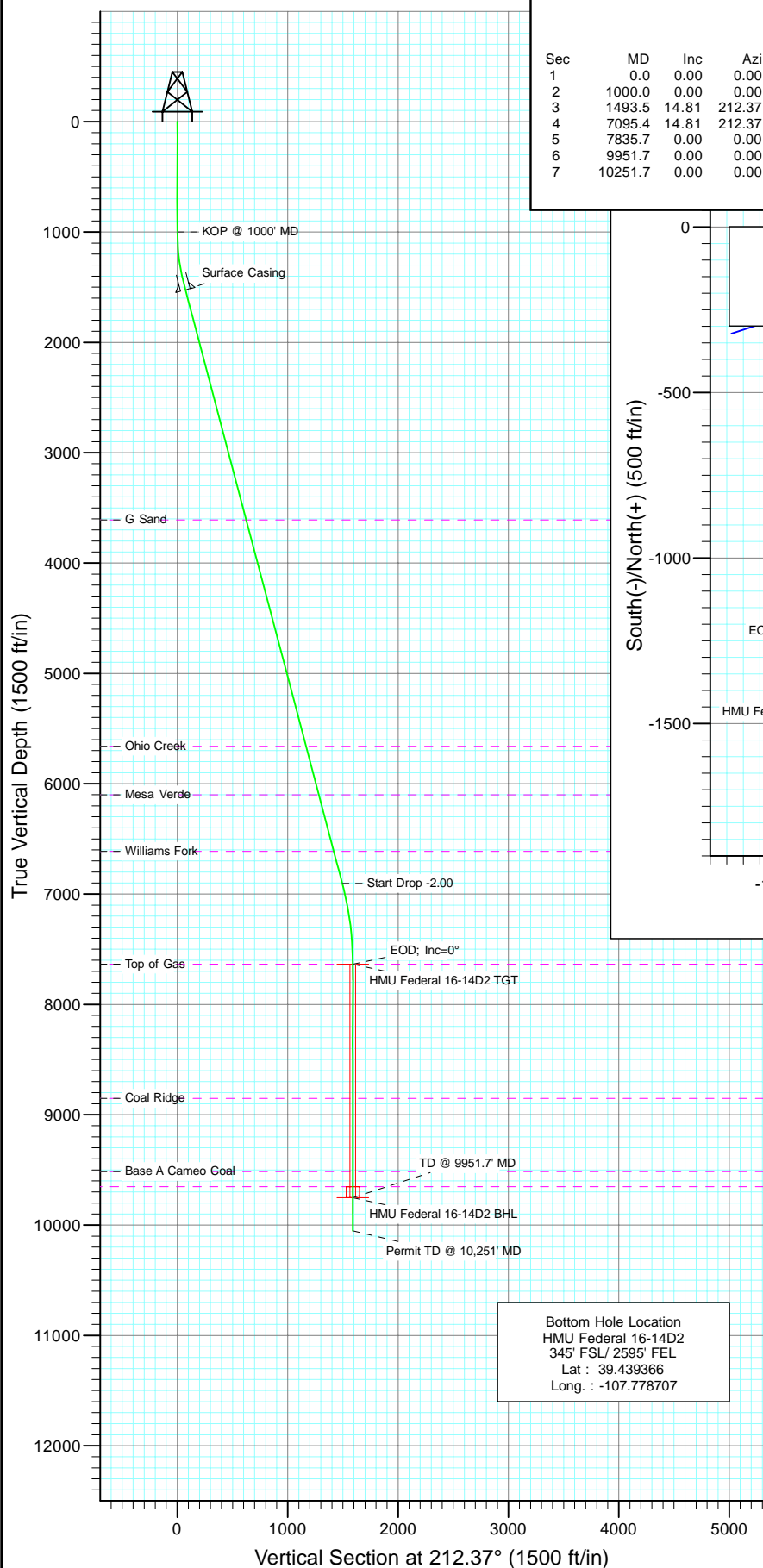
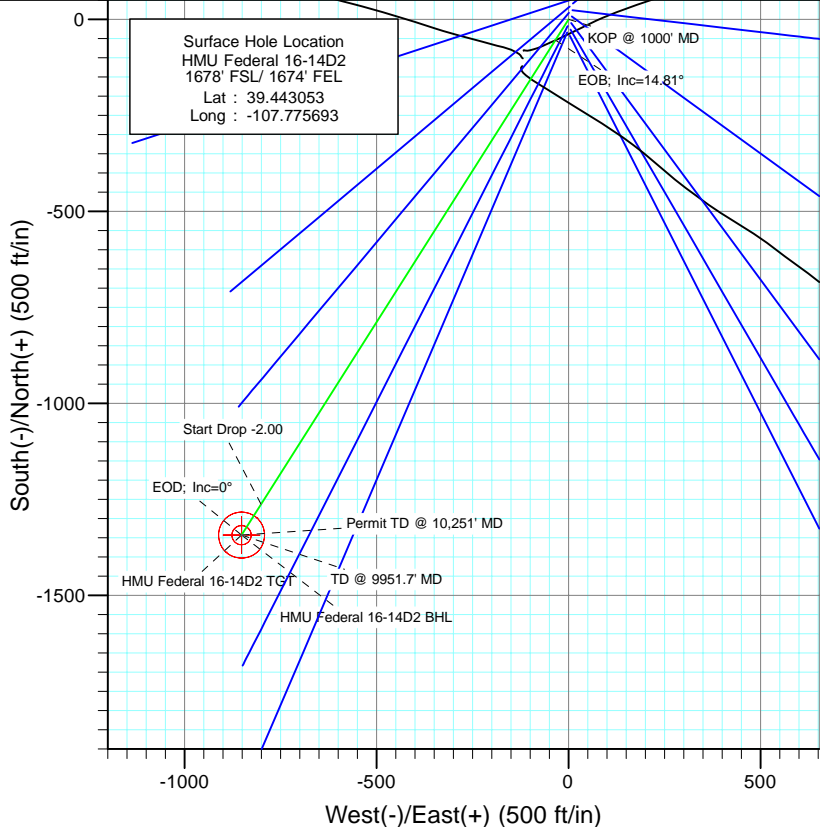




Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-14D2
Wellbore: DD
Design: Plan #1



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1493.5	14.81	212.37	1488.0	-53.6	-33.9	3.00	212.37	63.4	
4	7095.4	14.81	212.37	6904.0	-1262.6	-800.3	0.00	0.00	1494.9	
5	7835.7	0.00	0.00	7636.0	-1342.9	-851.2	2.00	180.00	1590.0	HMU Federal 16-14D2 TGT
6	9951.7	0.00	0.00	9752.0	-1342.9	-851.2	0.00	0.00	1590.0	HMU Federal 16-14D2 BHL
7	10251.7	0.00	0.00	10052.0	-1342.9	-851.2	0.00	0.00	1590.0	



Azimuths to True North
Magnetic North: 10.30°

Magnetic Field
Strength: 52330.6snT
Dip Angle: 65.77°
Date: 10/29/2010
Model: IGRF200510

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3610.0	3688.3	G Sand
5660.0	5808.7	Ohio Creek
6101.0	6264.9	Mesa Verde
6613.0	6794.5	Williams Fork
7636.0	7835.7	Top of Gas
8852.0	9051.7	Coal Ridge
9516.0	9715.7	Base A Cameo Coal
9652.0	9851.7	Rollins

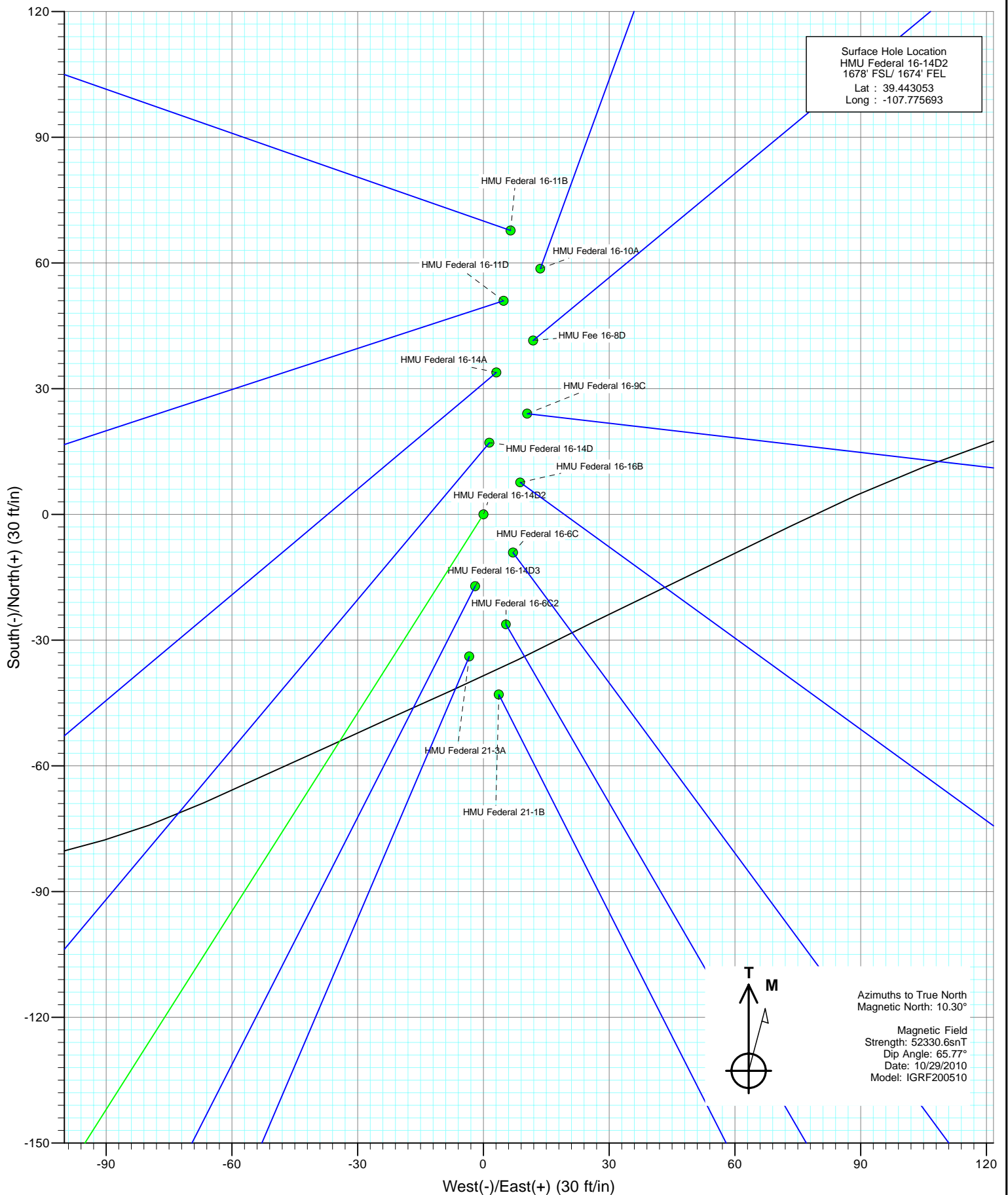
DESIGN DETAILS: Plan #1

105XXX; KR
KBE @ 7667.0ft (Original Well Elev)

Target	Azimuth	Origin	N/S	E/W	From TVD
HMU Federal 16-14D2 BHL	212.37	Slot	0.0	0.0	0.0

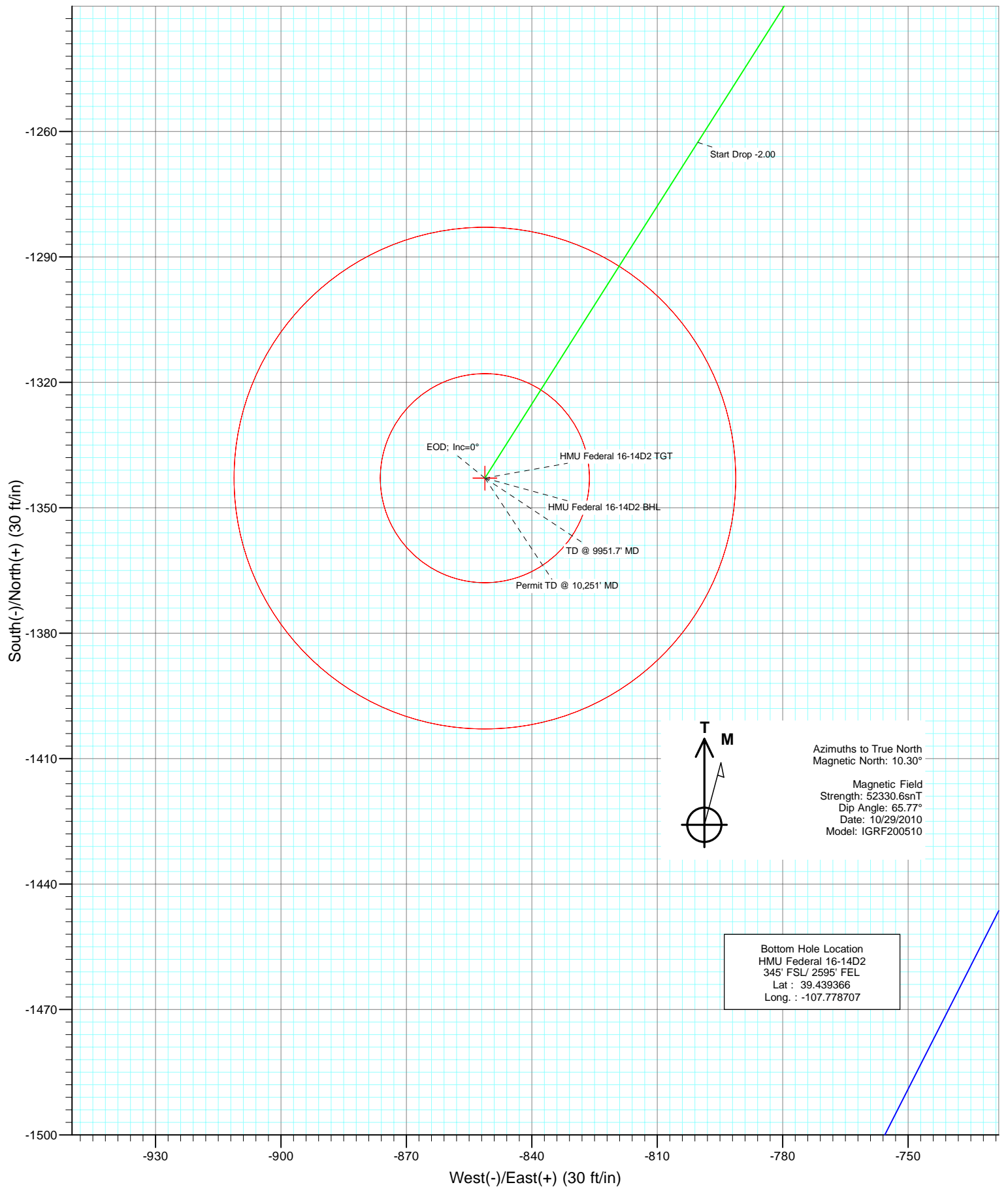


Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-14D2
Wellbore: DD
Design: Plan #1





Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-14D2
Wellbore: DD
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D2
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D2	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		(J16W)			
Site Position:		Northing:	1,594,381.52 ft	Latitude:	39.443239
From:	Lat/Long	Easting:	2,357,395.39 ft	Longitude:	-107.775670
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.44 °

Well	HMU Federal 16-14D2					
Well Position	+N/-S	0.0 ft	Northing:	1,594,313.95 ft	Latitude:	39.443053
	+E/-W	0.0 ft	Easting:	2,357,387.20 ft	Longitude:	-107.775693
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,645.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/29/2010	10.30	65.77	52,331

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	212.37

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,493.5	14.81	212.37	1,488.0	-53.6	-33.9	3.00	3.00	0.00	212.37	
7,095.4	14.81	212.37	6,904.0	-1,262.6	-800.3	0.00	0.00	0.00	0.00	
7,835.7	0.00	0.00	7,636.0	-1,342.9	-851.2	2.00	-2.00	0.00	180.00	HMU Federal 16-14D
9,951.7	0.00	0.00	9,752.0	-1,342.9	-851.2	0.00	0.00	0.00	0.00	HMU Federal 16-14D
10,251.7	0.00	0.00	10,052.0	-1,342.9	-851.2	0.00	0.00	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D2
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D2	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	
30.0	0.00	0.00	30.0	0.0	0.0	0.0	0.00	0.00	
60.0	0.00	0.00	60.0	0.0	0.0	0.0	0.00	0.00	
90.0	0.00	0.00	90.0	0.0	0.0	0.0	0.00	0.00	
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	
180.0	0.00	0.00	180.0	0.0	0.0	0.0	0.00	0.00	
210.0	0.00	0.00	210.0	0.0	0.0	0.0	0.00	0.00	
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	
270.0	0.00	0.00	270.0	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	
330.0	0.00	0.00	330.0	0.0	0.0	0.0	0.00	0.00	
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	
390.0	0.00	0.00	390.0	0.0	0.0	0.0	0.00	0.00	
420.0	0.00	0.00	420.0	0.0	0.0	0.0	0.00	0.00	
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	
510.0	0.00	0.00	510.0	0.0	0.0	0.0	0.00	0.00	
540.0	0.00	0.00	540.0	0.0	0.0	0.0	0.00	0.00	
570.0	0.00	0.00	570.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
630.0	0.00	0.00	630.0	0.0	0.0	0.0	0.00	0.00	
660.0	0.00	0.00	660.0	0.0	0.0	0.0	0.00	0.00	
690.0	0.00	0.00	690.0	0.0	0.0	0.0	0.00	0.00	
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	
750.0	0.00	0.00	750.0	0.0	0.0	0.0	0.00	0.00	
780.0	0.00	0.00	780.0	0.0	0.0	0.0	0.00	0.00	
810.0	0.00	0.00	810.0	0.0	0.0	0.0	0.00	0.00	
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	
870.0	0.00	0.00	870.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
930.0	0.00	0.00	930.0	0.0	0.0	0.0	0.00	0.00	
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	
990.0	0.00	0.00	990.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1000' MD
1,020.0	0.60	212.37	1,020.0	-0.1	-0.1	0.1	3.00	3.00	
1,050.0	1.50	212.37	1,050.0	-0.6	-0.4	0.7	3.00	3.00	
1,080.0	2.40	212.37	1,080.0	-1.4	-0.9	1.7	3.00	3.00	
1,110.0	3.30	212.37	1,109.9	-2.7	-1.7	3.2	3.00	3.00	
1,140.0	4.20	212.37	1,139.9	-4.3	-2.7	5.1	3.00	3.00	
1,170.0	5.10	212.37	1,169.8	-6.4	-4.0	7.6	3.00	3.00	
1,200.0	6.00	212.37	1,199.6	-8.8	-5.6	10.5	3.00	3.00	
1,230.0	6.90	212.37	1,229.4	-11.7	-7.4	13.8	3.00	3.00	
1,260.0	7.80	212.37	1,259.2	-14.9	-9.5	17.7	3.00	3.00	
1,290.0	8.70	212.37	1,288.9	-18.6	-11.8	22.0	3.00	3.00	
1,320.0	9.60	212.37	1,318.5	-22.6	-14.3	26.7	3.00	3.00	
1,350.0	10.50	212.37	1,348.0	-27.0	-17.1	32.0	3.00	3.00	
1,380.0	11.40	212.37	1,377.5	-31.8	-20.2	37.7	3.00	3.00	
1,410.0	12.30	212.37	1,406.9	-37.0	-23.5	43.8	3.00	3.00	
1,440.0	13.20	212.37	1,436.1	-42.6	-27.0	50.5	3.00	3.00	
1,470.0	14.10	212.37	1,465.3	-48.6	-30.8	57.5	3.00	3.00	
1,493.5	14.81	212.37	1,488.0	-53.6	-33.9	63.4	3.00	3.00	EOB; Inc=14.81°

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D2
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D2	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
1,500.0	14.81	212.37	1,494.3	-55.0	-34.8	65.1	0.00	0.00	
1,530.0	14.81	212.37	1,523.3	-61.4	-38.9	72.7	0.00	0.00	
1,534.3	14.81	212.37	1,527.4	-62.3	-39.5	73.8	0.00	0.00	Surface Casing
1,560.0	14.81	212.37	1,552.3	-67.9	-43.0	80.4	0.00	0.00	
1,590.0	14.81	212.37	1,581.3	-74.4	-47.1	88.1	0.00	0.00	
1,620.0	14.81	212.37	1,610.3	-80.9	-51.3	95.7	0.00	0.00	
1,650.0	14.81	212.37	1,639.3	-87.3	-55.4	103.4	0.00	0.00	
1,680.0	14.81	212.37	1,668.3	-93.8	-59.5	111.1	0.00	0.00	
1,710.0	14.81	212.37	1,697.3	-100.3	-63.6	118.7	0.00	0.00	
1,740.0	14.81	212.37	1,726.3	-106.8	-67.7	126.4	0.00	0.00	
1,770.0	14.81	212.37	1,755.3	-113.2	-71.8	134.1	0.00	0.00	
1,800.0	14.81	212.37	1,784.4	-119.7	-75.9	141.7	0.00	0.00	
1,830.0	14.81	212.37	1,813.4	-126.2	-80.0	149.4	0.00	0.00	
1,860.0	14.81	212.37	1,842.4	-132.7	-84.1	157.1	0.00	0.00	
1,890.0	14.81	212.37	1,871.4	-139.1	-88.2	164.7	0.00	0.00	
1,920.0	14.81	212.37	1,900.4	-145.6	-92.3	172.4	0.00	0.00	
1,950.0	14.81	212.37	1,929.4	-152.1	-96.4	180.1	0.00	0.00	
1,980.0	14.81	212.37	1,958.4	-158.6	-100.5	187.7	0.00	0.00	
2,010.0	14.81	212.37	1,987.4	-165.0	-104.6	195.4	0.00	0.00	
2,040.0	14.81	212.37	2,016.4	-171.5	-108.7	203.1	0.00	0.00	
2,070.0	14.81	212.37	2,045.4	-178.0	-112.8	210.7	0.00	0.00	
2,100.0	14.81	212.37	2,074.4	-184.5	-116.9	218.4	0.00	0.00	
2,130.0	14.81	212.37	2,103.4	-190.9	-121.0	226.1	0.00	0.00	
2,160.0	14.81	212.37	2,132.4	-197.4	-125.1	233.7	0.00	0.00	
2,190.0	14.81	212.37	2,161.4	-203.9	-129.2	241.4	0.00	0.00	
2,220.0	14.81	212.37	2,190.4	-210.3	-133.3	249.0	0.00	0.00	
2,250.0	14.81	212.37	2,219.4	-216.8	-137.4	256.7	0.00	0.00	
2,280.0	14.81	212.37	2,248.4	-223.3	-141.5	264.4	0.00	0.00	
2,310.0	14.81	212.37	2,277.4	-229.8	-145.6	272.0	0.00	0.00	
2,340.0	14.81	212.37	2,306.4	-236.2	-149.8	279.7	0.00	0.00	
2,370.0	14.81	212.37	2,335.4	-242.7	-153.9	287.4	0.00	0.00	
2,400.0	14.81	212.37	2,364.4	-249.2	-158.0	295.0	0.00	0.00	
2,430.0	14.81	212.37	2,393.4	-255.7	-162.1	302.7	0.00	0.00	
2,460.0	14.81	212.37	2,422.4	-262.1	-166.2	310.4	0.00	0.00	
2,490.0	14.81	212.37	2,451.4	-268.6	-170.3	318.0	0.00	0.00	

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 Federal 16-14D2 T			0.00	0.00	7,636.0	-1,342.9	-851.2	1,592,992.78	2,356,502.59	39.439366	-107.778707
- plan misses target center by 5338.3ft at 2490.0ft MD (2451.4 TVD, -268.6 N, -170.3 E)											
- Circle (radius 25.0)											
HMU Federal 16-14D2 E			0.00	0.00	9,752.0	-1,342.9	-851.2	1,592,992.78	2,356,502.59	39.439366	-107.778707
- plan misses target center by 7410.5ft at 2490.0ft MD (2451.4 TVD, -268.6 N, -170.3 E)											
- Circle (radius 60.0)											

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D2
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D2	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
2,500.0	14.81	212.37	2,461.1	-270.8	-171.6	320.6	0.00	0.00	
2,600.0	14.81	212.37	2,557.8	-292.4	-185.3	346.1	0.00	0.00	
2,700.0	14.81	212.37	2,654.5	-313.9	-199.0	371.7	0.00	0.00	
2,800.0	14.81	212.37	2,751.2	-335.5	-212.7	397.3	0.00	0.00	
2,900.0	14.81	212.37	2,847.8	-357.1	-226.4	422.8	0.00	0.00	
3,000.0	14.81	212.37	2,944.5	-378.7	-240.0	448.4	0.00	0.00	
3,100.0	14.81	212.37	3,041.2	-400.3	-253.7	473.9	0.00	0.00	
3,200.0	14.81	212.37	3,137.9	-421.9	-267.4	499.5	0.00	0.00	
3,300.0	14.81	212.37	3,234.6	-443.4	-281.1	525.0	0.00	0.00	
3,400.0	14.81	212.37	3,331.2	-465.0	-294.8	550.6	0.00	0.00	
3,500.0	14.81	212.37	3,427.9	-486.6	-308.4	576.1	0.00	0.00	
3,600.0	14.81	212.37	3,524.6	-508.2	-322.1	601.7	0.00	0.00	
3,688.3	14.81	212.37	3,610.0	-527.3	-334.2	624.3	0.00	0.00	G Sand
3,700.0	14.81	212.37	3,621.3	-529.8	-335.8	627.2	0.00	0.00	
3,800.0	14.81	212.37	3,718.0	-551.4	-349.5	652.8	0.00	0.00	
3,900.0	14.81	212.37	3,814.6	-572.9	-363.2	678.3	0.00	0.00	
4,000.0	14.81	212.37	3,911.3	-594.5	-376.8	703.9	0.00	0.00	
4,100.0	14.81	212.37	4,008.0	-616.1	-390.5	729.4	0.00	0.00	
4,200.0	14.81	212.37	4,104.7	-637.7	-404.2	755.0	0.00	0.00	
4,300.0	14.81	212.37	4,201.4	-659.3	-417.9	780.6	0.00	0.00	
4,400.0	14.81	212.37	4,298.0	-680.8	-431.6	806.1	0.00	0.00	
4,500.0	14.81	212.37	4,394.7	-702.4	-445.3	831.7	0.00	0.00	
4,600.0	14.81	212.37	4,491.4	-724.0	-458.9	857.2	0.00	0.00	
4,700.0	14.81	212.37	4,588.1	-745.6	-472.6	882.8	0.00	0.00	
4,800.0	14.81	212.37	4,684.8	-767.2	-486.3	908.3	0.00	0.00	
4,900.0	14.81	212.37	4,781.4	-788.8	-500.0	933.9	0.00	0.00	
5,000.0	14.81	212.37	4,878.1	-810.3	-513.7	959.4	0.00	0.00	
5,100.0	14.81	212.37	4,974.8	-831.9	-527.3	985.0	0.00	0.00	
5,200.0	14.81	212.37	5,071.5	-853.5	-541.0	1,010.5	0.00	0.00	
5,300.0	14.81	212.37	5,168.2	-875.1	-554.7	1,036.1	0.00	0.00	
5,400.0	14.81	212.37	5,264.8	-896.7	-568.4	1,061.6	0.00	0.00	
5,500.0	14.81	212.37	5,361.5	-918.3	-582.1	1,087.2	0.00	0.00	
5,600.0	14.81	212.37	5,458.2	-939.8	-595.7	1,112.7	0.00	0.00	
5,700.0	14.81	212.37	5,554.9	-961.4	-609.4	1,138.3	0.00	0.00	
5,800.0	14.81	212.37	5,651.6	-983.0	-623.1	1,163.8	0.00	0.00	
5,808.7	14.81	212.37	5,660.0	-984.9	-624.3	1,166.1	0.00	0.00	Ohio Creek
5,900.0	14.81	212.37	5,748.2	-1,004.6	-636.8	1,189.4	0.00	0.00	
6,000.0	14.81	212.37	5,844.9	-1,026.2	-650.5	1,215.0	0.00	0.00	
6,100.0	14.81	212.37	5,941.6	-1,047.7	-664.1	1,240.5	0.00	0.00	
6,200.0	14.81	212.37	6,038.3	-1,069.3	-677.8	1,266.1	0.00	0.00	
6,264.9	14.81	212.37	6,101.0	-1,083.3	-686.7	1,282.6	0.00	0.00	Mesa Verde
6,300.0	14.81	212.37	6,135.0	-1,090.9	-691.5	1,291.6	0.00	0.00	
6,400.0	14.81	212.37	6,231.6	-1,112.5	-705.2	1,317.2	0.00	0.00	
6,500.0	14.81	212.37	6,328.3	-1,134.1	-718.9	1,342.7	0.00	0.00	
6,600.0	14.81	212.37	6,425.0	-1,155.7	-732.5	1,368.3	0.00	0.00	
6,700.0	14.81	212.37	6,521.7	-1,177.2	-746.2	1,393.8	0.00	0.00	
6,794.5	14.81	212.37	6,613.0	-1,197.6	-759.1	1,418.0	0.00	0.00	Williams Fork
6,800.0	14.81	212.37	6,618.4	-1,198.8	-759.9	1,419.4	0.00	0.00	
6,900.0	14.81	212.37	6,715.0	-1,220.4	-773.6	1,444.9	0.00	0.00	
7,000.0	14.81	212.37	6,811.7	-1,242.0	-787.3	1,470.5	0.00	0.00	
7,095.4	14.81	212.37	6,904.0	-1,262.6	-800.3	1,494.9	0.00	0.00	Start Drop -2.00
7,100.0	14.71	212.37	6,908.4	-1,263.6	-800.9	1,496.0	2.00	-2.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D2
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D2	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
7,200.0	12.71	212.37	7,005.5	-1,283.6	-813.6	1,519.7	2.00	-2.00	
7,300.0	10.71	212.37	7,103.5	-1,300.7	-824.5	1,540.0	2.00	-2.00	
7,400.0	8.71	212.37	7,202.0	-1,315.0	-833.5	1,556.9	2.00	-2.00	
7,500.0	6.71	212.37	7,301.1	-1,326.3	-840.7	1,570.3	2.00	-2.00	
7,600.0	4.71	212.37	7,400.6	-1,334.7	-846.1	1,580.3	2.00	-2.00	
7,700.0	2.71	212.37	7,500.4	-1,340.2	-849.5	1,586.8	2.00	-2.00	
7,800.0	0.71	212.37	7,600.3	-1,342.7	-851.1	1,589.8	2.00	-2.00	
7,835.7	0.00	0.00	7,636.0	-1,342.9	-851.2	1,590.0	2.00	-2.00	EOD; Inc=0° - Top of Gas - HMU Federal 16-14
7,900.0	0.00	0.00	7,700.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,000.0	0.00	0.00	7,800.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,100.0	0.00	0.00	7,900.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,200.0	0.00	0.00	8,000.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,300.0	0.00	0.00	8,100.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,400.0	0.00	0.00	8,200.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,500.0	0.00	0.00	8,300.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,600.0	0.00	0.00	8,400.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,700.0	0.00	0.00	8,500.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,800.0	0.00	0.00	8,600.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
8,900.0	0.00	0.00	8,700.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,000.0	0.00	0.00	8,800.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,051.7	0.00	0.00	8,852.0	-1,342.9	-851.2	1,590.0	0.00	0.00	Coal Ridge
9,100.0	0.00	0.00	8,900.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,200.0	0.00	0.00	9,000.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,300.0	0.00	0.00	9,100.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,400.0	0.00	0.00	9,200.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,500.0	0.00	0.00	9,300.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,600.0	0.00	0.00	9,400.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,700.0	0.00	0.00	9,500.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,715.7	0.00	0.00	9,516.0	-1,342.9	-851.2	1,590.0	0.00	0.00	Base A Cameo Coal
9,800.0	0.00	0.00	9,600.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,851.7	0.00	0.00	9,652.0	-1,342.9	-851.2	1,590.0	0.00	0.00	Rollins
9,900.0	0.00	0.00	9,700.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
9,951.7	0.00	0.00	9,752.0	-1,342.9	-851.2	1,590.0	0.00	0.00	TD @ 9951.7' MD - HMU Federal 16-14D2 BHL
10,000.0	0.00	0.00	9,800.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
10,100.0	0.00	0.00	9,900.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
10,200.0	0.00	0.00	10,000.3	-1,342.9	-851.2	1,590.0	0.00	0.00	
10,251.7	0.00	0.00	10,052.0	-1,342.9	-851.2	1,590.0	0.00	0.00	Permit TD @ 10,251' MD

Targets									
Target Name									
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
HMU Federal 16-14D2 T - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,636.0	-1,342.9	-851.2	1,592,992.78	2,356,502.59	39.439366	-107.778707
HMU Federal 16-14D2 E - plan hits target center - Circle (radius 60.0)	0.00	0.00	9,752.0	-1,342.9	-851.2	1,592,992.78	2,356,502.59	39.439366	-107.778707

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-14D2
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-14D2	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,534.3	1,527.4	Surface Casing	5.500	6.000

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,688.3	3,610.0	G Sand		0.00	
5,808.7	5,660.0	Ohio Creek		0.00	
6,264.9	6,101.0	Mesa Verde		0.00	
6,794.5	6,613.0	Williams Fork		0.00	
7,835.7	7,636.0	Top of Gas		0.00	
9,051.7	8,852.0	Coal Ridge		0.00	
9,715.7	9,516.0	Base A Cameo Coal		0.00	
9,851.7	9,652.0	Rollins		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.0	1,000.0	0.0	0.0	KOP @ 1000' MD
1,493.5	1,488.0	-53.6	-33.9	EOB; Inc=14.81°
7,095.4	6,904.0	-1,262.6	-800.3	Start Drop -2.00
7,835.7	7,636.0	-1,342.9	-851.2	EOD; Inc=0°
9,951.7	9,752.0	-1,342.9	-851.2	TD @ 9951.7' MD
10,251.7	10,052.0	-1,342.9	-851.2	Permit TD @ 10,251' MD