

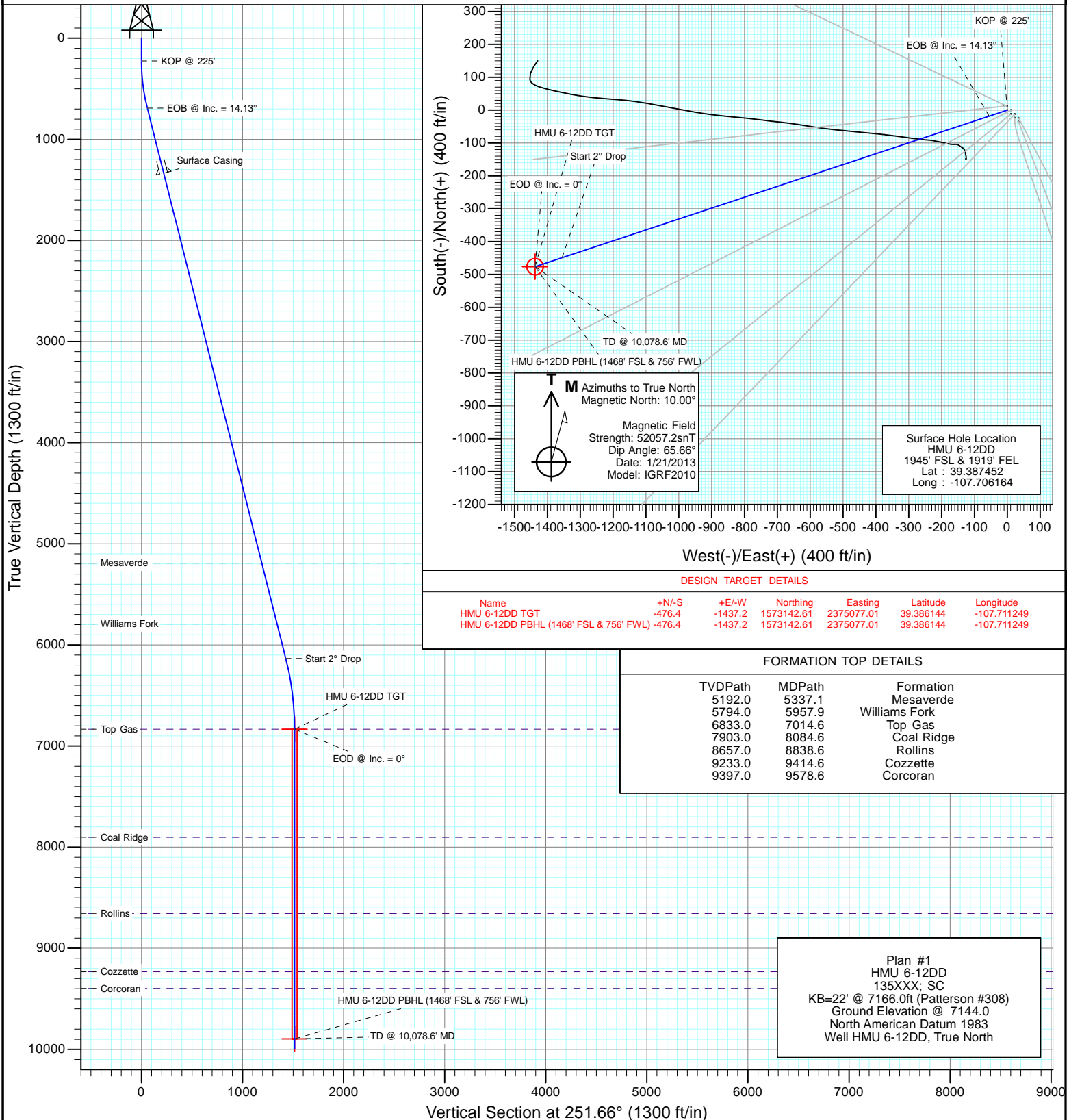


Project: Mamm Creek
Site: J6SEB Pad
Well: HMU 6-12DD
Wellbore: OH
Design: Plan #1



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	225.0	0.00	0.00	225.0	0.0	0.0	0.00	0.00	0.0	
3	695.9	14.13	251.66	691.1	-18.2	-54.8	3.00	251.66	57.8	
4	6308.3	14.13	251.66	6133.8	-449.1	-1355.0	0.00	0.00	1427.5	
5	7014.6	0.00	0.00	6833.0	-476.4	-1437.2	2.00	180.00	1514.1	HMU 6-12DD TGT
6	10078.6	0.00	0.00	9897.0	-476.4	-1437.2	0.00	0.00	1514.1	HMU 6-12DD PBHL (1468' FSL & 756' FWL)
7	10178.6	0.00	0.00	9997.0	-476.4	-1437.2	0.00	0.00	1514.1	



DESIGN TARGET DETAILS

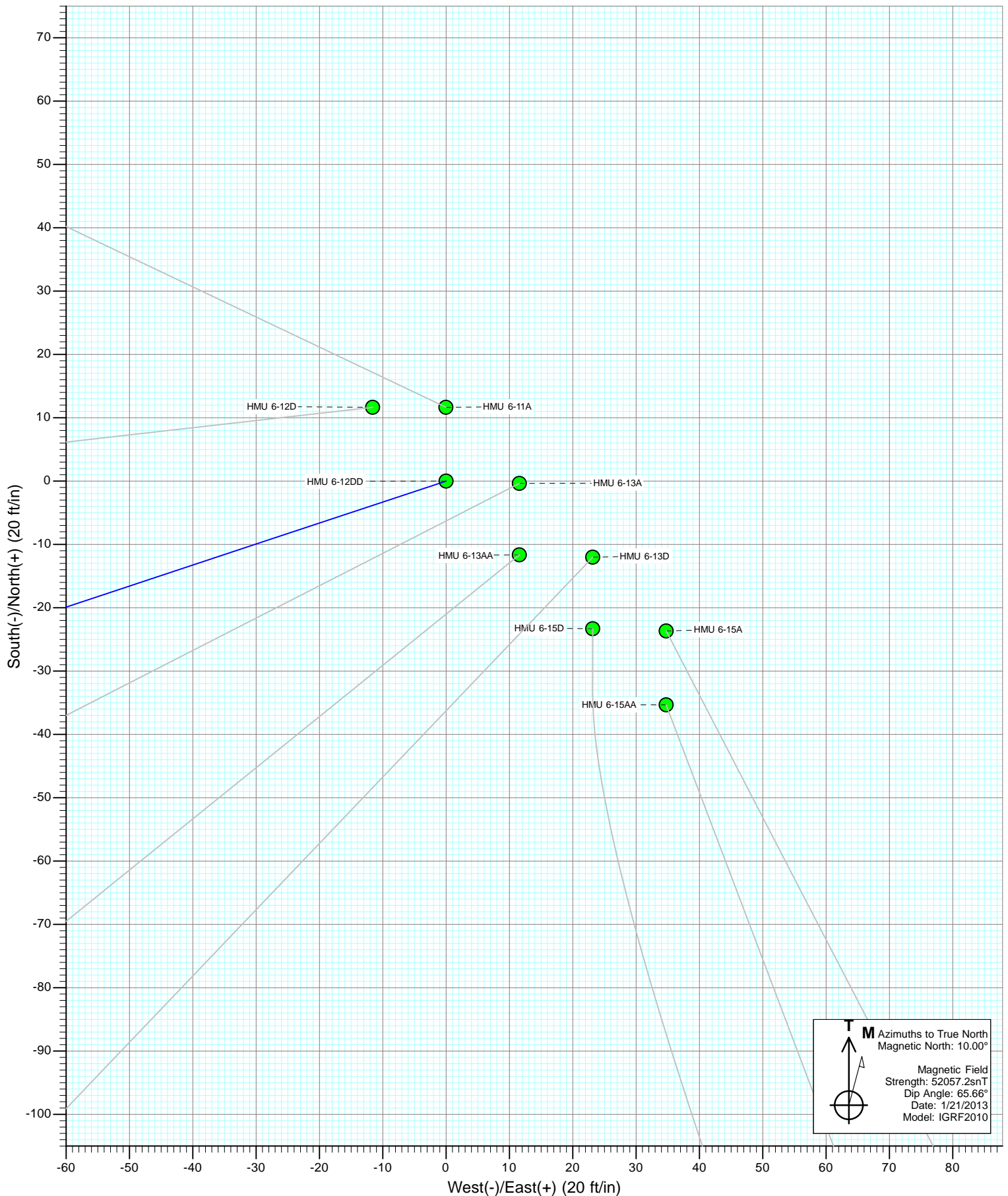
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
HMU 6-12DD TGT	-476.4	-1437.2	1573142.61	2375077.01	39.386144	-107.711249
HMU 6-12DD PBHL (1468' FSL & 756' FWL)	-476.4	-1437.2	1573142.61	2375077.01	39.386144	-107.711249

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5192.0	5337.1	Mesaverde
5794.0	5957.9	Williams Fork
6833.0	7014.6	Top Gas
7903.0	8084.6	Coal Ridge
8657.0	8838.6	Rollins
9233.0	9414.6	Cozzette
9397.0	9578.6	Corcoran

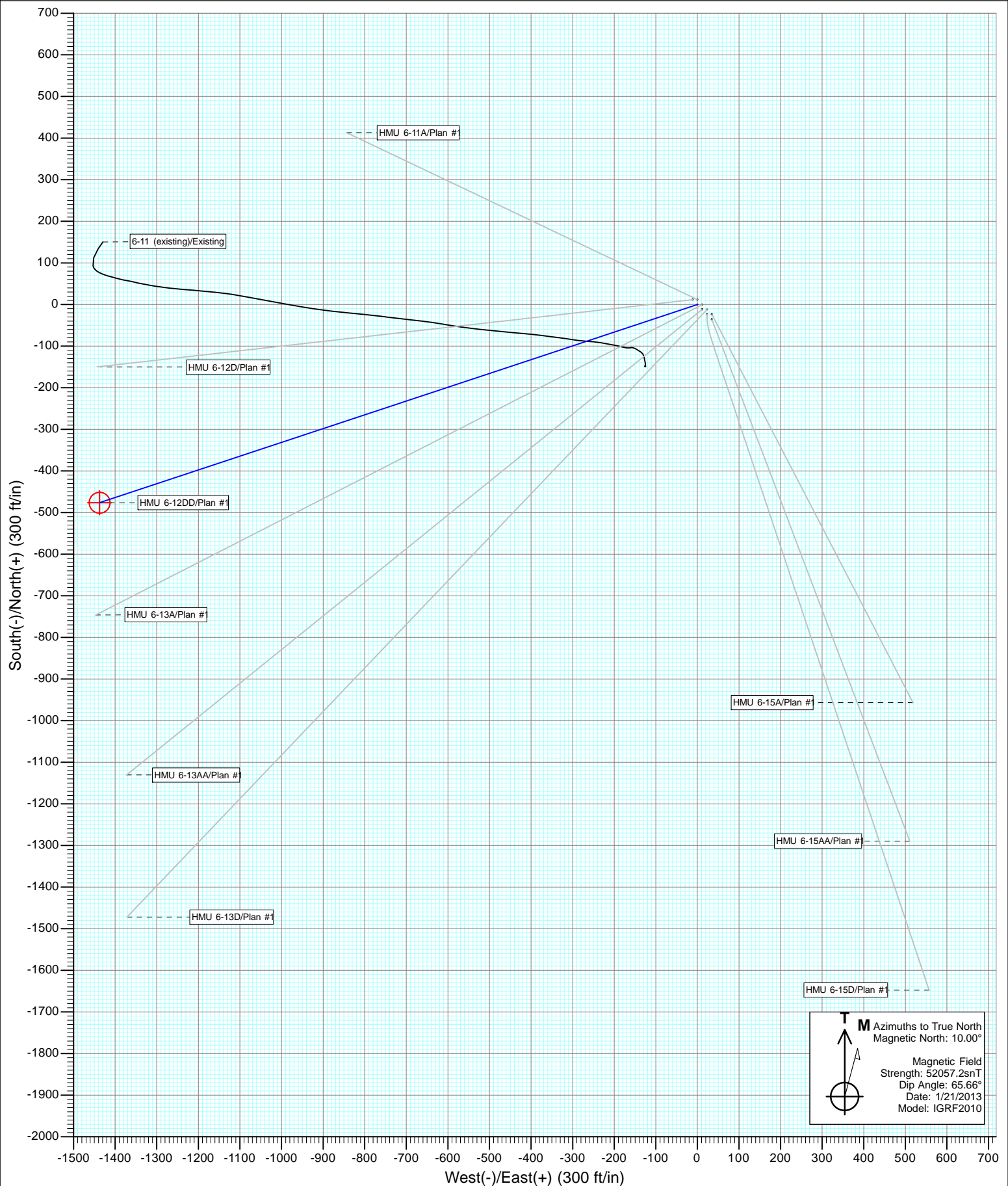


Project: Mamm Creek
Site: J6SEB Pad
Well: HMU 6-12DD
Wellbore: OH
Design: Plan #1



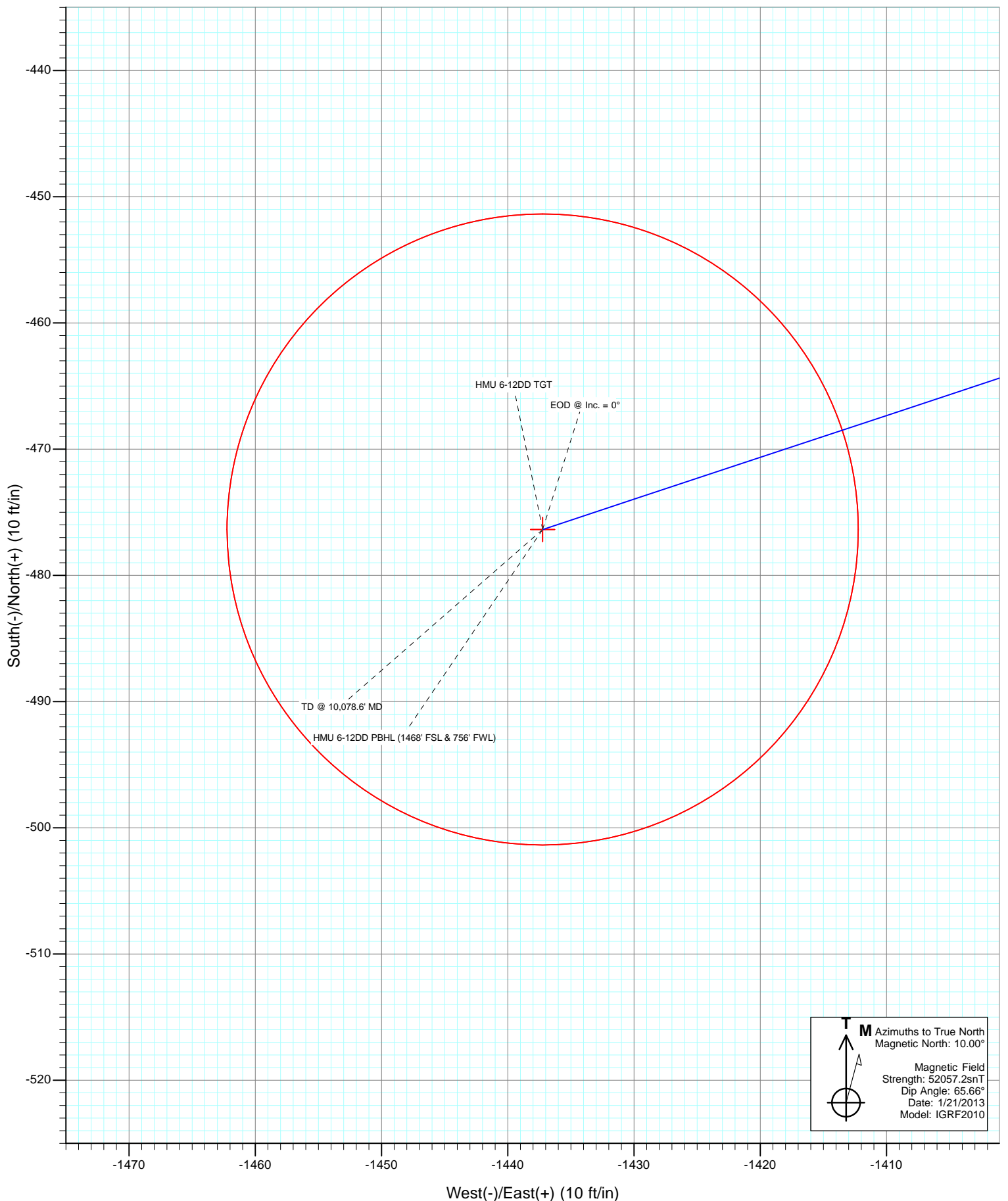


Project: Mamm Creek
Site: J6SEB Pad
Well: HMU 6-12DD
Wellbore: OH
Design: Plan #1





Project: Mamm Creek
Site: J6SEB Pad
Well: HMU 6-12DD
Wellbore: OH
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well HMU 6-12DD
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-12DD	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		J6SEB Pad			
Site Position:		Northing:	1,573,595.87 ft	Latitude:	39.387484
From:	Lat/Long	Easting:	2,376,514.08 ft	Longitude:	-107.706205
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.39 °

Well	HMU 6-12DD					
Well Position	+N/-S	0.0 ft	Northing:	1,573,583.93 ft	Latitude:	39.387452
	+E/-W	0.0 ft	Easting:	2,376,525.38 ft	Longitude:	-107.706164
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,144.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	1/21/2013	10.00	65.66	52,057

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	251.66

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	(°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
225.0	0.00	0.00	225.0	0.0	0.0	0.00	0.00	0.00	0.00	
695.9	14.13	251.66	691.1	-18.2	-54.8	3.00	3.00	0.00	251.66	
6,308.3	14.13	251.66	6,133.8	-449.1	-1,355.0	0.00	0.00	0.00	0.00	
7,014.6	0.00	0.00	6,833.0	-476.4	-1,437.2	2.00	-2.00	0.00	180.00	HMU 6-12DD TGT
10,078.6	0.00	0.00	9,897.0	-476.4	-1,437.2	0.00	0.00	0.00	0.00	HMU 6-12DD PBHL (
10,178.6	0.00	0.00	9,997.0	-476.4	-1,437.2	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' @ 7166.0ft (Patterson #308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-12DD	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	
225.0	0.00	0.00	225.0	0.0	0.0	0.0	0.00	0.00	KOP @ 225'
300.0	2.25	251.66	300.0	-0.5	-1.4	1.5	3.00	3.00	
400.0	5.25	251.66	399.8	-2.5	-7.6	8.0	3.00	3.00	
500.0	8.25	251.66	499.1	-6.2	-18.8	19.8	3.00	3.00	
600.0	11.25	251.66	597.6	-11.5	-34.8	36.7	3.00	3.00	
695.9	14.13	251.66	691.1	-18.2	-54.8	57.8	3.00	3.00	EOB @ Inc. = 14.13°
700.0	14.13	251.66	695.1	-18.5	-55.8	58.8	0.00	0.00	
800.0	14.13	251.66	792.1	-26.2	-78.9	83.2	0.00	0.00	
900.0	14.13	251.66	889.1	-33.8	-102.1	107.6	0.00	0.00	
1,000.0	14.13	251.66	986.0	-41.5	-125.3	132.0	0.00	0.00	
1,100.0	14.13	251.66	1,083.0	-49.2	-148.4	156.4	0.00	0.00	
1,200.0	14.13	251.66	1,180.0	-56.9	-171.6	180.8	0.00	0.00	
1,300.0	14.13	251.66	1,277.0	-64.6	-194.8	205.2	0.00	0.00	
1,359.8	14.13	251.66	1,335.0	-69.2	-208.6	219.8	0.00	0.00	Surface Casing
1,400.0	14.13	251.66	1,374.0	-72.2	-217.9	229.6	0.00	0.00	
1,500.0	14.13	251.66	1,470.9	-79.9	-241.1	254.0	0.00	0.00	
1,600.0	14.13	251.66	1,567.9	-87.6	-264.3	278.4	0.00	0.00	
1,700.0	14.13	251.66	1,664.9	-95.3	-287.4	302.8	0.00	0.00	
1,800.0	14.13	251.66	1,761.9	-102.9	-310.6	327.2	0.00	0.00	
1,900.0	14.13	251.66	1,858.8	-110.6	-333.8	351.6	0.00	0.00	
2,000.0	14.13	251.66	1,955.8	-118.3	-356.9	376.0	0.00	0.00	
2,100.0	14.13	251.66	2,052.8	-126.0	-380.1	400.4	0.00	0.00	
2,200.0	14.13	251.66	2,149.8	-133.7	-403.3	424.8	0.00	0.00	
2,300.0	14.13	251.66	2,246.7	-141.3	-426.4	449.2	0.00	0.00	
2,400.0	14.13	251.66	2,343.7	-149.0	-449.6	473.7	0.00	0.00	
2,500.0	14.13	251.66	2,440.7	-156.7	-472.8	498.1	0.00	0.00	
2,600.0	14.13	251.66	2,537.7	-164.4	-495.9	522.5	0.00	0.00	
2,700.0	14.13	251.66	2,634.6	-172.1	-519.1	546.9	0.00	0.00	
2,800.0	14.13	251.66	2,731.6	-179.7	-542.3	571.3	0.00	0.00	
2,900.0	14.13	251.66	2,828.6	-187.4	-565.4	595.7	0.00	0.00	
3,000.0	14.13	251.66	2,925.6	-195.1	-588.6	620.1	0.00	0.00	
3,100.0	14.13	251.66	3,022.5	-202.8	-611.8	644.5	0.00	0.00	
3,200.0	14.13	251.66	3,119.5	-210.4	-634.9	668.9	0.00	0.00	
3,300.0	14.13	251.66	3,216.5	-218.1	-658.1	693.3	0.00	0.00	
3,400.0	14.13	251.66	3,313.5	-225.8	-681.3	717.7	0.00	0.00	
3,500.0	14.13	251.66	3,410.5	-233.5	-704.4	742.1	0.00	0.00	
3,600.0	14.13	251.66	3,507.4	-241.2	-727.6	766.5	0.00	0.00	
3,700.0	14.13	251.66	3,604.4	-248.8	-750.8	790.9	0.00	0.00	
3,800.0	14.13	251.66	3,701.4	-256.5	-773.9	815.3	0.00	0.00	
3,900.0	14.13	251.66	3,798.4	-264.2	-797.1	839.7	0.00	0.00	
4,000.0	14.13	251.66	3,895.3	-271.9	-820.3	864.1	0.00	0.00	
4,100.0	14.13	251.66	3,992.3	-279.5	-843.4	888.5	0.00	0.00	
4,200.0	14.13	251.66	4,089.3	-287.2	-866.6	913.0	0.00	0.00	
4,300.0	14.13	251.66	4,186.3	-294.9	-889.8	937.4	0.00	0.00	
4,400.0	14.13	251.66	4,283.2	-302.6	-912.9	961.8	0.00	0.00	
4,500.0	14.13	251.66	4,380.2	-310.3	-936.1	986.2	0.00	0.00	
4,600.0	14.13	251.66	4,477.2	-317.9	-959.3	1,010.6	0.00	0.00	
4,700.0	14.13	251.66	4,574.2	-325.6	-982.4	1,035.0	0.00	0.00	
4,800.0	14.13	251.66	4,671.1	-333.3	-1,005.6	1,059.4	0.00	0.00	

Cathedral Energy Services

Planning Report

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Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-12DD	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
4,900.0	14.13	251.66	4,768.1	-341.0	-1,028.8	1,083.8	0.00	0.00	
5,000.0	14.13	251.66	4,865.1	-348.7	-1,051.9	1,108.2	0.00	0.00	
5,100.0	14.13	251.66	4,962.1	-356.3	-1,075.1	1,132.6	0.00	0.00	
5,200.0	14.13	251.66	5,059.0	-364.0	-1,098.3	1,157.0	0.00	0.00	
5,300.0	14.13	251.66	5,156.0	-371.7	-1,121.4	1,181.4	0.00	0.00	
5,337.1	14.13	251.66	5,192.0	-374.5	-1,130.0	1,190.5	0.00	0.00	Mesaverde
5,400.0	14.13	251.66	5,253.0	-379.4	-1,144.6	1,205.8	0.00	0.00	
5,500.0	14.13	251.66	5,350.0	-387.0	-1,167.8	1,230.2	0.00	0.00	
5,600.0	14.13	251.66	5,447.0	-394.7	-1,190.9	1,254.6	0.00	0.00	
5,700.0	14.13	251.66	5,543.9	-402.4	-1,214.1	1,279.0	0.00	0.00	
5,800.0	14.13	251.66	5,640.9	-410.1	-1,237.2	1,303.4	0.00	0.00	
5,900.0	14.13	251.66	5,737.9	-417.8	-1,260.4	1,327.8	0.00	0.00	
5,957.9	14.13	251.66	5,794.0	-422.2	-1,273.8	1,342.0	0.00	0.00	Williams Fork
6,000.0	14.13	251.66	5,834.9	-425.4	-1,283.6	1,352.2	0.00	0.00	
6,100.0	14.13	251.66	5,931.8	-433.1	-1,306.7	1,376.7	0.00	0.00	
6,200.0	14.13	251.66	6,028.8	-440.8	-1,329.9	1,401.1	0.00	0.00	
6,308.3	14.13	251.66	6,133.8	-449.1	-1,355.0	1,427.5	0.00	0.00	Start 2° Drop
6,400.0	12.29	251.66	6,223.1	-455.7	-1,374.9	1,448.4	2.00	-2.00	
6,500.0	10.29	251.66	6,321.2	-461.9	-1,393.5	1,468.0	2.00	-2.00	
6,600.0	8.29	251.66	6,419.8	-466.9	-1,408.8	1,484.2	2.00	-2.00	
6,700.0	6.29	251.66	6,519.0	-470.9	-1,420.9	1,496.9	2.00	-2.00	
6,800.0	4.29	251.66	6,618.6	-473.8	-1,429.6	1,506.1	2.00	-2.00	
6,900.0	2.29	251.66	6,718.4	-475.6	-1,435.1	1,511.8	2.00	-2.00	
7,000.0	0.29	251.66	6,818.4	-476.4	-1,437.2	1,514.1	2.00	-2.00	
7,014.6	0.00	0.00	6,833.0	-476.4	-1,437.2	1,514.1	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
7,100.0	0.00	0.00	6,918.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,200.0	0.00	0.00	7,018.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,300.0	0.00	0.00	7,118.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,400.0	0.00	0.00	7,218.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,500.0	0.00	0.00	7,318.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,600.0	0.00	0.00	7,418.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,700.0	0.00	0.00	7,518.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,800.0	0.00	0.00	7,618.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
7,900.0	0.00	0.00	7,718.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,000.0	0.00	0.00	7,818.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,084.6	0.00	0.00	7,903.0	-476.4	-1,437.2	1,514.1	0.00	0.00	Coal Ridge
8,100.0	0.00	0.00	7,918.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,200.0	0.00	0.00	8,018.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,300.0	0.00	0.00	8,118.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,400.0	0.00	0.00	8,218.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,500.0	0.00	0.00	8,318.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,600.0	0.00	0.00	8,418.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,700.0	0.00	0.00	8,518.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,800.0	0.00	0.00	8,618.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
8,838.6	0.00	0.00	8,657.0	-476.4	-1,437.2	1,514.1	0.00	0.00	Rollins
8,900.0	0.00	0.00	8,718.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,000.0	0.00	0.00	8,818.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,100.0	0.00	0.00	8,918.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,200.0	0.00	0.00	9,018.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,300.0	0.00	0.00	9,118.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,400.0	0.00	0.00	9,218.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,414.6	0.00	0.00	9,233.0	-476.4	-1,437.2	1,514.1	0.00	0.00	Cozzette

Cathedral Energy Services

Planning Report

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Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-12DD	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
9,500.0	0.00	0.00	9,318.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,578.6	0.00	0.00	9,397.0	-476.4	-1,437.2	1,514.1	0.00	0.00	Corcoran
9,600.0	0.00	0.00	9,418.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,700.0	0.00	0.00	9,518.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,800.0	0.00	0.00	9,618.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
9,900.0	0.00	0.00	9,718.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
10,000.0	0.00	0.00	9,818.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
10,078.6	0.00	0.00	9,897.0	-476.4	-1,437.2	1,514.1	0.00	0.00	TD @ 10,078.6' MD
10,100.0	0.00	0.00	9,918.4	-476.4	-1,437.2	1,514.1	0.00	0.00	
10,178.6	0.00	0.00	9,997.0	-476.4	-1,437.2	1,514.1	0.00	0.00	Permit TD @ 10,178.6' MD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HMU 6-12DD PBHL (14ft) - plan hits target center - Circle (radius 25.0)	0.00	0.00	9,897.0	-476.4	-1,437.2	1,573,142.61	2,375,077.01	39.386144	-107.711249
HMU 6-12DD TGT - plan hits target center - Point	0.00	0.00	6,833.0	-476.4	-1,437.2	1,573,142.61	2,375,077.01	39.386144	-107.711249

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,359.8	1,335.0	Surface Casing		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,337.1	5,192.0	Mesaverde			
5,957.9	5,794.0	Williams Fork			
7,014.6	6,833.0	Top Gas			
8,084.6	7,903.0	Coal Ridge			
8,838.6	8,657.0	Rollins			
9,414.6	9,233.0	Cozzette			
9,578.6	9,397.0	Corcoran			

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well HMU 6-12DD
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-12DD	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
225.0	225.0	0.0	0.0	KOP @ 225'
695.9	691.1	-18.2	-54.8	EOB @ Inc. = 14.13°
6,308.3	6,133.8	-449.1	-1,355.0	Start 2° Drop
7,014.6	6,833.0	-476.4	-1,437.2	EOD @ Inc. = 0°
10,078.6	9,897.0	-476.4	-1,437.2	TD @ 10,078.6' MD
10,178.6	9,997.0	-476.4	-1,437.2	Permit TD @ 10,178.6' MD