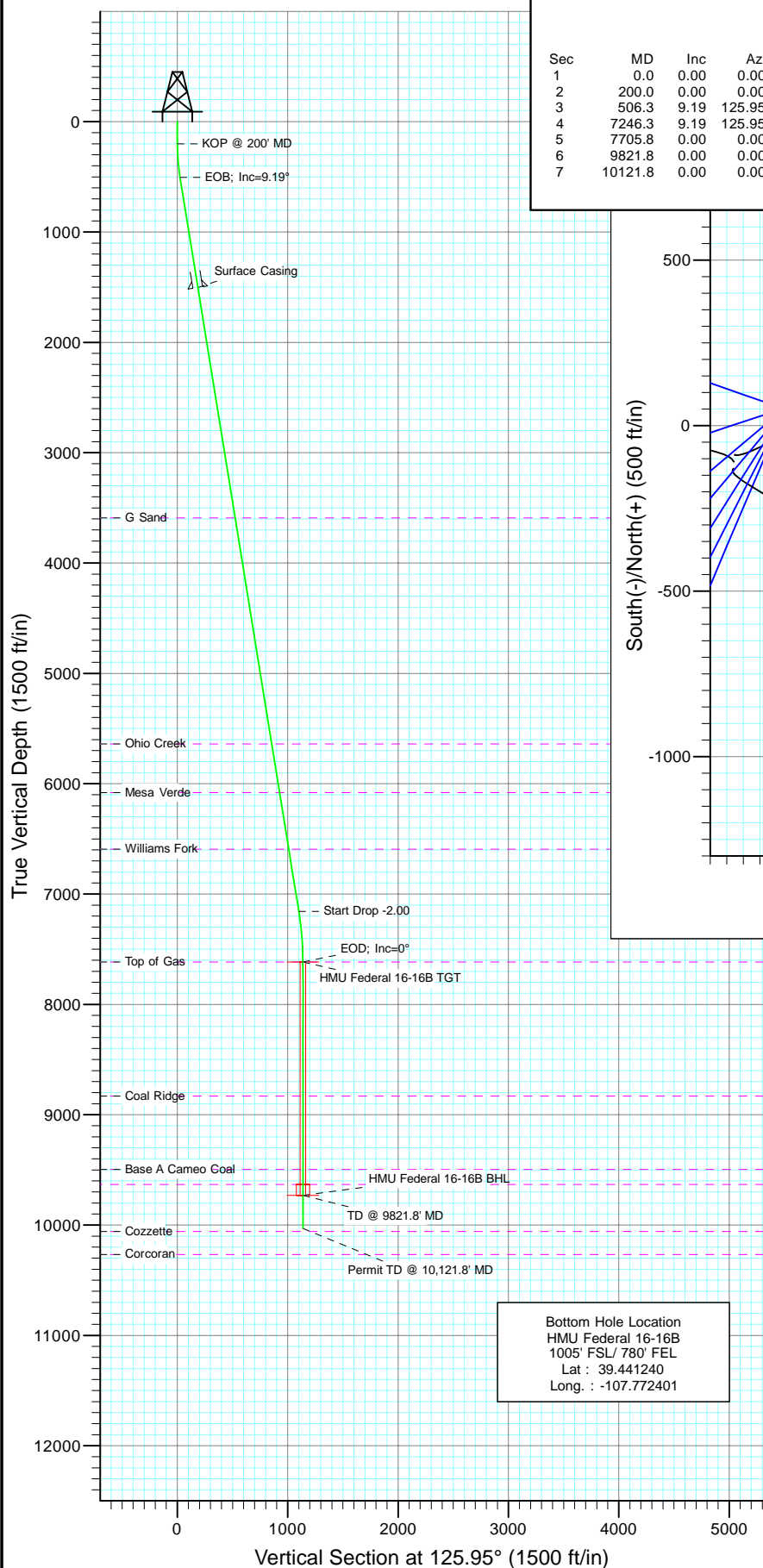
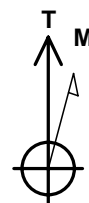
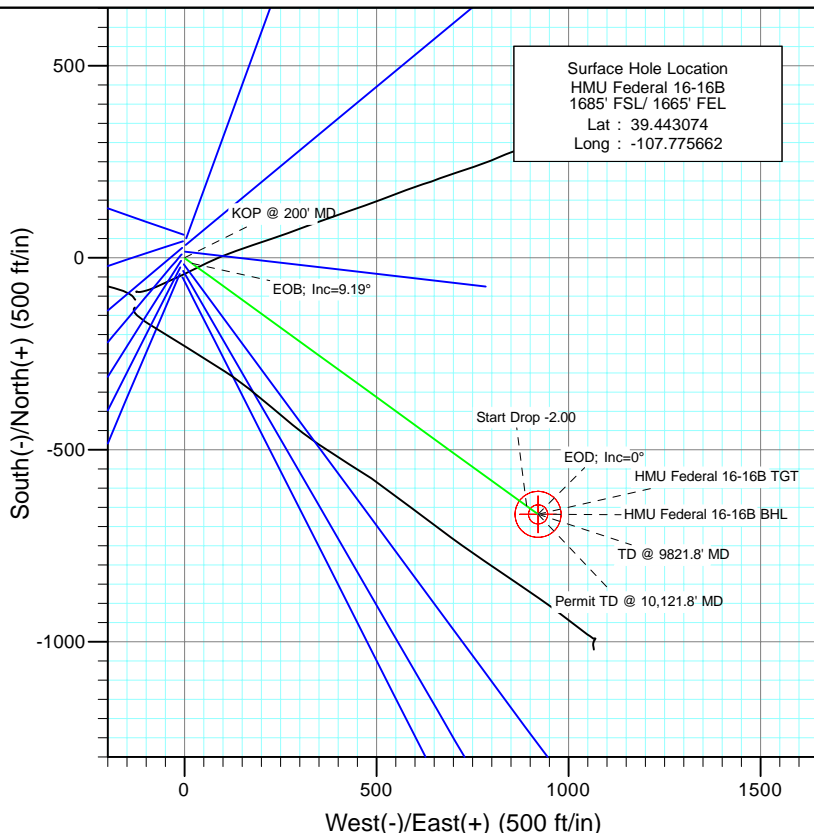




Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-16B
Wellbore: DD
Design: Plan #1



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	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	506.3	9.19	125.95	505.0	-14.4	19.8	3.00	125.95	24.5	
4	7246.3	9.19	125.95	7158.5	-646.4	891.2	0.00	0.00	1100.9	
5	7705.8	0.00	0.00	7616.0	-668.0	921.0	2.00	180.00	1137.7	HMU Federal 16-16B TGT
6	9821.8	0.00	0.00	9732.0	-668.0	921.0	0.00	0.00	1137.7	HMU Federal 16-16B BHL
7	10121.8	0.00	0.00	10032.0	-668.0	921.0	0.00	0.00	1137.7	



Azimuths to True North
Magnetic North: 10.30°

Magnetic Field
Strength: 52331.7snT
Dip Angle: 65.77°
Date: 10/25/2010
Model: IGRF200510

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3590.0	3631.4	G Sand
5640.0	5708.1	Ohio Creek
6081.0	6154.8	Mesa Verde
6593.0	6673.5	Williams Fork
7616.0	7705.8	Top of Gas
8832.0	8921.8	Coal Ridge
9496.0	9585.8	Base A Cameo Coal
9632.0	9721.8	Rollins

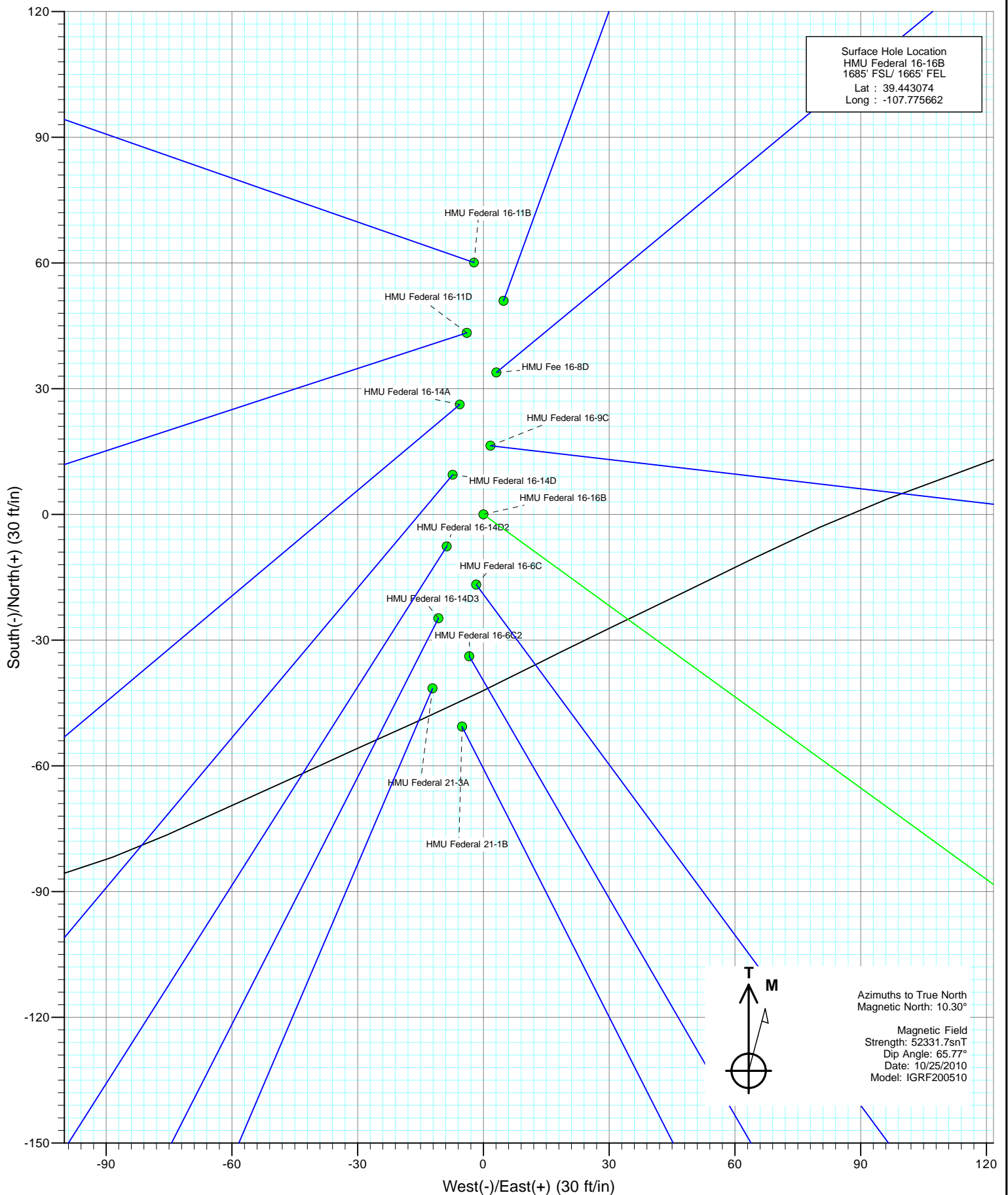
DESIGN DETAILS: Plan #1

Job #10xxx: KR
WELL @ 7667.0ft (Original Well Elev)

Target	Azimuth	Origin	N/S	E/W	From TVD
HMU Federal 16-16B BHL	125.95	Slot	0.0	0.0	0.0

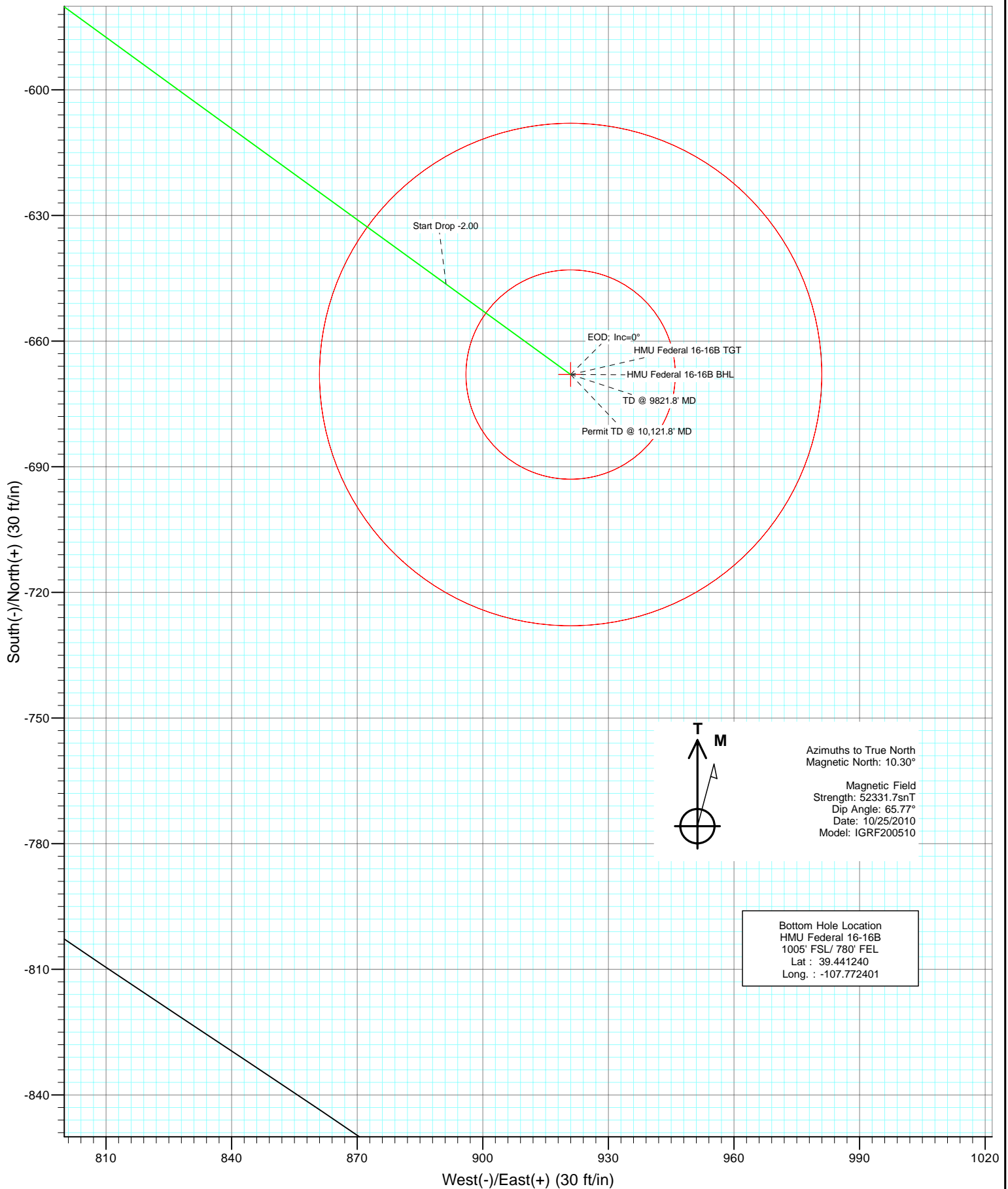


Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-16B
Wellbore: DD
Design: Plan #1





Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-16B
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 16-16B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-16B	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 16-16B					
Well Position	+N/-S	0.0 ft	Northing:	1,594,321.37 ft	Latitude:	39.443074
	+E/-W	0.0 ft	Easting:	2,357,396.14 ft	Longitude:	-107.775662
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	10/25/2010	10.30	65.77	52,332

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	125.95

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	
506.3	9.19	125.95	505.0	-14.4	19.8	3.00	3.00	0.00	125.95	
7,246.3	9.19	125.95	7,158.5	-646.4	891.2	0.00	0.00	0.00	0.00	
7,705.8	0.00	0.00	7,616.0	-668.0	921.0	2.00	-2.00	0.00	180.00	HMU Federal 16-16B
9,821.8	0.00	0.00	9,732.0	-668.0	921.0	0.00	0.00	0.00	0.00	HMU Federal 16-16B
10,121.8	0.00	0.00	10,032.0	-668.0	921.0	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 16-16B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-16B	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	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200' MD
210.0	0.30	125.95	210.0	0.0	0.0	0.0	3.00	3.00	
240.0	1.20	125.95	240.0	-0.2	0.3	0.4	3.00	3.00	
270.0	2.10	125.95	270.0	-0.8	1.0	1.3	3.00	3.00	
300.0	3.00	125.95	300.0	-1.5	2.1	2.6	3.00	3.00	
330.0	3.90	125.95	329.9	-2.6	3.6	4.4	3.00	3.00	
360.0	4.80	125.95	359.8	-3.9	5.4	6.7	3.00	3.00	
390.0	5.70	125.95	389.7	-5.5	7.6	9.4	3.00	3.00	
420.0	6.60	125.95	419.5	-7.4	10.2	12.7	3.00	3.00	
450.0	7.50	125.95	449.3	-9.6	13.2	16.3	3.00	3.00	
480.0	8.40	125.95	479.0	-12.0	16.6	20.5	3.00	3.00	
506.3	9.19	125.95	505.0	-14.4	19.8	24.5	3.00	3.00	EOB; Inc=9.19°
510.0	9.19	125.95	508.6	-14.7	20.3	25.1	0.00	0.00	
540.0	9.19	125.95	538.3	-17.6	24.2	29.9	0.00	0.00	
570.0	9.19	125.95	567.9	-20.4	28.1	34.7	0.00	0.00	
600.0	9.19	125.95	597.5	-23.2	32.0	39.5	0.00	0.00	
630.0	9.19	125.95	627.1	-26.0	35.8	44.3	0.00	0.00	
660.0	9.19	125.95	656.7	-28.8	39.7	49.1	0.00	0.00	
690.0	9.19	125.95	686.3	-31.6	43.6	53.8	0.00	0.00	
720.0	9.19	125.95	715.9	-34.4	47.5	58.6	0.00	0.00	
750.0	9.19	125.95	745.6	-37.2	51.3	63.4	0.00	0.00	
780.0	9.19	125.95	775.2	-40.1	55.2	68.2	0.00	0.00	
810.0	9.19	125.95	804.8	-42.9	59.1	73.0	0.00	0.00	
840.0	9.19	125.95	834.4	-45.7	63.0	77.8	0.00	0.00	
870.0	9.19	125.95	864.0	-48.5	66.9	82.6	0.00	0.00	
900.0	9.19	125.95	893.6	-51.3	70.7	87.4	0.00	0.00	
930.0	9.19	125.95	923.3	-54.1	74.6	92.2	0.00	0.00	
960.0	9.19	125.95	952.9	-56.9	78.5	97.0	0.00	0.00	
990.0	9.19	125.95	982.5	-59.7	82.4	101.8	0.00	0.00	
1,020.0	9.19	125.95	1,012.1	-62.6	86.3	106.6	0.00	0.00	
1,050.0	9.19	125.95	1,041.7	-65.4	90.1	111.3	0.00	0.00	
1,080.0	9.19	125.95	1,071.3	-68.2	94.0	116.1	0.00	0.00	
1,110.0	9.19	125.95	1,100.9	-71.0	97.9	120.9	0.00	0.00	
1,140.0	9.19	125.95	1,130.6	-73.8	101.8	125.7	0.00	0.00	
1,170.0	9.19	125.95	1,160.2	-76.6	105.6	130.5	0.00	0.00	
1,200.0	9.19	125.95	1,189.8	-79.4	109.5	135.3	0.00	0.00	
1,230.0	9.19	125.95	1,219.4	-82.3	113.4	140.1	0.00	0.00	
1,260.0	9.19	125.95	1,249.0	-85.1	117.3	144.9	0.00	0.00	
1,290.0	9.19	125.95	1,278.6	-87.9	121.2	149.7	0.00	0.00	
1,320.0	9.19	125.95	1,308.2	-90.7	125.0	154.5	0.00	0.00	
1,350.0	9.19	125.95	1,337.9	-93.5	128.9	159.3	0.00	0.00	
1,380.0	9.19	125.95	1,367.5	-96.3	132.8	164.0	0.00	0.00	
1,410.0	9.19	125.95	1,397.1	-99.1	136.7	168.8	0.00	0.00	
1,440.0	9.19	125.95	1,426.7	-101.9	140.6	173.6	0.00	0.00	
1,470.0	9.19	125.95	1,456.3	-104.8	144.4	178.4	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-16B	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	9.19	125.95	1,485.9	-107.6	148.3	183.2	0.00	0.00	
1,518.3	9.19	125.95	1,504.0	-109.3	150.7	186.1	0.00	0.00	Surface Casing
1,530.0	9.19	125.95	1,515.5	-110.4	152.2	188.0	0.00	0.00	
1,560.0	9.19	125.95	1,545.2	-113.2	156.1	192.8	0.00	0.00	
1,590.0	9.19	125.95	1,574.8	-116.0	159.9	197.6	0.00	0.00	
1,620.0	9.19	125.95	1,604.4	-118.8	163.8	202.4	0.00	0.00	
1,650.0	9.19	125.95	1,634.0	-121.6	167.7	207.2	0.00	0.00	
1,680.0	9.19	125.95	1,663.6	-124.4	171.6	212.0	0.00	0.00	
1,710.0	9.19	125.95	1,693.2	-127.3	175.5	216.7	0.00	0.00	
1,740.0	9.19	125.95	1,722.9	-130.1	179.3	221.5	0.00	0.00	
1,770.0	9.19	125.95	1,752.5	-132.9	183.2	226.3	0.00	0.00	
1,800.0	9.19	125.95	1,782.1	-135.7	187.1	231.1	0.00	0.00	
1,830.0	9.19	125.95	1,811.7	-138.5	191.0	235.9	0.00	0.00	
1,860.0	9.19	125.95	1,841.3	-141.3	194.9	240.7	0.00	0.00	
1,890.0	9.19	125.95	1,870.9	-144.1	198.7	245.5	0.00	0.00	
1,920.0	9.19	125.95	1,900.5	-147.0	202.6	250.3	0.00	0.00	
1,950.0	9.19	125.95	1,930.2	-149.8	206.5	255.1	0.00	0.00	
1,980.0	9.19	125.95	1,959.8	-152.6	210.4	259.9	0.00	0.00	
2,010.0	9.19	125.95	1,989.4	-155.4	214.2	264.7	0.00	0.00	
2,040.0	9.19	125.95	2,019.0	-158.2	218.1	269.5	0.00	0.00	
2,070.0	9.19	125.95	2,048.6	-161.0	222.0	274.2	0.00	0.00	
2,100.0	9.19	125.95	2,078.2	-163.8	225.9	279.0	0.00	0.00	
2,130.0	9.19	125.95	2,107.8	-166.6	229.8	283.8	0.00	0.00	
2,160.0	9.19	125.95	2,137.5	-169.5	233.6	288.6	0.00	0.00	
2,190.0	9.19	125.95	2,167.1	-172.3	237.5	293.4	0.00	0.00	
2,220.0	9.19	125.95	2,196.7	-175.1	241.4	298.2	0.00	0.00	
2,250.0	9.19	125.95	2,226.3	-177.9	245.3	303.0	0.00	0.00	
2,280.0	9.19	125.95	2,255.9	-180.7	249.1	307.8	0.00	0.00	
2,310.0	9.19	125.95	2,285.5	-183.5	253.0	312.6	0.00	0.00	
2,340.0	9.19	125.95	2,315.2	-186.3	256.9	317.4	0.00	0.00	
2,370.0	9.19	125.95	2,344.8	-189.1	260.8	322.2	0.00	0.00	
2,400.0	9.19	125.95	2,374.4	-192.0	264.7	326.9	0.00	0.00	
2,430.0	9.19	125.95	2,404.0	-194.8	268.5	331.7	0.00	0.00	
2,460.0	9.19	125.95	2,433.6	-197.6	272.4	336.5	0.00	0.00	
2,490.0	9.19	125.95	2,463.2	-200.4	276.3	341.3	0.00	0.00	

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									
HMU Federal 16-16B TC	0.00	0.00	7,616.0	-668.0	921.0	1,593,630.54	2,358,300.09	39.441240	-107.772401
- plan misses target center by 5214.0ft at 2490.0ft MD (2463.2 TVD, -200.4 N, 276.3 E)									
- Circle (radius 25.0)									
HMU Federal 16-16B Bf	0.00	0.00	9,732.0	-668.0	921.0	1,593,630.54	2,358,300.09	39.441240	-107.772401
- plan misses target center by 7312.3ft at 2490.0ft MD (2463.2 TVD, -200.4 N, 276.3 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 16-16B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-16B	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	9.19	125.95	2,473.1	-201.3	277.6	342.9	0.00	0.00	
2,600.0	9.19	125.95	2,571.8	-210.7	290.5	358.9	0.00	0.00	
2,700.0	9.19	125.95	2,670.5	-220.1	303.4	374.9	0.00	0.00	
2,800.0	9.19	125.95	2,769.2	-229.5	316.4	390.8	0.00	0.00	
2,900.0	9.19	125.95	2,868.0	-238.8	329.3	406.8	0.00	0.00	
3,000.0	9.19	125.95	2,966.7	-248.2	342.2	422.8	0.00	0.00	
3,100.0	9.19	125.95	3,065.4	-257.6	355.2	438.7	0.00	0.00	
3,200.0	9.19	125.95	3,164.1	-267.0	368.1	454.7	0.00	0.00	
3,300.0	9.19	125.95	3,262.8	-276.4	381.0	470.7	0.00	0.00	
3,400.0	9.19	125.95	3,361.5	-285.7	393.9	486.7	0.00	0.00	
3,500.0	9.19	125.95	3,460.3	-295.1	406.9	502.6	0.00	0.00	
3,600.0	9.19	125.95	3,559.0	-304.5	419.8	518.6	0.00	0.00	
3,631.4	9.19	125.95	3,590.0	-307.4	423.9	523.6	0.00	0.00	G Sand
3,700.0	9.19	125.95	3,657.7	-313.9	432.7	534.6	0.00	0.00	
3,800.0	9.19	125.95	3,756.4	-323.2	445.7	550.5	0.00	0.00	
3,900.0	9.19	125.95	3,855.1	-332.6	458.6	566.5	0.00	0.00	
4,000.0	9.19	125.95	3,953.8	-342.0	471.5	582.5	0.00	0.00	
4,100.0	9.19	125.95	4,052.6	-351.4	484.4	598.5	0.00	0.00	
4,200.0	9.19	125.95	4,151.3	-360.7	497.4	614.4	0.00	0.00	
4,300.0	9.19	125.95	4,250.0	-370.1	510.3	630.4	0.00	0.00	
4,400.0	9.19	125.95	4,348.7	-379.5	523.2	646.4	0.00	0.00	
4,500.0	9.19	125.95	4,447.4	-388.9	536.2	662.3	0.00	0.00	
4,600.0	9.19	125.95	4,546.1	-398.2	549.1	678.3	0.00	0.00	
4,700.0	9.19	125.95	4,644.9	-407.6	562.0	694.3	0.00	0.00	
4,800.0	9.19	125.95	4,743.6	-417.0	574.9	710.2	0.00	0.00	
4,900.0	9.19	125.95	4,842.3	-426.4	587.9	726.2	0.00	0.00	
5,000.0	9.19	125.95	4,941.0	-435.8	600.8	742.2	0.00	0.00	
5,100.0	9.19	125.95	5,039.7	-445.1	613.7	758.2	0.00	0.00	
5,200.0	9.19	125.95	5,138.4	-454.5	626.7	774.1	0.00	0.00	
5,300.0	9.19	125.95	5,237.2	-463.9	639.6	790.1	0.00	0.00	
5,400.0	9.19	125.95	5,335.9	-473.3	652.5	806.1	0.00	0.00	
5,500.0	9.19	125.95	5,434.6	-482.6	665.4	822.0	0.00	0.00	
5,600.0	9.19	125.95	5,533.3	-492.0	678.4	838.0	0.00	0.00	
5,700.0	9.19	125.95	5,632.0	-501.4	691.3	854.0	0.00	0.00	
5,708.1	9.19	125.95	5,640.0	-502.2	692.3	855.3	0.00	0.00	Ohio Creek
5,800.0	9.19	125.95	5,730.7	-510.8	704.2	870.0	0.00	0.00	
5,900.0	9.19	125.95	5,829.5	-520.1	717.2	885.9	0.00	0.00	
6,000.0	9.19	125.95	5,928.2	-529.5	730.1	901.9	0.00	0.00	
6,100.0	9.19	125.95	6,026.9	-538.9	743.0	917.9	0.00	0.00	
6,154.8	9.19	125.95	6,081.0	-544.0	750.1	926.6	0.00	0.00	Mesa Verde
6,200.0	9.19	125.95	6,125.6	-548.3	755.9	933.8	0.00	0.00	
6,300.0	9.19	125.95	6,224.3	-557.7	768.9	949.8	0.00	0.00	
6,400.0	9.19	125.95	6,323.0	-567.0	781.8	965.8	0.00	0.00	
6,500.0	9.19	125.95	6,421.8	-576.4	794.7	981.8	0.00	0.00	
6,600.0	9.19	125.95	6,520.5	-585.8	807.7	997.7	0.00	0.00	
6,673.5	9.19	125.95	6,593.0	-592.7	817.2	1,009.5	0.00	0.00	Williams Fork
6,700.0	9.19	125.95	6,619.2	-595.2	820.6	1,013.7	0.00	0.00	
6,800.0	9.19	125.95	6,717.9	-604.5	833.5	1,029.7	0.00	0.00	
6,900.0	9.19	125.95	6,816.6	-613.9	846.4	1,045.6	0.00	0.00	
7,000.0	9.19	125.95	6,915.3	-623.3	859.4	1,061.6	0.00	0.00	
7,100.0	9.19	125.95	7,014.1	-632.7	872.3	1,077.6	0.00	0.00	
7,200.0	9.19	125.95	7,112.8	-642.0	885.2	1,093.5	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-16B	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
7,246.3	9.19	125.95	7,158.5	-646.4	891.2	1,100.9	0.00	0.00	Start Drop -2.00
7,300.0	8.12	125.95	7,211.6	-651.1	897.7	1,109.0	2.00	-2.00	
7,400.0	6.12	125.95	7,310.8	-658.4	907.8	1,121.4	2.00	-2.00	
7,500.0	4.12	125.95	7,410.4	-663.6	915.0	1,130.3	2.00	-2.00	
7,600.0	2.12	125.95	7,510.2	-666.8	919.4	1,135.8	2.00	-2.00	
7,700.0	0.12	125.95	7,610.2	-668.0	921.0	1,137.7	2.00	-2.00	
7,705.8	0.00	0.00	7,616.0	-668.0	921.0	1,137.7	2.00	-2.00	EOD; Inc=0° - Top of Gas - HMU Federal 16-16
7,800.0	0.00	0.00	7,710.2	-668.0	921.0	1,137.7	0.00	0.00	
7,900.0	0.00	0.00	7,810.2	-668.0	921.0	1,137.7	0.00	0.00	
8,000.0	0.00	0.00	7,910.2	-668.0	921.0	1,137.7	0.00	0.00	
8,100.0	0.00	0.00	8,010.2	-668.0	921.0	1,137.7	0.00	0.00	
8,200.0	0.00	0.00	8,110.2	-668.0	921.0	1,137.7	0.00	0.00	
8,300.0	0.00	0.00	8,210.2	-668.0	921.0	1,137.7	0.00	0.00	
8,400.0	0.00	0.00	8,310.2	-668.0	921.0	1,137.7	0.00	0.00	
8,500.0	0.00	0.00	8,410.2	-668.0	921.0	1,137.7	0.00	0.00	
8,600.0	0.00	0.00	8,510.2	-668.0	921.0	1,137.7	0.00	0.00	
8,700.0	0.00	0.00	8,610.2	-668.0	921.0	1,137.7	0.00	0.00	
8,800.0	0.00	0.00	8,710.2	-668.0	921.0	1,137.7	0.00	0.00	
8,900.0	0.00	0.00	8,810.2	-668.0	921.0	1,137.7	0.00	0.00	
8,921.8	0.00	0.00	8,832.0	-668.0	921.0	1,137.7	0.00	0.00	Coal Ridge
9,000.0	0.00	0.00	8,910.2	-668.0	921.0	1,137.7	0.00	0.00	
9,100.0	0.00	0.00	9,010.2	-668.0	921.0	1,137.7	0.00	0.00	
9,200.0	0.00	0.00	9,110.2	-668.0	921.0	1,137.7	0.00	0.00	
9,300.0	0.00	0.00	9,210.2	-668.0	921.0	1,137.7	0.00	0.00	
9,400.0	0.00	0.00	9,310.2	-668.0	921.0	1,137.7	0.00	0.00	
9,500.0	0.00	0.00	9,410.2	-668.0	921.0	1,137.7	0.00	0.00	
9,585.8	0.00	0.00	9,496.0	-668.0	921.0	1,137.7	0.00	0.00	Base A Cameo Coal
9,600.0	0.00	0.00	9,510.2	-668.0	921.0	1,137.7	0.00	0.00	
9,700.0	0.00	0.00	9,610.2	-668.0	921.0	1,137.7	0.00	0.00	
9,721.8	0.00	0.00	9,632.0	-668.0	921.0	1,137.7	0.00	0.00	Rollins
9,800.0	0.00	0.00	9,710.2	-668.0	921.0	1,137.7	0.00	0.00	
9,821.8	0.00	0.00	9,732.0	-668.0	921.0	1,137.7	0.00	0.00	TD @ 9821.8' MD - HMU Federal 16-16B BHL
9,900.0	0.00	0.00	9,810.2	-668.0	921.0	1,137.7	0.00	0.00	
10,000.0	0.00	0.00	9,910.2	-668.0	921.0	1,137.7	0.00	0.00	
10,100.0	0.00	0.00	10,010.2	-668.0	921.0	1,137.7	0.00	0.00	
10,121.8	0.00	0.00	10,032.0	-668.0	921.0	1,137.7	0.00	0.00	Permit TD @ 10,121.8' 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									
HMU Federal 16-16B TC - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,616.0	-668.0	921.0	1,593,630.54	2,358,300.09	39.441240	-107.772401
HMU Federal 16-16B BHL - plan hits target center - Circle (radius 60.0)	0.00	0.00	9,732.0	-668.0	921.0	1,593,630.54	2,358,300.09	39.441240	-107.772401

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site:	(J16W)	North Reference:	True
Well:	HMU Federal 16-16B	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)
1,518.3	1,504.0	Surface Casing	5.500	6.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,631.4	3,590.0	G Sand		0.00	
5,708.1	5,640.0	Ohio Creek		0.00	
6,154.8	6,081.0	Mesa Verde		0.00	
6,673.5	6,593.0	Williams Fork		0.00	
7,705.8	7,616.0	Top of Gas		0.00	
8,921.8	8,832.0	Coal Ridge		0.00	
9,585.8	9,496.0	Base A Cameo Coal		0.00	
9,721.8	9,632.0	Rollins		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200' MD
506.3	505.0	-14.4	19.8	EOB; Inc=9.19°
7,246.3	7,158.5	-646.4	891.2	Start Drop -2.00
7,705.8	7,616.0	-668.0	921.0	EOD; Inc=0°
9,821.8	9,732.0	-668.0	921.0	TD @ 9821.8' MD
10,121.8	10,032.0	-668.0	921.0	Permit TD @ 10,121.8' MD

EnCana Oil & Gas (USA) Inc

Mamm Creek

(J16W)

HMU Federal 16-16B

DD

Plan #1

Anticollision Report

01 November, 2010

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,212.2ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	Systematic Ellipse
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program	Date	11/1/2010
From (ft)	To (ft)	Survey (Wellbore)
0.0	10,121.8	Plan #1 (DD)
		Tool Name
		MWD
		Description
		Geolink MWD

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance		Separation Factor	Warning
			Between Centres (ft)	Between Ellipses (ft)		
(J16W)						
Existing 16-11 - DD - DD	0.0	0.0	167.8			
Existing 16-11 - DD - DD	200.0	199.5	168.1	167.5	269.742	ES
Existing 16-11 - DD - DD	1,000.0	962.4	254.6	250.7	65.529	SF
Existing 16-16 - DD - DD	2,186.8	2,199.6	176.6	163.1	13.054	CC
Existing 16-16 - DD - DD	2,300.0	2,312.0	177.3	162.9	12.308	ES
Existing 16-16 - DD - DD	9,800.0	9,855.0	382.0	340.2	9.127	SF
Existing 16-9 - DD - DD	1,217.3	1,235.1	142.6	137.9	30.411	CC
Existing 16-9 - DD - DD	1,300.0	1,317.5	142.9	137.9	28.371	ES
Existing 16-9 - DD - DD	2,800.0	2,798.8	294.9	279.4	19.141	SF
HMU Federal 16-10A - DD - Plan #1	200.0	200.0	51.2	50.6	82.440	CC, ES
HMU Federal 16-10A - DD - Plan #1	500.0	498.8	66.3	64.6	38.117	SF
HMU Federal 16-11B - DD - Plan #1	200.0	200.0	60.2	59.5	96.807	CC, ES
HMU Federal 16-11B - DD - Plan #1	500.0	489.7	91.9	90.2	52.295	SF
HMU Federal 16-11D - DD - Plan #1	200.0	200.0	43.5	42.9	70.056	CC, ES
HMU Federal 16-11D - DD - Plan #1	500.0	497.6	63.1	61.4	36.594	SF
HMU Federal 16-14A - DD - Plan #1	200.0	200.0	26.8	26.2	43.182	CC, ES
HMU Federal 16-14A - DD - Plan #1	400.0	400.0	33.9	32.5	24.663	SF
HMU Federal 16-14D - DD - Plan #1	200.0	200.0	12.0	11.4	19.292	CC, ES
HMU Federal 16-14D - DD - Plan #1	300.0	300.0	14.5	13.5	14.966	SF
HMU Federal 16-14D2 - DD - Plan #1	200.0	200.0	11.6	11.0	18.706	CC, ES
HMU Federal 16-14D2 - DD - Plan #1	300.0	300.0	12.5	11.5	12.762	SF
HMU Federal 16-14D3 - DD - Plan #1	349.5	349.4	26.3	25.2	22.458	CC, ES
HMU Federal 16-14D3 - DD - Plan #1	500.0	498.8	31.7	29.9	17.783	SF
HMU Federal 16-6C - DD - Plan #1	360.7	360.3	15.1	13.9	12.370	CC, ES
HMU Federal 16-6C - DD - Plan #1	800.0	798.4	34.0	30.2	8.945	SF
HMU Federal 16-6C2 - DD - Plan #1	200.0	200.0	34.0	33.4	54.783	CC, ES
HMU Federal 16-6C2 - DD - Plan #1	700.0	691.1	59.1	56.0	19.134	SF
HMU Federal 16-9C - DD - Plan #1	200.0	200.0	16.5	15.9	26.527	CC, ES
HMU Federal 16-9C - DD - Plan #1	10,121.8	10,079.6	608.8	564.9	13.880	SF
HMU Federal 21-1B - DD - Plan #1	398.3	396.2	48.4	47.0	35.593	CC
HMU Federal 21-1B - DD - Plan #1	400.0	397.8	48.4	47.0	35.417	ES
HMU Federal 21-1B - DD - Plan #1	800.0	789.3	73.9	70.3	20.244	SF
HMU Federal 21-3A - DD - Plan #1	200.0	200.0	43.3	42.6	69.621	CC, ES
HMU Federal 21-3A - DD - Plan #1	500.0	490.7	63.1	61.2	34.420	SF
HMU Fee 16-8D - DD - Plan #1	200.0	200.0	34.0	33.4	54.746	CC, ES
HMU Fee 16-8D - DD - Plan #1	500.0	493.6	62.4	60.5	33.489	SF

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-11 - DD - DD													Offset Site Error:	0.0 ft
Survey Program: 212-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-130.48	-108.9	-127.6	167.8					
100.0	100.0	99.7	99.7	0.1	0.2	-130.37	-108.7	-127.9	167.8	167.6	0.29	574.081		
200.0	200.0	199.5	199.5	0.3	0.3	-130.04	-108.1	-128.7	168.1	167.5	0.62	269.742 ES		
300.0	300.0	299.9	299.9	0.5	0.5	105.46	-106.9	-130.0	169.0	168.0	0.99	171.518		
400.0	399.6	400.4	400.3	0.7	0.7	108.97	-104.3	-131.6	171.0	169.7	1.38	123.510		
500.0	498.8	497.4	497.3	1.0	0.9	114.01	-101.0	-133.9	176.1	174.2	1.83	96.032		
600.0	597.5	592.8	592.5	1.3	1.0	119.80	-97.6	-137.5	185.1	182.8	2.28	81.141		
700.0	696.2	687.2	686.7	1.6	1.2	125.16	-94.1	-142.6	197.6	194.8	2.72	72.765		
800.0	794.9	780.9	780.1	1.9	1.5	129.93	-90.7	-149.2	213.2	210.1	3.13	68.210		
900.0	893.6	873.0	871.7	2.3	1.7	134.23	-86.8	-157.6	232.1	228.6	3.52	65.988		
1,000.0	992.4	962.4	960.5	2.6	1.9	137.84	-82.9	-167.9	254.6	250.7	3.88	65.529 SF		
1,100.0	1,091.1	1,050.0	1,047.1	2.9	2.2	140.84	-79.3	-180.5	280.7	276.5	4.24	66.246		
1,200.0	1,189.8	1,135.9	1,131.6	3.3	2.5	143.36	-75.6	-195.3	310.4	305.8	4.58	67.798		
1,300.0	1,288.5	1,221.0	1,214.9	3.6	2.8	145.58	-71.2	-212.1	343.0	338.0	4.91	69.825		
1,400.0	1,387.2	1,310.8	1,302.5	3.9	3.1	147.62	-65.8	-231.2	377.6	372.4	5.24	72.043		
1,500.0	1,485.9	1,400.5	1,389.7	4.2	3.5	149.32	-60.5	-251.2	413.7	408.1	5.57	74.299		
1,600.0	1,584.7	1,490.3	1,477.0	4.6	3.9	150.75	-55.2	-272.0	450.6	444.7	5.89	76.481		
1,700.0	1,683.4	1,583.6	1,567.5	4.9	4.3	152.02	-49.5	-293.6	487.9	481.7	6.22	78.447		
1,800.0	1,782.1	1,676.6	1,657.9	5.2	4.7	153.17	-43.3	-314.9	525.3	518.7	6.55	80.232		
1,900.0	1,880.8	1,772.1	1,750.7	5.6	5.1	154.21	-36.9	-336.4	562.5	555.6	6.88	81.805		
2,000.0	1,979.5	1,869.6	1,845.7	5.9	5.6	155.15	-30.4	-357.6	599.0	591.8	7.21	83.100		
2,100.0	2,078.2	1,959.2	1,932.9	6.2	5.9	155.91	-24.4	-377.0	635.7	628.1	7.53	84.405		
2,200.0	2,176.9	2,056.4	2,027.6	6.5	6.4	156.69	-17.6	-397.8	672.2	664.3	7.86	85.471		
2,300.0	2,275.7	2,138.0	2,107.1	6.9	6.7	157.28	-11.7	-415.4	709.0	700.8	8.18	86.713		
2,400.0	2,374.4	2,224.4	2,191.0	7.2	7.1	157.83	-5.6	-435.1	747.0	738.5	8.50	87.929		
2,500.0	2,473.1	2,320.3	2,284.0	7.5	7.6	158.34	0.9	-457.6	785.6	776.8	8.83	88.970		
2,600.0	2,571.8	2,400.8	2,362.0	7.9	8.0	158.73	6.4	-476.7	824.5	815.3	9.14	90.164		
2,700.0	2,670.5	2,491.9	2,450.0	8.2	8.4	159.13	13.0	-499.1	864.3	854.9	9.47	91.243		
2,800.0	2,769.2	2,590.8	2,545.8	8.5	8.9	159.53	19.9	-523.0	903.7	893.9	9.81	92.088		
2,900.0	2,868.0	2,681.2	2,633.3	8.9	9.3	159.86	26.0	-544.5	942.7	932.6	10.14	92.934		
3,000.0	2,966.7	2,768.5	2,717.8	9.2	9.7	160.15	32.0	-565.6	982.1	971.7	10.47	93.805		
3,100.0	3,065.4	2,863.9	2,810.1	9.5	10.2	160.41	38.1	-589.0	1,021.8	1,011.0	10.81	94.515		
3,200.0	3,164.1	2,965.6	2,908.8	9.9	10.6	160.68	44.5	-613.1	1,060.7	1,049.5	11.16	95.034		
3,300.0	3,262.8	3,052.5	2,993.0	10.2	11.0	160.88	49.8	-633.4	1,099.2	1,087.7	11.49	95.664		
3,400.0	3,361.5	3,142.4	3,080.1	10.5	11.5	161.08	55.5	-655.0	1,138.4	1,126.6	11.82	96.277		
3,500.0	3,460.3	3,241.8	3,176.5	10.8	11.9	161.31	62.1	-678.4	1,177.3	1,165.1	12.17	96.718		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-16 - DD - DD													Offset Site Error:	0.0 ft
Survey Program: 212-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-134.99	-129.1	-129.2	182.7					
100.0	100.0	98.2	98.2	0.1	0.2	-135.00	-129.5	-129.5	183.1	182.9	0.29	626.768		
200.0	200.0	196.4	196.4	0.3	0.3	-135.03	-130.6	-130.4	184.6	184.0	0.62	296.410		
300.0	300.0	296.7	296.6	0.5	0.5	99.66	-132.2	-131.6	187.0	186.0	0.97	192.129		
400.0	399.6	396.4	396.4	0.7	0.7	101.62	-134.0	-132.2	190.1	188.8	1.37	139.031		
500.0	498.8	495.4	495.3	1.0	0.8	104.46	-137.1	-131.8	194.9	193.0	1.83	106.685		
600.0	597.5	596.6	596.4	1.3	1.0	107.69	-141.4	-130.2	200.6	198.3	2.31	86.908		
700.0	696.2	697.8	697.5	1.6	1.2	110.46	-145.9	-127.0	205.9	203.1	2.80	73.532		
800.0	794.9	800.2	799.6	1.9	1.4	112.72	-151.1	-122.0	210.4	207.1	3.30	63.666		
900.0	893.6	904.7	903.5	2.3	1.7	114.30	-157.4	-114.1	213.3	209.5	3.84	55.619		
1,000.0	992.4	1,009.5	1,007.5	2.6	1.9	115.00	-165.5	-102.7	214.4	210.0	4.40	48.669		
1,100.0	1,091.1	1,115.7	1,111.9	2.9	2.3	114.60	-175.8	-86.6	212.6	207.5	5.04	42.171		
1,200.0	1,189.8	1,218.2	1,211.9	3.3	2.7	113.32	-187.3	-67.5	208.5	202.8	5.72	36.441		
1,300.0	1,288.5	1,318.3	1,309.3	3.6	3.1	111.66	-199.4	-47.8	204.1	197.7	6.44	31.700		
1,400.0	1,387.2	1,418.2	1,406.3	3.9	3.5	109.61	-212.4	-27.5	199.8	192.6	7.19	27.769		
1,500.0	1,485.9	1,518.2	1,503.3	4.2	3.9	107.35	-225.6	-6.8	195.6	187.7	7.98	24.521		
1,600.0	1,584.7	1,618.9	1,600.6	4.6	4.4	104.73	-239.1	15.1	191.2	182.4	8.80	21.723		
1,700.0	1,683.4	1,717.8	1,696.3	4.9	4.8	102.12	-252.3	36.3	187.2	177.6	9.62	19.462		
1,800.0	1,782.1	1,817.1	1,792.4	5.2	5.3	99.51	-265.4	57.1	183.9	173.4	10.44	17.617		
1,900.0	1,880.8	1,916.7	1,889.1	5.6	5.7	96.96	-278.2	77.6	181.1	169.8	11.25	16.094		
2,000.0	1,979.5	2,015.6	1,985.1	5.9	6.2	94.46	-290.9	97.7	178.7	166.6	12.06	14.820		
2,100.0	2,078.2	2,114.5	2,081.1	6.2	6.6	91.85	-304.1	117.6	177.2	164.4	12.85	13.791		
2,186.8	2,163.9	2,199.6	2,163.7	6.5	7.0	89.70	-315.5	134.1	176.6	163.1	13.53	13.054 CC		
2,200.0	2,176.9	2,212.4	2,176.2	6.5	7.1	89.35	-317.3	136.7	176.6	163.0	13.63	12.956		
2,300.0	2,275.7	2,312.0	2,272.8	6.9	7.5	86.56	-331.9	156.2	177.3	162.9	14.40	12.308 ES		
2,400.0	2,374.4	2,410.6	2,368.5	7.2	8.0	83.95	-346.1	175.2	178.3	163.2	15.14	11.775		
2,500.0	2,473.1	2,508.5	2,463.3	7.5	8.5	81.28	-361.2	194.0	180.7	164.8	15.86	11.388		
2,600.0	2,571.8	2,607.6	2,559.3	7.9	8.9	78.56	-377.2	213.0	184.1	167.5	16.54	11.127		
2,700.0	2,670.5	2,707.6	2,656.3	8.2	9.4	76.13	-393.0	231.5	187.8	170.6	17.20	10.923		
2,800.0	2,769.2	2,807.6	2,753.3	8.5	9.8	73.89	-408.5	249.8	191.7	173.9	17.82	10.757		
2,900.0	2,868.0	2,907.1	2,849.7	8.9	10.3	71.52	-424.2	268.8	195.8	177.4	18.43	10.625		
3,000.0	2,966.7	3,007.0	2,946.4	9.2	10.8	69.07	-440.0	288.5	200.2	181.2	18.98	10.546		
3,100.0	3,065.4	3,107.1	3,043.1	9.5	11.3	66.44	-455.8	309.2	204.7	185.2	19.51	10.494		
3,200.0	3,164.1	3,206.9	3,139.3	9.9	11.8	63.77	-471.5	330.5	209.4	189.5	19.97	10.489		
3,300.0	3,262.8	3,307.2	3,236.1	10.2	12.3	61.28	-487.0	351.6	214.4	194.0	20.40	10.511		
3,400.0	3,361.5	3,408.7	3,334.2	10.5	12.8	58.83	-502.0	373.3	218.9	198.1	20.80	10.528		
3,500.0	3,460.3	3,509.3	3,431.4	10.8	13.3	56.46	-516.1	395.0	223.2	202.0	21.15	10.551		
3,600.0	3,559.0	3,610.1	3,528.8	11.2	13.7	54.21	-529.7	416.6	227.3	205.8	21.48	10.582		
3,700.0	3,657.7	3,711.3	3,626.9	11.5	14.2	52.12	-542.8	438.0	231.1	209.3	21.79	10.606		
3,800.0	3,756.4	3,810.0	3,722.7	11.8	14.7	50.20	-555.2	458.6	234.7	212.6	22.08	10.632		
3,900.0	3,855.1	3,906.4	3,816.0	12.2	15.1	48.45	-568.3	478.5	239.7	217.4	22.35	10.724		
4,000.0	3,953.8	4,004.6	3,911.1	12.5	15.6	46.82	-582.8	498.6	246.1	223.5	22.63	10.876		
4,100.0	4,052.6	4,104.3	4,007.6	12.8	16.1	45.30	-597.6	518.7	252.7	229.8	22.90	11.033		
4,200.0	4,151.3	4,204.1	4,104.2	13.2	16.5	43.85	-612.4	539.0	259.4	236.3	23.16	11.200		
4,300.0	4,250.0	4,303.9	4,200.8	13.5	17.0	42.54	-627.2	558.9	266.2	242.8	23.43	11.362		
4,400.0	4,348.7	4,404.6	4,298.5	13.8	17.5	41.33	-641.9	578.7	272.9	249.2	23.70	11.515		
4,500.0	4,447.4	4,504.8	4,395.7	14.2	17.9	40.23	-656.3	598.2	279.4	255.4	23.98	11.652		
4,600.0	4,546.1	4,605.4	4,493.4	14.5	18.4	39.22	-670.6	617.5	285.7	261.4	24.26	11.777		
4,700.0	4,644.9	4,704.9	4,590.1	14.8	18.9	38.33	-684.6	636.2	291.9	267.4	24.55	11.891		
4,800.0	4,743.6	4,800.1	4,682.4	15.1	19.3	37.41	-698.6	654.8	299.0	274.2	24.82	12.045		
4,900.0	4,842.3	4,899.0	4,778.0	15.5	19.8	36.33	-713.7	675.2	307.1	282.1	25.05	12.261		
5,000.0	4,941.0	4,998.3	4,873.9	15.8	20.3	35.27	-729.0	695.9	315.5	290.2	25.27	12.486		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-16 - DD - DD												Offset Site Error:	0.0 ft
Survey Program: 212-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	5,039.7	5,097.7	4,969.9	16.1	20.8	34.23	-744.1	716.8	323.9	298.4	25.48	12.714	
5,200.0	5,138.4	5,195.3	5,064.1	16.5	21.3	33.20	-759.2	737.8	332.8	307.1	25.67	12.962	
5,300.0	5,237.2	5,294.2	5,159.3	16.8	21.8	32.13	-774.6	759.5	342.0	316.2	25.85	13.233	
5,400.0	5,335.9	5,393.0	5,254.3	17.1	22.3	31.08	-790.0	781.6	351.7	325.6	26.01	13.518	
5,500.0	5,434.6	5,494.4	5,351.9	17.5	22.8	30.04	-805.7	804.2	361.2	335.0	26.18	13.797	
5,600.0	5,533.3	5,598.1	5,451.9	17.8	23.3	29.03	-820.9	827.1	370.0	343.6	26.34	14.046	
5,700.0	5,632.0	5,704.1	5,554.6	18.1	23.8	28.19	-835.5	848.9	377.4	350.9	26.54	14.219	
5,800.0	5,730.7	5,811.6	5,659.4	18.5	24.3	27.56	-849.0	869.1	383.0	356.2	26.80	14.289	
5,900.0	5,829.5	5,912.8	5,758.4	18.8	24.7	27.19	-861.0	886.2	387.1	359.9	27.12	14.271	
6,000.0	5,928.2	6,013.0	5,856.3	19.1	25.1	26.84	-873.1	903.1	391.4	363.9	27.46	14.253	
6,100.0	6,026.9	6,114.2	5,955.3	19.4	25.5	26.42	-884.8	920.6	395.4	367.6	27.76	14.240	
6,200.0	6,125.6	6,210.7	6,049.7	19.8	25.9	25.99	-896.0	937.5	399.6	371.5	28.05	14.246	
6,300.0	6,224.3	6,308.9	6,145.6	20.1	26.3	25.67	-908.4	954.4	404.6	376.2	28.36	14.266	
6,400.0	6,323.0	6,409.6	6,244.0	20.4	26.7	25.41	-921.4	971.4	409.6	380.9	28.70	14.271	
6,500.0	6,421.8	6,515.4	6,347.6	20.8	27.1	25.19	-934.5	988.6	413.9	384.9	29.06	14.243	
6,600.0	6,520.5	6,628.5	6,458.9	21.1	27.5	25.12	-946.7	1,004.7	415.8	386.3	29.48	14.105	
6,700.0	6,619.2	6,736.8	6,565.9	21.4	27.8	25.19	-956.4	1,017.8	415.1	385.1	29.94	13.864	
6,800.0	6,717.9	6,842.5	6,670.7	21.8	28.1	25.39	-964.9	1,029.1	412.7	382.3	30.43	13.561	
6,900.0	6,816.6	6,949.7	6,777.2	22.1	28.4	25.74	-972.6	1,038.8	408.9	377.9	30.99	13.194	
7,000.0	6,915.3	7,053.3	6,880.2	22.4	28.6	26.14	-978.7	1,047.1	403.4	371.9	31.57	12.781	
7,100.0	7,014.1	7,159.6	6,986.1	22.8	28.8	26.59	-984.2	1,055.0	397.2	365.0	32.16	12.351	
7,200.0	7,112.8	7,273.9	7,100.2	23.1	29.0	27.38	-988.2	1,060.3	388.1	355.2	32.90	11.798	
7,300.0	7,211.6	7,376.1	7,202.3	23.4	29.1	28.26	-990.3	1,062.7	377.3	343.6	33.65	11.212	
7,400.0	7,310.8	7,480.7	7,307.0	23.6	29.2	28.87	-991.2	1,065.0	368.1	333.8	34.26	10.745	
7,500.0	7,410.4	7,583.4	7,409.6	23.8	29.3	29.29	-991.1	1,066.4	360.8	326.0	34.74	10.385	
7,600.0	7,510.2	7,682.2	7,508.4	24.0	29.4	29.47	-991.0	1,067.7	356.4	321.4	35.08	10.161	
7,691.4	7,601.6	7,773.8	7,600.0	24.1	29.5	29.46	-991.0	1,068.7	355.2	319.9	35.28	10.069	
7,700.0	7,610.2	7,782.5	7,608.7	24.1	29.5	29.45	-991.0	1,068.8	355.2	319.9	35.29	10.065	
7,800.0	7,710.2	7,882.2	7,708.4	24.2	29.6	155.25	-990.9	1,069.8	355.6	320.1	35.50	10.018	
7,900.0	7,810.2	7,981.6	7,807.8	24.3	29.7	155.20	-991.4	1,070.4	356.3	320.5	35.74	9.968	
8,000.0	7,910.2	8,082.2	7,908.4	24.4	29.8	155.29	-992.1	1,070.1	356.8	320.8	36.05	9.900	
8,100.0	8,010.2	8,182.1	8,008.2	24.5	29.8	155.42	-992.9	1,069.6	357.3	321.0	36.36	9.827	
8,200.0	8,110.2	8,281.1	8,107.2	24.6	29.9	155.61	-994.0	1,068.8	358.0	321.3	36.71	9.754	
8,300.0	8,210.2	8,380.5	8,206.7	24.7	30.0	155.83	-995.5	1,067.9	359.0	321.9	37.06	9.686	
8,400.0	8,310.2	8,480.9	8,307.0	24.8	30.1	156.07	-996.9	1,067.0	359.9	322.5	37.42	9.618	
8,500.0	8,410.2	8,580.6	8,406.8	24.9	30.2	156.29	-998.3	1,066.1	360.8	323.0	37.78	9.551	
8,600.0	8,510.2	8,680.1	8,506.3	25.0	30.3	156.44	-999.6	1,065.6	361.8	323.7	38.11	9.495	
8,700.0	8,610.2	8,779.9	8,606.0	25.1	30.4	156.57	-1,001.0	1,065.3	363.0	324.5	38.43	9.445	
8,800.0	8,710.2	8,879.6	8,705.7	25.2	30.5	156.70	-1,002.4	1,065.0	364.2	325.4	38.75	9.397	
8,900.0	8,810.2	8,980.1	8,806.2	25.3	30.6	156.82	-1,003.8	1,064.8	365.3	326.3	39.08	9.349	
9,000.0	8,910.2	9,081.1	8,907.1	25.4	30.7	156.88	-1,004.9	1,064.8	366.3	326.9	39.38	9.302	
9,100.0	9,010.2	9,181.0	9,007.0	25.5	30.8	156.95	-1,005.8	1,064.8	367.2	327.5	39.68	9.253	
9,200.0	9,110.2	9,279.0	9,105.1	25.6	30.9	157.05	-1,007.1	1,064.6	368.3	328.3	40.00	9.208	
9,300.0	9,210.2	9,376.5	9,202.6	25.8	31.0	157.19	-1,009.0	1,064.4	370.0	329.7	40.32	9.176	
9,400.0	9,310.2	9,473.5	9,299.5	25.9	31.1	157.32	-1,011.5	1,064.6	372.5	331.9	40.65	9.165	
9,500.0	9,410.2	9,574.7	9,400.7	26.0	31.2	157.39	-1,014.3	1,065.2	375.2	334.3	40.96	9.162	
9,600.0	9,510.2	9,676.1	9,502.0	26.1	31.3	157.46	-1,016.6	1,065.6	377.6	336.3	41.27	9.149	
9,700.0	9,610.2	9,777.2	9,603.1	26.2	31.5	157.54	-1,018.7	1,066.0	379.6	338.0	41.58	9.130	
9,800.0	9,710.2	9,855.0	9,680.9	26.3	31.5	157.60	-1,020.1	1,066.1	382.0	340.2	41.85	9.127 SF	
9,900.0	9,810.2	9,855.0	9,680.9	26.4	31.5	157.60	-1,020.1	1,066.1	402.2	360.2	42.00	9.576	
10,000.0	9,910.2	9,855.0	9,680.9	26.5	31.5	157.60	-1,020.1	1,066.1	444.6	402.4	42.15	10.547	
10,100.0	10,010.2	9,855.0	9,680.9	26.7	31.5	157.60	-1,020.1	1,066.1	503.5	461.2	42.30	11.902	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-16 - DD - DD												Offset Site Error: 0.0 ft	
Survey Program: 212-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)			
10,121.8	10,032.0	9,855.0	9,680.9	26.7	31.5	157.60	-1,020.1	1,066.1	518.0	475.7	42.34	12.236	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-9 - DD - DD													Offset Site Error:	0.0 ft
Survey Program: 195-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-125.29	-88.7	-125.3	153.5					
100.0	100.0	100.2	100.2	0.1	0.2	-125.23	-88.5	-125.3	153.4	153.1	0.29	526.184		
200.0	200.0	200.4	200.4	0.3	0.3	-125.04	-88.0	-125.4	153.2	152.6	0.62	246.106		
217.3	217.3	217.8	217.8	0.3	0.3	109.07	-87.9	-125.5	153.2	152.5	0.68	224.017		
300.0	300.0	301.0	301.0	0.5	0.5	109.94	-87.7	-125.2	153.7	152.7	0.98	156.848		
400.0	399.6	403.3	403.2	0.7	0.7	112.11	-88.2	-123.0	155.0	153.6	1.37	112.886		
500.0	498.8	505.8	505.7	1.0	0.9	115.57	-88.8	-118.8	157.1	155.3	1.82	86.317		
600.0	597.5	609.2	608.9	1.3	1.1	119.90	-88.6	-112.2	158.7	156.4	2.27	69.869		
700.0	696.2	713.5	712.8	1.6	1.3	124.48	-86.5	-103.3	158.5	155.8	2.71	58.521		
800.0	794.9	817.8	816.2	1.9	1.6	129.35	-82.7	-91.1	155.9	152.8	3.12	49.902		
900.0	893.6	919.5	916.9	2.3	1.9	134.75	-77.2	-77.1	151.9	148.4	3.51	43.275		
1,000.0	992.4	1,020.7	1,016.6	2.6	2.2	140.89	-70.2	-61.8	147.8	143.9	3.88	38.116		
1,100.0	1,091.1	1,120.5	1,114.8	2.9	2.5	147.46	-62.8	-45.3	144.1	139.9	4.24	33.963		
1,200.0	1,189.8	1,217.7	1,210.5	3.3	2.8	154.08	-55.6	-29.6	142.6	138.0	4.62	30.871		
1,217.3	1,206.9	1,235.1	1,227.5	3.3	2.9	155.26	-54.3	-26.8	142.6	137.9	4.69	30.411 CC		
1,300.0	1,288.5	1,317.5	1,308.6	3.6	3.2	160.91	-48.2	-13.1	142.9	137.9	5.04	28.371 ES		
1,400.0	1,387.2	1,415.8	1,405.1	3.9	3.5	167.81	-40.3	3.4	145.2	139.7	5.51	26.338		
1,500.0	1,485.9	1,514.6	1,502.1	4.2	3.9	174.77	-31.7	20.6	149.4	143.3	6.06	24.646		
1,600.0	1,584.7	1,613.3	1,598.8	4.6	4.3	-178.63	-23.2	38.3	155.2	148.5	6.68	23.223		
1,700.0	1,683.4	1,710.9	1,694.5	4.9	4.7	-172.76	-14.9	55.4	163.3	155.9	7.35	22.223		
1,800.0	1,782.1	1,809.4	1,791.3	5.2	5.0	-167.70	-6.9	71.9	173.0	165.0	8.04	21.527		
1,900.0	1,880.8	1,909.3	1,889.6	5.6	5.4	-163.28	0.6	88.6	183.6	174.9	8.75	20.996		
2,000.0	1,979.5	2,009.4	1,987.9	5.9	5.7	-159.38	7.2	105.8	194.1	184.6	9.47	20.501		
2,100.0	2,078.2	2,108.3	2,085.0	6.2	6.1	-155.84	13.6	123.3	205.1	194.9	10.20	20.099		
2,200.0	2,176.9	2,206.8	2,181.7	6.5	6.5	-152.55	20.2	141.1	216.7	205.8	10.95	19.798		
2,300.0	2,275.7	2,305.7	2,278.9	6.9	6.8	-149.68	26.7	158.6	229.1	217.4	11.68	19.611		
2,400.0	2,374.4	2,405.6	2,376.9	7.2	7.2	-147.07	32.9	176.5	241.5	229.1	12.42	19.447		
2,500.0	2,473.1	2,503.5	2,473.0	7.5	7.6	-144.64	39.0	194.6	254.2	241.1	13.15	19.329		
2,600.0	2,571.8	2,602.9	2,570.3	7.9	8.0	-142.34	45.4	213.3	267.5	253.6	13.90	19.238		
2,700.0	2,670.5	2,701.7	2,667.0	8.2	8.4	-140.12	51.7	232.6	280.9	266.2	14.65	19.171		
2,800.0	2,769.2	2,798.8	2,762.0	8.5	8.8	-138.08	58.2	251.9	294.9	279.4	15.40	19.141 SF		
2,900.0	2,868.0	2,896.5	2,857.4	8.9	9.2	-136.08	65.1	271.8	309.6	293.4	16.15	19.168		
3,000.0	2,966.7	2,994.7	2,953.3	9.2	9.6	-134.36	72.2	291.2	324.7	307.9	16.88	19.241		
3,100.0	3,065.4	3,092.9	3,049.4	9.5	10.0	-132.87	79.3	310.2	340.2	322.6	17.59	19.345		
3,200.0	3,164.1	3,191.6	3,146.1	9.9	10.4	-131.55	86.3	329.0	355.9	337.6	18.29	19.464		
3,300.0	3,262.8	3,290.7	3,243.2	10.2	10.8	-130.42	93.2	347.4	371.6	352.7	18.97	19.591		
3,400.0	3,361.5	3,390.1	3,340.8	10.5	11.1	-129.46	99.9	365.3	387.3	367.6	19.64	19.719		
3,500.0	3,460.3	3,489.4	3,438.1	10.8	11.5	-128.46	106.4	384.0	402.8	382.5	20.33	19.809		
3,600.0	3,559.0	3,588.1	3,534.7	11.2	11.9	-127.51	112.9	402.8	418.4	397.4	21.01	19.913		
3,700.0	3,657.7	3,688.1	3,632.9	11.5	12.3	-126.71	119.1	421.1	433.8	412.1	21.68	20.007		
3,800.0	3,756.4	3,784.8	3,727.7	11.8	12.7	-125.95	125.2	439.2	449.4	427.1	22.35	20.108		
3,900.0	3,855.1	3,881.5	3,822.3	12.2	13.1	-125.18	131.8	457.7	465.6	442.5	23.02	20.224		
4,000.0	3,953.8	3,979.8	3,918.6	12.5	13.5	-124.47	138.6	476.4	481.9	458.3	23.68	20.349		
4,100.0	4,052.6	4,080.2	4,017.1	12.8	13.8	-123.88	145.6	494.7	498.3	474.0	24.34	20.472		
4,200.0	4,151.3	4,179.4	4,114.5	13.2	14.2	-123.37	151.9	512.5	514.2	489.2	25.00	20.570		
4,300.0	4,250.0	4,275.2	4,208.5	13.5	14.6	-122.88	158.5	529.9	530.6	505.0	25.64	20.698		
4,400.0	4,348.7	4,375.1	4,306.5	13.8	15.0	-122.43	165.4	547.8	547.1	520.8	26.29	20.814		
4,500.0	4,447.4	4,475.4	4,404.9	14.2	15.4	-122.03	172.1	565.6	563.3	536.4	26.93	20.919		
4,600.0	4,546.1	4,574.0	4,501.8	14.5	15.7	-121.67	178.5	582.8	579.4	551.8	27.57	21.013		
4,700.0	4,644.9	4,672.8	4,598.7	14.8	16.1	-121.26	184.9	600.9	595.6	567.4	28.23	21.101		
4,800.0	4,743.6	4,774.2	4,698.2	15.1	16.5	-120.85	191.2	619.5	611.6	582.7	28.88	21.172		
4,900.0	4,842.3	4,871.1	4,793.4	15.5	16.9	-120.48	197.0	637.2	627.3	597.7	29.53	21.243		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-9 - DD - DD													Offset Site Error:	0.0 ft
Survey Program: 195-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
5,000.0	4,941.0	4,968.1	4,888.4	15.8	17.2	-120.11	203.3	655.2	643.5	613.3	30.18	21.325		
5,100.0	5,039.7	5,065.7	4,984.2	16.1	17.6	-119.76	209.7	673.3	659.8	629.0	30.82	21.410		
5,200.0	5,138.4	5,166.6	5,083.2	16.5	18.0	-119.44	216.3	691.6	676.2	644.7	31.47	21.487		
5,300.0	5,237.2	5,266.9	5,181.6	16.8	18.4	-119.16	222.5	709.7	692.2	660.1	32.12	21.552		
5,400.0	5,335.9	5,367.6	5,280.5	17.1	18.8	-118.89	228.5	727.6	708.0	675.2	32.76	21.609		
5,500.0	5,434.6	5,464.4	5,375.6	17.5	19.1	-118.64	234.3	745.1	723.7	690.3	33.40	21.668		
5,600.0	5,533.3	5,559.0	5,468.3	17.8	19.5	-118.35	240.2	762.7	739.9	705.9	34.04	21.735		
5,700.0	5,632.0	5,654.3	5,561.6	18.1	19.9	-118.02	246.6	781.3	756.6	721.9	34.69	21.808		
5,800.0	5,730.7	5,741.8	5,647.1	18.5	20.3	-117.72	253.1	798.6	774.2	738.9	35.31	21.925		
5,900.0	5,829.5	5,840.1	5,743.1	18.8	20.7	-117.41	261.4	817.8	792.7	756.7	35.97	22.040		
6,000.0	5,928.2	5,945.4	5,846.1	19.1	21.1	-117.13	269.7	837.9	810.7	774.0	36.63	22.129		
6,100.0	6,026.9	6,050.9	5,949.6	19.4	21.5	-116.93	277.3	857.0	827.8	790.5	37.29	22.200		
6,200.0	6,125.6	6,155.3	6,052.3	19.8	21.9	-116.78	284.1	875.2	844.0	806.1	37.94	22.248		
6,300.0	6,224.3	6,252.7	6,147.8	20.1	22.2	-116.63	290.1	892.4	860.1	821.5	38.57	22.301		
6,400.0	6,323.0	6,350.9	6,244.3	20.4	22.6	-116.47	296.3	909.9	876.3	837.1	39.20	22.356		
6,500.0	6,421.8	6,453.0	6,344.7	20.8	23.0	-116.36	302.7	927.4	892.4	852.6	39.83	22.408		
6,600.0	6,520.5	6,556.6	6,446.9	21.1	23.3	-116.38	309.0	943.0	907.9	867.5	40.43	22.458		
6,700.0	6,619.2	6,663.7	6,552.8	21.4	23.6	-116.52	315.2	957.3	923.0	882.0	41.02	22.501		
6,800.0	6,717.9	6,778.6	6,666.9	21.8	23.9	-116.79	320.6	970.3	936.6	895.0	41.60	22.512		
6,900.0	6,816.6	6,887.6	6,775.3	22.1	24.2	-117.19	324.5	980.1	948.8	906.6	42.14	22.513		
7,000.0	6,915.3	7,000.9	6,888.4	22.4	24.4	-117.73	327.5	987.6	959.8	917.2	42.65	22.502		
7,100.0	7,014.1	7,115.2	7,002.6	22.8	24.5	-118.43	329.3	992.4	969.5	926.4	43.12	22.482		
7,200.0	7,112.8	7,223.6	7,111.0	23.1	24.6	-119.25	329.6	993.7	977.7	934.1	43.55	22.450		
7,300.0	7,211.6	7,320.1	7,207.4	23.4	24.7	-120.04	329.8	994.4	985.7	941.7	43.97	22.419		
7,400.0	7,310.8	7,417.4	7,304.8	23.6	24.8	-120.73	330.2	995.2	992.5	948.2	44.34	22.383		
7,500.0	7,410.4	7,515.2	7,402.6	23.8	24.9	-121.22	330.9	995.8	997.8	953.1	44.66	22.342		
7,600.0	7,510.2	7,613.0	7,500.4	24.0	25.0	-121.51	331.7	996.4	1,001.5	956.6	44.93	22.291		
7,700.0	7,610.2	7,711.7	7,599.0	24.1	25.1	-121.61	332.7	997.0	1,003.6	958.5	45.15	22.230		
7,800.0	7,710.2	7,808.4	7,695.7	24.2	25.2	4.37	333.8	997.6	1,004.8	959.5	45.36	22.153		
7,900.0	7,810.2	7,914.2	7,801.5	24.3	25.3	4.41	335.2	998.4	1,006.2	960.6	45.59	22.073		
8,000.0	7,910.2	8,019.2	7,906.5	24.4	25.5	4.44	335.7	999.0	1,006.7	960.9	45.81	21.976		
8,100.0	8,010.2	8,119.4	8,006.8	24.5	25.6	4.47	336.0	999.4	1,007.1	961.0	46.03	21.879		
8,200.0	8,110.2	8,219.3	8,106.6	24.6	25.7	4.49	336.3	999.8	1,007.4	961.2	46.25	21.782		
8,300.0	8,210.2	8,324.6	8,211.9	24.7	25.8	4.49	336.5	999.9	1,007.5	961.1	46.47	21.682		
8,400.0	8,310.2	8,429.8	8,317.1	24.8	25.9	4.48	336.0	999.6	1,007.1	960.4	46.69	21.569		
8,500.0	8,410.2	8,530.2	8,417.6	24.9	26.0	4.47	335.3	999.5	1,006.4	959.4	46.91	21.453		
8,600.0	8,510.2	8,631.6	8,518.9	25.0	26.0	4.47	334.5	999.3	1,005.5	958.4	47.13	21.336		
8,700.0	8,610.2	8,731.1	8,618.4	25.1	26.1	4.44	333.7	998.7	1,004.7	957.3	47.34	21.221		
8,800.0	8,710.2	8,830.5	8,717.8	25.2	26.2	4.41	333.0	998.1	1,003.9	956.4	47.56	21.109		
8,900.0	8,810.2	8,933.2	8,820.5	25.3	26.3	4.38	332.1	997.5	1,003.1	955.3	47.78	20.992		
9,000.0	8,910.2	9,035.6	8,922.9	25.4	26.4	4.35	331.0	997.0	1,001.9	953.9	48.01	20.870		
9,100.0	9,010.2	9,137.9	9,025.1	25.5	26.5	4.34	329.6	996.7	1,000.5	952.3	48.24	20.742		
9,200.0	9,110.2	9,240.8	9,128.1	25.6	26.6	4.33	327.9	996.3	998.9	950.4	48.47	20.610		
9,300.0	9,210.2	9,341.5	9,228.7	25.8	26.7	4.30	326.1	995.6	997.0	948.4	48.69	20.478		
9,400.0	9,310.2	9,436.5	9,323.7	25.9	26.8	4.23	324.6	994.4	995.4	946.5	48.90	20.357		
9,500.0	9,410.2	9,535.8	9,423.0	26.0	26.8	4.12	323.5	992.4	994.1	945.0	49.10	20.247		
9,600.0	9,510.2	9,640.9	9,528.1	26.1	26.9	3.95	322.1	989.4	992.6	943.3	49.29	20.136		
9,700.0	9,610.2	9,740.2	9,627.2	26.2	27.0	3.76	320.6	986.0	990.8	941.4	49.49	20.022		
9,800.0	9,710.2	9,842.1	9,729.1	26.3	27.0	3.58	318.9	982.6	989.0	939.3	49.68	19.906		
9,831.8	9,742.0	9,855.0	9,742.0	26.3	27.0	3.55	318.7	982.2	988.6	938.8	49.73	19.878		
9,900.0	9,810.2	9,855.0	9,742.0	26.4	27.0	3.55	318.7	982.2	990.9	941.1	49.82	19.891		
10,000.0	9,910.2	9,855.0	9,742.0	26.5	27.0	3.55	318.7	982.2	1,002.8	952.8	49.94	20.079		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - Existing 16-9 - DD - DD												Offset Site Error:	0.0 ft
Survey Program: 195-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
10,100.0	10,010.2	9,855.0	9,742.0	26.7	27.0	3.55	318.7	982.2	1,024.3	974.2	50.07	20.458	
10,121.8	10,032.0	9,855.0	9,742.0	26.7	27.0	3.55	318.7	982.2	1,030.2	980.1	50.10	20.565	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-10A - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	5.38	51.0	4.8	51.2						
100.0	100.0	100.0	100.0	0.1	0.1	5.38	51.0	4.8	51.2	51.0	0.27	188.131			
200.0	200.0	200.0	200.0	0.3	0.3	5.38	51.0	4.8	51.2	50.6	0.62	82.440 CC, ES			
300.0	300.0	300.0	300.0	0.5	0.5	-122.99	51.0	4.8	52.6	51.6	0.98	53.890			
400.0	399.6	399.6	399.6	0.7	0.7	-129.47	51.0	4.8	57.3	55.9	1.35	42.397			
500.0	498.8	498.8	498.8	1.0	0.8	-137.99	51.0	4.8	66.3	64.6	1.74	38.117 SF			
600.0	597.5	594.4	594.4	1.3	1.0	-144.44	53.2	5.6	80.8	78.7	2.11	38.258			
700.0	696.2	689.1	688.8	1.6	1.2	-147.02	59.8	8.0	99.7	97.2	2.50	39.916			
800.0	794.9	784.7	783.8	1.9	1.4	-147.44	70.3	11.8	121.8	118.9	2.91	41.913			
900.0	893.6	882.2	880.5	2.3	1.6	-147.57	81.6	15.9	144.4	141.0	3.33	43.371			
1,000.0	992.4	979.6	977.1	2.6	1.9	-147.67	92.9	20.1	166.9	163.2	3.76	44.436			
1,100.0	1,091.1	1,077.0	1,073.8	2.9	2.1	-147.75	104.2	24.2	189.5	185.3	4.19	45.240			
1,200.0	1,189.8	1,174.4	1,170.5	3.3	2.4	-147.81	115.4	28.3	212.0	207.4	4.62	45.866			
1,300.0	1,288.5	1,271.9	1,267.2	3.6	2.7	-147.86	126.7	32.4	234.6	229.5	5.06	46.365			
1,400.0	1,387.2	1,369.3	1,363.9	3.9	2.9	-147.90	138.0	36.5	257.1	251.6	5.50	46.771			
1,500.0	1,485.9	1,466.7	1,460.6	4.2	3.2	-147.93	149.3	40.6	279.7	273.7	5.94	47.108			
1,600.0	1,584.7	1,564.1	1,557.2	4.6	3.4	-147.96	160.5	44.7	302.2	295.8	6.38	47.390			
1,700.0	1,683.4	1,661.6	1,653.9	4.9	3.7	-147.99	171.8	48.8	324.8	317.9	6.82	47.631			
1,800.0	1,782.1	1,759.0	1,750.6	5.2	4.0	-148.01	183.1	52.9	347.3	340.1	7.26	47.838			
1,900.0	1,880.8	1,856.4	1,847.3	5.6	4.2	-148.03	194.4	57.0	369.9	362.2	7.70	48.018			
2,000.0	1,979.5	1,953.8	1,944.0	5.9	4.5	-148.04	205.6	61.1	392.4	384.3	8.15	48.176			
2,100.0	2,078.2	2,051.3	2,040.6	6.2	4.8	-148.06	216.9	65.2	415.0	406.4	8.59	48.316			
2,200.0	2,176.9	2,148.7	2,137.3	6.5	5.0	-148.07	228.2	69.3	437.5	428.5	9.03	48.440			
2,300.0	2,275.7	2,246.1	2,234.0	6.9	5.3	-148.08	239.5	73.4	460.1	450.6	9.48	48.551			
2,400.0	2,374.4	2,343.5	2,330.7	7.2	5.6	-148.09	250.8	77.5	482.6	472.7	9.92	48.651			
2,500.0	2,473.1	2,441.0	2,427.4	7.5	5.8	-148.10	262.0	81.6	505.2	494.8	10.36	48.741			
2,600.0	2,571.8	2,538.4	2,524.1	7.9	6.1	-148.11	273.3	85.7	527.7	516.9	10.81	48.823			
2,700.0	2,670.5	2,635.8	2,620.7	8.2	6.4	-148.12	284.6	89.9	550.3	539.0	11.25	48.898			
2,800.0	2,769.2	2,733.2	2,717.4	8.5	6.6	-148.13	295.9	94.0	572.8	561.1	11.70	48.967			
2,900.0	2,868.0	2,830.7	2,814.1	8.9	6.9	-148.14	307.1	98.1	595.4	583.2	12.14	49.030			
3,000.0	2,966.7	2,928.1	2,910.8	9.2	7.2	-148.14	318.4	102.2	617.9	605.3	12.59	49.088			
3,100.0	3,065.4	3,025.5	3,007.5	9.5	7.4	-148.15	329.7	106.3	640.5	627.4	13.03	49.142			
3,200.0	3,164.1	3,122.9	3,104.1	9.9	7.7	-148.15	341.0	110.4	663.0	649.5	13.48	49.192			
3,300.0	3,262.8	3,220.4	3,200.8	10.2	8.0	-148.16	352.2	114.5	685.6	671.7	13.92	49.239			
3,400.0	3,361.5	3,317.8	3,297.5	10.5	8.2	-148.16	363.5	118.6	708.1	693.8	14.37	49.282			
3,500.0	3,460.3	3,415.2	3,394.2	10.8	8.5	-148.17	374.8	122.7	730.7	715.9	14.81	49.323			
3,600.0	3,559.0	3,512.6	3,490.9	11.2	8.8	-148.17	386.1	126.8	753.2	738.0	15.26	49.361			
3,700.0	3,657.7	3,610.0	3,587.6	11.5	9.1	-148.18	397.4	130.9	775.8	760.1	15.71	49.396			
3,800.0	3,756.4	3,707.5	3,684.2	11.8	9.3	-148.18	408.6	135.0	798.3	782.2	16.15	49.430			
3,900.0	3,855.1	3,804.9	3,780.9	12.2	9.6	-148.19	419.9	139.1	820.9	804.3	16.60	49.461			
4,000.0	3,953.8	3,902.3	3,877.6	12.5	9.9	-148.19	431.2	143.2	843.4	826.4	17.04	49.491			
4,100.0	4,052.6	3,999.7	3,974.3	12.8	10.1	-148.19	442.5	147.3	866.0	848.5	17.49	49.519			
4,200.0	4,151.3	4,097.2	4,071.0	13.2	10.4	-148.20	453.7	151.4	888.5	870.6	17.93	49.546			
4,300.0	4,250.0	4,194.6	4,167.7	13.5	10.7	-148.20	465.0	155.5	911.1	892.7	18.38	49.571			
4,400.0	4,348.7	4,292.0	4,264.3	13.8	10.9	-148.20	476.3	159.7	933.6	914.8	18.83	49.595			
4,500.0	4,447.4	4,389.4	4,361.0	14.2	11.2	-148.20	487.6	163.8	956.2	936.9	19.27	49.618			
4,600.0	4,546.1	4,486.9	4,457.7	14.5	11.5	-148.21	498.8	167.9	978.7	959.0	19.72	49.640			
4,700.0	4,644.9	4,584.3	4,554.4	14.8	11.7	-148.21	510.1	172.0	1,001.3	981.1	20.16	49.660			
4,800.0	4,743.6	4,681.7	4,651.1	15.1	12.0	-148.21	521.4	176.1	1,023.8	1,003.2	20.61	49.680			
4,900.0	4,842.3	4,779.1	4,747.7	15.5	12.3	-148.21	532.7	180.2	1,046.4	1,025.3	21.05	49.699			
5,000.0	4,941.0	4,876.6	4,844.4	15.8	12.6	-148.22	544.0	184.3	1,068.9	1,047.4	21.50	49.717			
5,100.0	5,039.7	4,974.0	4,941.1	16.1	12.8	-148.22	555.2	188.4	1,091.5	1,069.5	21.95	49.734			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-10A - DD - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)				
5,200.0	5,138.4	5,071.4	5,037.8	16.5	13.1	-148.22	566.5	192.5	1,114.0	1,091.7	22.39	49.751		
5,300.0	5,237.2	5,168.8	5,134.5	16.8	13.4	-148.22	577.8	196.6	1,136.6	1,113.8	22.84	49.767		
5,400.0	5,335.9	5,266.3	5,231.2	17.1	13.6	-148.22	589.1	200.7	1,159.1	1,135.9	23.28	49.782		
5,500.0	5,434.6	5,363.7	5,327.8	17.5	13.9	-148.23	600.3	204.8	1,181.7	1,158.0	23.73	49.796		
5,600.0	5,533.3	5,461.1	5,424.5	17.8	14.2	-148.23	611.6	208.9	1,204.2	1,180.1	24.18	49.810		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-11B - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	-2.15	60.1	-2.3	60.2						
100.0	100.0	100.0	100.0	0.1	0.1	-2.15	60.1	-2.3	60.2	59.9	0.27	220.919			
200.0	200.0	200.0	200.0	0.3	0.3	-2.15	60.1	-2.3	60.2	59.5	0.62	96.807 CC, ES			
300.0	300.0	298.6	298.6	0.5	0.5	-132.06	60.9	-4.7	62.9	61.9	0.98	64.200			
400.0	399.6	395.7	395.3	0.7	0.7	-141.76	63.4	-11.7	72.5	71.2	1.37	53.084			
500.0	498.8	489.7	488.6	1.0	1.0	-152.57	67.3	-23.0	91.9	90.2	1.76	52.295 SF			
600.0	597.5	580.3	577.8	1.3	1.3	-161.36	72.6	-37.9	120.1	118.0	2.12	56.624			
700.0	696.2	669.3	664.7	1.6	1.7	-167.60	79.0	-56.3	153.9	151.4	2.46	62.511			
800.0	794.9	761.8	754.6	1.9	2.0	-171.97	86.1	-76.6	189.9	187.1	2.80	67.820			
900.0	893.6	854.3	844.6	2.3	2.4	-174.95	93.1	-96.8	226.6	223.4	3.14	72.268			
1,000.0	992.4	946.8	934.5	2.6	2.9	-177.10	100.2	-117.0	263.6	260.2	3.47	75.975			
1,100.0	1,091.1	1,039.3	1,024.5	2.9	3.3	-178.72	107.3	-137.3	301.0	297.1	3.81	79.085			
1,200.0	1,189.8	1,131.7	1,114.5	3.3	3.7	-179.99	114.3	-157.5	338.4	334.3	4.14	81.719			
1,300.0	1,288.5	1,224.2	1,204.4	3.6	4.1	179.00	121.4	-177.8	376.0	371.5	4.48	83.972			
1,400.0	1,387.2	1,316.7	1,294.4	3.9	4.5	178.17	128.5	-198.0	413.7	408.9	4.82	85.917			
1,500.0	1,485.9	1,409.2	1,384.3	4.2	4.9	177.47	135.5	-218.3	451.4	446.3	5.15	87.612			
1,600.0	1,584.7	1,501.7	1,474.3	4.6	5.3	176.89	142.6	-238.5	489.2	483.7	5.49	89.099			
1,700.0	1,683.4	1,594.1	1,564.3	4.9	5.7	176.39	149.7	-258.7	527.0	521.2	5.83	90.414			
1,800.0	1,782.1	1,686.6	1,654.2	5.2	6.1	175.95	156.7	-279.0	564.9	558.7	6.17	91.584			
1,900.0	1,880.8	1,779.1	1,744.2	5.6	6.6	175.57	163.8	-299.2	602.8	596.3	6.51	92.632			
2,000.0	1,979.5	1,871.6	1,834.1	5.9	7.0	175.24	170.9	-319.5	640.7	633.8	6.85	93.576			
2,100.0	2,078.2	1,964.1	1,924.1	6.2	7.4	174.94	178.0	-339.7	678.6	671.4	7.19	94.430			
2,200.0	2,176.9	2,056.5	2,014.1	6.5	7.8	174.67	185.0	-360.0	716.5	709.0	7.53	95.206			
2,300.0	2,275.7	2,149.0	2,104.0	6.9	8.2	174.43	192.1	-380.2	754.4	746.6	7.87	95.915			
2,400.0	2,374.4	2,241.5	2,194.0	7.2	8.6	174.22	199.2	-400.4	792.4	784.2	8.21	96.564			
2,500.0	2,473.1	2,334.0	2,283.9	7.5	9.0	174.02	206.2	-420.7	830.4	821.8	8.55	97.161			
2,600.0	2,571.8	2,426.5	2,373.9	7.9	9.5	173.84	213.3	-440.9	868.3	859.4	8.89	97.712			
2,700.0	2,670.5	2,518.9	2,463.9	8.2	9.9	173.67	220.4	-461.2	906.3	897.1	9.23	98.221			
2,800.0	2,769.2	2,611.4	2,553.8	8.5	10.3	173.52	227.4	-481.4	944.3	934.7	9.57	98.694			
2,900.0	2,868.0	2,703.9	2,643.8	8.9	10.7	173.38	234.5	-501.7	982.3	972.3	9.91	99.135			
3,000.0	2,966.7	2,796.4	2,733.7	9.2	11.1	173.25	241.6	-521.9	1,020.2	1,010.0	10.25	99.545			
3,100.0	3,065.4	2,888.9	2,823.7	9.5	11.5	173.13	248.6	-542.1	1,058.2	1,047.6	10.59	99.929			
3,200.0	3,164.1	2,981.3	2,913.7	9.9	12.0	173.02	255.7	-562.4	1,096.2	1,085.3	10.93	100.288			
3,300.0	3,262.8	3,073.8	3,003.6	10.2	12.4	172.92	262.8	-582.6	1,134.2	1,123.0	11.27	100.626			
3,400.0	3,361.5	3,166.3	3,093.6	10.5	12.8	172.82	269.9	-602.9	1,172.2	1,160.6	11.61	100.943			
3,500.0	3,460.3	3,258.8	3,183.5	10.8	13.2	172.73	276.9	-623.1	1,210.2	1,198.3	11.95	101.242			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-11D - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total	Separation	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-5.21	43.3	-4.0	43.5					
100.0	100.0	100.0	100.0	0.1	0.1	-5.21	43.3	-4.0	43.5	43.3	0.27	159.871		
200.0	200.0	200.0	200.0	0.3	0.3	-5.21	43.3	-4.0	43.5	42.9	0.62	70.056 CC, ES		
300.0	300.0	300.0	300.0	0.5	0.5	-133.62	43.3	-4.0	45.3	44.3	0.97	46.482		
400.0	399.6	399.7	399.7	0.7	0.7	-142.82	42.5	-6.4	50.9	49.6	1.34	37.897		
500.0	498.8	497.6	497.3	1.0	0.9	-156.82	40.2	-13.7	63.1	61.4	1.73	36.594 SF		
600.0	597.5	593.1	591.9	1.3	1.1	-169.58	36.4	-25.3	82.8	80.7	2.11	39.174		
700.0	696.2	688.1	685.6	1.6	1.4	-179.06	31.4	-40.4	107.2	104.7	2.51	42.737		
800.0	794.9	783.7	779.8	1.9	1.7	174.85	26.3	-56.0	133.6	130.6	2.91	45.875		
900.0	893.6	879.4	874.1	2.3	2.0	170.77	21.2	-71.5	160.9	157.6	3.32	48.453		
1,000.0	992.4	975.0	968.3	2.6	2.4	167.88	16.2	-87.1	188.8	185.1	3.73	50.557		
1,100.0	1,091.1	1,070.7	1,062.6	2.9	2.7	165.73	11.1	-102.6	217.0	212.9	4.15	52.289		
1,200.0	1,189.8	1,166.4	1,156.8	3.3	3.0	164.07	6.0	-118.2	245.4	240.9	4.57	53.732		
1,300.0	1,288.5	1,262.0	1,251.1	3.6	3.3	162.76	0.9	-133.8	274.0	269.0	4.99	54.950		
1,400.0	1,387.2	1,357.7	1,345.3	3.9	3.7	161.70	-4.2	-149.3	302.7	297.3	5.41	55.989		
1,500.0	1,485.9	1,453.3	1,439.6	4.2	4.0	160.82	-9.3	-164.9	331.5	325.7	5.83	56.886		
1,600.0	1,584.7	1,549.0	1,533.8	4.6	4.3	160.08	-14.4	-180.4	360.3	354.1	6.25	57.666		
1,700.0	1,683.4	1,644.6	1,628.0	4.9	4.7	159.45	-19.4	-196.0	389.2	382.5	6.67	58.352		
1,800.0	1,782.1	1,740.3	1,722.3	5.2	5.0	158.90	-24.5	-211.5	418.1	411.0	7.09	58.958		
1,900.0	1,880.8	1,836.0	1,816.5	5.6	5.3	158.43	-29.6	-227.1	447.1	439.6	7.51	59.499		
2,000.0	1,979.5	1,931.6	1,910.8	5.9	5.7	158.02	-34.7	-242.6	476.1	468.1	7.94	59.983		
2,100.0	2,078.2	2,027.3	2,005.0	6.2	6.0	157.65	-39.8	-258.2	505.0	496.7	8.36	60.420		
2,200.0	2,176.9	2,122.9	2,099.3	6.5	6.3	157.32	-44.9	-273.8	534.1	525.3	8.78	60.815		
2,300.0	2,275.7	2,218.6	2,193.5	6.9	6.7	157.03	-50.0	-289.3	563.1	553.9	9.20	61.175		
2,400.0	2,374.4	2,314.2	2,287.8	7.2	7.0	156.76	-55.1	-304.9	592.1	582.5	9.63	61.504		
2,500.0	2,473.1	2,409.9	2,382.0	7.5	7.3	156.52	-60.1	-320.4	621.2	611.1	10.05	61.806		
2,600.0	2,571.8	2,505.6	2,476.3	7.9	7.7	156.30	-65.2	-336.0	650.2	639.8	10.47	62.083		
2,700.0	2,670.5	2,601.2	2,570.5	8.2	8.0	156.10	-70.3	-351.5	679.3	668.4	10.90	62.340		
2,800.0	2,769.2	2,696.9	2,664.8	8.5	8.3	155.92	-75.4	-367.1	708.4	697.0	11.32	62.577		
2,900.0	2,868.0	2,792.5	2,759.0	8.9	8.7	155.75	-80.5	-382.6	737.4	725.7	11.74	62.798		
3,000.0	2,966.7	2,888.2	2,853.3	9.2	9.0	155.59	-85.6	-398.2	766.5	754.4	12.17	63.004		
3,100.0	3,065.4	2,983.8	2,947.5	9.5	9.3	155.45	-90.7	-413.8	795.6	783.0	12.59	63.196		
3,200.0	3,164.1	3,079.5	3,041.7	9.9	9.7	155.31	-95.8	-429.3	824.7	811.7	13.01	63.375		
3,300.0	3,262.8	3,175.2	3,136.0	10.2	10.0	155.19	-100.8	-444.9	853.8	840.4	13.44	63.544		
3,400.0	3,361.5	3,270.8	3,230.2	10.5	10.3	155.07	-105.9	-460.4	882.9	869.0	13.86	63.702		
3,500.0	3,460.3	3,366.5	3,324.5	10.8	10.7	154.96	-111.0	-476.0	912.0	897.7	14.28	63.851		
3,600.0	3,559.0	3,462.1	3,418.7	11.2	11.0	154.85	-116.1	-491.5	941.1	926.4	14.71	63.991		
3,700.0	3,657.7	3,557.8	3,513.0	11.5	11.3	154.76	-121.2	-507.1	970.2	955.1	15.13	64.124		
3,800.0	3,756.4	3,653.4	3,607.2	11.8	11.7	154.67	-126.3	-522.6	999.3	983.8	15.55	64.249		
3,900.0	3,855.1	3,749.1	3,701.5	12.2	12.0	154.58	-131.4	-538.2	1,028.4	1,012.5	15.98	64.368		
4,000.0	3,953.8	3,844.8	3,795.7	12.5	12.3	154.50	-136.4	-553.7	1,057.6	1,041.2	16.40	64.481		
4,100.0	4,052.6	3,940.4	3,890.0	12.8	12.7	154.42	-141.5	-569.3	1,086.7	1,069.8	16.82	64.588		
4,200.0	4,151.3	4,036.1	3,984.2	13.2	13.0	154.35	-146.6	-584.9	1,115.8	1,098.5	17.25	64.690		
4,300.0	4,250.0	4,131.7	4,078.5	13.5	13.3	154.28	-151.7	-600.4	1,144.9	1,127.2	17.67	64.787		
4,400.0	4,348.7	4,227.4	4,172.7	13.8	13.7	154.21	-156.8	-616.0	1,174.0	1,155.9	18.10	64.880		
4,500.0	4,447.4	4,323.0	4,267.0	14.2	14.0	154.15	-161.9	-631.5	1,203.2	1,184.6	18.52	64.968		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14A - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-12.15	26.2	-5.6	26.8					
100.0	100.0	100.0	100.0	0.1	0.1	-12.15	26.2	-5.6	26.8	26.6	0.27	98.543		
200.0	200.0	200.0	200.0	0.3	0.3	-12.15	26.2	-5.6	26.8	26.2	0.62	43.182 CC, ES		
300.0	300.0	300.5	300.4	0.5	0.5	-146.53	24.5	-7.7	27.8	26.9	0.98	28.384		
400.0	399.6	400.0	399.6	0.7	0.7	-166.67	19.5	-13.7	33.9	32.5	1.37	24.663 SF		
500.0	498.8	497.4	496.2	1.0	1.0	174.64	11.4	-23.3	49.3	47.6	1.80	27.448		
600.0	597.5	594.1	591.6	1.3	1.3	163.65	1.3	-35.3	71.8	69.6	2.24	32.033		
700.0	696.2	690.9	687.1	1.6	1.6	157.93	-8.8	-47.3	95.6	92.9	2.70	35.419		
800.0	794.9	787.7	782.7	1.9	1.9	154.51	-18.8	-59.3	120.0	116.8	3.17	37.905		
900.0	893.6	884.5	878.2	2.3	2.2	152.24	-28.9	-71.3	144.6	141.0	3.64	39.778		
1,000.0	992.4	981.3	973.7	2.6	2.5	150.63	-39.0	-83.3	169.4	165.3	4.11	41.230		
1,100.0	1,091.1	1,078.0	1,069.2	2.9	2.9	149.43	-49.1	-95.3	194.2	189.7	4.58	42.386		
1,200.0	1,189.8	1,174.8	1,164.7	3.3	3.2	148.50	-59.2	-107.3	219.2	214.1	5.06	43.326		
1,300.0	1,288.5	1,271.6	1,260.2	3.6	3.5	147.77	-69.3	-119.3	244.1	238.6	5.54	44.104		
1,400.0	1,387.2	1,368.4	1,355.7	3.9	3.8	147.17	-79.3	-131.2	269.1	263.1	6.01	44.758		
1,500.0	1,485.9	1,465.2	1,451.2	4.2	4.1	146.67	-89.4	-143.2	294.2	287.7	6.49	45.316		
1,600.0	1,584.7	1,562.0	1,546.7	4.6	4.5	146.25	-99.5	-155.2	319.2	312.2	6.97	45.797		
1,700.0	1,683.4	1,658.8	1,642.3	4.9	4.8	145.89	-109.6	-167.2	344.3	336.8	7.45	46.215		
1,800.0	1,782.1	1,755.6	1,737.8	5.2	5.1	145.58	-119.7	-179.2	369.3	361.4	7.93	46.583		
1,900.0	1,880.8	1,852.3	1,833.3	5.6	5.4	145.31	-129.8	-191.2	394.4	386.0	8.41	46.909		
2,000.0	1,979.5	1,949.1	1,928.8	5.9	5.8	145.07	-139.8	-203.2	419.5	410.6	8.89	47.200		
2,100.0	2,078.2	2,045.9	2,024.3	6.2	6.1	144.86	-149.9	-215.2	444.6	435.2	9.37	47.460		
2,200.0	2,176.9	2,142.7	2,119.8	6.5	6.4	144.67	-160.0	-227.2	469.7	459.8	9.85	47.695		
2,300.0	2,275.7	2,239.5	2,215.3	6.9	6.7	144.50	-170.1	-239.2	494.8	484.5	10.33	47.908		
2,400.0	2,374.4	2,336.3	2,310.8	7.2	7.0	144.35	-180.2	-251.2	519.9	509.1	10.81	48.102		
2,500.0	2,473.1	2,433.1	2,406.4	7.5	7.4	144.21	-190.2	-263.2	545.0	533.7	11.29	48.280		
2,600.0	2,571.8	2,529.9	2,501.9	7.9	7.7	144.08	-200.3	-275.2	570.1	558.3	11.77	48.442		
2,700.0	2,670.5	2,626.7	2,597.4	8.2	8.0	143.96	-210.4	-287.2	595.2	583.0	12.25	48.592		
2,800.0	2,769.2	2,723.4	2,692.9	8.5	8.3	143.86	-220.5	-299.2	620.3	607.6	12.73	48.731		
2,900.0	2,868.0	2,820.2	2,788.4	8.9	8.7	143.76	-230.6	-311.2	645.5	632.2	13.21	48.859		
3,000.0	2,966.7	2,917.0	2,883.9	9.2	9.0	143.67	-240.7	-323.2	670.6	656.9	13.69	48.979		
3,100.0	3,065.4	3,013.8	2,979.4	9.5	9.3	143.58	-250.7	-335.2	695.7	681.5	14.17	49.090		
3,200.0	3,164.1	3,110.6	3,074.9	9.9	9.6	143.50	-260.8	-347.2	720.8	706.2	14.65	49.194		
3,300.0	3,262.8	3,207.4	3,170.4	10.2	10.0	143.43	-270.9	-359.2	745.9	730.8	15.13	49.291		
3,400.0	3,361.5	3,304.2	3,266.0	10.5	10.3	143.36	-281.0	-371.2	771.1	755.4	15.61	49.383		
3,500.0	3,460.3	3,401.0	3,361.5	10.8	10.6	143.30	-291.1	-383.1	796.2	780.1	16.09	49.468		
3,600.0	3,559.0	3,497.8	3,457.0	11.2	10.9	143.24	-301.1	-395.1	821.3	804.7	16.58	49.549		
3,700.0	3,657.7	3,594.5	3,552.5	11.5	11.2	143.18	-311.2	-407.1	846.4	829.4	17.06	49.625		
3,800.0	3,756.4	3,691.3	3,648.0	11.8	11.6	143.13	-321.3	-419.1	871.6	854.0	17.54	49.698		
3,900.0	3,855.1	3,788.1	3,743.5	12.2	11.9	143.08	-331.4	-431.1	896.7	878.7	18.02	49.766		
4,000.0	3,953.8	3,884.9	3,839.0	12.5	12.2	143.03	-341.5	-443.1	921.8	903.3	18.50	49.830		
4,100.0	4,052.6	3,981.7	3,934.5	12.8	12.5	142.98	-351.6	-455.1	946.9	928.0	18.98	49.892		
4,200.0	4,151.3	4,078.5	4,030.1	13.2	12.9	142.94	-361.6	-467.1	972.1	952.6	19.46	49.950		
4,300.0	4,250.0	4,175.3	4,125.6	13.5	13.2	142.90	-371.7	-479.1	997.2	977.3	19.94	50.005		
4,400.0	4,348.7	4,272.1	4,221.1	13.8	13.5	142.86	-381.8	-491.1	1,022.3	1,001.9	20.42	50.058		
4,500.0	4,447.4	4,368.9	4,316.6	14.2	13.8	142.83	-391.9	-503.1	1,047.5	1,026.6	20.90	50.109		
4,600.0	4,546.1	4,465.6	4,412.1	14.5	14.2	142.79	-402.0	-515.1	1,072.6	1,051.2	21.38	50.157		
4,700.0	4,644.9	4,562.4	4,507.6	14.8	14.5	142.76	-412.1	-527.1	1,097.7	1,075.9	21.87	50.203		
4,800.0	4,743.6	4,659.2	4,603.1	15.1	14.8	142.72	-422.1	-539.1	1,122.9	1,100.5	22.35	50.247		
4,900.0	4,842.3	4,756.0	4,698.6	15.5	15.1	142.69	-432.2	-551.1	1,148.0	1,125.2	22.83	50.289		
5,000.0	4,941.0	4,852.8	4,794.1	15.8	15.4	142.66	-442.3	-563.1	1,173.1	1,149.8	23.31	50.329		
5,100.0	5,039.7	4,949.6	4,889.7	16.1	15.8	142.64	-452.4	-575.1	1,198.3	1,174.5	23.79	50.368		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-37.78	9.5	-7.3	12.0					
100.0	100.0	100.0	100.0	0.1	0.1	-37.78	9.5	-7.3	12.0	11.7	0.27	44.025		
200.0	200.0	200.0	200.0	0.3	0.3	-37.78	9.5	-7.3	12.0	11.4	0.62	19.292 CC, ES		
300.0	300.0	300.0	300.0	0.5	0.5	-166.61	9.5	-7.3	14.5	13.5	0.97	14.966 SF		
400.0	399.6	399.6	399.6	0.7	0.7	-171.26	9.5	-7.3	22.2	20.9	1.32	16.882		
500.0	498.8	498.8	498.8	1.0	0.8	-174.45	9.5	-7.3	35.2	33.5	1.66	21.211		
600.0	597.5	597.5	597.5	1.3	1.0	-176.18	9.5	-7.3	51.1	49.1	2.00	25.497		
700.0	696.2	696.2	696.2	1.6	1.2	-177.09	9.5	-7.3	67.0	64.7	2.35	28.528		
800.0	794.9	794.9	794.9	1.9	1.3	-177.65	9.5	-7.3	83.0	80.3	2.70	30.784		
900.0	893.6	893.6	893.6	2.3	1.5	-178.03	9.5	-7.3	98.9	95.9	3.04	32.530		
1,000.0	992.4	992.4	992.4	2.6	1.7	-178.30	9.5	-7.3	114.9	111.5	3.39	33.920		
1,100.0	1,091.1	1,090.7	1,090.7	2.9	1.9	-179.46	7.8	-8.7	131.0	127.3	3.73	35.079		
1,200.0	1,189.8	1,188.5	1,188.2	3.3	2.1	177.67	2.4	-13.3	147.6	143.5	4.09	36.044		
1,300.0	1,288.5	1,285.1	1,284.1	3.6	2.3	173.70	-6.8	-21.0	165.3	160.8	4.50	36.770		
1,400.0	1,387.2	1,380.2	1,377.7	3.9	2.5	169.07	-19.4	-31.6	184.9	179.9	4.96	37.250		
1,500.0	1,485.9	1,475.6	1,471.0	4.2	2.8	164.33	-34.9	-44.6	206.6	201.2	5.49	37.644		
1,600.0	1,584.7	1,571.8	1,564.9	4.6	3.1	160.39	-50.6	-57.8	229.7	223.6	6.05	37.981		
1,700.0	1,683.4	1,668.0	1,658.9	4.9	3.5	157.17	-66.4	-71.0	253.6	247.0	6.62	38.321		
1,800.0	1,782.1	1,764.2	1,752.8	5.2	3.8	154.50	-82.2	-84.3	278.1	270.9	7.19	38.670		
1,900.0	1,880.8	1,860.4	1,846.8	5.6	4.2	152.26	-98.0	-97.5	303.1	295.4	7.77	39.025		
2,000.0	1,979.5	1,956.6	1,940.8	5.9	4.5	150.36	-113.7	-110.7	328.5	320.2	8.34	39.380		
2,100.0	2,078.2	2,052.8	2,034.7	6.2	4.9	148.73	-129.5	-124.0	354.2	345.3	8.91	39.730		
2,200.0	2,176.9	2,148.9	2,128.7	6.5	5.3	147.32	-145.3	-137.2	380.1	370.6	9.49	40.072		
2,300.0	2,275.7	2,245.1	2,222.6	6.9	5.6	146.10	-161.0	-150.4	406.2	396.2	10.05	40.403		
2,400.0	2,374.4	2,341.3	2,316.6	7.2	6.0	145.01	-176.8	-163.7	432.5	421.8	10.62	40.722		
2,500.0	2,473.1	2,437.5	2,410.6	7.5	6.4	144.06	-192.6	-176.9	458.8	447.7	11.18	41.027		
2,600.0	2,571.8	2,533.7	2,504.5	7.9	6.8	143.20	-208.4	-190.1	485.3	473.6	11.75	41.318		
2,700.0	2,670.5	2,629.9	2,598.5	8.2	7.2	142.44	-224.1	-203.3	511.9	499.6	12.31	41.596		
2,800.0	2,769.2	2,726.1	2,692.4	8.5	7.6	141.74	-239.9	-216.6	538.6	525.7	12.87	41.861		
2,900.0	2,868.0	2,822.3	2,786.4	8.9	8.0	141.12	-255.7	-229.8	565.3	551.9	13.42	42.113		
3,000.0	2,966.7	2,918.4	2,880.3	9.2	8.3	140.55	-271.5	-243.0	592.1	578.1	13.98	42.352		
3,100.0	3,065.4	3,014.6	2,974.3	9.5	8.7	140.03	-287.2	-256.3	618.9	604.4	14.54	42.580		
3,200.0	3,164.1	3,110.8	3,068.3	9.9	9.1	139.55	-303.0	-269.5	645.8	630.7	15.09	42.797		
3,300.0	3,262.8	3,207.0	3,162.2	10.2	9.5	139.11	-318.8	-282.7	672.7	657.0	15.64	43.003		
3,400.0	3,361.5	3,303.2	3,256.2	10.5	9.9	138.71	-334.5	-296.0	699.6	683.4	16.20	43.199		
3,500.0	3,460.3	3,399.4	3,350.1	10.8	10.3	138.33	-350.3	-309.2	726.6	709.9	16.75	43.387		
3,600.0	3,559.0	3,495.6	3,444.1	11.2	10.7	137.98	-366.1	-322.4	753.6	736.3	17.30	43.565		
3,700.0	3,657.7	3,591.8	3,538.1	11.5	11.1	137.66	-381.9	-335.7	780.6	762.8	17.85	43.735		
3,800.0	3,756.4	3,687.9	3,632.0	11.8	11.5	137.36	-397.6	-348.9	807.7	789.3	18.40	43.898		
3,900.0	3,855.1	3,784.1	3,726.0	12.2	11.9	137.07	-413.4	-362.1	834.8	815.8	18.95	44.053		
4,000.0	3,953.8	3,880.3	3,819.9	12.5	12.3	136.81	-429.2	-375.4	861.8	842.3	19.50	44.201		
4,100.0	4,052.6	3,976.5	3,913.9	12.8	12.7	136.56	-444.9	-388.6	888.9	868.9	20.05	44.343		
4,200.0	4,151.3	4,072.7	4,007.8	13.2	13.1	136.33	-460.7	-401.8	916.1	895.5	20.60	44.479		
4,300.0	4,250.0	4,168.9	4,101.8	13.5	13.5	136.10	-476.5	-415.1	943.2	922.0	21.14	44.610		
4,400.0	4,348.7	4,265.1	4,195.8	13.8	13.9	135.90	-492.3	-428.3	970.3	948.6	21.69	44.735		
4,500.0	4,447.4	4,361.3	4,289.7	14.2	14.3	135.70	-508.0	-441.5	997.5	975.2	22.24	44.855		
4,600.0	4,546.1	4,457.4	4,383.7	14.5	14.7	135.51	-523.8	-454.8	1,024.7	1,001.9	22.79	44.970		
4,700.0	4,644.9	4,553.6	4,477.6	14.8	15.1	135.33	-539.6	-468.0	1,051.8	1,028.5	23.33	45.081		
4,800.0	4,743.6	4,649.8	4,571.6	15.1	15.4	135.17	-555.3	-481.2	1,079.0	1,055.1	23.88	45.187		
4,900.0	4,842.3	4,746.0	4,665.6	15.5	15.8	135.01	-571.1	-494.5	1,106.2	1,081.8	24.42	45.290		
5,000.0	4,941.0	4,842.2	4,759.5	15.8	16.2	134.85	-586.9	-507.7	1,133.4	1,108.4	24.97	45.389		
5,100.0	5,039.7	4,938.4	4,853.5	16.1	16.6	134.71	-602.7	-520.9	1,160.6	1,135.1	25.52	45.484		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,200.0	5,138.4	5,034.6	4,947.4	16.5	17.0	134.57	-618.4	-534.2	1,187.8	1,161.7	26.06	45.575		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D2 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-131.13	-7.6	-8.8	11.6					
100.0	100.0	100.0	100.0	0.1	0.1	-131.13	-7.6	-8.8	11.6	11.4	0.27	42.688		
200.0	200.0	200.0	200.0	0.3	0.3	-131.13	-7.6	-8.8	11.6	11.0	0.62	18.706 CC, ES		
300.0	300.0	300.0	300.0	0.5	0.5	114.69	-7.6	-8.8	12.5	11.5	0.98	12.762 SF		
400.0	399.6	399.6	399.6	0.7	0.7	138.91	-7.6	-8.8	17.3	15.9	1.34	12.894		
500.0	498.8	498.8	498.8	1.0	0.8	156.29	-7.6	-8.8	28.5	26.8	1.69	16.865		
600.0	597.5	597.5	597.5	1.3	1.0	164.74	-7.6	-8.8	43.6	41.5	2.03	21.498		
700.0	696.2	696.2	696.2	1.6	1.2	168.82	-7.6	-8.8	59.1	56.8	2.37	24.968		
800.0	794.9	794.9	794.9	1.9	1.3	171.19	-7.6	-8.8	74.9	72.2	2.71	27.612		
900.0	893.6	893.6	893.6	2.3	1.5	172.73	-7.6	-8.8	90.7	87.6	3.06	29.682		
1,000.0	992.4	992.4	992.4	2.6	1.7	173.82	-7.6	-8.8	106.6	103.2	3.40	31.341		
1,100.0	1,091.1	1,090.8	1,090.8	2.9	1.9	173.60	-9.5	-9.9	122.5	118.8	3.75	32.667		
1,200.0	1,189.8	1,188.9	1,188.6	3.3	2.1	171.33	-15.5	-13.8	138.9	134.7	4.13	33.638		
1,300.0	1,288.5	1,286.1	1,285.0	3.6	2.3	167.71	-25.7	-20.2	156.0	151.5	4.56	34.247		
1,400.0	1,387.2	1,381.9	1,379.4	3.9	2.5	163.27	-39.8	-29.1	174.7	169.7	5.06	34.543		
1,500.0	1,485.9	1,475.9	1,471.0	4.2	2.8	158.41	-57.5	-40.3	195.8	190.1	5.64	34.680		
1,600.0	1,584.7	1,571.0	1,563.0	4.6	3.2	153.65	-77.9	-53.3	219.1	212.8	6.29	34.857		
1,700.0	1,683.4	1,666.7	1,655.5	4.9	3.6	149.77	-98.6	-66.4	243.8	236.8	6.94	35.121		
1,800.0	1,782.1	1,762.4	1,748.0	5.2	4.0	146.60	-119.2	-79.5	269.3	261.7	7.59	35.460		
1,900.0	1,880.8	1,858.1	1,840.6	5.6	4.4	143.97	-139.9	-92.6	295.4	287.2	8.24	35.846		
2,000.0	1,979.5	1,953.8	1,933.1	5.9	4.8	141.76	-160.5	-105.7	322.1	313.2	8.88	36.257		
2,100.0	2,078.2	2,049.5	2,025.6	6.2	5.2	139.89	-181.2	-118.8	349.1	339.6	9.52	36.677		
2,200.0	2,176.9	2,145.2	2,118.1	6.5	5.7	138.29	-201.9	-131.9	376.4	366.3	10.15	37.095		
2,300.0	2,275.7	2,240.9	2,210.6	6.9	6.1	136.90	-222.5	-145.0	404.0	393.2	10.77	37.505		
2,400.0	2,374.4	2,336.6	2,303.1	7.2	6.5	135.69	-243.2	-158.0	431.7	420.3	11.39	37.902		
2,500.0	2,473.1	2,432.3	2,395.7	7.5	7.0	134.63	-263.8	-171.1	459.6	447.6	12.01	38.285		
2,600.0	2,571.8	2,528.0	2,488.2	7.9	7.4	133.69	-284.5	-184.2	487.7	475.0	12.62	38.650		
2,700.0	2,670.5	2,623.7	2,580.7	8.2	7.9	132.85	-305.1	-197.3	515.8	502.6	13.23	39.000		
2,800.0	2,769.2	2,719.4	2,673.2	8.5	8.3	132.09	-325.8	-210.4	544.1	530.2	13.83	39.332		
2,900.0	2,868.0	2,815.1	2,765.7	8.9	8.8	131.41	-346.4	-223.5	572.4	557.9	14.44	39.649		
3,000.0	2,966.7	2,910.8	2,858.2	9.2	9.2	130.80	-367.1	-236.6	600.8	585.7	15.04	39.949		
3,100.0	3,065.4	3,006.5	2,950.8	9.5	9.7	130.23	-387.7	-249.7	629.2	613.6	15.64	40.235		
3,200.0	3,164.1	3,102.2	3,043.3	9.9	10.1	129.72	-408.4	-262.8	657.7	641.5	16.24	40.507		
3,300.0	3,262.8	3,197.8	3,135.8	10.2	10.6	129.25	-429.0	-275.9	686.3	669.4	16.83	40.765		
3,400.0	3,361.5	3,293.5	3,228.3	10.5	11.0	128.82	-449.7	-289.0	714.8	697.4	17.43	41.011		
3,500.0	3,460.3	3,389.2	3,320.8	10.8	11.5	128.42	-470.3	-302.0	743.5	725.4	18.03	41.245		
3,600.0	3,559.0	3,484.9	3,413.3	11.2	11.9	128.05	-491.0	-315.1	772.1	753.5	18.62	41.468		
3,700.0	3,657.7	3,580.6	3,505.9	11.5	12.4	127.71	-511.6	-328.2	800.8	781.6	19.21	41.680		
3,800.0	3,756.4	3,676.3	3,598.4	11.8	12.9	127.39	-532.3	-341.3	829.5	809.7	19.80	41.883		
3,900.0	3,855.1	3,772.0	3,690.9	12.2	13.3	127.09	-553.0	-354.4	858.2	837.8	20.40	42.076		
4,000.0	3,953.8	3,867.7	3,783.4	12.5	13.8	126.81	-573.6	-367.5	886.9	865.9	20.99	42.261		
4,100.0	4,052.6	3,963.4	3,875.9	12.8	14.2	126.55	-594.3	-380.6	915.7	894.1	21.58	42.438		
4,200.0	4,151.3	4,059.1	3,968.4	13.2	14.7	126.30	-614.9	-393.7	944.5	922.3	22.17	42.607		
4,300.0	4,250.0	4,154.8	4,061.0	13.5	15.1	126.07	-635.6	-406.8	973.3	950.5	22.76	42.769		
4,400.0	4,348.7	4,250.5	4,153.5	13.8	15.6	125.86	-656.2	-419.9	1,002.1	978.7	23.35	42.924		
4,500.0	4,447.4	4,346.2	4,246.0	14.2	16.1	125.65	-676.9	-433.0	1,030.9	1,006.9	23.93	43.072		
4,600.0	4,546.1	4,441.9	4,338.5	14.5	16.5	125.46	-697.5	-446.1	1,059.7	1,035.2	24.52	43.215		
4,700.0	4,644.9	4,537.6	4,431.0	14.8	17.0	125.27	-718.2	-459.1	1,088.5	1,063.4	25.11	43.352		
4,800.0	4,743.6	4,633.3	4,523.6	15.1	17.4	125.10	-738.8	-472.2	1,117.4	1,091.7	25.70	43.484		
4,900.0	4,842.3	4,729.0	4,616.1	15.5	17.9	124.93	-759.5	-485.3	1,146.3	1,120.0	26.28	43.610		
5,000.0	4,941.0	4,824.7	4,708.6	15.8	18.4	124.77	-780.1	-498.4	1,175.1	1,148.2	26.87	43.732		
5,100.0	5,039.7	4,920.3	4,801.1	16.1	18.8	124.62	-800.8	-511.5	1,204.0	1,176.5	27.46	43.850		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-14D3 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-156.57	-24.8	-10.7	27.0					
100.0	100.0	100.0	100.0	0.1	0.1	-156.57	-24.8	-10.7	27.0	26.7	0.27	99.125		
200.0	200.0	200.0	200.0	0.3	0.3	-156.57	-24.8	-10.7	27.0	26.4	0.62	43.437		
300.0	300.0	300.0	300.0	0.5	0.5	83.01	-24.8	-10.7	26.5	25.6	0.98	27.122		
349.5	349.4	349.4	349.4	0.6	0.6	90.00	-24.8	-10.7	26.3	25.2	1.17	22.458 CC, ES		
400.0	399.6	399.6	399.6	0.7	0.7	99.87	-24.8	-10.7	26.7	25.4	1.37	19.495		
500.0	498.8	498.8	498.8	1.0	0.8	123.51	-24.8	-10.7	31.7	29.9	1.78	17.783 SF		
600.0	597.5	596.4	596.3	1.3	1.0	138.62	-26.9	-11.8	44.0	41.8	2.15	20.453		
700.0	696.2	693.7	693.3	1.6	1.2	142.51	-33.5	-15.2	60.1	57.6	2.55	23.564		
800.0	794.9	790.3	789.1	1.9	1.4	141.47	-44.4	-20.7	78.8	75.7	3.02	26.083		
900.0	893.6	885.6	883.0	2.3	1.7	138.38	-59.3	-28.3	99.9	96.4	3.56	28.097		
1,000.0	992.4	979.3	974.3	2.6	2.1	134.55	-78.1	-37.8	124.1	119.9	4.15	29.879		
1,100.0	1,091.1	1,072.0	1,063.5	2.9	2.5	130.61	-100.4	-49.2	151.4	146.7	4.77	31.722		
1,200.0	1,189.8	1,167.3	1,154.9	3.3	3.0	127.45	-124.6	-61.5	180.2	174.8	5.41	33.332		
1,300.0	1,288.5	1,262.7	1,246.4	3.6	3.4	125.16	-148.7	-73.7	209.4	203.4	6.03	34.716		
1,400.0	1,387.2	1,358.0	1,337.8	3.9	3.9	123.43	-172.9	-86.0	238.8	232.2	6.65	35.902		
1,500.0	1,485.9	1,453.4	1,429.2	4.2	4.4	122.08	-197.0	-98.3	268.4	261.1	7.27	36.926		
1,600.0	1,584.7	1,548.8	1,520.7	4.6	4.9	121.00	-221.2	-110.5	298.0	290.1	7.88	37.816		
1,700.0	1,683.4	1,644.1	1,612.1	4.9	5.4	120.11	-245.3	-122.8	327.8	319.3	8.49	38.595		
1,800.0	1,782.1	1,739.5	1,703.5	5.2	5.9	119.37	-269.4	-135.1	357.6	348.5	9.10	39.283		
1,900.0	1,880.8	1,834.9	1,795.0	5.6	6.4	118.74	-293.6	-147.3	387.4	377.7	9.71	39.894		
2,000.0	1,979.5	1,930.2	1,886.4	5.9	6.9	118.21	-317.7	-159.6	417.3	407.0	10.32	40.439		
2,100.0	2,078.2	2,025.6	1,977.8	6.2	7.4	117.74	-341.9	-171.9	447.2	436.3	10.93	40.929		
2,200.0	2,176.9	2,120.9	2,069.3	6.5	7.9	117.33	-366.0	-184.2	477.2	465.6	11.53	41.372		
2,300.0	2,275.7	2,216.3	2,160.7	6.9	8.4	116.97	-390.2	-196.4	507.1	495.0	12.14	41.773		
2,400.0	2,374.4	2,311.7	2,252.1	7.2	8.9	116.66	-414.3	-208.7	537.1	524.3	12.75	42.139		
2,500.0	2,473.1	2,407.0	2,343.6	7.5	9.4	116.37	-438.5	-221.0	567.1	553.7	13.35	42.474		
2,600.0	2,571.8	2,502.4	2,435.0	7.9	9.9	116.11	-462.6	-233.2	597.1	583.1	13.96	42.781		
2,700.0	2,670.5	2,597.8	2,526.5	8.2	10.4	115.88	-486.7	-245.5	627.1	612.5	14.56	43.064		
2,800.0	2,769.2	2,693.1	2,617.9	8.5	10.9	115.67	-510.9	-257.8	657.1	641.9	15.17	43.325		
2,900.0	2,868.0	2,788.5	2,709.3	8.9	11.4	115.48	-535.0	-270.0	687.1	671.3	15.77	43.568		
3,000.0	2,966.7	2,883.8	2,800.8	9.2	11.9	115.30	-559.2	-282.3	717.1	700.8	16.38	43.793		
3,100.0	3,065.4	2,979.2	2,892.2	9.5	12.4	115.14	-583.3	-294.6	747.2	730.2	16.98	44.003		
3,200.0	3,164.1	3,074.6	2,983.6	9.9	12.9	114.99	-607.5	-306.9	777.2	759.6	17.58	44.199		
3,300.0	3,262.8	3,169.9	3,075.1	10.2	13.4	114.85	-631.6	-319.1	807.3	789.1	18.19	44.383		
3,400.0	3,361.5	3,265.3	3,166.5	10.5	13.9	114.72	-655.8	-331.4	837.3	818.5	18.79	44.555		
3,500.0	3,460.3	3,360.7	3,257.9	10.8	14.4	114.60	-679.9	-343.7	867.4	848.0	19.40	44.717		
3,600.0	3,559.0	3,456.0	3,349.4	11.2	14.9	114.49	-704.0	-355.9	897.4	877.4	20.00	44.869		
3,700.0	3,657.7	3,551.4	3,440.8	11.5	15.4	114.39	-728.2	-368.2	927.5	906.9	20.60	45.013		
3,800.0	3,756.4	3,646.7	3,532.2	11.8	15.9	114.29	-752.3	-380.5	957.5	936.3	21.21	45.149		
3,900.0	3,855.1	3,742.1	3,623.7	12.2	16.4	114.20	-776.5	-392.7	987.6	965.8	21.81	45.277		
4,000.0	3,953.8	3,837.5	3,715.1	12.5	16.9	114.11	-800.6	-405.0	1,017.7	995.3	22.42	45.399		
4,100.0	4,052.6	3,932.8	3,806.5	12.8	17.4	114.03	-824.8	-417.3	1,047.7	1,024.7	23.02	45.514		
4,200.0	4,151.3	4,028.2	3,898.0	13.2	17.9	113.95	-848.9	-429.6	1,077.8	1,054.2	23.62	45.624		
4,300.0	4,250.0	4,123.5	3,989.4	13.5	18.4	113.88	-873.1	-441.8	1,107.9	1,083.7	24.23	45.729		
4,400.0	4,348.7	4,218.9	4,080.9	13.8	18.9	113.81	-897.2	-454.1	1,138.0	1,113.1	24.83	45.828		
4,500.0	4,447.4	4,314.3	4,172.3	14.2	19.4	113.75	-921.3	-466.4	1,168.0	1,142.6	25.43	45.923		
4,600.0	4,546.1	4,409.6	4,263.7	14.5	19.9	113.68	-945.5	-478.6	1,198.1	1,172.1	26.04	46.014		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-174.22	-16.8	-1.7	16.8					
100.0	100.0	100.0	100.0	0.1	0.1	-174.22	-16.8	-1.7	16.8	16.6	0.27	61.835		
200.0	200.0	200.0	200.0	0.3	0.3	-174.22	-16.8	-1.7	16.8	16.2	0.62	27.096		
300.0	300.0	300.0	300.0	0.5	0.5	68.15	-16.8	-1.7	15.7	14.7	0.98	16.044		
360.7	360.5	360.3	360.3	0.6	0.6	79.97	-17.5	-1.1	15.1	13.9	1.22	12.370 CC, ES		
400.0	399.6	399.4	399.4	0.7	0.7	88.17	-18.8	-0.2	15.3	14.0	1.38	11.131		
500.0	498.8	499.1	498.7	1.0	0.9	106.08	-25.1	4.5	18.4	16.6	1.87	9.878		
600.0	597.5	599.0	597.8	1.3	1.1	111.88	-35.5	12.2	23.3	20.9	2.42	9.657		
700.0	696.2	698.9	696.0	1.6	1.5	105.06	-50.1	22.9	28.1	25.0	3.09	9.098		
800.0	794.9	798.4	792.9	1.9	1.9	92.73	-68.2	36.3	34.0	30.2	3.81	8.945 SF		
900.0	893.6	897.9	889.8	2.3	2.3	83.52	-86.8	50.0	41.3	36.8	4.46	9.263		
1,000.0	992.4	997.5	986.6	2.6	2.7	77.17	-105.4	63.7	49.3	44.2	5.07	9.729		
1,100.0	1,091.1	1,097.1	1,083.4	2.9	3.2	72.63	-124.0	77.4	57.7	52.1	5.65	10.217		
1,200.0	1,189.8	1,196.6	1,180.3	3.3	3.6	69.26	-142.6	91.2	66.4	60.2	6.22	10.682		
1,300.0	1,288.5	1,296.2	1,277.1	3.6	4.0	66.67	-161.2	104.9	75.3	68.5	6.78	11.109		
1,400.0	1,387.2	1,395.7	1,373.9	3.9	4.5	64.64	-179.7	118.6	84.3	77.0	7.34	11.495		
1,500.0	1,485.9	1,495.3	1,470.8	4.2	4.9	62.99	-198.3	132.3	93.4	85.5	7.89	11.843		
1,600.0	1,584.7	1,594.8	1,567.6	4.6	5.3	61.64	-216.9	146.0	102.6	94.1	8.44	12.156		
1,700.0	1,683.4	1,694.4	1,664.5	4.9	5.8	60.51	-235.5	159.7	111.7	102.8	8.98	12.438		
1,800.0	1,782.1	1,793.9	1,761.3	5.2	6.2	59.56	-254.1	173.4	121.0	111.4	9.53	12.692		
1,900.0	1,880.8	1,893.5	1,858.1	5.6	6.6	58.74	-272.7	187.2	130.2	120.2	10.08	12.923		
2,000.0	1,979.5	1,993.0	1,955.0	5.9	7.1	58.02	-291.3	200.9	139.5	128.9	10.62	13.133		
2,100.0	2,078.2	2,092.6	2,051.8	6.2	7.5	57.40	-309.8	214.6	148.8	137.6	11.17	13.325		
2,200.0	2,176.9	2,192.1	2,148.6	6.5	8.0	56.85	-328.4	228.3	158.1	146.4	11.71	13.500		
2,300.0	2,275.7	2,291.7	2,245.5	6.9	8.4	56.36	-347.0	242.0	167.5	155.2	12.26	13.662		
2,400.0	2,374.4	2,391.3	2,342.3	7.2	8.9	55.93	-365.6	255.7	176.8	164.0	12.80	13.810		
2,500.0	2,473.1	2,490.8	2,439.2	7.5	9.3	55.53	-384.2	269.4	186.1	172.8	13.35	13.947		
2,600.0	2,571.8	2,590.4	2,536.0	7.9	9.7	55.18	-402.8	283.2	195.5	181.6	13.89	14.074		
2,700.0	2,670.5	2,689.9	2,632.8	8.2	10.2	54.85	-421.4	296.9	204.9	190.4	14.43	14.193		
2,800.0	2,769.2	2,789.5	2,729.7	8.5	10.6	54.56	-439.9	310.6	214.2	199.3	14.98	14.303		
2,900.0	2,868.0	2,889.0	2,826.5	8.9	11.1	54.29	-458.5	324.3	223.6	208.1	15.52	14.405		
3,000.0	2,966.7	2,988.6	2,923.4	9.2	11.5	54.04	-477.1	338.0	233.0	216.9	16.07	14.501		
3,100.0	3,065.4	3,088.1	3,020.2	9.5	11.9	53.81	-495.7	351.7	242.4	225.8	16.61	14.591		
3,200.0	3,164.1	3,187.7	3,117.0	9.9	12.4	53.60	-514.3	365.4	251.8	234.6	17.15	14.676		
3,300.0	3,262.8	3,287.2	3,213.9	10.2	12.8	53.40	-532.9	379.2	261.1	243.4	17.70	14.756		
3,400.0	3,361.5	3,386.8	3,310.7	10.5	13.3	53.22	-551.4	392.9	270.5	252.3	18.24	14.831		
3,500.0	3,460.3	3,486.4	3,407.5	10.8	13.7	53.05	-570.0	406.6	279.9	261.1	18.79	14.901		
3,600.0	3,559.0	3,585.9	3,504.4	11.2	14.1	52.89	-588.6	420.3	289.3	270.0	19.33	14.968		
3,700.0	3,657.7	3,685.5	3,601.2	11.5	14.6	52.74	-607.2	434.0	298.7	278.9	19.87	15.032		
3,800.0	3,756.4	3,785.0	3,698.1	11.8	15.0	52.60	-625.8	447.7	308.1	287.7	20.42	15.092		
3,900.0	3,855.1	3,884.6	3,794.9	12.2	15.5	52.47	-644.4	461.4	317.5	296.6	20.96	15.149		
4,000.0	3,953.8	3,984.1	3,891.7	12.5	15.9	52.34	-663.0	475.2	326.9	305.4	21.50	15.203		
4,100.0	4,052.6	4,083.7	3,988.6	12.8	16.4	52.22	-681.5	488.9	336.3	314.3	22.05	15.255		
4,200.0	4,151.3	4,183.2	4,085.4	13.2	16.8	52.11	-700.1	502.6	345.8	323.2	22.59	15.304		
4,300.0	4,250.0	4,282.8	4,182.2	13.5	17.2	52.01	-718.7	516.3	355.2	332.0	23.14	15.351		
4,400.0	4,348.7	4,382.3	4,279.1	13.8	17.7	51.91	-737.3	530.0	364.6	340.9	23.68	15.396		
4,500.0	4,447.4	4,481.9	4,375.9	14.2	18.1	51.81	-755.9	543.7	374.0	349.8	24.22	15.439		
4,600.0	4,546.1	4,581.5	4,472.8	14.5	18.6	51.72	-774.5	557.5	383.4	358.6	24.77	15.480		
4,700.0	4,644.9	4,681.0	4,569.6	14.8	19.0	51.64	-793.0	571.2	392.8	367.5	25.31	15.519		
4,800.0	4,743.6	4,780.6	4,666.4	15.1	19.5	51.55	-811.6	584.9	402.2	376.4	25.85	15.557		
4,900.0	4,842.3	4,880.1	4,763.3	15.5	19.9	51.48	-830.2	598.6	411.6	385.2	26.40	15.593		
5,000.0	4,941.0	4,979.7	4,860.1	15.8	20.3	51.40	-848.8	612.3	421.0	394.1	26.94	15.628		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis			
5,100.0	5,039.7	5,079.2	4,956.9	16.1	20.8	51.33	-867.4	626.0	430.5	403.0	27.49	15.662		
5,200.0	5,138.4	5,178.8	5,053.8	16.5	21.2	51.26	-886.0	639.7	439.9	411.8	28.03	15.694		
5,300.0	5,237.2	5,278.3	5,150.6	16.8	21.7	51.20	-904.6	653.5	449.3	420.7	28.57	15.725		
5,400.0	5,335.9	5,377.9	5,247.5	17.1	22.1	51.13	-923.1	667.2	458.7	429.6	29.12	15.755		
5,500.0	5,434.6	5,477.4	5,344.3	17.5	22.5	51.07	-941.7	680.9	468.1	438.5	29.66	15.783		
5,600.0	5,533.3	5,577.0	5,441.1	17.8	23.0	51.01	-960.3	694.6	477.5	447.3	30.20	15.811		
5,700.0	5,632.0	5,676.6	5,538.0	18.1	23.4	50.96	-978.9	708.3	487.0	456.2	30.75	15.838		
5,800.0	5,730.7	5,776.1	5,634.8	18.5	23.9	50.91	-997.5	722.0	496.4	465.1	31.29	15.864		
5,900.0	5,829.5	5,875.7	5,731.7	18.8	24.3	50.85	-1,016.1	735.7	505.8	474.0	31.83	15.889		
6,000.0	5,928.2	5,975.2	5,828.5	19.1	24.8	50.80	-1,034.6	749.5	515.2	482.8	32.38	15.913		
6,100.0	6,026.9	6,074.8	5,925.3	19.4	25.2	50.76	-1,053.2	763.2	524.6	491.7	32.92	15.936		
6,200.0	6,125.6	6,174.3	6,022.2	19.8	25.6	50.71	-1,071.8	776.9	534.1	500.6	33.47	15.959		
6,300.0	6,224.3	6,273.9	6,119.0	20.1	26.1	50.67	-1,090.4	790.6	543.5	509.5	34.01	15.981		
6,400.0	6,323.0	6,373.4	6,215.8	20.4	26.5	50.62	-1,109.0	804.3	552.9	518.4	34.55	16.002		
6,500.0	6,421.8	6,473.0	6,312.7	20.8	27.0	50.58	-1,127.6	818.0	562.3	527.2	35.10	16.022		
6,600.0	6,520.5	6,572.5	6,409.5	21.1	27.4	50.54	-1,146.2	831.7	571.8	536.1	35.64	16.042		
6,700.0	6,619.2	6,672.1	6,506.4	21.4	27.9	50.50	-1,164.7	845.5	581.2	545.0	36.18	16.062		
6,800.0	6,717.9	6,771.6	6,603.2	21.8	28.3	50.46	-1,183.3	859.2	590.6	553.9	36.73	16.080		
6,900.0	6,816.6	6,871.2	6,700.0	22.1	28.7	50.43	-1,201.9	872.9	600.0	562.7	37.27	16.099		
7,000.0	6,915.3	6,970.8	6,796.9	22.4	29.2	50.39	-1,220.5	886.6	609.4	571.6	37.82	16.116		
7,100.0	7,014.1	7,070.3	6,893.7	22.8	29.6	50.36	-1,239.1	900.3	618.9	580.5	38.36	16.134		
7,200.0	7,112.8	7,178.9	6,999.5	23.1	30.1	50.34	-1,259.0	915.0	628.0	589.1	38.93	16.132		
7,300.0	7,211.6	7,301.3	7,119.5	23.4	30.5	50.34	-1,278.2	929.1	634.5	595.0	39.57	16.035		
7,400.0	7,310.8	7,424.0	7,240.8	23.6	30.9	50.76	-1,293.2	940.2	639.4	599.3	40.12	15.938		
7,500.0	7,410.4	7,546.9	7,362.9	23.8	31.1	50.91	-1,304.0	948.2	643.0	602.4	40.57	15.850		
7,600.0	7,510.2	7,670.0	7,485.7	24.0	31.3	51.00	-1,310.7	953.1	645.2	604.3	40.92	15.769		
7,700.0	7,610.2	7,793.2	7,608.9	24.1	31.4	51.04	-1,313.0	954.9	645.9	604.8	41.16	15.694		
7,800.0	7,710.2	7,894.5	7,710.2	24.2	31.5	176.99	-1,313.0	954.9	645.9	604.6	41.39	15.607		
7,900.0	7,810.2	7,994.5	7,810.2	24.3	31.6	176.99	-1,313.0	954.9	645.9	604.3	41.62	15.521		
8,000.0	7,910.2	8,094.5	7,910.2	24.4	31.7	176.99	-1,313.0	954.9	645.9	604.1	41.85	15.434		
8,100.0	8,010.2	8,194.5	8,010.2	24.5	31.7	176.99	-1,313.0	954.9	645.9	603.9	42.09	15.348		
8,200.0	8,110.2	8,294.5	8,110.2	24.6	31.8	176.99	-1,313.0	954.9	645.9	603.6	42.32	15.263		
8,300.0	8,210.2	8,394.5	8,210.2	24.7	31.9	176.99	-1,313.0	954.9	645.9	603.4	42.56	15.178		
8,400.0	8,310.2	8,494.5	8,310.2	24.8	32.0	176.99	-1,313.0	954.9	645.9	603.2	42.80	15.093		
8,500.0	8,410.2	8,594.5	8,410.2	24.9	32.1	176.99	-1,313.0	954.9	645.9	602.9	43.04	15.008		
8,600.0	8,510.2	8,694.5	8,510.2	25.0	32.2	176.99	-1,313.0	954.9	645.9	602.7	43.28	14.924		
8,700.0	8,610.2	8,794.5	8,610.2	25.1	32.2	176.99	-1,313.0	954.9	645.9	602.4	43.52	14.841		
8,800.0	8,710.2	8,894.5	8,710.2	25.2	32.3	176.99	-1,313.0	954.9	645.9	602.2	43.77	14.758		
8,900.0	8,810.2	8,994.5	8,810.2	25.3	32.4	176.99	-1,313.0	954.9	645.9	601.9	44.02	14.675		
9,000.0	8,910.2	9,094.5	8,910.2	25.4	32.5	176.99	-1,313.0	954.9	645.9	601.7	44.26	14.593		
9,100.0	9,010.2	9,194.5	9,010.2	25.5	32.6	176.99	-1,313.0	954.9	645.9	601.4	44.51	14.511		
9,200.0	9,110.2	9,294.5	9,110.2	25.6	32.7	176.99	-1,313.0	954.9	645.9	601.2	44.76	14.430		
9,300.0	9,210.2	9,394.5	9,210.2	25.8	32.7	176.99	-1,313.0	954.9	645.9	600.9	45.02	14.350		
9,400.0	9,310.2	9,494.5	9,310.2	25.9	32.8	176.99	-1,313.0	954.9	645.9	600.7	45.27	14.269		
9,500.0	9,410.2	9,594.5	9,410.2	26.0	32.9	176.99	-1,313.0	954.9	645.9	600.4	45.52	14.190		
9,600.0	9,510.2	9,694.5	9,510.2	26.1	33.0	176.99	-1,313.0	954.9	645.9	600.2	45.78	14.110		
9,700.0	9,610.2	9,794.5	9,610.2	26.2	33.1	176.99	-1,313.0	954.9	645.9	599.9	46.04	14.032		
9,800.0	9,710.2	9,894.5	9,710.2	26.3	33.2	176.99	-1,313.0	954.9	645.9	599.7	46.29	13.953		
9,900.0	9,810.2	9,994.5	9,810.2	26.4	33.3	176.99	-1,313.0	954.9	645.9	599.4	46.55	13.876		
10,000.0	9,910.2	10,094.5	9,910.2	26.5	33.4	176.99	-1,313.0	954.9	645.9	599.1	46.81	13.799		
10,100.0	10,010.2	10,194.5	10,010.2	26.7	33.5	176.99	-1,313.0	954.9	645.9	598.9	47.07	13.722		
10,121.8	10,032.0	10,216.3	10,032.0	26.7	33.5	176.99	-1,313.0	954.9	645.9	598.8	47.13	13.705		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C2 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	-174.29	-33.9	-3.4	34.0					
100.0	100.0	100.0	100.0	0.1	0.1	-174.29	-33.9	-3.4	34.0	33.8	0.27	125.017		
200.0	200.0	200.0	200.0	0.3	0.3	-174.29	-33.9	-3.4	34.0	33.4	0.62	54.783 CC, ES		
300.0	300.0	298.6	298.5	0.5	0.5	60.96	-36.1	-2.1	34.8	33.8	0.98	35.628		
400.0	399.6	397.1	396.7	0.7	0.7	64.25	-42.7	1.7	37.3	35.9	1.38	26.966		
500.0	498.8	495.4	494.3	1.0	1.0	68.81	-53.6	8.0	41.5	39.6	1.89	21.966		
600.0	597.5	593.6	590.8	1.3	1.3	71.35	-68.8	16.9	48.6	46.1	2.48	19.606		
700.0	696.2	691.1	685.7	1.6	1.8	69.54	-88.2	28.1	59.1	56.0	3.09	19.134 SF		
800.0	794.9	790.0	781.1	1.9	2.2	66.46	-110.5	41.0	72.0	68.3	3.67	19.588		
900.0	893.6	889.1	876.8	2.3	2.7	64.29	-132.9	53.9	85.0	80.8	4.25	19.984		
1,000.0	992.4	988.2	972.5	2.6	3.2	62.70	-155.3	66.9	98.2	93.3	4.83	20.321		
1,100.0	1,091.1	1,087.3	1,068.1	2.9	3.7	61.49	-177.7	79.9	111.3	105.9	5.40	20.607		
1,200.0	1,189.8	1,186.4	1,163.8	3.3	4.1	60.53	-200.1	92.8	124.6	118.6	5.97	20.852		
1,300.0	1,288.5	1,285.5	1,259.5	3.6	4.6	59.76	-222.5	105.8	137.8	131.3	6.54	21.064		
1,400.0	1,387.2	1,384.6	1,355.1	3.9	5.1	59.12	-244.9	118.7	151.1	144.0	7.11	21.248		
1,500.0	1,485.9	1,483.7	1,450.8	4.2	5.6	58.58	-267.3	131.7	164.4	156.7	7.68	21.410		
1,600.0	1,584.7	1,582.8	1,546.4	4.6	6.1	58.13	-289.7	144.7	177.7	169.5	8.25	21.552		
1,700.0	1,683.4	1,681.9	1,642.1	4.9	6.6	57.74	-312.1	157.6	191.0	182.2	8.81	21.679		
1,800.0	1,782.1	1,781.0	1,737.8	5.2	7.0	57.40	-334.5	170.6	204.4	195.0	9.38	21.792		
1,900.0	1,880.8	1,880.1	1,833.4	5.6	7.5	57.10	-356.9	183.6	217.7	207.8	9.94	21.893		
2,000.0	1,979.5	1,979.2	1,929.1	5.9	8.0	56.84	-379.3	196.5	231.0	220.5	10.51	21.985		
2,100.0	2,078.2	2,078.3	2,024.7	6.2	8.5	56.60	-401.7	209.5	244.4	233.3	11.07	22.069		
2,200.0	2,176.9	2,177.4	2,120.4	6.5	9.0	56.39	-424.1	222.4	257.7	246.1	11.64	22.145		
2,300.0	2,275.7	2,276.5	2,216.1	6.9	9.5	56.20	-446.5	235.4	271.1	258.9	12.20	22.215		
2,400.0	2,374.4	2,375.6	2,311.7	7.2	10.0	56.03	-468.9	248.4	284.4	271.7	12.77	22.279		
2,500.0	2,473.1	2,474.7	2,407.4	7.5	10.4	55.87	-491.3	261.3	297.8	284.5	13.33	22.338		
2,600.0	2,571.8	2,573.8	2,503.1	7.9	10.9	55.73	-513.7	274.3	311.1	297.2	13.89	22.392		
2,700.0	2,670.5	2,672.9	2,598.7	8.2	11.4	55.60	-536.1	287.3	324.5	310.0	14.46	22.443		
2,800.0	2,769.2	2,772.0	2,694.4	8.5	11.9	55.48	-558.5	300.2	337.9	322.8	15.02	22.490		
2,900.0	2,868.0	2,871.1	2,790.0	8.9	12.4	55.36	-580.9	313.2	351.2	335.6	15.59	22.534		
3,000.0	2,966.7	2,970.2	2,885.7	9.2	12.9	55.26	-603.3	326.1	364.6	348.4	16.15	22.575		
3,100.0	3,065.4	3,069.3	2,981.4	9.5	13.4	55.16	-625.7	339.1	377.9	361.2	16.71	22.613		
3,200.0	3,164.1	3,168.4	3,077.0	9.9	13.9	55.07	-648.1	352.1	391.3	374.0	17.28	22.649		
3,300.0	3,262.8	3,267.5	3,172.7	10.2	14.3	54.99	-670.5	365.0	404.7	386.8	17.84	22.683		
3,400.0	3,361.5	3,366.6	3,268.4	10.5	14.8	54.91	-692.9	378.0	418.0	399.6	18.40	22.715		
3,500.0	3,460.3	3,465.7	3,364.0	10.8	15.3	54.84	-715.3	391.0	431.4	412.4	18.97	22.745		
3,600.0	3,559.0	3,564.8	3,459.7	11.2	15.8	54.77	-737.7	403.9	444.8	425.2	19.53	22.773		
3,700.0	3,657.7	3,663.9	3,555.3	11.5	16.3	54.70	-760.1	416.9	458.1	438.0	20.09	22.800		
3,800.0	3,756.4	3,763.0	3,651.0	11.8	16.8	54.64	-782.5	429.8	471.5	450.8	20.66	22.826		
3,900.0	3,855.1	3,862.1	3,746.7	12.2	17.3	54.58	-804.9	442.8	484.9	463.6	21.22	22.850		
4,000.0	3,953.8	3,961.2	3,842.3	12.5	17.7	54.53	-827.3	455.8	498.2	476.5	21.78	22.873		
4,100.0	4,052.6	4,060.3	3,938.0	12.8	18.2	54.48	-849.7	468.7	511.6	489.3	22.35	22.895		
4,200.0	4,151.3	4,159.4	4,033.7	13.2	18.7	54.43	-872.1	481.7	525.0	502.1	22.91	22.916		
4,300.0	4,250.0	4,258.5	4,129.3	13.5	19.2	54.38	-894.5	494.7	538.3	514.9	23.47	22.936		
4,400.0	4,348.7	4,357.6	4,225.0	13.8	19.7	54.34	-916.9	507.6	551.7	527.7	24.03	22.955		
4,500.0	4,447.4	4,456.7	4,320.6	14.2	20.2	54.29	-939.3	520.6	565.1	540.5	24.60	22.973		
4,600.0	4,546.1	4,555.8	4,416.3	14.5	20.7	54.25	-961.7	533.5	578.5	553.3	25.16	22.990		
4,700.0	4,644.9	4,654.9	4,512.0	14.8	21.2	54.21	-984.1	546.5	591.8	566.1	25.72	23.007		
4,800.0	4,743.6	4,754.0	4,607.6	15.1	21.6	54.18	-1,006.5	559.5	605.2	578.9	26.29	23.023		
4,900.0	4,842.3	4,853.1	4,703.3	15.5	22.1	54.14	-1,028.9	572.4	618.6	591.7	26.85	23.038		
5,000.0	4,941.0	4,952.2	4,799.0	15.8	22.6	54.11	-1,051.3	585.4	631.9	604.5	27.41	23.053		
5,100.0	5,039.7	5,051.3	4,894.6	16.1	23.1	54.08	-1,073.7	598.4	645.3	617.3	27.98	23.067		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-6C2 - DD - Plan #1													Offset Site Error: 0.0 ft			
Survey Program: 0-MWD															Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning			
5,200.0	5,138.4	5,150.4	4,990.3	16.5	23.6	54.04	-1,096.1	611.3	658.7	630.1	28.54	23.081				
5,300.0	5,237.2	5,249.5	5,085.9	16.8	24.1	54.01	-1,118.5	624.3	672.1	643.0	29.10	23.094				
5,400.0	5,335.9	5,348.6	5,181.6	17.1	24.6	53.99	-1,140.9	637.2	685.4	655.8	29.66	23.106				
5,500.0	5,434.6	5,447.7	5,277.3	17.5	25.1	53.96	-1,163.3	650.2	698.8	668.6	30.23	23.118				
5,600.0	5,533.3	5,546.8	5,372.9	17.8	25.5	53.93	-1,185.7	663.2	712.2	681.4	30.79	23.130				
5,700.0	5,632.0	5,645.9	5,468.6	18.1	26.0	53.91	-1,208.1	676.1	725.5	694.2	31.35	23.141				
5,800.0	5,730.7	5,745.0	5,564.3	18.5	26.5	53.88	-1,230.5	689.1	738.9	707.0	31.92	23.152				
5,900.0	5,829.5	5,844.1	5,659.9	18.8	27.0	53.86	-1,252.9	702.1	752.3	719.8	32.48	23.163				
6,000.0	5,928.2	5,943.2	5,755.6	19.1	27.5	53.83	-1,275.3	715.0	765.7	732.6	33.04	23.173				
6,100.0	6,026.9	6,042.3	5,851.2	19.4	28.0	53.81	-1,297.7	728.0	779.0	745.4	33.60	23.183				
6,200.0	6,125.6	6,141.4	5,946.9	19.8	28.5	53.79	-1,320.1	740.9	792.4	758.2	34.17	23.192				
6,300.0	6,224.3	6,240.5	6,042.6	20.1	29.0	53.77	-1,342.5	753.9	805.8	771.1	34.73	23.202				
6,400.0	6,323.0	6,339.6	6,138.2	20.4	29.4	53.75	-1,364.9	766.9	819.2	783.9	35.29	23.211				
6,500.0	6,421.8	6,438.7	6,233.9	20.8	29.9	53.73	-1,387.3	779.8	832.5	796.7	35.86	23.219				
6,600.0	6,520.5	6,537.8	6,329.6	21.1	30.4	53.71	-1,409.7	792.8	845.9	809.5	36.42	23.228				
6,700.0	6,619.2	6,636.9	6,425.2	21.4	30.9	53.69	-1,432.1	805.8	859.3	822.3	36.98	23.236				
6,800.0	6,717.9	6,736.0	6,520.9	21.8	31.4	53.67	-1,454.5	818.7	872.7	835.1	37.54	23.244				
6,900.0	6,816.6	6,835.1	6,616.5	22.1	31.9	53.66	-1,476.9	831.7	886.0	847.9	38.11	23.252				
7,000.0	6,915.3	6,934.2	6,712.2	22.4	32.4	53.64	-1,499.3	844.6	899.4	860.7	38.67	23.259				
7,100.0	7,014.1	7,033.3	6,807.9	22.8	32.8	53.62	-1,521.7	857.6	912.8	873.5	39.23	23.266				
7,200.0	7,112.8	7,144.8	6,915.5	23.1	33.4	53.62	-1,546.6	872.0	925.9	886.1	39.82	23.251				
7,300.0	7,211.6	7,283.1	7,050.4	23.4	33.9	53.81	-1,573.3	887.5	936.2	895.7	40.52	23.103				
7,400.0	7,310.8	7,422.3	7,187.3	23.6	34.4	54.04	-1,594.4	899.7	944.2	903.0	41.13	22.954				
7,500.0	7,410.4	7,562.0	7,325.9	23.8	34.7	54.21	-1,609.8	908.6	950.0	908.3	41.62	22.822				
7,600.0	7,510.2	7,702.1	7,465.6	24.0	34.9	54.30	-1,619.3	914.1	953.6	911.6	42.00	22.702				
7,700.0	7,610.2	7,842.4	7,605.9	24.1	35.1	54.33	-1,623.0	916.2	955.0	912.7	42.27	22.596				
7,800.0	7,710.2	7,946.8	7,710.2	24.2	35.1	-179.71	-1,623.0	916.2	955.0	912.5	42.49	22.476				
7,900.0	7,810.2	8,046.8	7,810.2	24.3	35.2	-179.71	-1,623.0	916.2	955.0	912.3	42.72	22.357				
8,000.0	7,910.2	8,146.8	7,910.2	24.4	35.3	-179.71	-1,623.0	916.2	955.0	912.1	42.95	22.238				
8,100.0	8,010.2	8,246.8	8,010.2	24.5	35.4	-179.71	-1,623.0	916.2	955.0	911.9	43.17	22.120				
8,200.0	8,110.2	8,346.8	8,110.2	24.6	35.4	-179.71	-1,623.0	916.2	955.0	911.6	43.41	22.003				
8,300.0	8,210.2	8,446.8	8,210.2	24.7	35.5	-179.71	-1,623.0	916.2	955.0	911.4	43.64	21.885				
8,400.0	8,310.2	8,546.8	8,310.2	24.8	35.6	-179.71	-1,623.0	916.2	955.0	911.2	43.87	21.769				
8,500.0	8,410.2	8,646.8	8,410.2	24.9	35.6	-179.71	-1,623.0	916.2	955.0	910.9	44.11	21.652				
8,600.0	8,510.2	8,746.8	8,510.2	25.0	35.7	-179.71	-1,623.0	916.2	955.0	910.7	44.34	21.537				
8,700.0	8,610.2	8,846.8	8,610.2	25.1	35.8	-179.71	-1,623.0	916.2	955.0	910.5	44.58	21.422				
8,800.0	8,710.2	8,946.8	8,710.2	25.2	35.9	-179.71	-1,623.0	916.2	955.0	910.2	44.82	21.307				
8,900.0	8,810.2	9,046.8	8,810.2	25.3	35.9	-179.71	-1,623.0	916.2	955.0	910.0	45.06	21.193				
9,000.0	8,910.2	9,146.8	8,910.2	25.4	36.0	-179.71	-1,623.0	916.2	955.0	909.7	45.31	21.079				
9,100.0	9,010.2	9,246.8	9,010.2	25.5	36.1	-179.71	-1,623.0	916.2	955.0	909.5	45.55	20.966				
9,200.0	9,110.2	9,346.8	9,110.2	25.6	36.2	-179.71	-1,623.0	916.2	955.0	909.2	45.80	20.854				
9,300.0	9,210.2	9,446.8	9,210.2	25.8	36.3	-179.71	-1,623.0	916.2	955.0	909.0	46.04	20.742				
9,400.0	9,310.2	9,546.8	9,310.2	25.9	36.3	-179.71	-1,623.0	916.2	955.0	908.7	46.29	20.631				
9,500.0	9,410.2	9,646.8	9,410.2	26.0	36.4	-179.71	-1,623.0	916.2	955.0	908.5	46.54	20.520				
9,600.0	9,510.2	9,746.8	9,510.2	26.1	36.5	-179.71	-1,623.0	916.2	955.0	908.2	46.79	20.410				
9,700.0	9,610.2	9,846.8	9,610.2	26.2	36.6	-179.71	-1,623.0	916.2	955.0	908.0	47.04	20.301				
9,800.0	9,710.2	9,946.8	9,710.2	26.3	36.7	-179.71	-1,623.0	916.2	955.0	907.7	47.30	20.192				
9,900.0	9,810.2	10,046.8	9,810.2	26.4	36.7	-179.71	-1,623.0	916.2	955.0	907.5	47.55	20.084				
10,000.0	9,910.2	10,146.8	9,910.2	26.5	36.8	-179.71	-1,623.0	916.2	955.0	907.2	47.81	19.977				
10,100.0	10,010.2	10,246.8	10,010.2	26.7	36.9	-179.71	-1,623.0	916.2	955.0	907.0	48.06	19.870				
10,121.8	10,032.0	10,268.6	10,032.0	26.7	36.9	-179.71	-1,623.0	916.2	955.0	906.9	48.12	19.847				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-9C - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	5.90	16.4	1.7	16.5						
100.0	100.0	100.0	100.0	0.1	0.1	5.90	16.4	1.7	16.5	16.2	0.27	60.536			
200.0	200.0	200.0	200.0	0.3	0.3	5.90	16.4	1.7	16.5	15.9	0.62	26.527 CC, ES			
300.0	300.0	300.0	300.0	0.5	0.5	-127.27	16.4	1.7	17.9	17.0	0.98	18.388			
400.0	399.6	400.0	400.0	0.7	0.7	-136.49	16.1	4.3	22.6	21.3	1.35	16.762			
500.0	498.8	500.2	499.8	1.0	0.9	-139.25	15.2	12.1	29.8	28.0	1.78	16.769			
600.0	597.5	600.1	599.0	1.3	1.1	-138.07	13.8	23.9	37.9	35.6	2.26	16.775			
700.0	696.2	699.7	697.9	1.6	1.4	-136.97	12.4	36.0	45.9	43.1	2.76	16.604			
800.0	794.9	799.4	796.9	1.9	1.6	-136.19	11.0	48.1	53.8	50.6	3.28	16.428			
900.0	893.6	899.1	895.8	2.3	1.9	-135.62	9.6	60.2	61.8	58.0	3.80	16.269			
1,000.0	992.4	998.8	994.7	2.6	2.2	-135.18	8.2	72.3	69.8	65.5	4.33	16.132			
1,100.0	1,091.1	1,098.5	1,093.7	2.9	2.4	-134.83	6.8	84.4	77.8	73.0	4.86	16.014			
1,200.0	1,189.8	1,198.1	1,192.6	3.3	2.7	-134.54	5.4	96.5	85.9	80.5	5.40	15.913			
1,300.0	1,288.5	1,297.8	1,291.5	3.6	3.0	-134.30	4.0	108.6	93.9	87.9	5.93	15.825			
1,400.0	1,387.2	1,397.5	1,390.4	3.9	3.3	-134.10	2.6	120.7	101.9	95.4	6.47	15.749			
1,500.0	1,485.9	1,497.2	1,489.4	4.2	3.5	-133.93	1.2	132.8	109.9	102.9	7.01	15.683			
1,600.0	1,584.7	1,596.9	1,588.3	4.6	3.8	-133.78	-0.2	144.8	117.9	110.4	7.55	15.625			
1,700.0	1,683.4	1,696.5	1,687.2	4.9	4.1	-133.65	-1.7	156.9	125.9	117.8	8.09	15.573			
1,800.0	1,782.1	1,796.2	1,786.2	5.2	4.4	-133.54	-3.1	169.0	133.9	125.3	8.63	15.526			
1,900.0	1,880.8	1,895.9	1,885.1	5.6	4.6	-133.44	-4.5	181.1	141.9	132.8	9.17	15.485			
2,000.0	1,979.5	1,995.6	1,984.0	5.9	4.9	-133.35	-5.9	193.2	150.0	140.2	9.71	15.448			
2,100.0	2,078.2	2,095.2	2,083.0	6.2	5.2	-133.27	-7.3	205.3	158.0	147.7	10.25	15.414			
2,200.0	2,176.9	2,194.9	2,181.9	6.5	5.4	-133.20	-8.7	217.4	166.0	155.2	10.79	15.383			
2,300.0	2,275.7	2,294.6	2,280.8	6.9	5.7	-133.13	-10.1	229.5	174.0	162.7	11.33	15.355			
2,400.0	2,374.4	2,394.3	2,379.8	7.2	6.0	-133.07	-11.5	241.6	182.0	170.1	11.87	15.329			
2,500.0	2,473.1	2,494.0	2,478.7	7.5	6.3	-133.02	-12.9	253.7	190.0	177.6	12.42	15.305			
2,600.0	2,571.8	2,593.6	2,577.6	7.9	6.5	-132.96	-14.3	265.8	198.0	185.1	12.96	15.283			
2,700.0	2,670.5	2,693.3	2,676.6	8.2	6.8	-132.92	-15.7	277.9	206.1	192.6	13.50	15.263			
2,800.0	2,769.2	2,793.0	2,775.5	8.5	7.1	-132.87	-17.1	290.0	214.1	200.0	14.04	15.244			
2,900.0	2,868.0	2,892.7	2,874.4	8.9	7.4	-132.83	-18.5	302.0	222.1	207.5	14.59	15.226			
3,000.0	2,966.7	2,992.3	2,973.4	9.2	7.7	-132.80	-19.9	314.1	230.1	215.0	15.13	15.210			
3,100.0	3,065.4	3,092.0	3,072.3	9.5	7.9	-132.76	-21.3	326.2	238.1	222.5	15.67	15.195			
3,200.0	3,164.1	3,191.7	3,171.2	9.9	8.2	-132.73	-22.7	338.3	246.1	229.9	16.21	15.180			
3,300.0	3,262.8	3,291.4	3,270.2	10.2	8.5	-132.70	-24.1	350.4	254.2	237.4	16.76	15.167			
3,400.0	3,361.5	3,391.1	3,369.1	10.5	8.8	-132.67	-25.5	362.5	262.2	244.9	17.30	15.154			
3,500.0	3,460.3	3,490.7	3,468.0	10.8	9.0	-132.64	-27.0	374.6	270.2	252.4	17.84	15.142			
3,600.0	3,559.0	3,590.4	3,566.9	11.2	9.3	-132.62	-28.4	386.7	278.2	259.8	18.39	15.131			
3,700.0	3,657.7	3,690.1	3,665.9	11.5	9.6	-132.59	-29.8	398.8	286.2	267.3	18.93	15.120			
3,800.0	3,756.4	3,789.8	3,764.8	11.8	9.9	-132.57	-31.2	410.9	294.2	274.8	19.47	15.110			
3,900.0	3,855.1	3,889.4	3,863.7	12.2	10.1	-132.55	-32.6	423.0	302.3	282.2	20.02	15.100			
4,000.0	3,953.8	3,989.1	3,962.7	12.5	10.4	-132.53	-34.0	435.1	310.3	289.7	20.56	15.091			
4,100.0	4,052.6	4,088.8	4,061.6	12.8	10.7	-132.51	-35.4	447.1	318.3	297.2	21.10	15.083			
4,200.0	4,151.3	4,188.5	4,160.5	13.2	11.0	-132.49	-36.8	459.2	326.3	304.7	21.65	15.074			
4,300.0	4,250.0	4,288.2	4,259.5	13.5	11.2	-132.47	-38.2	471.3	334.3	312.1	22.19	15.067			
4,400.0	4,348.7	4,387.8	4,358.4	13.8	11.5	-132.46	-39.6	483.4	342.4	319.6	22.73	15.059			
4,500.0	4,447.4	4,487.5	4,457.3	14.2	11.8	-132.44	-41.0	495.5	350.4	327.1	23.28	15.052			
4,600.0	4,546.1	4,587.2	4,556.3	14.5	12.1	-132.43	-42.4	507.6	358.4	334.6	23.82	15.045			
4,700.0	4,644.9	4,686.9	4,655.2	14.8	12.3	-132.41	-43.8	519.7	366.4	342.0	24.36	15.038			
4,800.0	4,743.6	4,786.5	4,754.1	15.1	12.6	-132.40	-45.2	531.8	374.4	349.5	24.91	15.032			
4,900.0	4,842.3	4,886.2	4,853.1	15.5	12.9	-132.38	-46.6	543.9	382.4	357.0	25.45	15.026			
5,000.0	4,941.0	4,985.9	4,952.0	15.8	13.2	-132.37	-48.0	556.0	390.5	364.5	25.99	15.020			
5,100.0	5,039.7	5,085.6	5,050.9	16.1	13.4	-132.36	-49.4	568.1	398.5	371.9	26.54	15.015			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 16-9C - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,200.0	5,138.4	5,185.3	5,149.9	16.5	13.7	-132.35	-50.9	580.2	406.5	379.4	27.08	15.010		
5,300.0	5,237.2	5,284.9	5,248.8	16.8	14.0	-132.34	-52.3	592.2	414.5	386.9	27.63	15.004		
5,400.0	5,335.9	5,384.6	5,347.7	17.1	14.3	-132.32	-53.7	604.3	422.5	394.4	28.17	14.999		
5,500.0	5,434.6	5,484.3	5,446.7	17.5	14.5	-132.31	-55.1	616.4	430.5	401.8	28.71	14.995		
5,600.0	5,533.3	5,584.0	5,545.6	17.8	14.8	-132.30	-56.5	628.5	438.6	409.3	29.26	14.990		
5,700.0	5,632.0	5,683.7	5,644.5	18.1	15.1	-132.29	-57.9	640.6	446.6	416.8	29.80	14.986		
5,800.0	5,730.7	5,783.3	5,743.5	18.5	15.4	-132.28	-59.3	652.7	454.6	424.3	30.34	14.981		
5,900.0	5,829.5	5,883.0	5,842.4	18.8	15.6	-132.28	-60.7	664.8	462.6	431.7	30.89	14.977		
6,000.0	5,928.2	5,982.7	5,941.3	19.1	15.9	-132.27	-62.1	676.9	470.6	439.2	31.43	14.973		
6,100.0	6,026.9	6,082.4	6,040.2	19.4	16.2	-132.26	-63.5	689.0	478.6	446.7	31.98	14.969		
6,200.0	6,125.6	6,182.0	6,139.2	19.8	16.5	-132.25	-64.9	701.1	486.7	454.1	32.52	14.966		
6,300.0	6,224.3	6,281.7	6,238.1	20.1	16.7	-132.24	-66.3	713.2	494.7	461.6	33.06	14.962		
6,400.0	6,323.0	6,381.4	6,337.0	20.4	17.0	-132.23	-67.7	725.3	502.7	469.1	33.61	14.959		
6,500.0	6,421.8	6,481.1	6,436.0	20.8	17.3	-132.23	-69.1	737.4	510.7	476.6	34.15	14.955		
6,600.0	6,520.5	6,580.8	6,534.9	21.1	17.6	-132.22	-70.5	749.4	518.7	484.0	34.69	14.952		
6,700.0	6,619.2	6,680.4	6,633.8	21.4	17.8	-132.21	-71.9	761.5	526.8	491.5	35.24	14.949		
6,800.0	6,717.9	6,776.7	6,729.5	21.8	18.1	-132.32	-73.2	772.1	535.0	499.3	35.71	14.982		
6,900.0	6,816.6	6,872.0	6,824.5	22.1	18.3	-132.75	-74.0	779.5	544.1	508.0	36.08	15.081		
7,000.0	6,915.3	6,966.8	6,919.2	22.4	18.4	-133.48	-74.5	783.7	554.0	517.6	36.34	15.246		
7,100.0	7,014.1	7,061.6	7,014.1	22.8	18.5	-134.49	-74.6	784.8	564.8	528.3	36.50	15.473		
7,200.0	7,112.8	7,160.4	7,112.8	23.1	18.6	-135.62	-74.6	784.8	576.2	539.6	36.63	15.729		
7,300.0	7,211.6	7,259.2	7,211.6	23.4	18.7	-136.75	-74.6	784.8	587.4	550.7	36.76	15.981		
7,400.0	7,310.8	7,358.4	7,310.8	23.6	18.9	-137.68	-74.6	784.8	596.6	559.7	36.89	16.171		
7,500.0	7,410.4	7,458.0	7,410.4	23.8	19.0	-138.34	-74.6	784.8	603.2	566.2	37.05	16.282		
7,600.0	7,510.2	7,557.8	7,510.2	24.0	19.1	-138.74	-74.6	784.8	607.3	570.1	37.22	16.315		
7,700.0	7,610.2	7,657.8	7,610.2	24.1	19.2	-138.88	-74.6	784.8	608.7	571.3	37.42	16.268		
7,800.0	7,710.2	7,757.8	7,710.2	24.2	19.3	-12.92	-74.6	784.8	608.8	571.1	37.67	16.161		
7,900.0	7,810.2	7,857.8	7,810.2	24.3	19.5	-12.92	-74.6	784.8	608.8	570.8	37.92	16.053		
8,000.0	7,910.2	7,957.8	7,910.2	24.4	19.6	-12.92	-74.6	784.8	608.8	570.6	38.17	15.947		
8,100.0	8,010.2	8,057.8	8,010.2	24.5	19.7	-12.92	-74.6	784.8	608.8	570.3	38.43	15.841		
8,200.0	8,110.2	8,157.8	8,110.2	24.6	19.8	-12.92	-74.6	784.8	608.8	570.1	38.68	15.736		
8,300.0	8,210.2	8,257.8	8,210.2	24.7	20.0	-12.92	-74.6	784.8	608.8	569.8	38.94	15.632		
8,400.0	8,310.2	8,357.8	8,310.2	24.8	20.1	-12.92	-74.6	784.8	608.8	569.6	39.20	15.529		
8,500.0	8,410.2	8,457.8	8,410.2	24.9	20.2	-12.92	-74.6	784.8	608.8	569.3	39.46	15.426		
8,600.0	8,510.2	8,557.8	8,510.2	25.0	20.3	-12.92	-74.6	784.8	608.8	569.0	39.72	15.325		
8,700.0	8,610.2	8,657.8	8,610.2	25.1	20.5	-12.92	-74.6	784.8	608.8	568.8	39.99	15.224		
8,800.0	8,710.2	8,757.8	8,710.2	25.2	20.6	-12.92	-74.6	784.8	608.8	568.5	40.25	15.124		
8,900.0	8,810.2	8,857.8	8,810.2	25.3	20.7	-12.92	-74.6	784.8	608.8	568.2	40.52	15.025		
9,000.0	8,910.2	8,957.8	8,910.2	25.4	20.9	-12.92	-74.6	784.8	608.8	568.0	40.78	14.926		
9,100.0	9,010.2	9,057.8	9,010.2	25.5	21.0	-12.92	-74.6	784.8	608.8	567.7	41.05	14.829		
9,200.0	9,110.2	9,157.8	9,110.2	25.6	21.1	-12.92	-74.6	784.8	608.8	567.4	41.32	14.732		
9,300.0	9,210.2	9,257.8	9,210.2	25.8	21.3	-12.92	-74.6	784.8	608.8	567.2	41.59	14.636		
9,400.0	9,310.2	9,357.8	9,310.2	25.9	21.4	-12.92	-74.6	784.8	608.8	566.9	41.86	14.541		
9,500.0	9,410.2	9,457.8	9,410.2	26.0	21.5	-12.92	-74.6	784.8	608.8	566.6	42.14	14.447		
9,600.0	9,510.2	9,557.8	9,510.2	26.1	21.7	-12.92	-74.6	784.8	608.8	566.3	42.41	14.354		
9,700.0	9,610.2	9,657.8	9,610.2	26.2	21.8	-12.92	-74.6	784.8	608.8	566.1	42.69	14.261		
9,800.0	9,710.2	9,757.8	9,710.2	26.3	21.9	-12.92	-74.6	784.8	608.8	565.8	42.96	14.169		
9,900.0	9,810.2	9,857.8	9,810.2	26.4	22.1	-12.92	-74.6	784.8	608.8	565.5	43.24	14.079		
10,000.0	9,910.2	9,957.8	9,910.2	26.5	22.2	-12.92	-74.6	784.8	608.8	565.2	43.52	13.989		
10,100.0	10,010.2	10,057.8	10,010.2	26.7	22.3	-12.92	-74.6	784.8	608.8	565.0	43.80	13.899		
10,121.8	10,032.0	10,079.6	10,032.0	26.7	22.4	-12.92	-74.6	784.8	608.8	564.9	43.86	13.880 SF		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 21-1B - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-174.27	-50.6	-5.1	50.9					
100.0	100.0	100.0	100.0	0.1	0.1	-174.27	-50.6	-5.1	50.9	50.6	0.27	186.868		
200.0	200.0	200.0	200.0	0.3	0.3	-174.27	-50.6	-5.1	50.9	50.3	0.62	81.886		
300.0	300.0	300.0	300.0	0.5	0.5	62.43	-50.6	-5.1	49.6	48.6	0.98	50.787		
398.3	397.9	396.2	396.1	0.7	0.7	68.70	-52.8	-4.0	48.4	47.0	1.36	35.593 CC		
400.0	399.6	397.8	397.8	0.7	0.7	68.83	-52.9	-4.0	48.4	47.0	1.37	35.417 ES		
500.0	498.8	495.8	495.5	1.0	0.9	76.79	-59.6	-0.6	49.9	48.0	1.85	27.025		
600.0	597.5	593.9	592.8	1.3	1.1	82.77	-70.8	5.1	54.8	52.4	2.40	22.879		
700.0	696.2	691.9	689.2	1.6	1.5	83.72	-86.4	13.0	62.9	59.9	3.01	20.940		
800.0	794.9	789.3	784.0	1.9	1.9	81.16	-106.2	23.1	73.9	70.3	3.65	20.244 SF		
900.0	893.6	885.6	876.5	2.3	2.4	76.72	-130.1	35.2	88.1	83.8	4.30	20.511		
1,000.0	992.4	983.4	969.5	2.6	2.9	72.19	-157.0	48.8	105.0	100.1	4.90	21.412		
1,100.0	1,091.1	1,081.7	1,063.0	2.9	3.4	68.87	-184.2	62.5	122.4	116.9	5.49	22.279		
1,200.0	1,189.8	1,180.0	1,156.4	3.3	4.0	66.39	-211.3	76.3	140.0	133.9	6.07	23.073		
1,300.0	1,288.5	1,278.2	1,249.8	3.6	4.5	64.46	-238.4	90.0	157.9	151.2	6.64	23.787		
1,400.0	1,387.2	1,376.5	1,343.3	3.9	5.1	62.92	-265.5	103.8	175.9	168.7	7.20	24.425		
1,500.0	1,485.9	1,474.8	1,436.7	4.2	5.6	61.67	-292.7	117.5	194.0	186.2	7.76	24.995		
1,600.0	1,584.7	1,573.0	1,530.2	4.6	6.2	60.64	-319.8	131.2	212.2	203.8	8.32	25.506		
1,700.0	1,683.4	1,671.3	1,623.6	4.9	6.8	59.77	-346.9	145.0	230.4	221.5	8.87	25.965		
1,800.0	1,782.1	1,769.6	1,717.1	5.2	7.3	59.02	-374.0	158.7	248.7	239.2	9.43	26.379		
1,900.0	1,880.8	1,867.8	1,810.5	5.6	7.9	58.38	-401.2	172.4	267.0	257.0	9.98	26.754		
2,000.0	1,979.5	1,966.1	1,904.0	5.9	8.4	57.82	-428.3	186.2	285.3	274.8	10.53	27.095		
2,100.0	2,078.2	2,064.4	1,997.4	6.2	9.0	57.33	-455.4	199.9	303.7	292.6	11.08	27.406		
2,200.0	2,176.9	2,162.6	2,090.9	6.5	9.6	56.89	-482.5	213.7	322.1	310.4	11.63	27.691		
2,300.0	2,275.7	2,260.9	2,184.3	6.9	10.1	56.50	-509.7	227.4	340.5	328.3	12.18	27.952		
2,400.0	2,374.4	2,359.2	2,277.7	7.2	10.7	56.15	-536.8	241.1	358.9	346.2	12.73	28.193		
2,500.0	2,473.1	2,457.4	2,371.2	7.5	11.2	55.83	-563.9	254.9	377.3	364.0	13.28	28.416		
2,600.0	2,571.8	2,555.7	2,464.6	7.9	11.8	55.55	-591.0	268.6	395.7	381.9	13.83	28.622		
2,700.0	2,670.5	2,654.0	2,558.1	8.2	12.4	55.29	-618.2	282.3	414.2	399.8	14.37	28.814		
2,800.0	2,769.2	2,752.2	2,651.5	8.5	12.9	55.05	-645.3	296.1	432.6	417.7	14.92	28.993		
2,900.0	2,868.0	2,850.5	2,745.0	8.9	13.5	54.83	-672.4	309.8	451.1	435.6	15.47	29.160		
3,000.0	2,966.7	2,948.8	2,838.4	9.2	14.0	54.63	-699.5	323.6	469.6	453.5	16.02	29.316		
3,100.0	3,065.4	3,047.0	2,931.9	9.5	14.6	54.44	-726.7	337.3	488.0	471.5	16.56	29.462		
3,200.0	3,164.1	3,145.3	3,025.3	9.9	15.2	54.27	-753.8	351.0	506.5	489.4	17.11	29.600		
3,300.0	3,262.8	3,243.6	3,118.8	10.2	15.7	54.11	-780.9	364.8	525.0	507.3	17.66	29.729		
3,400.0	3,361.5	3,341.8	3,212.2	10.5	16.3	53.96	-808.0	378.5	543.5	525.3	18.21	29.851		
3,500.0	3,460.3	3,440.1	3,305.6	10.8	16.9	53.82	-835.2	392.2	561.9	543.2	18.75	29.967		
3,600.0	3,559.0	3,538.4	3,399.1	11.2	17.4	53.69	-862.3	406.0	580.4	561.1	19.30	30.076		
3,700.0	3,657.7	3,636.7	3,492.5	11.5	18.0	53.57	-889.4	419.7	598.9	579.1	19.85	30.179		
3,800.0	3,756.4	3,734.9	3,586.0	11.8	18.5	53.45	-916.5	433.4	617.4	597.0	20.39	30.277		
3,900.0	3,855.1	3,833.2	3,679.4	12.2	19.1	53.34	-943.7	447.2	635.9	615.0	20.94	30.370		
4,000.0	3,953.8	3,931.5	3,772.9	12.5	19.7	53.24	-970.8	460.9	654.4	632.9	21.49	30.459		
4,100.0	4,052.6	4,029.7	3,866.3	12.8	20.2	53.14	-997.9	474.7	672.9	650.9	22.03	30.543		
4,200.0	4,151.3	4,128.0	3,959.8	13.2	20.8	53.05	-1,025.0	488.4	691.4	668.8	22.58	30.623		
4,300.0	4,250.0	4,226.3	4,053.2	13.5	21.3	52.96	-1,052.2	502.1	709.9	686.8	23.12	30.700		
4,400.0	4,348.7	4,324.5	4,146.7	13.8	21.9	52.88	-1,079.3	515.9	728.4	704.7	23.67	30.773		
4,500.0	4,447.4	4,422.8	4,240.1	14.2	22.5	52.80	-1,106.4	529.6	746.9	722.7	24.22	30.843		
4,600.0	4,546.1	4,521.1	4,333.6	14.5	23.0	52.73	-1,133.5	543.3	765.4	740.7	24.76	30.910		
4,700.0	4,644.9	4,619.3	4,427.0	14.8	23.6	52.66	-1,160.7	557.1	783.9	758.6	25.31	30.975		
4,800.0	4,743.6	4,717.6	4,520.4	15.1	24.2	52.59	-1,187.8	570.8	802.4	776.6	25.86	31.036		
4,900.0	4,842.3	4,815.9	4,613.9	15.5	24.7	52.52	-1,214.9	584.6	821.0	794.6	26.40	31.095		
5,000.0	4,941.0	4,914.1	4,707.3	15.8	25.3	52.46	-1,242.0	598.3	839.5	812.5	26.95	31.152		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 21-1B - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis			
5,100.0	5,039.7	5,012.4	4,800.8	16.1	25.8	52.40	-1,269.2	612.0	858.0	830.5	27.49	31.207		
5,200.0	5,138.4	5,110.7	4,894.2	16.5	26.4	52.35	-1,296.3	625.8	876.5	848.4	28.04	31.259		
5,300.0	5,237.2	5,208.9	4,987.7	16.8	27.0	52.29	-1,323.4	639.5	895.0	866.4	28.59	31.310		
5,400.0	5,335.9	5,307.2	5,081.1	17.1	27.5	52.24	-1,350.5	653.2	913.5	884.4	29.13	31.359		
5,500.0	5,434.6	5,405.5	5,174.6	17.5	28.1	52.19	-1,377.7	667.0	932.0	902.4	29.68	31.406		
5,600.0	5,533.3	5,503.7	5,268.0	17.8	28.7	52.14	-1,404.8	680.7	950.5	920.3	30.22	31.451		
5,700.0	5,632.0	5,602.0	5,361.5	18.1	29.2	52.10	-1,431.9	694.5	969.1	938.3	30.77	31.495		
5,800.0	5,730.7	5,700.3	5,454.9	18.5	29.8	52.05	-1,459.0	708.2	987.6	956.3	31.31	31.537		
5,900.0	5,829.5	5,798.5	5,548.3	18.8	30.3	52.01	-1,486.2	721.9	1,006.1	974.2	31.86	31.578		
6,000.0	5,928.2	5,896.8	5,641.8	19.1	30.9	51.97	-1,513.3	735.7	1,024.6	992.2	32.41	31.618		
6,100.0	6,026.9	5,995.1	5,735.2	19.4	31.5	51.93	-1,540.4	749.4	1,043.1	1,010.2	32.95	31.656		
6,200.0	6,125.6	6,093.3	5,828.7	19.8	32.0	51.89	-1,567.5	763.1	1,061.6	1,028.2	33.50	31.693		
6,300.0	6,224.3	6,191.6	5,922.1	20.1	32.6	51.85	-1,594.7	776.9	1,080.2	1,046.1	34.04	31.729		
6,400.0	6,323.0	6,289.9	6,015.6	20.4	33.2	51.81	-1,621.8	790.6	1,098.7	1,064.1	34.59	31.763		
6,500.0	6,421.8	6,388.2	6,109.0	20.8	33.7	51.78	-1,648.9	804.3	1,117.2	1,082.1	35.14	31.797		
6,600.0	6,520.5	6,486.4	6,202.5	21.1	34.3	51.75	-1,676.0	818.1	1,135.7	1,100.0	35.68	31.830		
6,700.0	6,619.2	6,584.7	6,295.9	21.4	34.8	51.71	-1,703.2	831.8	1,154.2	1,118.0	36.23	31.861		
6,800.0	6,717.9	6,683.0	6,389.4	21.8	35.4	51.68	-1,730.3	845.6	1,172.8	1,136.0	36.77	31.892		
6,900.0	6,816.6	6,781.2	6,482.8	22.1	36.0	51.65	-1,757.4	859.3	1,191.3	1,154.0	37.32	31.922		
7,000.0	6,915.3	6,879.5	6,576.2	22.4	36.5	51.62	-1,784.5	873.0	1,209.8	1,171.9	37.86	31.951		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Federal 21-3A - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total	Separation	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-163.70	-41.5	-12.1	43.3					
100.0	100.0	100.0	100.0	0.1	0.1	-163.70	-41.5	-12.1	43.3	43.0	0.27	158.878		
200.0	200.0	200.0	200.0	0.3	0.3	-163.70	-41.5	-12.1	43.3	42.6	0.62	69.621 CC, ES		
300.0	300.0	297.7	297.7	0.5	0.5	73.74	-43.8	-13.1	45.0	44.0	0.97	46.189		
400.0	399.6	394.8	394.5	0.7	0.7	82.31	-50.7	-16.0	51.1	49.7	1.37	37.413		
500.0	498.8	490.7	489.6	1.0	1.0	92.35	-61.8	-20.8	63.1	61.2	1.83	34.420 SF		
600.0	597.5	585.2	582.6	1.3	1.3	99.91	-77.1	-27.3	81.5	79.2	2.34	34.852		
700.0	696.2	678.1	673.2	1.6	1.7	103.43	-96.3	-35.5	105.1	102.2	2.88	36.516		
800.0	794.9	769.1	760.8	1.9	2.2	104.67	-119.0	-45.1	133.0	129.6	3.44	38.639		
900.0	893.6	862.5	849.7	2.3	2.7	104.90	-145.2	-56.3	164.0	159.9	4.02	40.750		
1,000.0	992.4	957.5	940.1	2.6	3.2	105.03	-172.1	-67.7	195.1	190.5	4.62	42.257		
1,100.0	1,091.1	1,052.6	1,030.5	2.9	3.7	105.13	-198.9	-79.2	226.2	221.0	5.21	43.377		
1,200.0	1,189.8	1,147.6	1,121.0	3.3	4.3	105.20	-225.8	-90.6	257.3	251.5	5.82	44.240		
1,300.0	1,288.5	1,242.6	1,211.4	3.6	4.8	105.25	-252.7	-102.1	288.4	282.0	6.42	44.923		
1,400.0	1,387.2	1,337.7	1,301.8	3.9	5.3	105.30	-279.5	-113.5	319.6	312.5	7.03	45.477		
1,500.0	1,485.9	1,432.7	1,392.3	4.2	5.9	105.34	-306.4	-125.0	350.7	343.1	7.63	45.934		
1,600.0	1,584.7	1,527.7	1,482.7	4.6	6.4	105.37	-333.3	-136.4	381.8	373.6	8.24	46.318		
1,700.0	1,683.4	1,622.8	1,573.1	4.9	6.9	105.39	-360.2	-147.8	412.9	404.1	8.85	46.644		
1,800.0	1,782.1	1,717.8	1,663.6	5.2	7.5	105.42	-387.0	-159.3	444.1	434.6	9.46	46.925		
1,900.0	1,880.8	1,812.8	1,754.0	5.6	8.0	105.44	-413.9	-170.7	475.2	465.1	10.07	47.169		
2,000.0	1,979.5	1,907.9	1,844.4	5.9	8.5	105.45	-440.8	-182.2	506.3	495.6	10.69	47.384		
2,100.0	2,078.2	2,002.9	1,934.9	6.2	9.1	105.47	-467.6	-193.6	537.4	526.1	11.30	47.573		
2,200.0	2,176.9	2,097.9	2,025.3	6.5	9.6	105.48	-494.5	-205.1	568.5	556.6	11.91	47.742		
2,300.0	2,275.7	2,193.0	2,115.7	6.9	10.2	105.50	-521.4	-216.5	599.7	587.1	12.52	47.893		
2,400.0	2,374.4	2,288.0	2,206.2	7.2	10.7	105.51	-548.3	-227.9	630.8	617.7	13.13	48.029		
2,500.0	2,473.1	2,383.0	2,296.6	7.5	11.2	105.52	-575.1	-239.4	661.9	648.2	13.75	48.152		
2,600.0	2,571.8	2,478.1	2,387.1	7.9	11.8	105.53	-602.0	-250.8	693.0	678.7	14.36	48.264		
2,700.0	2,670.5	2,573.1	2,477.5	8.2	12.3	105.53	-628.9	-262.3	724.2	709.2	14.97	48.367		
2,800.0	2,769.2	2,668.1	2,567.9	8.5	12.9	105.54	-655.7	-273.7	755.3	739.7	15.59	48.461		
2,900.0	2,868.0	2,763.2	2,658.4	8.9	13.4	105.55	-682.6	-285.2	786.4	770.2	16.20	48.547		
3,000.0	2,966.7	2,858.2	2,748.8	9.2	13.9	105.56	-709.5	-296.6	817.5	800.7	16.81	48.627		
3,100.0	3,065.4	2,953.3	2,839.2	9.5	14.5	105.56	-736.4	-308.0	848.6	831.2	17.43	48.701		
3,200.0	3,164.1	3,048.3	2,929.7	9.9	15.0	105.57	-763.2	-319.5	879.8	861.7	18.04	48.770		
3,300.0	3,262.8	3,143.3	3,020.1	10.2	15.5	105.57	-790.1	-330.9	910.9	892.2	18.65	48.834		
3,400.0	3,361.5	3,238.4	3,110.5	10.5	16.1	105.58	-817.0	-342.4	942.0	922.7	19.27	48.893		
3,500.0	3,460.3	3,333.4	3,201.0	10.8	16.6	105.58	-843.8	-353.8	973.1	953.3	19.88	48.949		
3,600.0	3,559.0	3,428.4	3,291.4	11.2	17.2	105.59	-870.7	-365.3	1,004.3	983.8	20.49	49.002		
3,700.0	3,657.7	3,523.5	3,381.8	11.5	17.7	105.59	-897.6	-376.7	1,035.4	1,014.3	21.11	49.051		
3,800.0	3,756.4	3,618.5	3,472.3	11.8	18.2	105.59	-924.5	-388.1	1,066.5	1,044.8	21.72	49.097		
3,900.0	3,855.1	3,713.5	3,562.7	12.2	18.8	105.60	-951.3	-399.6	1,097.6	1,075.3	22.34	49.141		
4,000.0	3,953.8	3,808.6	3,653.1	12.5	19.3	105.60	-978.2	-411.0	1,128.7	1,105.8	22.95	49.182		
4,100.0	4,052.6	3,903.6	3,743.6	12.8	19.9	105.60	-1,005.1	-422.5	1,159.9	1,136.3	23.56	49.221		
4,200.0	4,151.3	3,998.6	3,834.0	13.2	20.4	105.61	-1,031.9	-433.9	1,191.0	1,166.8	24.18	49.258		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Fee 16-8D - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	5.24	33.9	3.1	34.0						
100.0	100.0	100.0	100.0	0.1	0.1	5.24	33.9	3.1	34.0	33.7	0.27	124.934			
200.0	200.0	200.0	200.0	0.3	0.3	5.24	33.9	3.1	34.0	33.4	0.62	54.746 CC, ES			
300.0	300.0	298.7	298.6	0.5	0.5	-121.27	35.5	5.1	37.2	36.2	0.98	37.997			
400.0	399.6	396.7	396.4	0.7	0.7	-122.46	40.3	10.9	46.7	45.3	1.38	33.790			
500.0	498.8	493.6	492.5	1.0	1.0	-123.55	48.2	20.5	62.4	60.5	1.86	33.489 SF			
600.0	597.5	589.1	586.4	1.3	1.3	-123.48	59.1	33.5	83.0	80.6	2.40	34.534			
700.0	696.2	685.3	680.3	1.6	1.7	-121.87	72.4	49.6	106.2	103.2	2.97	35.715			
800.0	794.9	782.5	775.1	1.9	2.1	-120.72	86.0	66.0	129.7	126.1	3.56	36.454			
900.0	893.6	879.6	869.9	2.3	2.5	-119.93	99.6	82.5	153.2	149.1	4.15	36.947			
1,000.0	992.4	976.8	964.7	2.6	2.9	-119.34	113.2	98.9	176.8	172.0	4.74	37.298			
1,100.0	1,091.1	1,074.0	1,059.5	2.9	3.3	-118.90	126.8	115.4	200.3	195.0	5.33	37.558			
1,200.0	1,189.8	1,171.2	1,154.3	3.3	3.7	-118.54	140.5	131.8	223.9	217.9	5.93	37.759			
1,300.0	1,288.5	1,268.3	1,249.1	3.6	4.1	-118.26	154.1	148.3	247.4	240.9	6.53	37.918			
1,400.0	1,387.2	1,365.5	1,343.9	3.9	4.5	-118.02	167.7	164.7	271.0	263.9	7.12	38.047			
1,500.0	1,485.9	1,462.7	1,438.7	4.2	5.0	-117.82	181.3	181.2	294.6	286.9	7.72	38.154			
1,600.0	1,584.7	1,559.9	1,533.5	4.6	5.4	-117.66	195.0	197.6	318.2	309.8	8.32	38.244			
1,700.0	1,683.4	1,657.0	1,628.3	4.9	5.8	-117.51	208.6	214.1	341.7	332.8	8.92	38.320			
1,800.0	1,782.1	1,754.2	1,723.1	5.2	6.2	-117.38	222.2	230.6	365.3	355.8	9.52	38.386			
1,900.0	1,880.8	1,851.4	1,817.9	5.6	6.6	-117.27	235.8	247.0	388.9	378.8	10.12	38.443			
2,000.0	1,979.5	1,948.6	1,912.7	5.9	7.0	-117.17	249.5	263.5	412.5	401.8	10.72	38.494			
2,100.0	2,078.2	2,045.8	2,007.5	6.2	7.4	-117.09	263.1	279.9	436.1	424.8	11.32	38.538			
2,200.0	2,176.9	2,142.9	2,102.3	6.5	7.8	-117.01	276.7	296.4	459.7	447.8	11.92	38.578			
2,300.0	2,275.7	2,240.1	2,197.1	6.9	8.3	-116.94	290.3	312.8	483.3	470.7	12.52	38.613			
2,400.0	2,374.4	2,337.3	2,291.9	7.2	8.7	-116.87	303.9	329.3	506.8	493.7	13.12	38.646			
2,500.0	2,473.1	2,434.5	2,386.7	7.5	9.1	-116.81	317.6	345.7	530.4	516.7	13.72	38.675			
2,600.0	2,571.8	2,531.6	2,481.5	7.9	9.5	-116.76	331.2	362.2	554.0	539.7	14.32	38.701			
2,700.0	2,670.5	2,628.8	2,576.3	8.2	9.9	-116.71	344.8	378.6	577.6	562.7	14.92	38.725			
2,800.0	2,769.2	2,726.0	2,671.1	8.5	10.3	-116.66	358.4	395.1	601.2	585.7	15.52	38.748			
2,900.0	2,868.0	2,823.2	2,765.9	8.9	10.7	-116.62	372.1	411.5	624.8	608.7	16.12	38.768			
3,000.0	2,966.7	2,920.3	2,860.7	9.2	11.2	-116.58	385.7	428.0	648.4	631.7	16.72	38.787			
3,100.0	3,065.4	3,017.5	2,955.5	9.5	11.6	-116.55	399.3	444.4	672.0	654.7	17.32	38.804			
3,200.0	3,164.1	3,114.7	3,050.3	9.9	12.0	-116.51	412.9	460.9	695.6	677.7	17.92	38.821			
3,300.0	3,262.8	3,211.9	3,145.1	10.2	12.4	-116.48	426.5	477.3	719.2	700.6	18.52	38.836			
3,400.0	3,361.5	3,309.0	3,239.9	10.5	12.8	-116.45	440.2	493.8	742.8	723.6	19.12	38.850			
3,500.0	3,460.3	3,406.2	3,334.7	10.8	13.2	-116.42	453.8	510.2	766.4	746.6	19.72	38.863			
3,600.0	3,559.0	3,503.4	3,429.5	11.2	13.6	-116.40	467.4	526.7	789.9	769.6	20.32	38.876			
3,700.0	3,657.7	3,600.6	3,524.3	11.5	14.1	-116.37	481.0	543.1	813.5	792.6	20.92	38.887			
3,800.0	3,756.4	3,697.8	3,619.1	11.8	14.5	-116.35	494.7	559.6	837.1	815.6	21.52	38.898			
3,900.0	3,855.1	3,794.9	3,713.9	12.2	14.9	-116.33	508.3	576.0	860.7	838.6	22.12	38.909			
4,000.0	3,953.8	3,892.1	3,808.7	12.5	15.3	-116.31	521.9	592.5	884.3	861.6	22.72	38.918			
4,100.0	4,052.6	3,989.3	3,903.5	12.8	15.7	-116.29	535.5	608.9	907.9	884.6	23.32	38.928			
4,200.0	4,151.3	4,086.5	3,998.3	13.2	16.1	-116.27	549.2	625.4	931.5	907.6	23.92	38.936			
4,300.0	4,250.0	4,183.6	4,093.1	13.5	16.5	-116.25	562.8	641.8	955.1	930.6	24.52	38.945			
4,400.0	4,348.7	4,280.8	4,187.9	13.8	17.0	-116.23	576.4	658.3	978.7	953.6	25.13	38.953			
4,500.0	4,447.4	4,378.0	4,282.7	14.2	17.4	-116.22	590.0	674.7	1,002.3	976.6	25.73	38.960			
4,600.0	4,546.1	4,475.2	4,377.5	14.5	17.8	-116.20	603.6	691.2	1,025.9	999.5	26.33	38.967			
4,700.0	4,644.9	4,572.3	4,472.3	14.8	18.2	-116.19	617.3	707.6	1,049.5	1,022.5	26.93	38.974			
4,800.0	4,743.6	4,669.5	4,567.1	15.1	18.6	-116.17	630.9	724.1	1,073.1	1,045.5	27.53	38.981			
4,900.0	4,842.3	4,766.7	4,661.9	15.5	19.0	-116.16	644.5	740.5	1,096.7	1,068.5	28.13	38.987			
5,000.0	4,941.0	4,863.9	4,756.7	15.8	19.4	-116.15	658.1	757.0	1,120.2	1,091.5	28.73	38.993			
5,100.0	5,039.7	4,961.0	4,851.5	16.1	19.9	-116.14	671.8	773.5	1,143.8	1,114.5	29.33	38.999			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design (J16W) - HMU Fee 16-8D - DD - Plan #1												Offset Site Error:	0.0 ft		
Survey Program:		0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)					
5,200.0	5,138.4	5,058.2	4,946.3	16.5	20.3	-116.12	685.4	789.9	1,167.4	1,137.5	29.93	39.004			
5,300.0	5,237.2	5,155.4	5,041.1	16.8	20.7	-116.11	699.0	806.4	1,191.0	1,160.5	30.53	39.009			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-16B
Project:	Mamm Creek	TVD Reference:	WELL @ 7667.0ft (Original Well Elev)
Reference Site:	(J16W)	MD Reference:	WELL @ 7667.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HMU Federal 16-16B	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	EDM 5000.1 US Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 7667.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: HMU Federal 16-16B
Coordinate System is US State Plane 1983, Colorado Central Zone
Grid Convergence at Surface is: -1.44°

