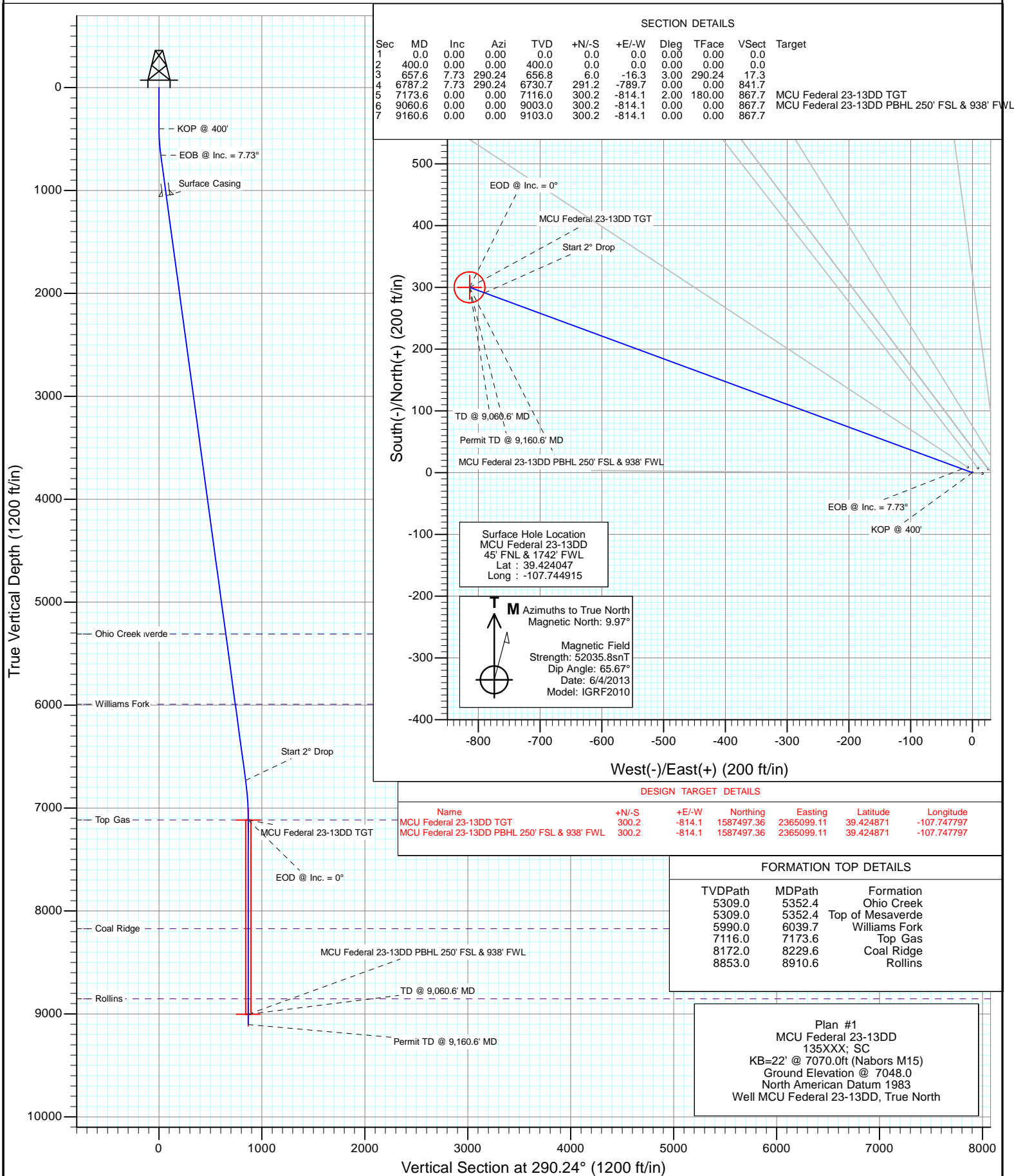
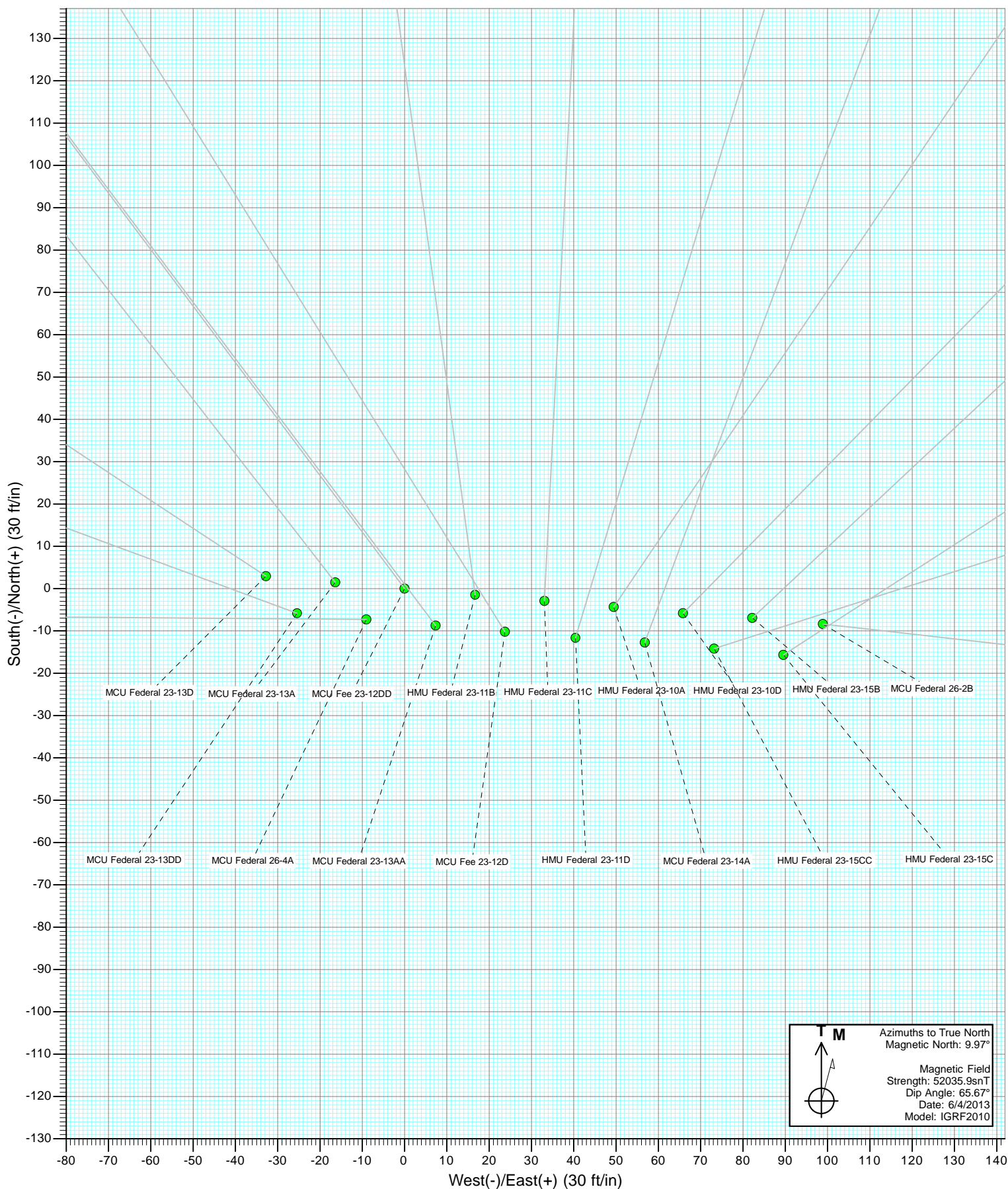
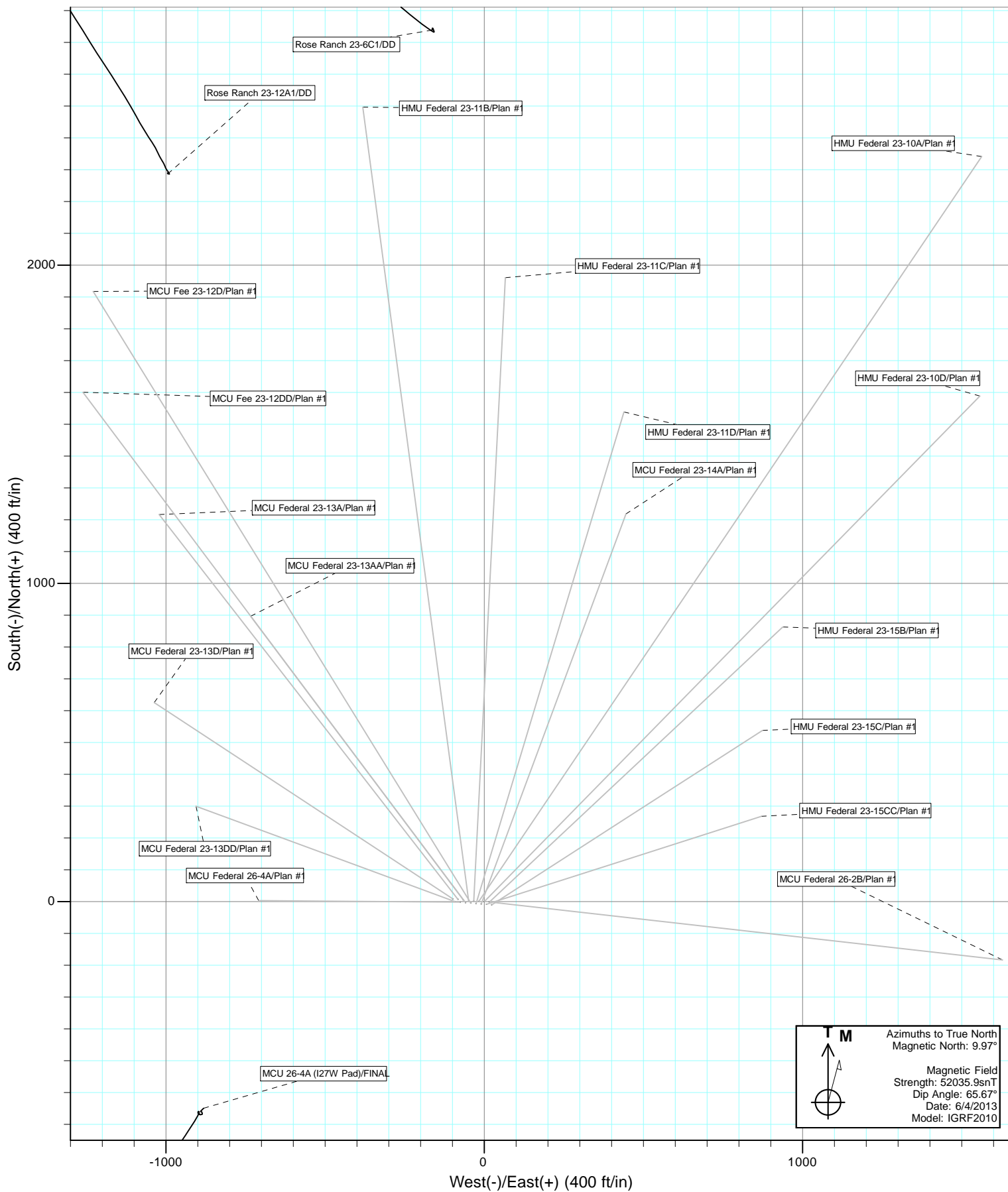




Project: Mamm Creek
Site: C26W Pad
Well: MCU Federal 23-13DD
Wellbore: OH
Design: Plan #1

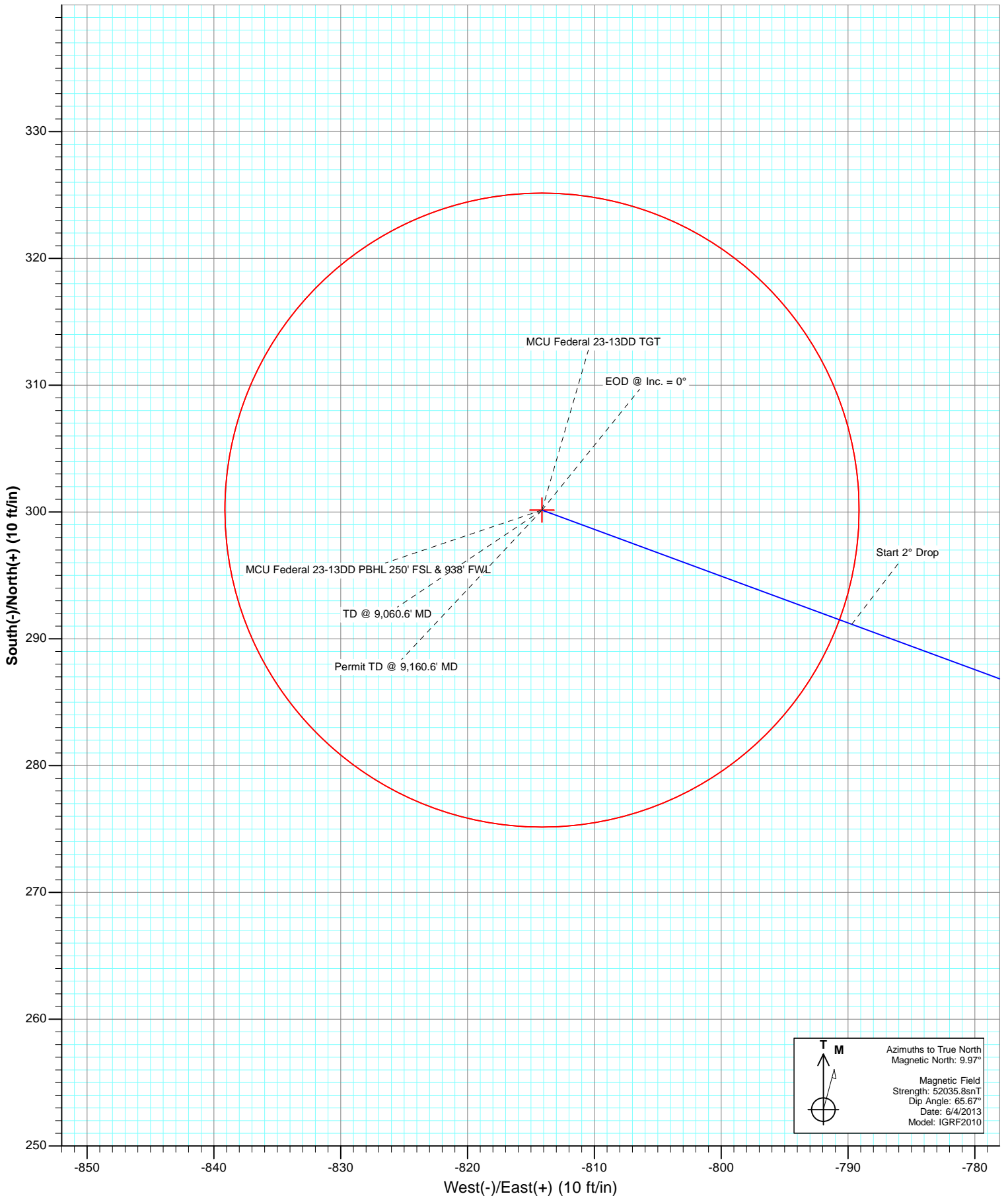








Project: Mamm Creek
Site: C26W Pad
Well: MCU Federal 23-13DD
Wellbore: OH
Plan: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well MCU Federal 23-13DD
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7070.0ft (Nabors M15)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7070.0ft (Nabors M15)
Site:	C26W Pad	North Reference:	True
Well:	MCU Federal 23-13DD	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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		C26W Pad			
Site Position:		Northing:	1,587,164.53 ft	Latitude:	39.424020
From:	Lat/Long	Easting:	2,366,020.27 ft	Longitude:	-107.744508
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.42 °

Well	MCU Federal 23-13DD					
Well Position	+N/-S	0.0 ft	Northing:	1,587,177.19 ft	Latitude:	39.424047
	+E/-W	0.0 ft	Easting:	2,365,905.57 ft	Longitude:	-107.744915
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,048.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/4/2013	9.98	65.67	52,036

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	290.24

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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
657.6	7.73	290.24	656.8	6.0	-16.3	3.00	3.00	0.00	290.24	
6,787.2	7.73	290.24	6,730.7	291.2	-789.7	0.00	0.00	0.00	0.00	
7,173.6	0.00	0.00	7,116.0	300.2	-814.1	2.00	-2.00	0.00	180.00	MCU Federal 23-13D
9,060.6	0.00	0.00	9,003.0	300.2	-814.1	0.00	0.00	0.00	0.00	MCU Federal 23-13D
9,160.6	0.00	0.00	9,103.0	300.2	-814.1	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' @ 7070.0ft (Nabors M15)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7070.0ft (Nabors M15)
Site:	C26W Pad	North Reference:	True
Well:	MCU Federal 23-13DD	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	KOP @ 400'
500.0	3.00	290.24	500.0	0.9	-2.5	2.6	3.00	3.00	
600.0	6.00	290.24	599.6	3.6	-9.8	10.5	3.00	3.00	
657.6	7.73	290.24	656.8	6.0	-16.3	17.3	3.00	3.00	EOB @ Inc. = 7.73°
700.0	7.73	290.24	698.8	8.0	-21.6	23.0	0.00	0.00	
800.0	7.73	290.24	797.9	12.6	-34.2	36.5	0.00	0.00	
900.0	7.73	290.24	897.0	17.3	-46.9	49.9	0.00	0.00	
1,000.0	7.73	290.24	996.1	21.9	-59.5	63.4	0.00	0.00	
1,054.4	7.73	290.24	1,050.0	24.5	-66.3	70.7	0.00	0.00	Surface Casing
1,100.0	7.73	290.24	1,095.2	26.6	-72.1	76.8	0.00	0.00	
1,200.0	7.73	290.24	1,194.3	31.2	-84.7	90.3	0.00	0.00	
1,300.0	7.73	290.24	1,293.4	35.9	-97.3	103.7	0.00	0.00	
1,400.0	7.73	290.24	1,392.5	40.5	-110.0	117.2	0.00	0.00	
1,500.0	7.73	290.24	1,491.6	45.2	-122.6	130.6	0.00	0.00	
1,600.0	7.73	290.24	1,590.7	49.8	-135.2	144.1	0.00	0.00	
1,700.0	7.73	290.24	1,689.8	54.5	-147.8	157.5	0.00	0.00	
1,800.0	7.73	290.24	1,788.8	59.1	-160.4	171.0	0.00	0.00	
1,900.0	7.73	290.24	1,887.9	63.8	-173.0	184.4	0.00	0.00	
2,000.0	7.73	290.24	1,987.0	68.4	-185.7	197.9	0.00	0.00	
2,100.0	7.73	290.24	2,086.1	73.1	-198.3	211.3	0.00	0.00	
2,200.0	7.73	290.24	2,185.2	77.8	-210.9	224.8	0.00	0.00	
2,300.0	7.73	290.24	2,284.3	82.4	-223.5	238.2	0.00	0.00	
2,400.0	7.73	290.24	2,383.4	87.1	-236.1	251.7	0.00	0.00	
2,500.0	7.73	290.24	2,482.5	91.7	-248.7	265.1	0.00	0.00	
2,600.0	7.73	290.24	2,581.6	96.4	-261.4	278.6	0.00	0.00	
2,700.0	7.73	290.24	2,680.7	101.0	-274.0	292.0	0.00	0.00	
2,800.0	7.73	290.24	2,779.8	105.7	-286.6	305.5	0.00	0.00	
2,900.0	7.73	290.24	2,878.8	110.3	-299.2	318.9	0.00	0.00	
3,000.0	7.73	290.24	2,977.9	115.0	-311.8	332.4	0.00	0.00	
3,100.0	7.73	290.24	3,077.0	119.6	-324.5	345.8	0.00	0.00	
3,200.0	7.73	290.24	3,176.1	124.3	-337.1	359.3	0.00	0.00	
3,300.0	7.73	290.24	3,275.2	128.9	-349.7	372.7	0.00	0.00	
3,400.0	7.73	290.24	3,374.3	133.6	-362.3	386.2	0.00	0.00	
3,500.0	7.73	290.24	3,473.4	138.2	-374.9	399.6	0.00	0.00	
3,600.0	7.73	290.24	3,572.5	142.9	-387.5	413.0	0.00	0.00	
3,700.0	7.73	290.24	3,671.6	147.5	-400.2	426.5	0.00	0.00	
3,800.0	7.73	290.24	3,770.7	152.2	-412.8	439.9	0.00	0.00	
3,900.0	7.73	290.24	3,869.8	156.8	-425.4	453.4	0.00	0.00	
4,000.0	7.73	290.24	3,968.9	161.5	-438.0	466.8	0.00	0.00	
4,100.0	7.73	290.24	4,067.9	166.1	-450.6	480.3	0.00	0.00	
4,200.0	7.73	290.24	4,167.0	170.8	-463.3	493.7	0.00	0.00	
4,300.0	7.73	290.24	4,266.1	175.4	-475.9	507.2	0.00	0.00	
4,400.0	7.73	290.24	4,365.2	180.1	-488.5	520.6	0.00	0.00	
4,500.0	7.73	290.24	4,464.3	184.8	-501.1	534.1	0.00	0.00	
4,600.0	7.73	290.24	4,563.4	189.4	-513.7	547.5	0.00	0.00	
4,700.0	7.73	290.24	4,662.5	194.1	-526.3	561.0	0.00	0.00	
4,800.0	7.73	290.24	4,761.6	198.7	-539.0	574.4	0.00	0.00	
4,900.0	7.73	290.24	4,860.7	203.4	-551.6	587.9	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well MCU Federal 23-13DD
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7070.0ft (Nabors M15)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7070.0ft (Nabors M15)
Site:	C26W Pad	North Reference:	True
Well:	MCU Federal 23-13DD	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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	7.73	290.24	4,959.8	208.0	-564.2	601.3	0.00	0.00	
5,100.0	7.73	290.24	5,058.9	212.7	-576.8	614.8	0.00	0.00	
5,200.0	7.73	290.24	5,158.0	217.3	-589.4	628.2	0.00	0.00	
5,300.0	7.73	290.24	5,257.0	222.0	-602.1	641.7	0.00	0.00	
5,352.4	7.73	290.24	5,309.0	224.4	-608.7	648.7	0.00	0.00	Top of Mesaverde - Ohio Creek
5,400.0	7.73	290.24	5,356.1	226.6	-614.7	655.1	0.00	0.00	
5,500.0	7.73	290.24	5,455.2	231.3	-627.3	668.6	0.00	0.00	
5,600.0	7.73	290.24	5,554.3	235.9	-639.9	682.0	0.00	0.00	
5,700.0	7.73	290.24	5,653.4	240.6	-652.5	695.5	0.00	0.00	
5,800.0	7.73	290.24	5,752.5	245.2	-665.1	708.9	0.00	0.00	
5,900.0	7.73	290.24	5,851.6	249.9	-677.8	722.4	0.00	0.00	
6,000.0	7.73	290.24	5,950.7	254.5	-690.4	735.8	0.00	0.00	
6,039.7	7.73	290.24	5,990.0	256.4	-695.4	741.1	0.00	0.00	Williams Fork
6,100.0	7.73	290.24	6,049.8	259.2	-703.0	749.3	0.00	0.00	
6,200.0	7.73	290.24	6,148.9	263.8	-715.6	762.7	0.00	0.00	
6,300.0	7.73	290.24	6,248.0	268.5	-728.2	776.2	0.00	0.00	
6,400.0	7.73	290.24	6,347.1	273.1	-740.9	789.6	0.00	0.00	
6,500.0	7.73	290.24	6,446.1	277.8	-753.5	803.0	0.00	0.00	
6,600.0	7.73	290.24	6,545.2	282.4	-766.1	816.5	0.00	0.00	
6,700.0	7.73	290.24	6,644.3	287.1	-778.7	829.9	0.00	0.00	
6,787.2	7.73	290.24	6,730.7	291.2	-789.7	841.7	0.00	0.00	Start 2° Drop
6,800.0	7.47	290.24	6,743.4	291.7	-791.3	843.4	2.00	-2.00	
6,900.0	5.47	290.24	6,842.8	295.6	-801.9	854.6	2.00	-2.00	
7,000.0	3.47	290.24	6,942.5	298.3	-809.2	862.4	2.00	-2.00	
7,100.0	1.47	290.24	7,042.4	299.8	-813.2	866.7	2.00	-2.00	
7,173.6	0.00	0.00	7,116.0	300.2	-814.1	867.7	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
7,200.0	0.00	0.00	7,142.4	300.2	-814.1	867.7	0.00	0.00	
7,300.0	0.00	0.00	7,242.4	300.2	-814.1	867.7	0.00	0.00	
7,400.0	0.00	0.00	7,342.4	300.2	-814.1	867.7	0.00	0.00	
7,500.0	0.00	0.00	7,442.4	300.2	-814.1	867.7	0.00	0.00	
7,600.0	0.00	0.00	7,542.4	300.2	-814.1	867.7	0.00	0.00	
7,700.0	0.00	0.00	7,642.4	300.2	-814.1	867.7	0.00	0.00	
7,800.0	0.00	0.00	7,742.4	300.2	-814.1	867.7	0.00	0.00	
7,900.0	0.00	0.00	7,842.4	300.2	-814.1	867.7	0.00	0.00	
8,000.0	0.00	0.00	7,942.4	300.2	-814.1	867.7	0.00	0.00	
8,100.0	0.00	0.00	8,042.4	300.2	-814.1	867.7	0.00	0.00	
8,200.0	0.00	0.00	8,142.4	300.2	-814.1	867.7	0.00	0.00	
8,229.6	0.00	0.00	8,172.0	300.2	-814.1	867.7	0.00	0.00	Coal Ridge
8,300.0	0.00	0.00	8,242.4	300.2	-814.1	867.7	0.00	0.00	
8,400.0	0.00	0.00	8,342.4	300.2	-814.1	867.7	0.00	0.00	
8,500.0	0.00	0.00	8,442.4	300.2	-814.1	867.7	0.00	0.00	
8,600.0	0.00	0.00	8,542.4	300.2	-814.1	867.7	0.00	0.00	
8,700.0	0.00	0.00	8,642.4	300.2	-814.1	867.7	0.00	0.00	
8,800.0	0.00	0.00	8,742.4	300.2	-814.1	867.7	0.00	0.00	
8,900.0	0.00	0.00	8,842.4	300.2	-814.1	867.7	0.00	0.00	
8,910.6	0.00	0.00	8,853.0	300.2	-814.1	867.7	0.00	0.00	Rollins
9,000.0	0.00	0.00	8,942.4	300.2	-814.1	867.7	0.00	0.00	
9,060.6	0.00	0.00	9,003.0	300.2	-814.1	867.7	0.00	0.00	TD @ 9,060.6' MD
9,100.0	0.00	0.00	9,042.4	300.2	-814.1	867.7	0.00	0.00	
9,160.6	0.00	0.00	9,103.0	300.2	-814.1	867.7	0.00	0.00	Permit TD @ 9,160.6' MD

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well MCU Federal 23-13DD
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7070.0ft (Nabors M15)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7070.0ft (Nabors M15)
Site:	C26W Pad	North Reference:	True
Well:	MCU Federal 23-13DD	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
MCU Federal 23-13DD 1 - hit/miss target - Shape - Point	0.00	0.00	7,116.0	300.2	-814.1	1,587,497.36	2,365,099.11	39.424871	-107.747797
MCU Federal 23-13DD f - plan hits target center - Circle (radius 25.0)	0.00	0.00	9,003.0	300.2	-814.1	1,587,497.36	2,365,099.11	39.424871	-107.747797

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,054.4	1,050.0	Surface Casing		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,352.4	5,309.0	Ohio Creek			
5,352.4	5,309.0	Top of Mesaverde			
6,039.7	5,990.0	Williams Fork			
7,173.6	7,116.0	Top Gas			
8,229.6	8,172.0	Coal Ridge			
8,910.6	8,853.0	Rollins			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
400.0	400.0	0.0	0.0	KOP @ 400'
657.6	656.8	6.0	-16.3	EOB @ Inc. = 7.73°
6,787.2	6,730.7	291.2	-789.7	Start 2° Drop
7,173.6	7,116.0	300.2	-814.1	EOD @ Inc. = 0°
9,060.6	9,003.0	300.2	-814.1	TD @ 9,060.6' MD
9,160.6	9,103.0	300.2	-814.1	Permit TD @ 9,160.6' MD