5.33	234.38	1,893.2	-87.1	-121.6	149.6	0.00	0.00	
2,000.0	5.33	234.38	1,992.7	-92.5	-129.2	158.9	0.00	0.00	
2,100.0	5.33	234.38	2,092.3	-97.9	-136.7	168.2	0.00	0.00	
2,200.0	5.33	234.38	2,191.9	-103.4	-144.3	177.5	0.00	0.00	
2,300.0	5.33	234.38	2,291.4	-108.8	-151.8	186.8	0.00	0.00	
2,400.0	5.33	234.38	2,391.0	-114.2	-159.4	196.0	0.00	0.00	
2,500.0	5.33	234.38	2,490.6	-119.6	-166.9	205.3	0.00	0.00	
2,600.0	5.33	234.38	2,590.1	-125.0	-174.5	214.6	0.00	0.00	
2,700.0	5.33	234.38	2,689.7	-130.4	-182.0	223.9	0.00	0.00	
2,800.0	5.33	234.38	2,789.3	-135.8	-189.6	233.2	0.00	0.00	
2,900.0	5.33	234.38	2,888.8	-141.2	-197.1	242.5	0.00	0.00	
3,000.0	5.33	234.38	2,988.4	-146.6	-204.6	251.7	0.00	0.00	
3,100.0	5.33	234.38	3,088.0	-152.0	-212.2	261.0	0.00	0.00	
3,200.0	5.33	234.38	3,187.6	-157.4	-219.7	270.3	0.00	0.00	
3,300.0	5.33	234.38	3,287.1	-162.8	-227.3	279.6	0.00	0.00	
3,400.0	5.33	234.38	3,386.7	-168.2	-234.8	288.9	0.00	0.00	
3,500.0	5.33	234.38	3,486.3	-173.7	-242.4	298.2	0.00	0.00	
3,600.0	5.33	234.38	3,585.8	-179.1	-249.9	307.5	0.00	0.00	
3,700.0	5.33	234.38	3,685.4	-184.5	-257.5	316.7	0.00	0.00	
3,800.0	5.33	234.38	3,785.0	-189.9	-265.0	326.0	0.00	0.00	
3,900.0	5.33	234.38	3,884.5	-195.3	-272.6	335.3	0.00	0.00	
4,000.0	5.33	234.38	3,984.1	-200.7	-280.1	344.6	0.00	0.00	
4,100.0	5.33	234.38	4,083.7	-206.1	-287.7	353.9	0.00	0.00	
4,200.0	5.33	234.38	4,183.2	-211.5	-295.2	363.2	0.00	0.00	
4,300.0	5.33	234.38	4,282.8	-216.9	-302.8	372.5	0.00	0.00	
4,400.0	5.33	234.38	4,382.4	-222.3	-310.3	381.7	0.00	0.00	
4,500.0	5.33	234.38	4,481.9	-227.7	-317.9	391.0	0.00	0.00	
4,600.0	5.33	234.38	4,581.5	-233.1	-325.4	400.3	0.00	0.00	
4,700.0	5.33	234.38	4,681.1	-238.5	-333.0	409.6	0.00	0.00	
4,800.0	5.33	234.38	4,780.6	-244.0	-340.5	418.9	0.00	0.00	
4,900.0	5.33	234.38	4,880.2	-249.4	-348.1	428.2	0.00	0.00	

Cathedral Energy Services

Planning Report

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Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7903.0ft (Patterson 308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7903.0ft (Patterson 308)
Site:	M16W Pad (SWSW S16-T7S-R93W)	North Reference:	True
Well:	MCU 16-13CC (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
5,000.0	5.33	234.38	4,979.8	-254.8	-355.6	437.5	0.00	0.00	
5,100.0	5.33	234.38	5,079.3	-260.2	-363.2	446.7	0.00	0.00	
5,200.0	5.33	234.38	5,178.9	-265.6	-370.7	456.0	0.00	0.00	
5,300.0	5.33	234.38	5,278.5	-271.0	-378.3	465.3	0.00	0.00	
5,400.0	5.33	234.38	5,378.0	-276.4	-385.8	474.6	0.00	0.00	
5,500.0	5.33	234.38	5,477.6	-281.8	-393.3	483.9	0.00	0.00	
5,600.0	5.33	234.38	5,577.2	-287.2	-400.9	493.2	0.00	0.00	
5,700.0	5.33	234.38	5,676.8	-292.6	-408.4	502.4	0.00	0.00	
5,800.0	5.33	234.38	5,776.3	-298.0	-416.0	511.7	0.00	0.00	
5,900.0	5.33	234.38	5,875.9	-303.4	-423.5	521.0	0.00	0.00	
6,000.0	5.33	234.38	5,975.5	-308.8	-431.1	530.3	0.00	0.00	
6,100.0	5.33	234.38	6,075.0	-314.2	-438.6	539.6	0.00	0.00	
6,200.0	5.33	234.38	6,174.6	-319.7	-446.2	548.9	0.00	0.00	
6,300.0	5.33	234.38	6,274.2	-325.1	-453.7	558.2	0.00	0.00	
6,342.0	5.33	234.38	6,316.0	-327.3	-456.9	562.1	0.00	0.00	Ohio Creek
6,400.0	5.33	234.38	6,373.7	-330.5	-461.3	567.4	0.00	0.00	
6,500.0	5.33	234.38	6,473.3	-335.9	-468.8	576.7	0.00	0.00	
6,600.0	5.33	234.38	6,572.9	-341.3	-476.4	586.0	0.00	0.00	
6,700.0	5.33	234.38	6,672.4	-346.7	-483.9	595.3	0.00	0.00	
6,800.0	5.33	234.38	6,772.0	-352.1	-491.5	604.6	0.00	0.00	
6,900.0	5.33	234.38	6,871.6	-357.5	-499.0	613.9	0.00	0.00	
7,000.0	5.33	234.38	6,971.1	-362.9	-506.6	623.2	0.00	0.00	
7,100.0	5.33	234.38	7,070.7	-368.3	-514.1	632.4	0.00	0.00	
7,114.4	5.33	234.38	7,085.0	-369.1	-515.2	633.8	0.00	0.00	Williams Fork
7,200.0	5.33	234.38	7,170.3	-373.7	-521.7	641.7	0.00	0.00	
7,300.0	5.33	234.38	7,269.8	-379.1	-529.2	651.0	0.00	0.00	
7,400.0	5.33	234.38	7,369.4	-384.5	-536.8	660.3	0.00	0.00	
7,500.0	5.33	234.38	7,469.0	-390.0	-544.3	669.6	0.00	0.00	
7,600.0	5.33	234.38	7,568.5	-395.4	-551.9	678.9	0.00	0.00	
7,698.9	5.33	234.38	7,667.0	-400.7	-559.3	688.0	0.00	0.00	Start 2° Drop
7,700.0	5.31	234.38	7,668.1	-400.8	-559.4	688.1	2.00	-2.00	
7,800.0	3.31	234.38	7,767.8	-405.1	-565.5	695.7	2.00	-2.00	
7,900.0	1.31	234.38	7,867.7	-407.5	-568.8	699.7	2.00	-2.00	
7,965.3	0.00	0.00	7,933.0	-407.9	-569.4	700.4	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
8,000.0	0.00	0.00	7,967.7	-407.9	-569.4	700.4	0.00	0.00	
8,100.0	0.00	0.00	8,067.7	-407.9	-569.4	700.4	0.00	0.00	
8,200.0	0.00	0.00	8,167.7	-407.9	-569.4	700.4	0.00	0.00	
8,300.0	0.00	0.00	8,267.7	-407.9	-569.4	700.4	0.00	0.00	
8,400.0	0.00	0.00	8,367.7	-407.9	-569.4	700.4	0.00	0.00	
8,500.0	0.00	0.00	8,467.7	-407.9	-569.4	700.4	0.00	0.00	
8,600.0	0.00	0.00	8,567.7	-407.9	-569.4	700.4	0.00	0.00	
8,700.0	0.00	0.00	8,667.7	-407.9	-569.4	700.4	0.00	0.00	
8,800.0	0.00	0.00	8,767.7	-407.9	-569.4	700.4	0.00	0.00	
8,900.0	0.00	0.00	8,867.7	-407.9	-569.4	700.4	0.00	0.00	
9,000.0	0.00	0.00	8,967.7	-407.9	-569.4	700.4	0.00	0.00	
9,094.3	0.00	0.00	9,062.0	-407.9	-569.4	700.4	0.00	0.00	Coal Ridge
9,100.0	0.00	0.00	9,067.7	-407.9	-569.4	700.4	0.00	0.00	
9,200.0	0.00	0.00	9,167.7	-407.9	-569.4	700.4	0.00	0.00	
9,300.0	0.00	0.00	9,267.7	-407.9	-569.4	700.4	0.00	0.00	
9,400.0	0.00	0.00	9,367.7	-407.9	-569.4	700.4	0.00	0.00	
9,500.0	0.00	0.00	9,467.7	-407.9	-569.4	700.4	0.00	0.00	
9,600.0	0.00	0.00	9,567.7	-407.9	-569.4	700.4	0.00	0.00	

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Site:	M16W Pad (SWSW S16-T7S-R93W)	North Reference:	True
Well:	MCU 16-13CC (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
9,700.0	0.00	0.00	9,667.7	-407.9	-569.4	700.4	0.00	0.00	
9,800.0	0.00	0.00	9,767.7	-407.9	-569.4	700.4	0.00	0.00	
9,890.3	0.00	0.00	9,858.0	-407.9	-569.4	700.4	0.00	0.00	Rollins
9,900.0	0.00	0.00	9,867.7	-407.9	-569.4	700.4	0.00	0.00	
10,000.0	0.00	0.00	9,967.7	-407.9	-569.4	700.4	0.00	0.00	
10,040.3	0.00	0.00	10,008.0	-407.9	-569.4	700.4	0.00	0.00	TD @ 10,040.3' MD
10,100.0	0.00	0.00	10,067.7	-407.9	-569.4	700.4	0.00	0.00	
10,140.3	0.00	0.00	10,108.0	-407.9	-569.4	700.4	0.00	0.00	Permit TD @ 10,140.3' MD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
MCU 16-13CC BHL (13C - plan hits target center - Circle (radius 25.0))	0.00	0.00	10,008.0	-407.9	-569.4	1,592,801.89	2,354,587.40	39.438710	-107.785469
MCU 16-13CC TGT - plan hits target center - Point	0.00	0.00	7,933.0	-407.9	-569.4	1,592,801.89	2,354,587.40	39.438710	-107.785469

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,103.4	1,100.0	Surface Casing		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,342.0	6,316.0	Ohio Creek			
7,114.4	7,085.0	Williams Fork			
7,965.3	7,933.0	Top Gas			
9,094.3	9,062.0	Coal Ridge			
9,890.3	9,858.0	Rollins			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
200.0	200.0	0.0	0.0	KOP @ 200'
377.6	377.3	-4.8	-6.7	EOB @ Inc. = 5.33°
7,698.9	7,667.0	-400.7	-559.3	Start 2° Drop
7,965.3	7,933.0	-407.9	-569.4	EOD @ Inc. = 0°
10,040.3	10,008.0	-407.9	-569.4	TD @ 10,040.3' MD
10,140.3	10,108.0	-407.9	-569.4	Permit TD @ 10,140.3' MD