

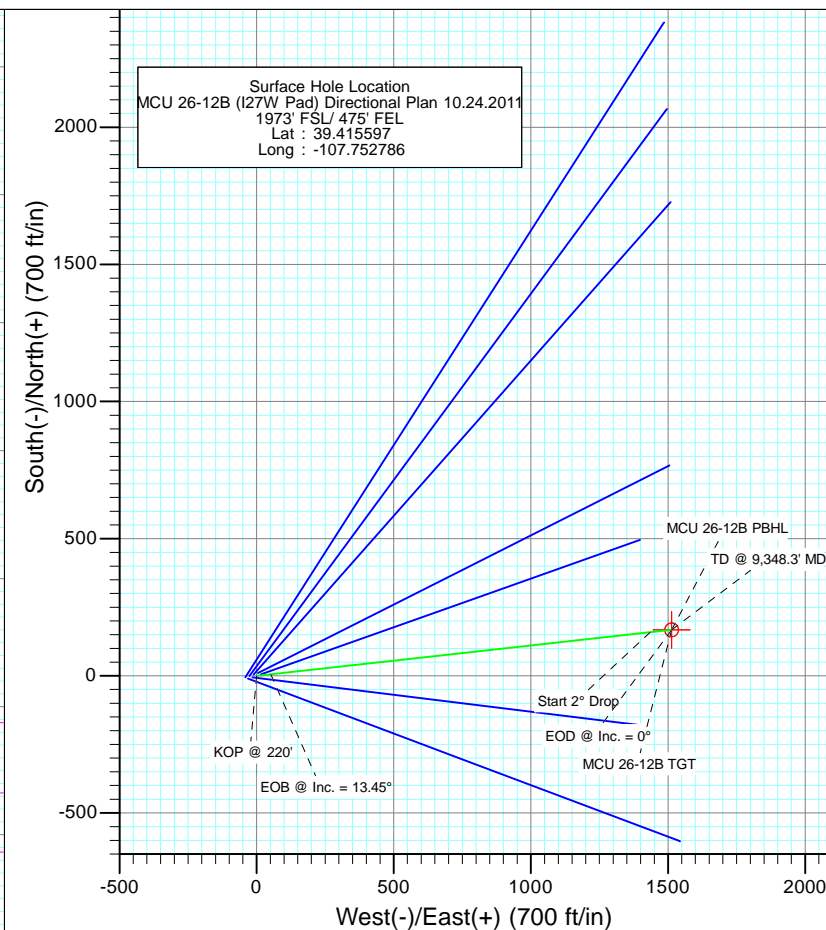
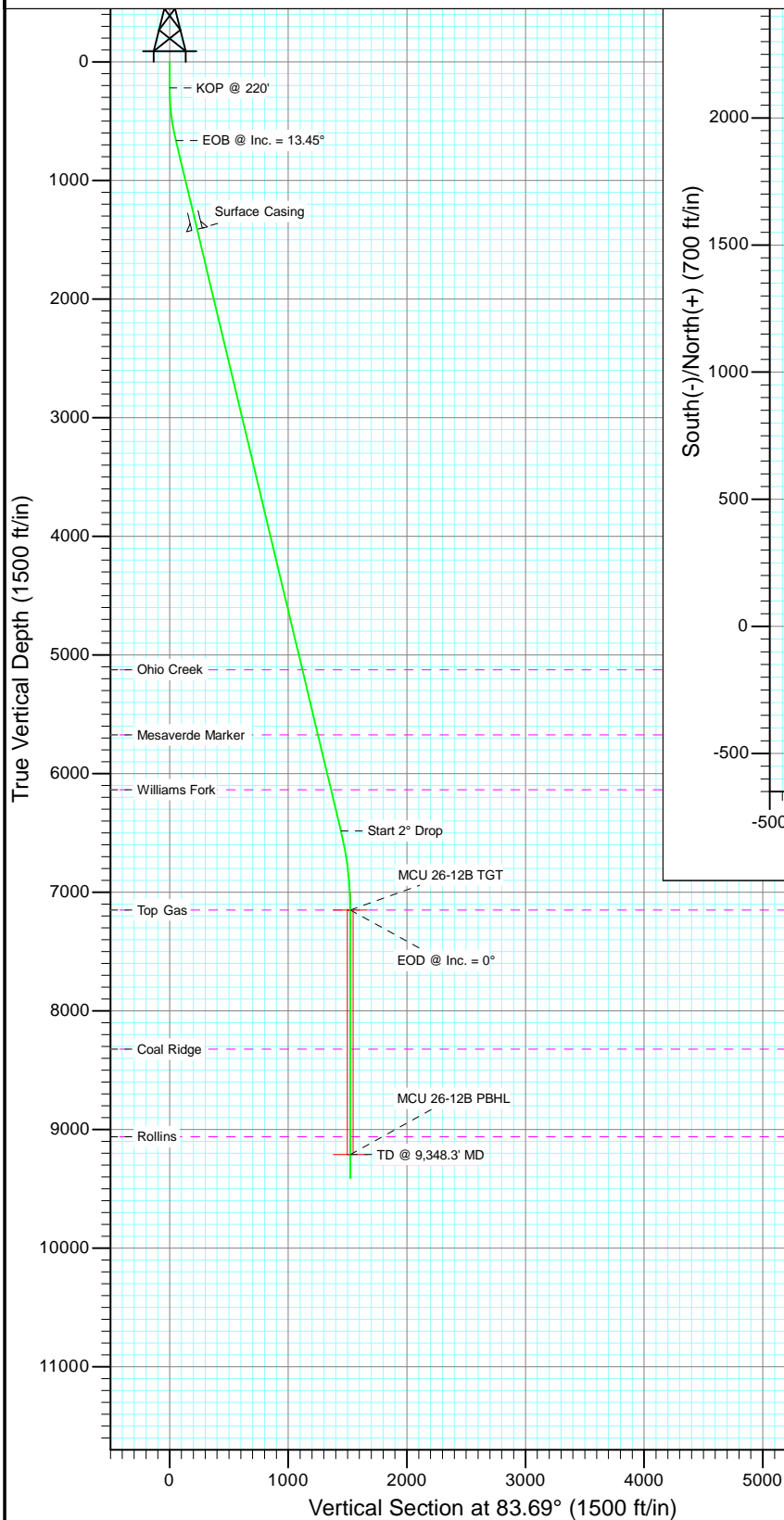


Project: Mamm Creek
 Site: I27W
 Well: MCU 26-12B (I27W Pad) Directional Plan 10.24.2011
 Wellbore: OH
 Design: Plan #2



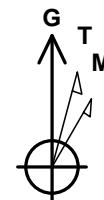
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	220.0	0.00	0.00	220.0	0.0	0.0	0.00	0.00	0.0	
3	668.2	13.45	83.69	664.1	5.8	52.0	3.00	83.69	52.3	
4	6652.0	13.45	83.69	6483.9	158.7	1435.0	0.00	0.00	1443.7	
5	7324.3	0.00	0.00	7150.0	167.3	1513.0	2.00	180.00	1522.2	MCU 26-12B TGT
6	9384.3	0.00	0.00	9210.0	167.3	1513.0	0.00	0.00	1522.2	MCU 26-12B PBHL
7	9584.3	0.00	0.00	9410.0	167.3	1513.0	0.00	0.00	1522.2	



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5125.0	5254.8	Ohio Creek
5674.0	5819.3	Mesaverde Marker
6135.0	6293.3	Williams Fork
7150.0	7324.3	Top Gas
8323.0	8497.3	Coal Ridge
9060.0	9234.3	Rollins



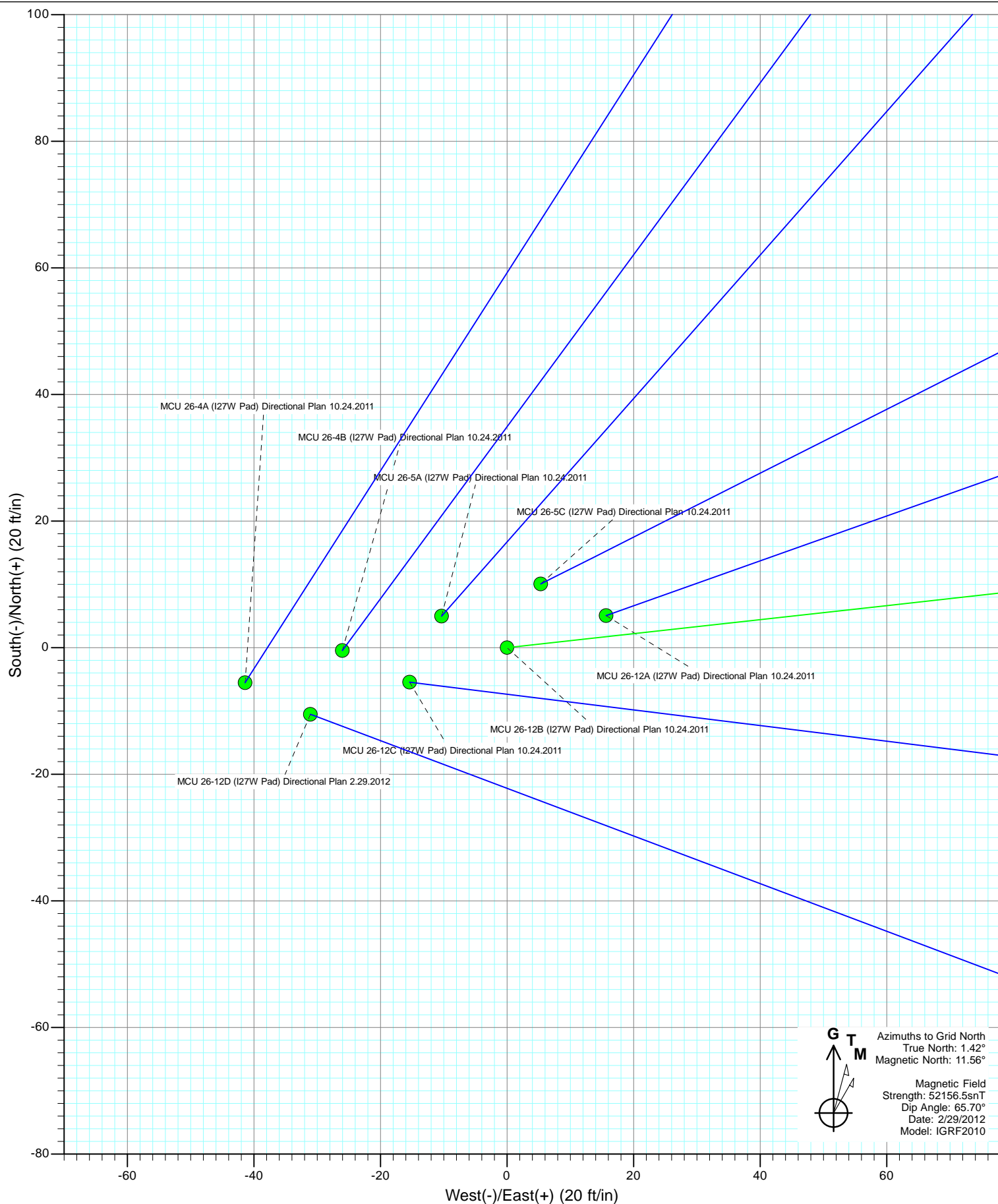
Azimuths to Grid North
 True North: 1.42°
 Magnetic North: 11.56°

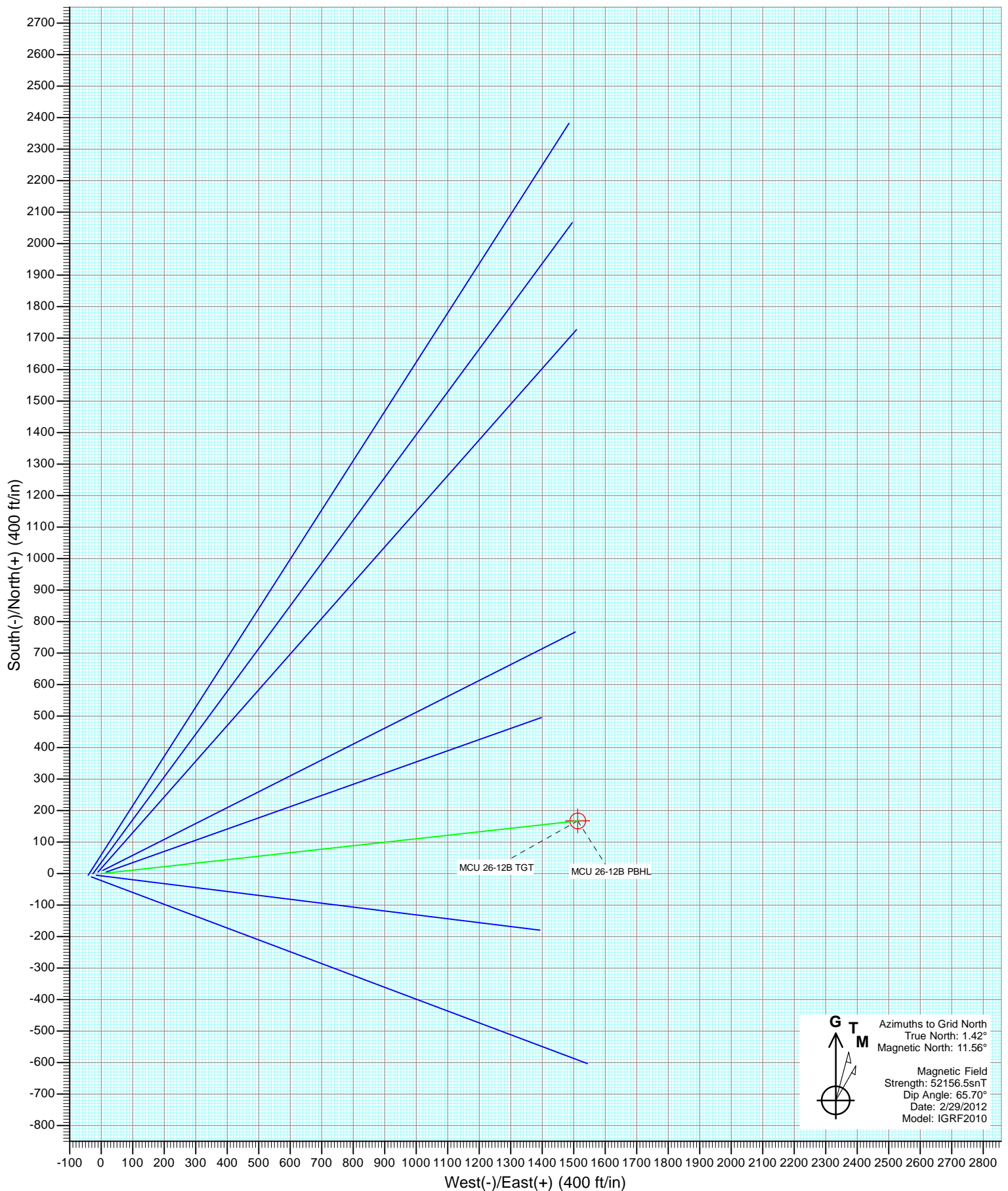
Magnetic Field
 Strength: 52156.5nT
 Dip Angle: 65.70°
 Date: 2/29/2012
 Model: IGRF2010

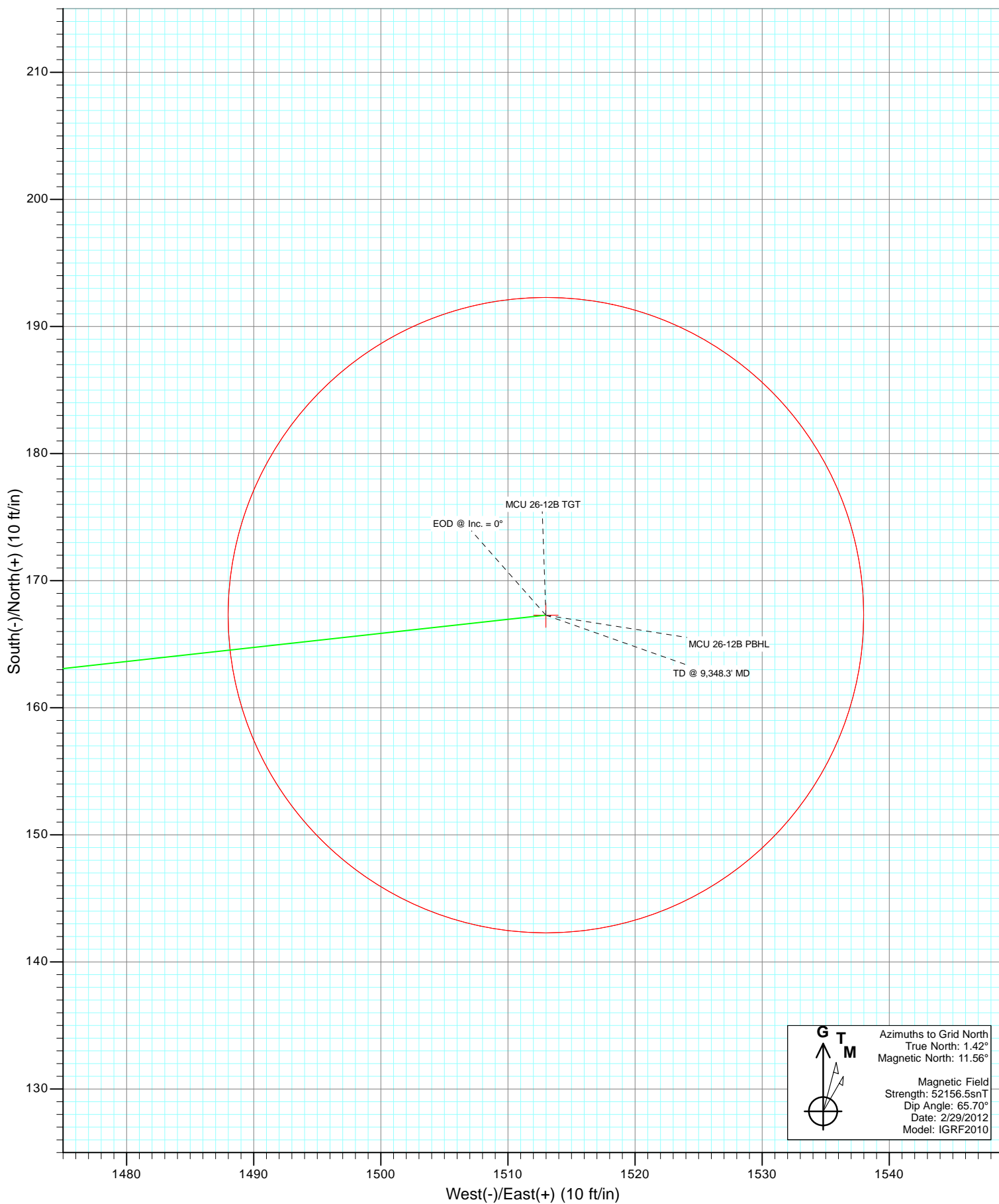
Plan #2
 MCU 26-12B (I27W Pad) Directional Plan 10.24.2011
 125XXX; SC

KBE @ 7223.0ft (Original Well Elev)
 North American Datum 1983
 Well MCU 26-12B (I27W Pad) Directional Plan 10.24.2011, Grid North

Target		Azimuth	Origin Type	N/S	E/W
No Target (Freehand)		83.69	Slot	0.0	0.0
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
MCU 26-12B TGT	7150.0	167.3	1513.0	39.416159	-107.747447
MCU 26-12B PBHL	9210.0	167.3	1513.0	39.416159	-107.747447







Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well MCU 26-12B (I27W Pad) Directional Plan 1
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7223.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7223.0ft (Original Well Elev)
Site:	I27W	North Reference:	Grid
Well:	MCU 26-12B (I27W Pad) Directional Plan 10.24.2011	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

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	I27W			
Site Position:		Northing:	1,584,160.49 ft	Latitude: 39.415612
From:	Lat/Long	Easting:	2,363,622.14 ft	Longitude: -107.752731
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: -1.42 °

Well	MCU 26-12B (I27W Pad) Directional Plan 10.24.2011			
Well Position	+N/-S	0.0 ft	Northing:	1,584,155.41 ft
	+E/-W	0.0 ft	Easting:	2,363,606.47 ft
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft
			Ground Level:	7,201.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/29/2012	10.14	65.70	52,156

Design	Plan #2			
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	83.69

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	
220.0	0.00	0.00	220.0	0.0	0.0	0.00	0.00	0.00	0.00	
668.2	13.45	83.69	664.1	5.8	52.0	3.00	3.00	0.00	83.69	
6,652.0	13.45	83.69	6,483.9	158.7	1,435.0	0.00	0.00	0.00	0.00	
7,324.3	0.00	0.00	7,150.0	167.3	1,513.0	2.00	-2.00	0.00	180.00	MCU 26-12B TGT
9,384.3	0.00	0.00	9,210.0	167.3	1,513.0	0.00	0.00	0.00	0.00	MCU 26-12B PBHL
9,584.3	0.00	0.00	9,410.0	167.3	1,513.0	0.00	0.00	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well MCU 26-12B (I27W Pad) Directional Plan 1
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7223.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7223.0ft (Original Well Elev)
Site:	I27W	North Reference:	Grid
Well:	MCU 26-12B (I27W Pad) Directional Plan 10.24.2011	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

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	
220.0	0.00	0.00	220.0	0.0	0.0	0.0	0.00	0.00	KOP @ 220'
300.0	2.40	83.69	300.0	0.2	1.7	1.7	3.00	3.00	
400.0	5.40	83.69	399.7	0.9	8.4	8.5	3.00	3.00	
500.0	8.40	83.69	499.0	2.3	20.4	20.5	3.00	3.00	
600.0	11.40	83.69	597.5	4.1	37.5	37.7	3.00	3.00	
668.2	13.45	83.69	664.1	5.8	52.0	52.3	3.00	3.00	EOB @ Inc. = 13.45°
700.0	13.45	83.69	695.0	6.6	59.4	59.7	0.00	0.00	
800.0	13.45	83.69	792.3	9.1	82.5	83.0	0.00	0.00	
900.0	13.45	83.69	889.5	11.7	105.6	106.2	0.00	0.00	
1,000.0	13.45	83.69	986.8	14.2	128.7	129.5	0.00	0.00	
1,100.0	13.45	83.69	1,084.1	16.8	151.8	152.8	0.00	0.00	
1,200.0	13.45	83.69	1,181.3	19.3	174.9	176.0	0.00	0.00	
1,300.0	13.45	83.69	1,278.6	21.9	198.0	199.3	0.00	0.00	
1,400.0	13.45	83.69	1,375.8	24.5	221.2	222.5	0.00	0.00	
1,438.1	13.45	83.69	1,412.9	25.4	230.0	231.4	0.00	0.00	Surface Casing
1,500.0	13.45	83.69	1,473.1	27.0	244.3	245.8	0.00	0.00	
1,600.0	13.45	83.69	1,570.4	29.6	267.4	269.0	0.00	0.00	
1,700.0	13.45	83.69	1,667.6	32.1	290.5	292.3	0.00	0.00	
1,800.0	13.45	83.69	1,764.9	34.7	313.6	315.5	0.00	0.00	
1,900.0	13.45	83.69	1,862.1	37.2	336.7	338.8	0.00	0.00	
2,000.0	13.45	83.69	1,959.4	39.8	359.8	362.0	0.00	0.00	
2,100.0	13.45	83.69	2,056.7	42.3	382.9	385.3	0.00	0.00	
2,200.0	13.45	83.69	2,153.9	44.9	406.0	408.5	0.00	0.00	
2,300.0	13.45	83.69	2,251.2	47.5	429.2	431.8	0.00	0.00	
2,400.0	13.45	83.69	2,348.4	50.0	452.3	455.0	0.00	0.00	
2,500.0	13.45	83.69	2,445.7	52.6	475.4	478.3	0.00	0.00	
2,600.0	13.45	83.69	2,543.0	55.1	498.5	501.5	0.00	0.00	
2,700.0	13.45	83.69	2,640.2	57.7	521.6	524.8	0.00	0.00	
2,800.0	13.45	83.69	2,737.5	60.2	544.7	548.0	0.00	0.00	
2,900.0	13.45	83.69	2,834.7	62.8	567.8	571.3	0.00	0.00	
3,000.0	13.45	83.69	2,932.0	65.3	590.9	594.5	0.00	0.00	
3,100.0	13.45	83.69	3,029.2	67.9	614.0	617.8	0.00	0.00	
3,200.0	13.45	83.69	3,126.5	70.4	637.2	641.0	0.00	0.00	
3,300.0	13.45	83.69	3,223.8	73.0	660.3	664.3	0.00	0.00	
3,400.0	13.45	83.69	3,321.0	75.6	683.4	687.5	0.00	0.00	
3,500.0	13.45	83.69	3,418.3	78.1	706.5	710.8	0.00	0.00	
3,600.0	13.45	83.69	3,515.5	80.7	729.6	734.0	0.00	0.00	
3,700.0	13.45	83.69	3,612.8	83.2	752.7	757.3	0.00	0.00	
3,800.0	13.45	83.69	3,710.1	85.8	775.8	780.6	0.00	0.00	
3,900.0	13.45	83.69	3,807.3	88.3	798.9	803.8	0.00	0.00	
4,000.0	13.45	83.69	3,904.6	90.9	822.0	827.1	0.00	0.00	
4,100.0	13.45	83.69	4,001.8	93.4	845.2	850.3	0.00	0.00	
4,200.0	13.45	83.69	4,099.1	96.0	868.3	873.6	0.00	0.00	
4,300.0	13.45	83.69	4,196.4	98.6	891.4	896.8	0.00	0.00	
4,400.0	13.45	83.69	4,293.6	101.1	914.5	920.1	0.00	0.00	
4,500.0	13.45	83.69	4,390.9	103.7	937.6	943.3	0.00	0.00	
4,600.0	13.45	83.69	4,488.1	106.2	960.7	966.6	0.00	0.00	
4,700.0	13.45	83.69	4,585.4	108.8	983.8	989.8	0.00	0.00	
4,800.0	13.45	83.69	4,682.7	111.3	1,006.9	1,013.1	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well MCU 26-12B (I27W Pad) Directional Plan 1
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7223.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7223.0ft (Original Well Elev)
Site:	I27W	North Reference:	Grid
Well:	MCU 26-12B (I27W Pad) Directional Plan 10.24.2011	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

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
4,900.0	13.45	83.69	4,779.9	113.9	1,030.0	1,036.3	0.00	0.00	
5,000.0	13.45	83.69	4,877.2	116.4	1,053.2	1,059.6	0.00	0.00	
5,100.0	13.45	83.69	4,974.4	119.0	1,076.3	1,082.8	0.00	0.00	
5,200.0	13.45	83.69	5,071.7	121.6	1,099.4	1,106.1	0.00	0.00	
5,254.8	13.45	83.69	5,125.0	123.0	1,112.0	1,118.8	0.00	0.00	Ohio Creek
5,300.0	13.45	83.69	5,168.9	124.1	1,122.5	1,129.3	0.00	0.00	
5,400.0	13.45	83.69	5,266.2	126.7	1,145.6	1,152.6	0.00	0.00	
5,500.0	13.45	83.69	5,363.5	129.2	1,168.7	1,175.8	0.00	0.00	
5,600.0	13.45	83.69	5,460.7	131.8	1,191.8	1,199.1	0.00	0.00	
5,700.0	13.45	83.69	5,558.0	134.3	1,214.9	1,222.3	0.00	0.00	
5,800.0	13.45	83.69	5,655.2	136.9	1,238.0	1,245.6	0.00	0.00	
5,819.3	13.45	83.69	5,674.0	137.4	1,242.5	1,250.1	0.00	0.00	Mesaverde Marker
5,900.0	13.45	83.69	5,752.5	139.4	1,261.2	1,268.8	0.00	0.00	
6,000.0	13.45	83.69	5,849.8	142.0	1,284.3	1,292.1	0.00	0.00	
6,100.0	13.45	83.69	5,947.0	144.6	1,307.4	1,315.3	0.00	0.00	
6,200.0	13.45	83.69	6,044.3	147.1	1,330.5	1,338.6	0.00	0.00	
6,293.3	13.45	83.69	6,135.0	149.5	1,352.0	1,360.3	0.00	0.00	Williams Fork
6,300.0	13.45	83.69	6,141.5	149.7	1,353.6	1,361.9	0.00	0.00	
6,400.0	13.45	83.69	6,238.8	152.2	1,376.7	1,385.1	0.00	0.00	
6,500.0	13.45	83.69	6,336.1	154.8	1,399.8	1,408.4	0.00	0.00	
6,600.0	13.45	83.69	6,433.3	157.3	1,422.9	1,431.6	0.00	0.00	
6,652.0	13.45	83.69	6,483.9	158.7	1,435.0	1,443.7	0.00	0.00	Start 2° Drop
6,700.0	12.49	83.69	6,530.7	159.8	1,445.7	1,454.5	2.00	-2.00	
6,800.0	10.49	83.69	6,628.7	162.0	1,465.4	1,474.4	2.00	-2.00	
6,900.0	8.49	83.69	6,727.3	163.8	1,481.8	1,490.9	2.00	-2.00	
7,000.0	6.49	83.69	6,826.4	165.3	1,494.8	1,503.9	2.00	-2.00	
7,100.0	4.49	83.69	6,926.0	166.3	1,504.3	1,513.4	2.00	-2.00	
7,200.0	2.49	83.69	7,025.8	167.0	1,510.3	1,519.5	2.00	-2.00	
7,300.0	0.49	83.69	7,125.7	167.3	1,512.9	1,522.1	2.00	-2.00	
7,324.3	0.00	0.00	7,150.0	167.3	1,513.0	1,522.2	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
7,400.0	0.00	0.00	7,225.7	167.3	1,513.0	1,522.2	0.00	0.00	
7,500.0	0.00	0.00	7,325.7	167.3	1,513.0	1,522.2	0.00	0.00	
7,600.0	0.00	0.00	7,425.7	167.3	1,513.0	1,522.2	0.00	0.00	
7,700.0	0.00	0.00	7,525.7	167.3	1,513.0	1,522.2	0.00	0.00	
7,800.0	0.00	0.00	7,625.7	167.3	1,513.0	1,522.2	0.00	0.00	
7,900.0	0.00	0.00	7,725.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,000.0	0.00	0.00	7,825.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,100.0	0.00	0.00	7,925.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,200.0	0.00	0.00	8,025.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,300.0	0.00	0.00	8,125.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,400.0	0.00	0.00	8,225.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,497.3	0.00	0.00	8,323.0	167.3	1,513.0	1,522.2	0.00	0.00	Coal Ridge
8,500.0	0.00	0.00	8,325.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,600.0	0.00	0.00	8,425.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,700.0	0.00	0.00	8,525.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,800.0	0.00	0.00	8,625.7	167.3	1,513.0	1,522.2	0.00	0.00	
8,900.0	0.00	0.00	8,725.7	167.3	1,513.0	1,522.2	0.00	0.00	
9,000.0	0.00	0.00	8,825.7	167.3	1,513.0	1,522.2	0.00	0.00	
9,100.0	0.00	0.00	8,925.7	167.3	1,513.0	1,522.2	0.00	0.00	
9,200.0	0.00	0.00	9,025.7	167.3	1,513.0	1,522.2	0.00	0.00	
9,234.3	0.00	0.00	9,060.0	167.3	1,513.0	1,522.2	0.00	0.00	Rollins
9,300.0	0.00	0.00	9,125.7	167.3	1,513.0	1,522.2	0.00	0.00	

Cathedral Energy Services

Planning Report

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Wellbore:	OH		
Design:	Plan #2		

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
9,384.3	0.00	0.00	9,210.0	167.3	1,513.0	1,522.2	0.00	0.00	TD @ 9,348.3' MD
9,400.0	0.00	0.00	9,225.7	167.3	1,513.0	1,522.2	0.00	0.00	
9,500.0	0.00	0.00	9,325.7	167.3	1,513.0	1,522.2	0.00	0.00	
9,584.3	0.00	0.00	9,410.0	167.3	1,513.0	1,522.2	0.00	0.00	Permit TD @ 9,584.3' MD

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
MCU 26-12B TGT	0.00	360.00	7,150.0	167.3	1,513.0	1,584,322.69	2,365,119.46	39.416159	-107.747447
- hit/miss target									
- Shape									
- Point									
MCU 26-12B PBHL	0.00	360.00	9,210.0	167.3	1,513.0	1,584,322.69	2,365,119.46	39.416159	-107.747447
- plan hits target center									
- Circle (radius 25.0)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,438.1	1,412.9	Surface Casing	5.500	6.000	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
5,254.8	5,125.0	Ohio Creek				
5,819.3	5,674.0	Mesaverde Marker				
6,293.3	6,135.0	Williams Fork				
7,324.3	7,150.0	Top Gas				
8,497.3	8,323.0	Coal Ridge				
9,234.3	9,060.0	Rollins				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
220.0	220.0	0.0	0.0	KOP @ 220'	
668.2	664.1	5.8	52.0	EOB @ Inc. = 13.45°	
6,652.0	6,483.9	158.7	1,435.0	Start 2° Drop	
7,324.3	7,150.0	167.3	1,513.0	EOD @ Inc. = 0°	
9,384.3	9,210.0	167.3	1,513.0	TD @ 9,348.3' MD	
9,584.3	9,410.0	167.3	1,513.0	Permit TD @ 9,584.3' MD	