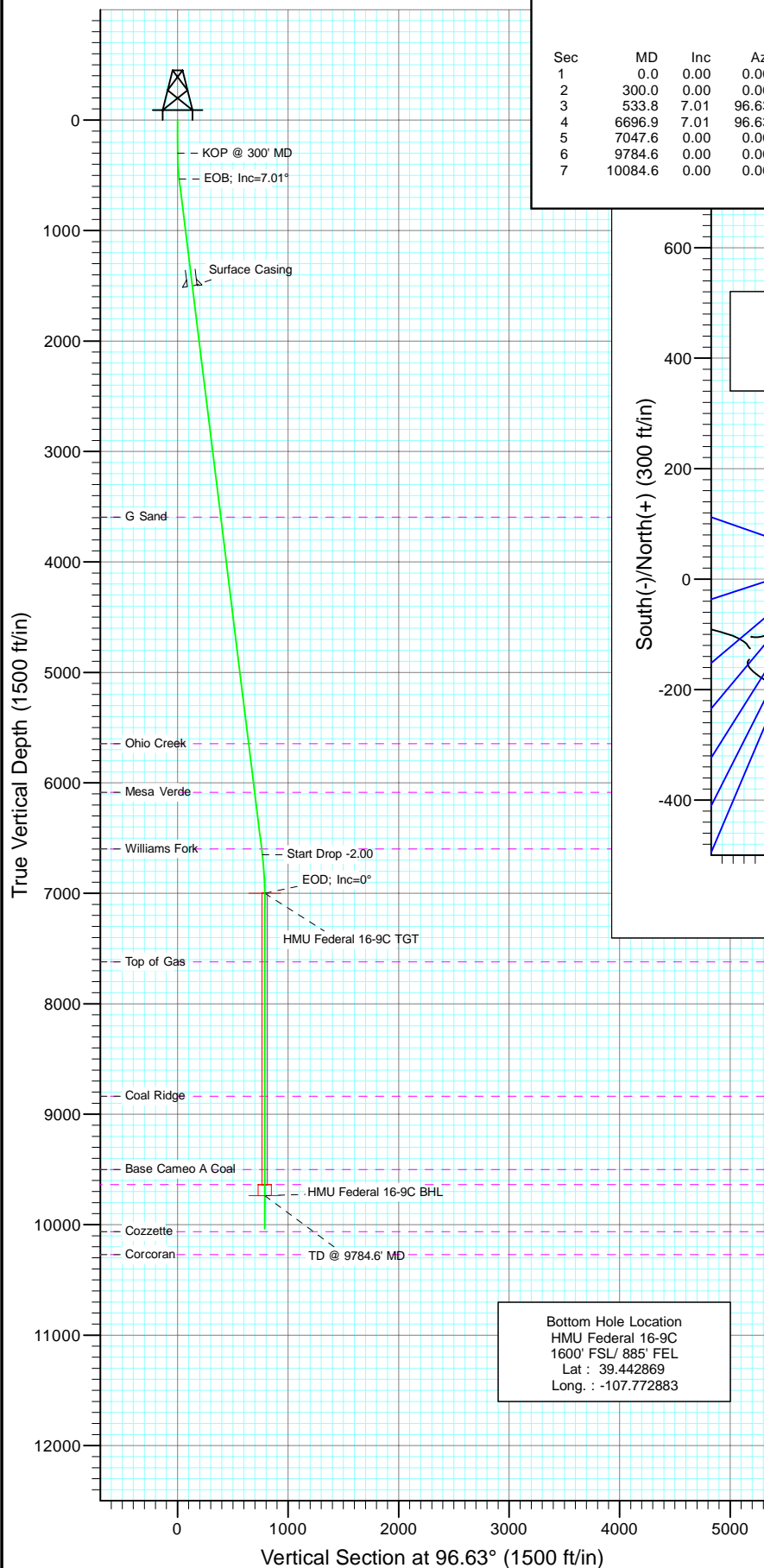
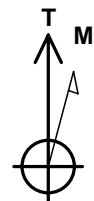
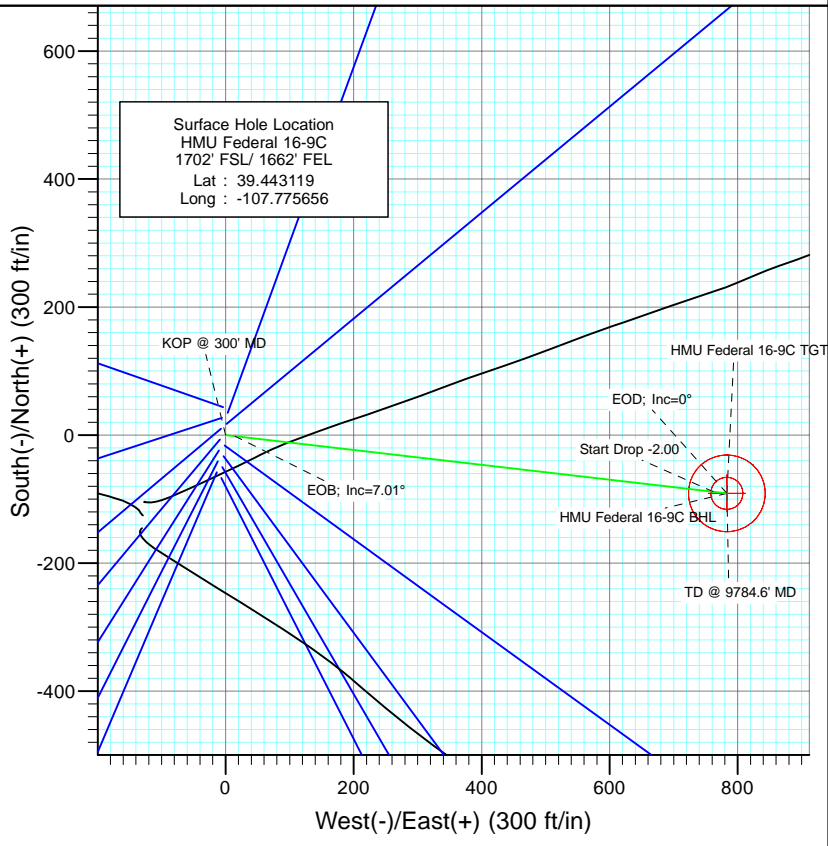




Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-9C
Wellbore: DD
Design: Plan #1



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	
3	533.8	7.01	96.63	533.2	-1.7	14.2	3.00	96.63	14.3	
4	6696.9	7.01	96.63	6650.1	-88.6	761.8	0.00	0.00	767.0	
5	7047.6	0.00	0.00	7000.0	-91.0	783.1	2.00	180.00	788.4	HMU Federal 16-9C TGT
6	9784.6	0.00	0.00	9737.0	-91.0	783.1	0.00	0.00	788.4	HMU Federal 16-9C BHL
7	10084.6	0.00	0.00	10037.0	-91.0	783.1	0.00	0.00	788.4	



Azimuths to True North
Magnetic North: 10.30°

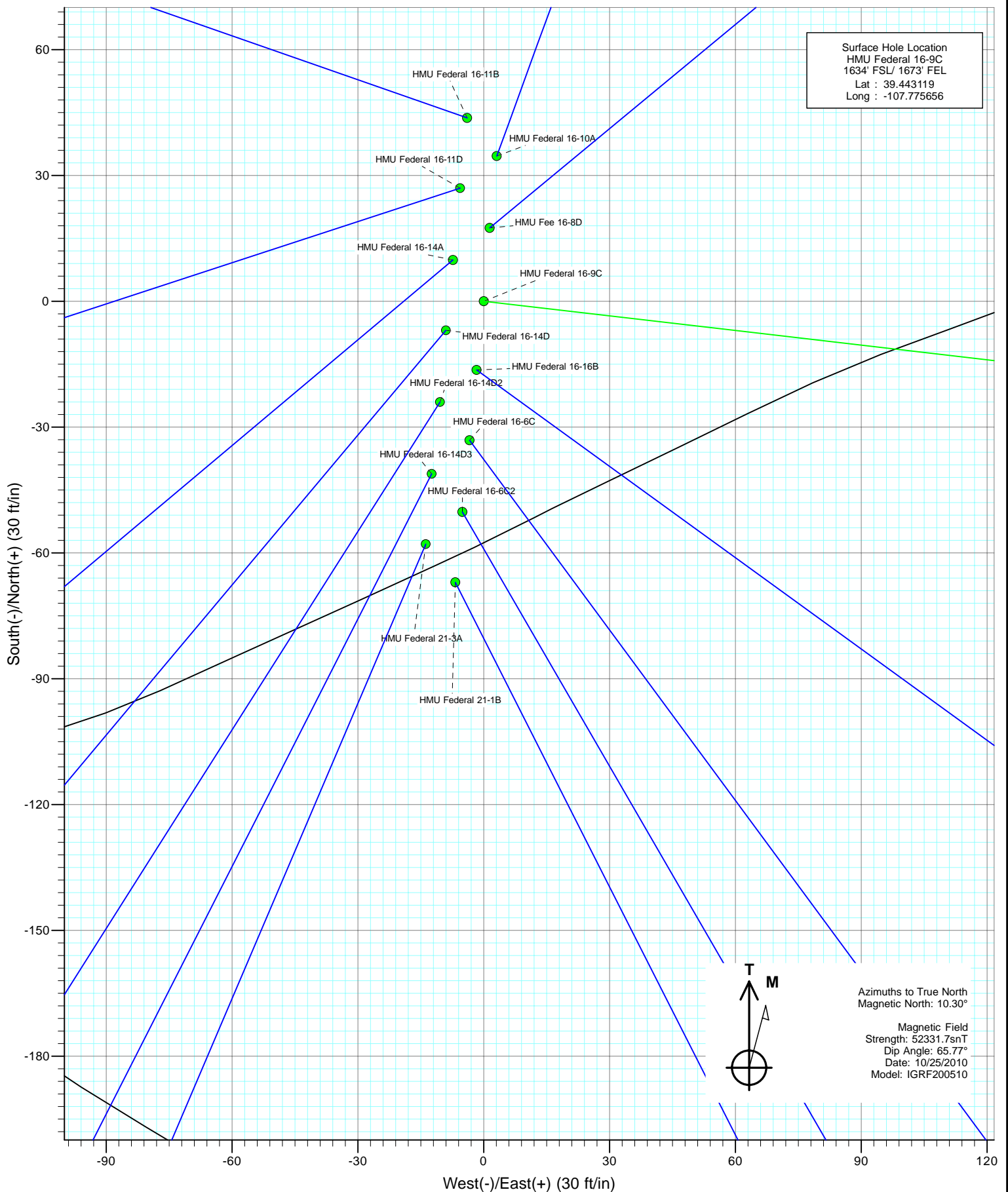
Magnetic Field
Strength: 52331.7snT
Dip Angle: 65.77°
Date: 10/25/2010
Model: IGRF200510

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3595.0	3618.7	G Sand
5645.0	5684.1	Ohio Creek
6086.0	6128.5	Mesa Verde
6598.0	6644.3	Williams Fork
7621.0	7668.6	Top of Gas
8837.0	8884.6	Coal Ridge
9501.0	9548.6	Base Cameo A Coal
9637.0	9684.6	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 16-9C BHL	96.63	Slot	0.0	0.0

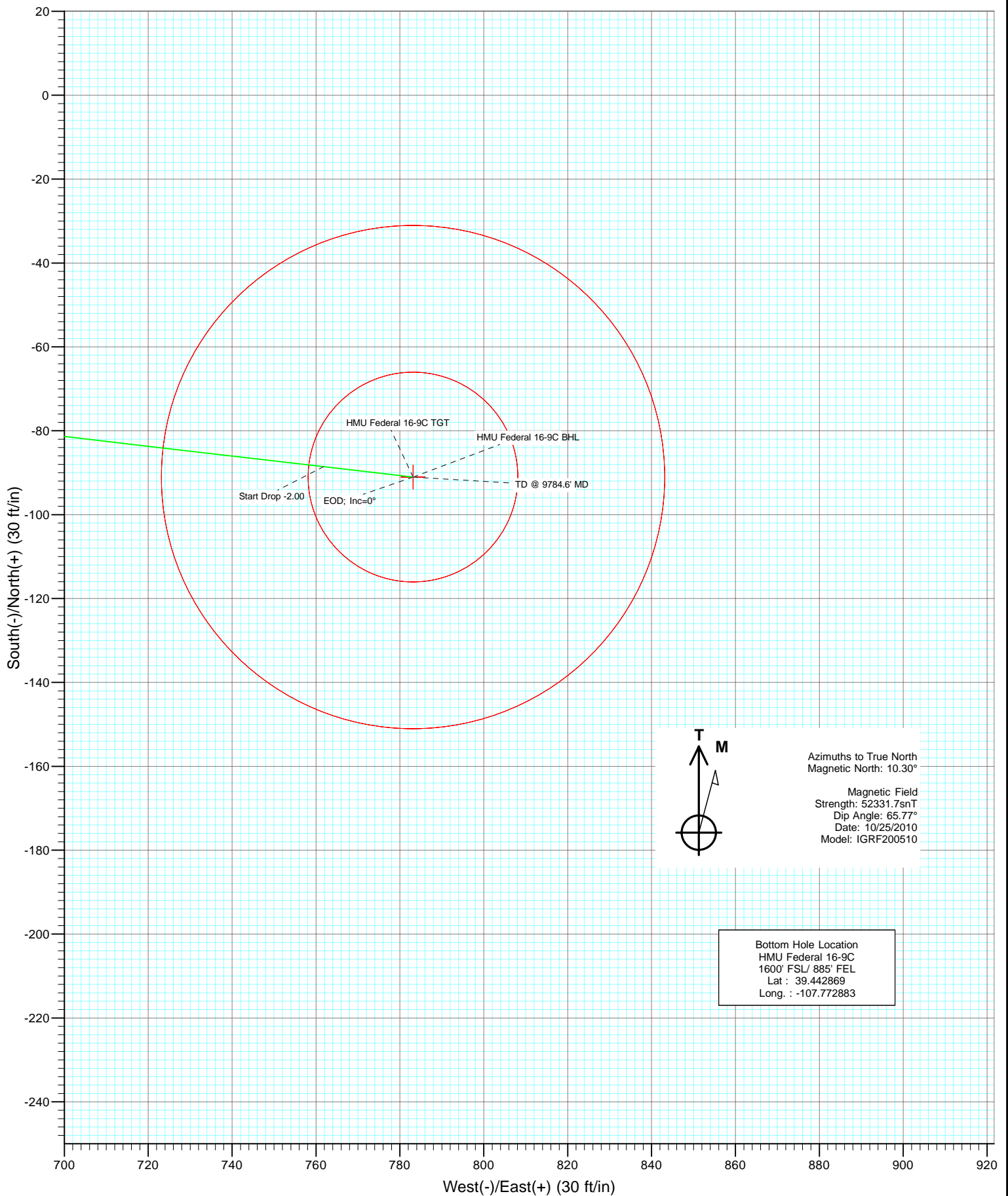


Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-9C
Wellbore: DD
Design: Plan #1





Project: Mamm Creek
Site: (J16W)
Well: HMU Federal 16-9C
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 16-9C
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 16-9C	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 16-9C					
Well Position	+N/-S	0.0 ft	Northing:	1,594,337.72 ft	Latitude:	39.443119
	+E/-W	0.0 ft	Easting:	2,357,398.24 ft	Longitude:	-107.775656
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)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	96.63

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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
533.8	7.01	96.63	533.2	-1.7	14.2	3.00	3.00	0.00	96.63	
6,696.9	7.01	96.63	6,650.1	-88.6	761.8	0.00	0.00	0.00	0.00	
7,047.6	0.00	0.00	7,000.0	-91.0	783.1	2.00	-2.00	0.00	180.00	HMU Federal 16-9C 1
9,784.6	0.00	0.00	9,737.0	-91.0	783.1	0.00	0.00	0.00	0.00	HMU Federal 16-9C E
10,084.6	0.00	0.00	10,037.0	-91.0	783.1	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 16-9C
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 16-9C	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
30.0	0.00	0.00	30.0	0.0	0.0	0.0	0.00	0.00	
60.0	0.00	0.00	60.0	0.0	0.0	0.0	0.00	0.00	
90.0	0.00	0.00	90.0	0.0	0.0	0.0	0.00	0.00	
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	
180.0	0.00	0.00	180.0	0.0	0.0	0.0	0.00	0.00	
210.0	0.00	0.00	210.0	0.0	0.0	0.0	0.00	0.00	
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	
270.0	0.00	0.00	270.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	KOP @ 300' MD
330.0	0.90	96.63	330.0	0.0	0.2	0.2	3.00	3.00	
360.0	1.80	96.63	360.0	-0.1	0.9	0.9	3.00	3.00	
390.0	2.70	96.63	390.0	-0.2	2.1	2.1	3.00	3.00	
420.0	3.60	96.63	419.9	-0.4	3.7	3.8	3.00	3.00	
450.0	4.50	96.63	449.8	-0.7	5.8	5.9	3.00	3.00	
480.0	5.40	96.63	479.7	-1.0	8.4	8.5	3.00	3.00	
510.0	6.30	96.63	509.6	-1.3	11.5	11.5	3.00	3.00	
533.8	7.01	96.63	533.2	-1.7	14.2	14.3	3.00	3.00	EOB; Inc=7.01°
540.0	7.01	96.63	539.4	-1.7	14.9	15.0	0.00	0.00	
570.0	7.01	96.63	569.1	-2.2	18.6	18.7	0.00	0.00	
600.0	7.01	96.63	598.9	-2.6	22.2	22.4	0.00	0.00	
630.0	7.01	96.63	628.7	-3.0	25.9	26.0	0.00	0.00	
660.0	7.01	96.63	658.5	-3.4	29.5	29.7	0.00	0.00	
690.0	7.01	96.63	688.2	-3.9	33.1	33.4	0.00	0.00	
720.0	7.01	96.63	718.0	-4.3	36.8	37.0	0.00	0.00	
750.0	7.01	96.63	747.8	-4.7	40.4	40.7	0.00	0.00	
780.0	7.01	96.63	777.6	-5.1	44.1	44.4	0.00	0.00	
810.0	7.01	96.63	807.3	-5.5	47.7	48.0	0.00	0.00	
840.0	7.01	96.63	837.1	-6.0	51.3	51.7	0.00	0.00	
870.0	7.01	96.63	866.9	-6.4	55.0	55.4	0.00	0.00	
900.0	7.01	96.63	896.7	-6.8	58.6	59.0	0.00	0.00	
930.0	7.01	96.63	926.5	-7.2	62.3	62.7	0.00	0.00	
960.0	7.01	96.63	956.2	-7.7	65.9	66.3	0.00	0.00	
990.0	7.01	96.63	986.0	-8.1	69.5	70.0	0.00	0.00	
1,020.0	7.01	96.63	1,015.8	-8.5	73.2	73.7	0.00	0.00	
1,050.0	7.01	96.63	1,045.6	-8.9	76.8	77.3	0.00	0.00	
1,080.0	7.01	96.63	1,075.3	-9.4	80.5	81.0	0.00	0.00	
1,110.0	7.01	96.63	1,105.1	-9.8	84.1	84.7	0.00	0.00	
1,140.0	7.01	96.63	1,134.9	-10.2	87.7	88.3	0.00	0.00	
1,170.0	7.01	96.63	1,164.7	-10.6	91.4	92.0	0.00	0.00	
1,200.0	7.01	96.63	1,194.4	-11.0	95.0	95.7	0.00	0.00	
1,230.0	7.01	96.63	1,224.2	-11.5	98.7	99.3	0.00	0.00	
1,260.0	7.01	96.63	1,254.0	-11.9	102.3	103.0	0.00	0.00	
1,290.0	7.01	96.63	1,283.8	-12.3	105.9	106.6	0.00	0.00	
1,320.0	7.01	96.63	1,313.5	-12.7	109.6	110.3	0.00	0.00	
1,350.0	7.01	96.63	1,343.3	-13.2	113.2	114.0	0.00	0.00	
1,380.0	7.01	96.63	1,373.1	-13.6	116.8	117.6	0.00	0.00	
1,410.0	7.01	96.63	1,402.9	-14.0	120.5	121.3	0.00	0.00	
1,440.0	7.01	96.63	1,432.6	-14.4	124.1	125.0	0.00	0.00	
1,470.0	7.01	96.63	1,462.4	-14.9	127.8	128.6	0.00	0.00	
1,500.0	7.01	96.63	1,492.2	-15.3	131.4	132.3	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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
1,512.7	7.01	96.63	1,504.8	-15.5	133.0	133.8	0.00	0.00	Surface Casing
1,530.0	7.01	96.63	1,522.0	-15.7	135.0	136.0	0.00	0.00	
1,560.0	7.01	96.63	1,551.7	-16.1	138.7	139.6	0.00	0.00	
1,590.0	7.01	96.63	1,581.5	-16.5	142.3	143.3	0.00	0.00	
1,620.0	7.01	96.63	1,611.3	-17.0	146.0	146.9	0.00	0.00	
1,650.0	7.01	96.63	1,641.1	-17.4	149.6	150.6	0.00	0.00	
1,680.0	7.01	96.63	1,670.8	-17.8	153.2	154.3	0.00	0.00	
1,710.0	7.01	96.63	1,700.6	-18.2	156.9	157.9	0.00	0.00	
1,740.0	7.01	96.63	1,730.4	-18.7	160.5	161.6	0.00	0.00	
1,770.0	7.01	96.63	1,760.2	-19.1	164.2	165.3	0.00	0.00	
1,800.0	7.01	96.63	1,789.9	-19.5	167.8	168.9	0.00	0.00	
1,830.0	7.01	96.63	1,819.7	-19.9	171.4	172.6	0.00	0.00	
1,860.0	7.01	96.63	1,849.5	-20.4	175.1	176.3	0.00	0.00	
1,890.0	7.01	96.63	1,879.3	-20.8	178.7	179.9	0.00	0.00	
1,920.0	7.01	96.63	1,909.0	-21.2	182.4	183.6	0.00	0.00	
1,950.0	7.01	96.63	1,938.8	-21.6	186.0	187.2	0.00	0.00	
1,980.0	7.01	96.63	1,968.6	-22.0	189.6	190.9	0.00	0.00	
2,010.0	7.01	96.63	1,998.4	-22.5	193.3	194.6	0.00	0.00	
2,040.0	7.01	96.63	2,028.1	-22.9	196.9	198.2	0.00	0.00	
2,070.0	7.01	96.63	2,057.9	-23.3	200.6	201.9	0.00	0.00	
2,100.0	7.01	96.63	2,087.7	-23.7	204.2	205.6	0.00	0.00	
2,130.0	7.01	96.63	2,117.5	-24.2	207.8	209.2	0.00	0.00	
2,160.0	7.01	96.63	2,147.2	-24.6	211.5	212.9	0.00	0.00	
2,190.0	7.01	96.63	2,177.0	-25.0	215.1	216.6	0.00	0.00	
2,220.0	7.01	96.63	2,206.8	-25.4	218.7	220.2	0.00	0.00	
2,250.0	7.01	96.63	2,236.6	-25.9	222.4	223.9	0.00	0.00	
2,280.0	7.01	96.63	2,266.3	-26.3	226.0	227.5	0.00	0.00	
2,310.0	7.01	96.63	2,296.1	-26.7	229.7	231.2	0.00	0.00	
2,340.0	7.01	96.63	2,325.9	-27.1	233.3	234.9	0.00	0.00	
2,370.0	7.01	96.63	2,355.7	-27.5	236.9	238.5	0.00	0.00	
2,400.0	7.01	96.63	2,385.4	-28.0	240.6	242.2	0.00	0.00	
2,430.0	7.01	96.63	2,415.2	-28.4	244.2	245.9	0.00	0.00	
2,460.0	7.01	96.63	2,445.0	-28.8	247.9	249.5	0.00	0.00	
2,490.0	7.01	96.63	2,474.8	-29.2	251.5	253.2	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 16-9C BHI	0.00	0.00	9,737.0	-91.0	783.1	1,594,227.10	2,358,178.85	39.442869	-107.772883
- plan misses target center by 7281.9ft at 2490.0ft MD (2474.8 TVD, -29.2 N, 251.5 E)									
- Circle (radius 60.0)									
HMU Federal 16-9C TG	0.00	0.00	7,000.0	-91.0	783.1	1,594,227.10	2,358,178.85	39.442869	-107.772883
- plan misses target center by 4556.8ft at 2490.0ft MD (2474.8 TVD, -29.2 N, 251.5 E)									
- Circle (radius 25.0)									

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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	7.01	96.63	2,484.7	-29.4	252.7	254.4	0.00	0.00	
2,600.0	7.01	96.63	2,584.0	-30.8	264.8	266.6	0.00	0.00	
2,700.0	7.01	96.63	2,683.2	-32.2	277.0	278.8	0.00	0.00	
2,800.0	7.01	96.63	2,782.5	-33.6	289.1	291.1	0.00	0.00	
2,900.0	7.01	96.63	2,881.7	-35.0	301.2	303.3	0.00	0.00	
3,000.0	7.01	96.63	2,981.0	-36.4	313.4	315.5	0.00	0.00	
3,100.0	7.01	96.63	3,080.2	-37.8	325.5	327.7	0.00	0.00	
3,200.0	7.01	96.63	3,179.5	-39.2	337.6	339.9	0.00	0.00	
3,300.0	7.01	96.63	3,278.7	-40.7	349.8	352.1	0.00	0.00	
3,400.0	7.01	96.63	3,378.0	-42.1	361.9	364.3	0.00	0.00	
3,500.0	7.01	96.63	3,477.2	-43.5	374.0	376.5	0.00	0.00	
3,600.0	7.01	96.63	3,576.5	-44.9	386.2	388.8	0.00	0.00	
3,618.7	7.01	96.63	3,595.0	-45.2	388.4	391.0	0.00	0.00	G Sand
3,700.0	7.01	96.63	3,675.7	-46.3	398.3	401.0	0.00	0.00	
3,800.0	7.01	96.63	3,775.0	-47.7	410.4	413.2	0.00	0.00	
3,900.0	7.01	96.63	3,874.2	-49.1	422.5	425.4	0.00	0.00	
4,000.0	7.01	96.63	3,973.5	-50.5	434.7	437.6	0.00	0.00	
4,100.0	7.01	96.63	4,072.7	-51.9	446.8	449.8	0.00	0.00	
4,200.0	7.01	96.63	4,172.0	-53.4	458.9	462.0	0.00	0.00	
4,300.0	7.01	96.63	4,271.2	-54.8	471.1	474.2	0.00	0.00	
4,400.0	7.01	96.63	4,370.5	-56.2	483.2	486.5	0.00	0.00	
4,500.0	7.01	96.63	4,469.7	-57.6	495.3	498.7	0.00	0.00	
4,600.0	7.01	96.63	4,569.0	-59.0	507.5	510.9	0.00	0.00	
4,700.0	7.01	96.63	4,668.2	-60.4	519.6	523.1	0.00	0.00	
4,800.0	7.01	96.63	4,767.5	-61.8	531.7	535.3	0.00	0.00	
4,900.0	7.01	96.63	4,866.7	-63.2	543.9	547.5	0.00	0.00	
5,000.0	7.01	96.63	4,966.0	-64.6	556.0	559.7	0.00	0.00	
5,100.0	7.01	96.63	5,065.2	-66.0	568.1	571.9	0.00	0.00	
5,200.0	7.01	96.63	5,164.5	-67.5	580.3	584.2	0.00	0.00	
5,300.0	7.01	96.63	5,263.7	-68.9	592.4	596.4	0.00	0.00	
5,400.0	7.01	96.63	5,363.0	-70.3	604.5	608.6	0.00	0.00	
5,500.0	7.01	96.63	5,462.2	-71.7	616.6	620.8	0.00	0.00	
5,600.0	7.01	96.63	5,561.5	-73.1	628.8	633.0	0.00	0.00	
5,684.1	7.01	96.63	5,645.0	-74.3	639.0	643.3	0.00	0.00	Ohio Creek
5,700.0	7.01	96.63	5,660.7	-74.5	640.9	645.2	0.00	0.00	
5,800.0	7.01	96.63	5,760.0	-75.9	653.0	657.4	0.00	0.00	
5,900.0	7.01	96.63	5,859.2	-77.3	665.2	669.6	0.00	0.00	
6,000.0	7.01	96.63	5,958.5	-78.7	677.3	681.9	0.00	0.00	
6,100.0	7.01	96.63	6,057.8	-80.1	689.4	694.1	0.00	0.00	
6,128.5	7.01	96.63	6,086.0	-80.5	692.9	697.5	0.00	0.00	Mesa Verde
6,200.0	7.01	96.63	6,157.0	-81.6	701.6	706.3	0.00	0.00	
6,300.0	7.01	96.63	6,256.3	-83.0	713.7	718.5	0.00	0.00	
6,400.0	7.01	96.63	6,355.5	-84.4	725.8	730.7	0.00	0.00	
6,500.0	7.01	96.63	6,454.8	-85.8	738.0	742.9	0.00	0.00	
6,600.0	7.01	96.63	6,554.0	-87.2	750.1	755.1	0.00	0.00	
6,644.3	7.01	96.63	6,598.0	-87.8	755.5	760.5	0.00	0.00	Williams Fork
6,696.9	7.01	96.63	6,650.1	-88.6	761.8	767.0	0.00	0.00	Start Drop -2.00
6,700.0	6.95	96.63	6,653.3	-88.6	762.2	767.3	2.00	-2.00	
6,800.0	4.95	96.63	6,752.7	-89.8	772.5	777.7	2.00	-2.00	
6,900.0	2.95	96.63	6,852.5	-90.6	779.4	784.6	2.00	-2.00	
7,000.0	0.95	96.63	6,952.4	-91.0	782.7	788.0	2.00	-2.00	
7,047.6	0.00	0.00	7,000.0	-91.0	783.1	788.4	2.00	-2.00	EOD; Inc=0° - HMU Federal 16-9C TGT

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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
7,100.0	0.00	0.00	7,052.4	-91.0	783.1	788.4	0.00	0.00	
7,200.0	0.00	0.00	7,152.4	-91.0	783.1	788.4	0.00	0.00	
7,300.0	0.00	0.00	7,252.4	-91.0	783.1	788.4	0.00	0.00	
7,400.0	0.00	0.00	7,352.4	-91.0	783.1	788.4	0.00	0.00	
7,500.0	0.00	0.00	7,452.4	-91.0	783.1	788.4	0.00	0.00	
7,600.0	0.00	0.00	7,552.4	-91.0	783.1	788.4	0.00	0.00	
7,668.6	0.00	0.00	7,621.0	-91.0	783.1	788.4	0.00	0.00	Top of Gas
7,700.0	0.00	0.00	7,652.4	-91.0	783.1	788.4	0.00	0.00	
7,800.0	0.00	0.00	7,752.4	-91.0	783.1	788.4	0.00	0.00	
7,900.0	0.00	0.00	7,852.4	-91.0	783.1	788.4	0.00	0.00	
8,000.0	0.00	0.00	7,952.4	-91.0	783.1	788.4	0.00	0.00	
8,100.0	0.00	0.00	8,052.4	-91.0	783.1	788.4	0.00	0.00	
8,200.0	0.00	0.00	8,152.4	-91.0	783.1	788.4	0.00	0.00	
8,300.0	0.00	0.00	8,252.4	-91.0	783.1	788.4	0.00	0.00	
8,400.0	0.00	0.00	8,352.4	-91.0	783.1	788.4	0.00	0.00	
8,500.0	0.00	0.00	8,452.4	-91.0	783.1	788.4	0.00	0.00	
8,600.0	0.00	0.00	8,552.4	-91.0	783.1	788.4	0.00	0.00	
8,700.0	0.00	0.00	8,652.4	-91.0	783.1	788.4	0.00	0.00	
8,800.0	0.00	0.00	8,752.4	-91.0	783.1	788.4	0.00	0.00	
8,884.6	0.00	0.00	8,837.0	-91.0	783.1	788.4	0.00	0.00	Coal Ridge
8,900.0	0.00	0.00	8,852.4	-91.0	783.1	788.4	0.00	0.00	
9,000.0	0.00	0.00	8,952.4	-91.0	783.1	788.4	0.00	0.00	
9,100.0	0.00	0.00	9,052.4	-91.0	783.1	788.4	0.00	0.00	
9,200.0	0.00	0.00	9,152.4	-91.0	783.1	788.4	0.00	0.00	
9,300.0	0.00	0.00	9,252.4	-91.0	783.1	788.4	0.00	0.00	
9,400.0	0.00	0.00	9,352.4	-91.0	783.1	788.4	0.00	0.00	
9,500.0	0.00	0.00	9,452.4	-91.0	783.1	788.4	0.00	0.00	
9,548.6	0.00	0.00	9,501.0	-91.0	783.1	788.4	0.00	0.00	Base Cameo A Coal
9,600.0	0.00	0.00	9,552.4	-91.0	783.1	788.4	0.00	0.00	
9,684.6	0.00	0.00	9,637.0	-91.0	783.1	788.4	0.00	0.00	Rollins
9,700.0	0.00	0.00	9,652.4	-91.0	783.1	788.4	0.00	0.00	
9,784.6	0.00	0.00	9,737.0	-91.0	783.1	788.4	0.00	0.00	TD @ 9784.6' MD - HMU Federal 16-9C BHL
9,800.0	0.00	0.00	9,752.4	-91.0	783.1	788.4	0.00	0.00	
9,900.0	0.00	0.00	9,852.4	-91.0	783.1	788.4	0.00	0.00	
10,000.0	0.00	0.00	9,952.4	-91.0	783.1	788.4	0.00	0.00	
10,084.6	0.00	0.00	10,037.0	-91.0	783.1	788.4	0.00	0.00	Permit TD @ 10,084.6' 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 16-9C BHL	0.00	0.00	9,737.0	-91.0	783.1	1,594,227.10	2,358,178.85	39.442869	-107.772883
- plan hits target center									
- Circle (radius 60.0)									
HMU Federal 16-9C TG	0.00	0.00	7,000.0	-91.0	783.1	1,594,227.10	2,358,178.85	39.442869	-107.772883
- plan hits target center									
- Circle (radius 25.0)									

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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)
1,512.7	1,504.8	Surface Casing	5.500	6.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,618.7	3,595.0	G Sand			
5,684.1	5,645.0	Ohio Creek			
6,128.5	6,086.0	Mesa Verde			
6,644.3	6,598.0	Williams Fork			
7,668.6	7,621.0	Top of Gas			
8,884.6	8,837.0	Coal Ridge			
9,548.6	9,501.0	Base Cameo A Coal			
9,684.6	9,637.0	Rollins			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
300.0	300.0	0.0	0.0	KOP @ 300' MD
533.8	533.2	-1.7	14.2	EOB; Inc=7.01°
6,696.9	6,650.1	-88.6	761.8	Start Drop -2.00
7,047.6	7,000.0	-91.0	783.1	EOD; Inc=0°
9,784.6	9,737.0	-91.0	783.1	TD @ 9784.6' MD
10,084.6	10,037.0	-91.0	783.1	Permit TD @ 10,084.6' MD

EnCana Oil & Gas (USA) Inc

Mamm Creek

(J16W)

HMU Federal 16-9C

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 16-9C
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 16-9C	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	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,208.5ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	11/1/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	10,083.9	Plan #1 (DD)	MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
(J16W)						
Existing 16-11 - DD - DD	0.0	0.0	180.1			
Existing 16-11 - DD - DD	306.3	306.7	180.4	179.4	180.220	ES
Existing 16-11 - DD - DD	1,100.0	1,058.4	282.7	278.7	70.726	SF
Existing 16-16 - DD - DD	0.0	0.0	195.7			
Existing 16-16 - DD - DD	9,800.0	9,855.0	989.0	944.4	22.176	SF
Existing 16-9 - DD - DD	2,455.0	2,478.0	77.5	65.7	6.567	CC
Existing 16-9 - DD - DD	2,600.0	2,622.9	78.7	65.3	5.867	ES
Existing 16-9 - DD - DD	2,800.0	2,821.4	84.3	68.8	5.445	SF
HMU Federal 16-10A - DD - Plan #1	300.0	300.0	34.7	33.8	35.801	CC
HMU Federal 16-10A - DD - Plan #1	400.0	400.0	34.9	33.6	26.333	ES
HMU Federal 16-10A - DD - Plan #1	600.0	597.4	43.6	41.5	20.779	SF
HMU Federal 16-11B - DD - Plan #1	200.0	200.0	43.9	43.3	70.640	CC, ES
HMU Federal 16-11B - DD - Plan #1	500.0	492.9	63.7	62.0	36.601	SF
HMU Federal 16-11D - DD - Plan #1	300.0	300.0	27.5	26.6	28.379	CC, ES
HMU Federal 16-11D - DD - Plan #1	500.0	498.2	36.0	34.2	20.988	SF
HMU Federal 16-14A - DD - Plan #1	251.9	251.9	12.3	11.4	15.251	CC
HMU Federal 16-14A - DD - Plan #1	300.0	299.9	12.4	11.4	12.772	ES, SF
HMU Federal 16-14D - DD - Plan #1	300.0	300.0	11.4	10.4	11.730	CC, ES
HMU Federal 16-14D - DD - Plan #1	400.0	400.0	13.4	12.1	10.135	SF
HMU Federal 16-14D2 - DD - Plan #1	300.0	300.0	26.2	25.2	27.012	CC, ES
HMU Federal 16-14D2 - DD - Plan #1	500.0	499.6	30.9	29.2	18.232	SF
HMU Federal 16-14D3 - DD - Plan #1	300.0	300.0	43.0	42.0	44.305	CC, ES
HMU Federal 16-14D3 - DD - Plan #1	600.0	596.3	54.3	52.2	25.999	SF
HMU Federal 16-16B - DD - Plan #1	200.0	200.0	16.5	15.9	26.527	CC, ES
HMU Federal 16-16B - DD - Plan #1	10,084.6	10,121.8	608.8	564.9	13.878	SF
HMU Federal 16-6C - DD - Plan #1	300.0	300.0	33.3	32.3	34.334	CC, ES
HMU Federal 16-6C - DD - Plan #1	600.0	595.1	50.6	48.4	23.000	SF
HMU Federal 16-6C2 - DD - Plan #1	200.0	200.0	50.5	49.9	81.310	CC, ES
HMU Federal 16-6C2 - DD - Plan #1	700.0	682.4	101.3	98.6	37.029	SF
HMU Federal 21-1B - DD - Plan #1	300.0	300.0	67.4	66.4	69.416	CC, ES
HMU Federal 21-1B - DD - Plan #1	800.0	779.2	120.2	117.0	37.842	SF
HMU Federal 21-3A - DD - Plan #1	200.0	200.0	59.5	58.9	95.832	CC, ES
HMU Federal 21-3A - DD - Plan #1	500.0	488.1	84.3	82.6	49.935	SF
HMU Fee 16-8D - DD - Plan #1	200.0	200.0	17.5	16.9	28.223	CC, ES
HMU Fee 16-8D - DD - Plan #1	400.0	398.2	25.3	24.0	18.900	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 16-9C
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 16-9C	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 (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-134.10	-125.3	-129.3	180.1					
100.0	100.0	99.8	99.8	0.1	0.2	-133.99	-125.1	-129.6	180.1	179.8	0.29	616.319		
200.0	200.0	199.6	199.6	0.3	0.3	-133.69	-124.5	-130.4	180.3	179.7	0.62	289.448		
300.0	300.0	300.3	300.3	0.5	0.5	-133.10	-123.3	-131.7	180.4	179.4	0.97	185.749		
306.3	306.3	306.7	306.7	0.5	0.5	130.32	-123.1	-131.8	180.4	179.4	1.00	180.220 ES		
400.0	400.0	401.5	401.4	0.7	0.7	131.84	-120.6	-133.4	181.6	180.2	1.34	135.367		
500.0	499.6	499.4	499.3	0.9	0.9	134.71	-117.4	-135.6	186.6	184.9	1.72	108.662		
600.0	598.9	595.9	595.6	1.1	1.1	138.52	-113.9	-139.3	196.2	194.1	2.11	93.086		
700.0	698.2	691.2	690.7	1.4	1.3	142.28	-110.4	-144.6	208.3	205.8	2.50	83.293		
800.0	797.4	786.0	785.2	1.6	1.5	145.79	-106.9	-151.4	222.7	219.8	2.89	77.166		
900.0	896.7	879.4	878.1	1.9	1.7	149.18	-102.9	-160.0	239.5	236.2	3.27	73.284		
1,000.0	995.9	969.6	967.6	2.2	1.9	152.21	-99.1	-170.6	259.4	255.8	3.64	71.344		
1,100.0	1,095.2	1,058.4	1,055.4	2.4	2.2	154.94	-95.4	-183.5	282.7	278.7	4.00	70.726 SF		
1,200.0	1,194.4	1,146.1	1,141.6	2.7	2.5	157.44	-91.5	-198.9	309.3	305.0	4.35	71.063		
1,300.0	1,293.7	1,235.4	1,229.0	3.0	2.8	159.84	-86.7	-216.7	338.5	333.8	4.71	71.883		
1,400.0	1,392.9	1,325.1	1,316.4	3.3	3.2	162.03	-81.4	-236.0	369.7	364.6	5.06	73.076		
1,500.0	1,492.2	1,415.9	1,404.7	3.5	3.6	163.93	-76.0	-256.5	402.2	396.8	5.40	74.435		
1,600.0	1,591.4	1,507.7	1,493.9	3.8	4.0	165.58	-70.5	-277.7	435.7	430.0	5.75	75.841		
1,700.0	1,690.7	1,602.4	1,585.9	4.1	4.4	167.07	-64.7	-299.6	469.5	463.4	6.09	77.108		
1,800.0	1,789.9	1,697.9	1,678.6	4.4	4.8	168.44	-58.3	-321.4	503.2	496.8	6.43	78.226		
1,900.0	1,889.2	1,795.1	1,773.1	4.6	5.2	169.64	-51.8	-343.2	536.7	529.9	6.78	79.218		
2,000.0	1,988.4	1,891.4	1,866.9	4.9	5.7	170.68	-45.3	-363.9	569.6	562.5	7.12	80.050		
2,100.0	2,087.7	1,985.1	1,958.2	5.2	6.1	171.59	-39.0	-384.4	602.8	595.4	7.45	80.903		
2,200.0	2,186.9	2,080.6	2,051.2	5.5	6.5	172.45	-32.3	-404.6	635.7	627.9	7.79	81.602		
2,300.0	2,286.2	2,166.7	2,135.0	5.7	6.9	173.17	-26.1	-423.5	669.3	661.2	8.11	82.507		
2,400.0	2,385.4	2,252.8	2,218.5	6.0	7.3	173.80	-20.0	-443.5	704.2	695.8	8.43	83.524		
2,500.0	2,484.7	2,347.1	2,310.0	6.3	7.7	174.41	-13.7	-465.5	739.3	730.6	8.76	84.356		
2,600.0	2,584.0	2,429.3	2,389.6	6.6	8.1	174.92	-7.9	-485.4	775.4	766.3	9.08	85.400		
2,700.0	2,683.2	2,526.5	2,483.5	6.8	8.6	175.47	-0.9	-509.3	811.8	802.4	9.42	86.211		
2,800.0	2,782.5	2,625.1	2,579.0	7.1	9.0	175.96	5.8	-532.9	847.7	837.9	9.76	86.897		
2,900.0	2,881.7	2,714.5	2,665.6	7.4	9.4	176.37	11.9	-554.2	883.5	873.5	10.08	87.654		
3,000.0	2,981.0	2,804.0	2,752.2	7.7	9.9	176.74	17.9	-576.0	920.0	909.6	10.40	88.448		
3,100.0	3,080.2	2,903.7	2,848.7	7.9	10.4	177.09	24.2	-600.2	956.3	945.5	10.74	89.030		
3,200.0	3,179.5	3,003.4	2,945.5	8.2	10.8	177.42	30.4	-623.6	991.7	980.7	11.08	89.511		
3,300.0	3,278.7	3,089.0	3,028.4	8.5	11.2	177.67	35.7	-643.9	1,027.5	1,016.1	11.40	90.161		
3,400.0	3,378.0	3,185.2	3,121.6	8.8	11.7	177.96	41.9	-666.9	1,063.6	1,051.8	11.73	90.655		
3,500.0	3,477.2	3,288.0	3,221.3	9.1	12.1	178.26	48.8	-690.7	1,099.0	1,086.9	12.08	90.978		
3,600.0	3,576.5	3,389.1	3,319.7	9.3	12.6	178.55	55.7	-713.2	1,133.4	1,121.0	12.42	91.228		
3,700.0	3,675.7	3,469.0	3,397.3	9.6	13.0	178.77	61.4	-731.5	1,168.5	1,155.8	12.73	91.763		
3,800.0	3,775.0	3,556.8	3,482.3	9.9	13.4	178.99	67.6	-752.2	1,204.4	1,191.4	13.06	92.256		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-138.03	-145.5	-130.9	195.7					
100.0	100.0	98.1	98.1	0.1	0.2	-138.04	-145.9	-131.2	196.2	195.9	0.29	669.934		
200.0	200.0	196.2	196.2	0.3	0.3	-138.04	-147.0	-132.1	197.7	197.0	0.62	316.704		
300.0	300.0	296.4	296.4	0.5	0.5	-138.09	-148.5	-133.3	199.6	198.7	0.97	205.075		
400.0	400.0	396.2	396.2	0.7	0.7	125.57	-150.4	-133.9	202.9	201.6	1.32	153.992		
500.0	499.6	495.1	495.0	0.9	0.8	126.49	-153.5	-133.5	209.6	207.9	1.69	123.843		
600.0	598.9	596.3	596.0	1.1	1.0	127.89	-157.7	-131.9	218.7	216.6	2.10	104.364		
700.0	698.2	697.3	697.0	1.4	1.2	128.99	-162.2	-128.7	227.2	224.7	2.51	90.424		
800.0	797.4	799.2	798.6	1.6	1.4	129.61	-167.4	-123.8	235.0	232.1	2.95	79.668		
900.0	896.7	902.6	901.5	1.9	1.7	129.57	-173.6	-116.0	241.5	238.1	3.42	70.621		
1,000.0	995.9	1,005.5	1,003.5	2.2	1.9	128.71	-181.6	-104.9	246.9	243.0	3.93	62.763		
1,100.0	1,095.2	1,109.2	1,105.6	2.4	2.3	126.85	-191.5	-89.4	250.7	246.2	4.52	55.454		
1,200.0	1,194.4	1,210.3	1,204.3	2.7	2.6	124.23	-202.8	-70.7	253.6	248.5	5.16	49.143		
1,300.0	1,293.7	1,309.0	1,300.3	3.0	3.0	121.43	-214.7	-51.4	257.0	251.2	5.83	44.069		
1,400.0	1,392.9	1,407.6	1,396.0	3.3	3.5	118.46	-227.4	-31.3	261.3	254.8	6.53	40.003		
1,500.0	1,492.2	1,506.5	1,491.8	3.5	3.9	115.49	-240.4	-10.9	266.3	259.1	7.25	36.759		
1,600.0	1,591.4	1,606.4	1,588.5	3.8	4.3	112.42	-253.8	10.6	271.8	263.9	7.99	34.037		
1,700.0	1,690.7	1,704.9	1,683.8	4.1	4.8	109.53	-266.9	31.8	278.0	269.3	8.71	31.921		
1,800.0	1,789.9	1,803.6	1,779.4	4.4	5.2	106.85	-280.0	52.6	285.0	275.6	9.42	30.248		
1,900.0	1,889.2	1,903.1	1,875.9	4.6	5.7	104.39	-292.9	73.2	292.5	282.4	10.12	28.897		
2,000.0	1,988.4	2,001.2	1,971.1	4.9	6.1	102.15	-305.4	93.1	300.4	289.6	10.81	27.798		
2,100.0	2,087.7	2,099.1	2,066.2	5.2	6.6	100.03	-318.4	112.8	309.3	297.8	11.47	26.960		
2,200.0	2,186.9	2,195.4	2,159.7	5.5	7.0	98.17	-331.3	131.6	318.8	306.7	12.12	26.298		
2,300.0	2,286.2	2,292.9	2,254.2	5.7	7.5	96.33	-345.5	150.8	329.8	317.1	12.77	25.836		
2,400.0	2,385.4	2,391.0	2,349.4	6.0	7.9	94.64	-359.6	169.8	341.0	327.6	13.40	25.453		
2,500.0	2,484.7	2,486.0	2,441.5	6.3	8.3	93.13	-374.0	187.9	353.3	339.3	14.01	25.211		
2,600.0	2,584.0	2,583.3	2,535.7	6.6	8.8	91.63	-389.7	206.7	366.8	352.1	14.62	25.085		
2,700.0	2,683.2	2,683.0	2,632.4	6.8	9.3	90.30	-405.5	225.3	380.3	365.1	15.22	24.982		
2,800.0	2,782.5	2,782.8	2,729.3	7.1	9.7	89.11	-421.1	243.6	393.8	378.0	15.82	24.894		
2,900.0	2,881.7	2,880.4	2,823.9	7.4	10.2	87.98	-436.3	261.9	407.3	390.9	16.41	24.818		
3,000.0	2,981.0	2,979.4	2,919.7	7.7	10.6	86.76	-452.0	281.4	421.3	404.3	17.00	24.789		
3,100.0	3,080.2	3,077.9	3,015.0	7.9	11.1	85.56	-467.6	301.3	435.4	417.8	17.59	24.751		
3,200.0	3,179.5	3,177.2	3,110.6	8.2	11.6	84.28	-483.3	322.5	449.6	431.4	18.17	24.749		
3,300.0	3,278.7	3,276.7	3,206.6	8.5	12.1	83.10	-498.8	343.5	463.8	445.0	18.73	24.758		
3,400.0	3,378.0	3,380.2	3,306.6	8.8	12.6	81.94	-514.3	365.5	477.6	458.2	19.31	24.731		
3,500.0	3,477.2	3,481.4	3,404.3	9.1	13.1	80.83	-528.6	387.3	490.7	470.9	19.87	24.696		
3,600.0	3,576.5	3,582.7	3,502.3	9.3	13.6	79.78	-542.5	409.1	503.6	483.2	20.42	24.657		
3,700.0	3,675.7	3,685.2	3,601.6	9.6	14.1	78.80	-555.9	430.8	516.0	495.0	20.97	24.603		
3,800.0	3,775.0	3,785.0	3,698.4	9.9	14.5	77.92	-568.4	451.7	527.9	506.3	21.51	24.540		
3,900.0	3,874.2	3,877.2	3,787.8	10.2	15.0	77.16	-580.5	470.8	540.6	518.6	22.02	24.547		
4,000.0	3,973.5	3,970.4	3,877.9	10.4	15.4	76.47	-594.1	489.9	554.7	532.1	22.53	24.615		
4,100.0	4,072.7	4,069.7	3,974.0	10.7	15.9	75.79	-608.9	510.0	569.1	546.1	23.06	24.681		
4,200.0	4,172.0	4,168.6	4,069.8	11.0	16.4	75.15	-623.6	530.1	583.7	560.1	23.58	24.751		
4,300.0	4,271.2	4,267.9	4,166.0	11.3	16.8	74.56	-638.3	550.1	598.1	574.0	24.10	24.819		
4,400.0	4,370.5	4,368.0	4,263.0	11.5	17.3	74.01	-653.0	569.9	612.6	588.0	24.62	24.882		
4,500.0	4,469.7	4,469.0	4,361.0	11.8	17.8	73.51	-667.6	589.6	626.7	601.6	25.14	24.928		
4,600.0	4,569.0	4,569.3	4,458.4	12.1	18.2	73.06	-681.9	608.9	640.7	615.0	25.66	24.970		
4,700.0	4,668.2	4,668.7	4,555.0	12.4	18.7	72.66	-695.9	627.7	654.5	628.3	26.18	25.003		
4,800.0	4,767.5	4,762.0	4,645.5	12.6	19.1	72.29	-709.3	645.4	668.6	641.9	26.68	25.054		
4,900.0	4,866.7	4,855.8	4,736.3	12.9	19.6	71.84	-723.5	664.5	683.8	656.6	27.18	25.153		
5,000.0	4,966.0	4,953.9	4,831.0	13.2	20.1	71.35	-738.5	684.9	699.3	671.6	27.69	25.256		
5,100.0	5,065.2	5,052.9	4,926.6	13.5	20.6	70.88	-753.7	705.6	714.9	686.7	28.19	25.356		

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 16-9C
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 16-9C	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)				
5,200.0	5,164.5	5,149.3	5,019.6	13.8	21.0	70.41	-768.5	726.1	730.5	701.8	28.69	25.462		
5,300.0	5,263.7	5,246.1	5,113.0	14.0	21.5	69.92	-783.5	747.2	746.6	717.4	29.18	25.583		
5,400.0	5,363.0	5,343.1	5,206.4	14.3	22.0	69.42	-798.6	768.7	762.9	733.2	29.67	25.709		
5,500.0	5,462.2	5,443.1	5,302.5	14.6	22.6	68.92	-814.2	791.1	779.3	749.1	30.16	25.835		
5,600.0	5,561.5	5,548.8	5,404.4	14.9	23.1	68.41	-830.2	814.6	795.2	764.6	30.67	25.930		
5,700.0	5,660.7	5,657.4	5,509.3	15.1	23.6	67.95	-845.6	837.8	810.1	778.9	31.17	25.989		
5,800.0	5,760.0	5,772.4	5,621.1	15.4	24.1	67.61	-860.6	860.3	823.4	791.7	31.69	25.980		
5,900.0	5,859.2	5,879.6	5,725.8	15.7	24.5	67.44	-873.4	878.9	835.0	802.8	32.21	25.921		
6,000.0	5,958.5	5,977.2	5,821.3	16.0	24.9	67.33	-885.2	895.3	846.6	813.9	32.73	25.869		
6,100.0	6,057.8	6,080.4	5,922.3	16.2	25.3	67.19	-897.4	913.0	858.0	824.8	33.26	25.800		
6,200.0	6,157.0	6,176.9	6,016.7	16.5	25.7	67.03	-908.4	929.9	869.2	835.4	33.76	25.748		
6,300.0	6,256.3	6,268.9	6,106.5	16.8	26.1	66.90	-919.7	945.9	881.2	846.9	34.24	25.732		
6,400.0	6,355.5	6,367.2	6,202.6	17.1	26.5	66.80	-932.4	962.6	893.6	858.9	34.75	25.714		
6,500.0	6,454.8	6,474.1	6,307.1	17.3	27.0	66.72	-945.9	980.4	905.8	870.5	35.28	25.673		
6,600.0	6,554.0	6,598.5	6,429.3	17.6	27.4	66.72	-960.1	999.0	916.2	880.4	35.86	25.552		
6,700.0	6,653.3	6,718.2	6,547.5	17.9	27.8	66.86	-971.3	1,014.0	923.9	887.5	36.44	25.353		
6,800.0	6,752.7	6,829.4	6,657.7	18.1	28.1	67.08	-980.3	1,026.1	930.7	893.8	36.95	25.188		
6,900.0	6,852.5	6,944.1	6,771.6	18.3	28.4	67.17	-988.6	1,036.7	937.6	900.3	37.36	25.094		
7,000.0	6,952.4	7,053.4	6,880.3	18.4	28.6	67.11	-995.1	1,045.4	944.2	906.5	37.67	25.065		
7,100.0	7,052.4	7,168.3	6,994.8	18.6	28.8	163.43	-1,001.0	1,053.9	951.1	913.3	37.88	25.110		
7,200.0	7,152.4	7,299.4	7,125.7	18.7	29.0	163.19	-1,005.2	1,059.3	955.3	917.2	38.09	25.077		
7,300.0	7,252.4	7,409.4	7,235.7	18.8	29.1	163.09	-1,007.2	1,061.7	957.7	919.4	38.33	24.988		
7,400.0	7,352.4	7,523.1	7,349.3	18.9	29.3	162.96	-1,007.6	1,064.0	958.7	920.1	38.56	24.864		
7,500.0	7,452.4	7,623.8	7,450.0	19.0	29.3	162.89	-1,007.4	1,065.2	958.8	920.0	38.78	24.720		
7,600.0	7,552.4	7,722.7	7,548.9	19.2	29.4	162.82	-1,007.4	1,066.5	959.1	920.1	39.01	24.586		
7,700.0	7,652.4	7,824.1	7,650.3	19.3	29.5	162.76	-1,007.3	1,067.6	959.4	920.2	39.24	24.447		
7,800.0	7,752.4	7,920.5	7,746.7	19.4	29.6	162.71	-1,007.4	1,068.4	959.8	920.3	39.47	24.316		
7,900.0	7,852.4	8,020.0	7,846.2	19.5	29.7	162.70	-1,008.1	1,068.7	960.5	920.8	39.71	24.188		
8,000.0	7,952.4	8,120.8	7,947.0	19.6	29.8	162.74	-1,008.8	1,068.3	961.1	921.1	39.96	24.052		
8,100.0	8,052.4	8,218.9	8,045.1	19.8	29.9	162.79	-1,009.7	1,067.7	961.7	921.5	40.21	23.920		
8,200.0	8,152.4	8,315.4	8,141.6	19.9	30.0	162.86	-1,010.9	1,066.8	962.7	922.2	40.46	23.794		
8,300.0	8,252.4	8,415.3	8,241.4	20.0	30.0	162.94	-1,012.4	1,065.9	963.8	923.1	40.72	23.671		
8,400.0	8,352.4	8,516.4	8,342.5	20.1	30.1	163.02	-1,013.8	1,064.9	964.9	923.9	40.98	23.547		
8,500.0	8,452.4	8,615.5	8,441.6	20.3	30.2	163.08	-1,015.2	1,064.2	966.0	924.7	41.24	23.423		
8,600.0	8,552.4	8,714.5	8,540.7	20.4	30.3	163.13	-1,016.5	1,063.8	967.1	925.6	41.50	23.305		
8,700.0	8,652.4	8,814.0	8,640.1	20.5	30.4	163.17	-1,017.8	1,063.5	968.4	926.6	41.76	23.190		
8,800.0	8,752.4	8,913.7	8,739.8	20.7	30.5	163.21	-1,019.3	1,063.2	969.7	927.7	42.02	23.078		
8,900.0	8,852.4	9,016.1	8,842.2	20.8	30.6	163.24	-1,020.6	1,063.1	970.9	928.6	42.28	22.961		
9,000.0	8,952.4	9,117.8	8,943.9	20.9	30.7	163.25	-1,021.6	1,063.1	971.8	929.2	42.55	22.841		
9,100.0	9,052.4	9,215.5	9,041.6	21.0	30.8	163.28	-1,022.6	1,063.0	972.7	929.9	42.80	22.725		
9,200.0	9,152.4	9,309.9	9,136.0	21.2	30.9	163.31	-1,024.0	1,062.8	974.1	931.1	43.06	22.621		
9,300.0	9,252.4	9,402.9	9,229.0	21.3	31.0	163.36	-1,026.0	1,062.7	976.1	932.8	43.32	22.533		
9,400.0	9,352.4	9,498.7	9,324.7	21.4	31.1	163.38	-1,028.7	1,063.0	978.9	935.3	43.58	22.460		
9,500.0	9,452.4	9,602.3	9,428.3	21.6	31.3	163.39	-1,031.3	1,063.7	981.5	937.7	43.85	22.382		
9,600.0	9,552.4	9,705.3	9,531.2	21.7	31.4	163.41	-1,033.7	1,064.0	983.8	939.7	44.13	22.296		
9,700.0	9,652.4	9,809.5	9,635.4	21.8	31.5	163.42	-1,035.7	1,064.3	985.8	941.4	44.40	22.203		
9,800.0	9,752.4	9,855.0	9,680.9	22.0	31.5	163.43	-1,036.5	1,064.4	989.0	944.4	44.60	22.176 SF		
9,900.0	9,852.4	9,855.0	9,680.9	22.1	31.5	163.43	-1,036.5	1,064.4	1,001.2	956.5	44.74	22.380		
10,000.0	9,952.4	9,855.0	9,680.9	22.3	31.5	163.43	-1,036.5	1,064.4	1,023.1	978.2	44.88	22.797		
10,084.6	10,037.0	9,855.0	9,680.9	22.4	31.5	163.43	-1,036.5	1,064.4	1,048.7	1,003.7	45.00	23.306		

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 16-9C
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 16-9C	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		Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	-129.61	-105.1	-127.0	164.8					
100.0	100.0	100.3	100.3	0.1	0.2	-129.55	-104.9	-127.0	164.7	164.4	0.29	565.118		
200.0	200.0	200.5	200.5	0.3	0.3	-129.38	-104.4	-127.1	164.5	163.9	0.62	264.260		
300.0	300.0	301.1	301.1	0.5	0.5	-129.38	-104.1	-126.8	164.1	163.1	0.97	168.701		
329.2	329.2	330.9	330.9	0.5	0.5	133.95	-104.2	-126.5	164.0	162.9	1.08	152.379		
400.0	400.0	403.3	403.3	0.7	0.7	134.05	-104.6	-124.7	164.6	163.2	1.33	123.786		
500.0	499.6	506.2	506.1	0.9	0.9	134.89	-105.2	-120.5	167.3	165.6	1.71	98.093		
600.0	598.9	610.5	610.2	1.1	1.1	136.51	-104.9	-113.8	170.6	168.5	2.10	81.195		
700.0	698.2	716.0	715.3	1.4	1.3	138.22	-102.9	-104.7	171.5	169.0	2.50	68.527		
800.0	797.4	821.5	820.0	1.6	1.6	139.79	-99.0	-92.3	168.9	166.0	2.90	58.205		
900.0	896.7	925.1	922.4	1.9	1.9	141.54	-93.2	-78.0	163.7	160.4	3.29	49.771		
1,000.0	995.9	1,027.5	1,023.3	2.2	2.2	143.57	-86.1	-62.4	156.7	153.0	3.66	42.760		
1,100.0	1,095.2	1,128.3	1,122.4	2.4	2.5	145.70	-78.6	-45.7	148.5	144.4	4.03	36.869		
1,200.0	1,194.4	1,226.6	1,219.2	2.7	2.9	148.07	-71.3	-29.8	140.8	136.5	4.37	32.190		
1,300.0	1,293.7	1,327.4	1,318.3	3.0	3.2	150.69	-63.9	-13.2	133.1	128.4	4.72	28.212		
1,400.0	1,392.9	1,427.5	1,416.7	3.3	3.6	153.87	-55.7	3.8	125.2	120.1	5.05	24.770		
1,500.0	1,492.2	1,527.7	1,515.0	3.5	4.0	157.69	-47.0	21.2	116.9	111.5	5.39	21.689		
1,600.0	1,591.4	1,627.0	1,612.3	3.8	4.3	161.89	-38.5	39.1	108.7	103.0	5.75	18.921		
1,700.0	1,690.7	1,725.6	1,708.9	4.1	4.7	166.72	-30.0	56.2	101.8	95.7	6.14	16.587		
1,800.0	1,789.9	1,824.6	1,806.2	4.4	5.1	171.91	-22.1	72.8	96.4	89.8	6.59	14.625		
1,900.0	1,889.2	1,924.4	1,904.4	4.6	5.4	177.32	-14.7	89.5	91.9	84.8	7.12	12.917		
2,000.0	1,988.4	2,024.5	2,002.7	4.9	5.8	-177.27	-8.2	106.8	87.6	79.9	7.72	11.357		
2,100.0	2,087.7	2,124.4	2,100.8	5.2	6.2	-171.29	-1.7	124.5	83.8	75.3	8.43	9.940		
2,200.0	2,186.9	2,223.8	2,198.3	5.5	6.5	-164.64	4.9	142.4	80.6	71.3	9.27	8.700		
2,300.0	2,286.2	2,323.3	2,296.1	5.7	6.9	-157.81	11.4	160.0	78.9	68.7	10.20	7.733		
2,400.0	2,385.4	2,423.5	2,394.4	6.0	7.3	-150.74	17.6	178.1	77.8	66.6	11.22	6.936		
2,455.0	2,440.0	2,478.0	2,447.9	6.2	7.5	-146.72	21.0	188.2	77.5	65.7	11.81	6.567 CC		
2,500.0	2,484.7	2,522.6	2,491.7	6.3	7.7	-143.41	23.8	196.5	77.7	65.4	12.30	6.322		
2,600.0	2,584.0	2,622.9	2,589.9	6.6	8.1	-135.70	30.3	215.5	78.7	65.3	13.42	5.867 ES		
2,700.0	2,683.2	2,722.2	2,687.1	6.8	8.5	-128.12	36.6	234.9	80.8	66.3	14.48	5.577		
2,800.0	2,782.5	2,821.4	2,784.0	7.1	8.9	-120.57	43.4	254.8	84.3	68.8	15.48	5.445 SF		
2,900.0	2,881.7	2,920.5	2,880.8	7.4	9.3	-113.54	50.5	274.9	89.5	73.1	16.34	5.476		
3,000.0	2,981.0	3,019.7	2,977.8	7.7	9.7	-107.69	57.6	294.4	96.0	78.9	17.06	5.626		
3,100.0	3,080.2	3,119.0	3,075.0	7.9	10.1	-102.85	64.8	313.5	103.4	85.7	17.69	5.847		
3,200.0	3,179.5	3,218.6	3,172.5	8.2	10.5	-98.86	71.8	332.3	111.4	93.2	18.25	6.105		
3,300.0	3,278.7	3,318.3	3,270.3	8.5	10.9	-95.65	78.7	350.7	119.7	100.9	18.78	6.375		
3,400.0	3,378.0	3,418.0	3,368.1	8.8	11.3	-93.04	85.4	368.6	128.0	108.7	19.29	6.635		
3,500.0	3,477.2	3,517.4	3,465.5	9.1	11.7	-90.26	91.9	387.7	136.5	116.8	19.77	6.905		
3,600.0	3,576.5	3,617.3	3,563.4	9.3	12.0	-87.92	98.4	406.5	145.3	125.0	20.24	7.177		
3,700.0	3,675.7	3,716.9	3,661.1	9.6	12.4	-86.04	104.5	424.7	153.8	133.1	20.72	7.423		
3,800.0	3,775.0	3,815.4	3,757.7	9.9	12.8	-84.20	110.9	443.3	162.9	141.7	21.18	7.691		
3,900.0	3,874.2	3,914.4	3,854.6	10.2	13.2	-82.48	117.7	462.3	172.6	151.0	21.62	7.981		
4,000.0	3,973.5	4,014.2	3,952.4	10.4	13.6	-81.05	124.7	481.1	182.5	160.4	22.08	8.265		
4,100.0	4,072.7	4,115.1	4,051.4	10.7	14.0	-79.98	131.5	499.2	191.9	169.4	22.55	8.511		
4,200.0	4,172.0	4,213.4	4,147.9	11.0	14.4	-79.00	137.8	516.9	201.2	178.1	23.02	8.737		
4,300.0	4,271.2	4,312.8	4,245.3	11.3	14.7	-78.10	144.7	535.0	211.1	187.6	23.50	8.984		
4,400.0	4,370.5	4,413.1	4,343.8	11.5	15.1	-77.34	151.6	552.9	220.8	196.8	23.98	9.207		
4,500.0	4,469.7	4,513.5	4,442.4	11.8	15.5	-76.70	158.2	570.5	230.1	205.6	24.46	9.405		
4,600.0	4,569.0	4,611.8	4,538.9	12.1	15.9	-76.06	164.5	588.0	239.5	214.5	24.95	9.598		
4,700.0	4,668.2	4,711.8	4,637.0	12.4	16.3	-75.32	171.0	606.4	249.1	223.7	25.42	9.798		
4,800.0	4,767.5	4,812.7	4,736.0	12.6	16.6	-74.62	177.1	624.8	258.3	232.4	25.90	9.975		
4,900.0	4,866.7	4,910.4	4,831.9	12.9	17.0	-73.98	183.1	642.7	267.8	241.4	26.37	10.155		

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 16-9C
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 16-9C	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)		Between Centres (ft)	Between Ellipses (ft)					
5,000.0	4,966.0	5,009.6	4,929.1	13.2	17.4	-73.36	189.6	661.2	277.6	26.84	10.343		
5,100.0	5,065.2	5,109.3	5,026.9	13.5	17.8	-72.83	196.2	679.5	287.5	27.31	10.525		
5,200.0	5,164.5	5,210.1	5,125.9	13.8	18.2	-72.36	202.6	697.8	297.0	27.80	10.686		
5,300.0	5,263.7	5,310.4	5,224.3	14.0	18.6	-71.93	208.8	715.7	306.3	28.29	10.830		
5,400.0	5,363.0	5,410.1	5,322.2	14.3	18.9	-71.52	214.6	733.5	315.4	28.66	10.962		
5,500.0	5,462.2	5,507.7	5,418.0	14.6	19.3	-71.10	220.5	751.4	324.8	29.25	11.104		
5,600.0	5,561.5	5,604.7	5,513.1	14.9	19.7	-70.60	226.8	769.8	335.0	29.72	11.272		
5,700.0	5,660.7	5,700.9	5,607.1	15.1	20.1	-70.08	233.5	788.8	345.8	30.17	11.464		
5,800.0	5,760.0	5,797.6	5,701.6	15.4	20.5	-69.68	241.4	807.8	357.9	30.63	11.683		
5,900.0	5,859.2	5,899.6	5,801.3	15.7	20.9	-69.32	249.8	827.6	369.8	31.12	11.885		
6,000.0	5,958.5	6,003.2	5,902.8	16.0	21.3	-69.05	257.6	846.8	380.7	31.61	12.043		
6,100.0	6,057.8	6,106.6	6,004.3	16.2	21.7	-68.88	264.6	865.0	390.6	32.13	12.157		
6,200.0	6,157.0	6,206.1	6,102.1	16.5	22.1	-68.70	270.8	882.4	399.8	32.63	12.252		
6,300.0	6,256.3	6,305.0	6,199.2	16.8	22.4	-68.48	277.0	900.1	409.3	33.13	12.356		
6,400.0	6,355.5	6,405.9	6,298.4	17.1	22.8	-68.32	283.4	917.8	418.8	33.63	12.452		
6,500.0	6,454.8	6,511.5	6,402.3	17.3	23.2	-68.32	289.9	934.8	427.3	34.16	12.509		
6,600.0	6,554.0	6,614.8	6,504.5	17.6	23.5	-68.56	296.1	949.3	434.8	34.73	12.518		
6,700.0	6,653.3	6,723.4	6,612.1	17.9	23.8	-68.99	301.8	962.7	440.8	35.35	12.470		
6,800.0	6,752.7	6,832.3	6,720.3	18.1	24.0	-69.42	306.2	973.7	445.4	35.89	12.410		
6,900.0	6,852.5	6,940.2	6,827.8	18.3	24.3	-69.62	309.7	982.3	449.4	36.30	12.381		
7,000.0	6,952.4	7,049.4	6,936.9	18.4	24.4	-69.58	312.0	988.3	452.7	36.58	12.374		
7,100.0	7,052.4	7,161.7	7,049.1	18.6	24.6	27.28	313.1	991.6	454.8	36.78	12.363		
7,200.0	7,152.4	7,262.5	7,149.9	18.7	24.7	27.35	313.2	992.3	455.2	37.01	12.299		
7,300.0	7,252.4	7,361.7	7,249.1	18.8	24.8	27.42	313.6	993.1	455.8	37.23	12.242		
7,400.0	7,352.4	7,461.2	7,348.6	18.9	24.9	27.47	314.1	993.7	456.6	37.47	12.188		
7,500.0	7,452.4	7,560.3	7,447.7	19.0	25.0	27.49	314.8	994.4	457.6	37.70	12.136		
7,600.0	7,552.4	7,659.5	7,546.8	19.2	25.1	27.51	315.7	995.0	458.7	37.94	12.090		
7,700.0	7,652.4	7,759.2	7,646.5	19.3	25.2	27.52	316.8	995.6	459.9	38.18	12.045		
7,800.0	7,752.4	7,857.7	7,745.0	19.4	25.3	27.51	318.2	996.3	461.4	38.43	12.007		
7,900.0	7,852.4	7,961.8	7,849.1	19.5	25.4	27.54	319.1	997.0	462.5	38.68	11.958		
8,000.0	7,952.4	8,062.9	7,950.3	19.6	25.5	27.57	319.5	997.5	463.1	38.93	11.897		
8,100.0	8,052.4	8,162.9	8,050.2	19.8	25.6	27.60	319.8	997.9	463.6	39.17	11.834		
8,200.0	8,152.4	8,264.3	8,151.6	19.9	25.7	27.62	320.1	998.3	464.0	39.42	11.769		
8,300.0	8,252.4	8,367.3	8,254.6	20.0	25.8	27.61	319.9	998.1	463.8	39.68	11.687		
8,400.0	8,352.4	8,468.2	8,355.5	20.1	25.9	27.62	319.3	997.9	463.2	39.94	11.596		
8,500.0	8,452.4	8,568.7	8,456.0	20.3	26.0	27.65	318.6	997.7	462.5	40.19	11.506		
8,600.0	8,552.4	8,669.6	8,556.9	20.4	26.1	27.66	317.8	997.4	461.6	40.45	11.411		
8,700.0	8,652.4	8,769.2	8,656.5	20.5	26.2	27.64	317.0	996.8	460.6	40.71	11.313		
8,800.0	8,752.4	8,869.7	8,757.0	20.7	26.3	27.61	316.3	996.2	459.7	40.98	11.218		
8,900.0	8,852.4	8,970.6	8,857.9	20.8	26.4	27.61	315.3	995.6	458.6	41.25	11.119		
9,000.0	8,952.4	9,071.3	8,958.6	20.9	26.4	27.63	314.1	995.2	457.3	41.51	11.018		
9,100.0	9,052.4	9,171.9	9,059.2	21.0	26.5	27.68	312.7	994.9	455.9	41.77	10.915		
9,200.0	9,152.4	9,273.7	9,161.0	21.2	26.6	27.73	310.9	994.5	454.2	42.03	10.807		
9,300.0	9,252.4	9,374.5	9,261.7	21.3	26.7	27.74	309.1	993.6	452.2	42.29	10.693		
9,400.0	9,352.4	9,473.5	9,360.7	21.4	26.8	27.65	307.8	992.1	450.3	42.57	10.578		
9,500.0	9,452.4	9,575.9	9,463.0	21.6	26.9	27.45	306.6	989.7	448.2	42.87	10.457		
9,600.0	9,552.4	9,678.5	9,565.7	21.7	26.9	27.16	305.1	986.4	445.5	43.18	10.316		
9,700.0	9,652.4	9,778.3	9,665.3	21.8	27.0	26.86	303.6	983.0	442.6	43.50	10.175		
9,790.0	9,742.4	9,855.0	9,742.0	22.0	27.0	26.65	302.3	980.5	440.1	43.75	10.059		
9,800.0	9,752.4	9,855.0	9,742.0	22.0	27.0	26.65	302.3	980.5	440.2	43.77	10.058		
9,900.0	9,852.4	9,855.0	9,742.0	22.1	27.0	26.65	302.3	980.5	453.7	43.91	10.334		
10,000.0	9,952.4	9,855.0	9,742.0	22.3	27.0	26.65	302.3	980.5	487.8	44.04	11.075		

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 16-9C
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 16-9C	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	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)				
10,084.6	10,037.0	9,855.0	9,742.0	22.4	27.0	26.65	302.3	980.5	529.8	485.6	44.16	11.997		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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 (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	5.13	34.6	3.1	34.7					
100.0	100.0	100.0	100.0	0.1	0.1	5.13	34.6	3.1	34.7	34.5	0.27	127.599		
200.0	200.0	200.0	200.0	0.3	0.3	5.13	34.6	3.1	34.7	34.1	0.62	55.914		
300.0	300.0	300.0	300.0	0.5	0.5	5.13	34.6	3.1	34.7	33.8	0.97	35.801	CC	
304.2	304.2	304.2	304.2	0.5	0.5	-91.51	34.6	3.1	34.7	33.8	0.99	35.258		
400.0	400.0	400.0	400.0	0.7	0.7	-95.79	34.6	3.1	34.9	33.6	1.33	26.333	ES	
500.0	499.6	499.6	499.6	0.9	0.8	-108.04	34.6	3.1	36.5	34.8	1.71	21.404		
600.0	598.9	597.4	597.3	1.1	1.0	-121.04	36.9	4.0	43.6	41.5	2.10	20.779	SF	
700.0	698.2	694.9	694.5	1.4	1.2	-126.22	43.9	6.5	55.6	53.1	2.50	22.212		
800.0	797.4	793.0	791.9	1.6	1.4	-126.83	54.9	10.5	70.4	67.5	2.93	24.004		
900.0	896.7	891.8	890.0	1.9	1.7	-127.00	66.3	14.7	85.6	82.2	3.38	25.308		
1,000.0	995.9	990.6	988.1	2.2	1.9	-127.12	77.8	18.8	100.8	96.9	3.84	26.252		
1,100.0	1,095.2	1,089.5	1,086.2	2.4	2.2	-127.20	89.2	23.0	115.9	111.6	4.30	26.961		
1,200.0	1,194.4	1,188.3	1,184.3	2.7	2.4	-127.27	100.6	27.2	131.1	126.3	4.77	27.509		
1,300.0	1,293.7	1,287.2	1,282.4	3.0	2.7	-127.32	112.1	31.3	146.2	141.0	5.23	27.945		
1,400.0	1,392.9	1,386.0	1,380.5	3.3	3.0	-127.37	123.5	35.5	161.4	155.7	5.70	28.298		
1,500.0	1,492.2	1,484.9	1,478.6	3.5	3.2	-127.40	135.0	39.7	176.6	170.4	6.18	28.590		
1,600.0	1,591.4	1,583.7	1,576.6	3.8	3.5	-127.43	146.4	43.8	191.7	185.1	6.65	28.835		
1,700.0	1,690.7	1,682.5	1,674.7	4.1	3.8	-127.46	157.8	48.0	206.9	199.8	7.12	29.043		
1,800.0	1,789.9	1,781.4	1,772.8	4.4	4.0	-127.48	169.3	52.1	222.1	214.5	7.60	29.222		
1,900.0	1,889.2	1,880.2	1,870.9	4.6	4.3	-127.50	180.7	56.3	237.2	229.2	8.08	29.377		
2,000.0	1,988.4	1,979.1	1,969.0	4.9	4.6	-127.52	192.2	60.5	252.4	243.8	8.55	29.513		
2,100.0	2,087.7	2,077.9	2,067.1	5.2	4.8	-127.53	203.6	64.6	267.6	258.5	9.03	29.633		
2,200.0	2,186.9	2,176.8	2,165.2	5.5	5.1	-127.55	215.1	68.8	282.7	273.2	9.51	29.739		
2,300.0	2,286.2	2,275.6	2,263.3	5.7	5.4	-127.56	226.5	73.0	297.9	287.9	9.98	29.835		
2,400.0	2,385.4	2,374.5	2,361.4	6.0	5.6	-127.57	237.9	77.1	313.0	302.6	10.46	29.920		
2,500.0	2,484.7	2,473.3	2,459.5	6.3	5.9	-127.58	249.4	81.3	328.2	317.3	10.94	29.998		
2,600.0	2,584.0	2,572.1	2,557.6	6.6	6.2	-127.59	260.8	85.5	343.4	332.0	11.42	30.069		
2,700.0	2,683.2	2,671.0	2,655.6	6.8	6.5	-127.60	272.3	89.6	358.5	346.6	11.90	30.133		
2,800.0	2,782.5	2,769.8	2,753.7	7.1	6.7	-127.61	283.7	93.8	373.7	361.3	12.38	30.192		
2,900.0	2,881.7	2,868.7	2,851.8	7.4	7.0	-127.61	295.1	98.0	388.9	376.0	12.86	30.246		
3,000.0	2,981.0	2,967.5	2,949.9	7.7	7.3	-127.62	306.6	102.1	404.0	390.7	13.34	30.296		
3,100.0	3,080.2	3,066.4	3,048.0	7.9	7.6	-127.62	318.0	106.3	419.2	405.4	13.82	30.342		
3,200.0	3,179.5	3,165.2	3,146.1	8.2	7.8	-127.63	329.5	110.5	434.4	420.1	14.30	30.385		
3,300.0	3,278.7	3,264.0	3,244.2	8.5	8.1	-127.64	340.9	114.6	449.5	434.7	14.78	30.424		
3,400.0	3,378.0	3,362.9	3,342.3	8.8	8.4	-127.64	352.4	118.8	464.7	449.4	15.25	30.462		
3,500.0	3,477.2	3,461.7	3,440.4	9.1	8.6	-127.65	363.8	123.0	479.9	464.1	15.73	30.496		
3,600.0	3,576.5	3,560.6	3,538.5	9.3	8.9	-127.65	375.2	127.1	495.0	478.8	16.21	30.529		
3,700.0	3,675.7	3,659.4	3,636.6	9.6	9.2	-127.65	386.7	131.3	510.2	493.5	16.69	30.559		
3,800.0	3,775.0	3,758.3	3,734.6	9.9	9.5	-127.66	398.1	135.5	525.3	508.2	17.17	30.588		
3,900.0	3,874.2	3,857.1	3,832.7	10.2	9.7	-127.66	409.6	139.6	540.5	522.9	17.65	30.615		
4,000.0	3,973.5	3,955.9	3,930.8	10.4	10.0	-127.66	421.0	143.8	555.7	537.5	18.14	30.641		
4,100.0	4,072.7	4,054.8	4,028.9	10.7	10.3	-127.67	432.4	148.0	570.8	552.2	18.62	30.665		
4,200.0	4,172.0	4,153.6	4,127.0	11.0	10.6	-127.67	443.9	152.1	586.0	566.9	19.10	30.688		
4,300.0	4,271.2	4,252.5	4,225.1	11.3	10.8	-127.67	455.3	156.3	601.2	581.6	19.58	30.709		
4,400.0	4,370.5	4,351.3	4,323.2	11.5	11.1	-127.68	466.8	160.5	616.3	596.3	20.06	30.730		
4,500.0	4,469.7	4,450.2	4,421.3	11.8	11.4	-127.68	478.2	164.6	631.5	611.0	20.54	30.749		
4,600.0	4,569.0	4,549.0	4,519.4	12.1	11.6	-127.68	489.6	168.8	646.7	625.6	21.02	30.768		
4,700.0	4,668.2	4,647.9	4,617.5	12.4	11.9	-127.68	501.1	173.0	661.8	640.3	21.50	30.786		
4,800.0	4,767.5	4,746.7	4,715.6	12.6	12.2	-127.69	512.5	177.1	677.0	655.0	21.98	30.802		
4,900.0	4,866.7	4,845.5	4,813.6	12.9	12.5	-127.69	524.0	181.3	692.1	669.7	22.46	30.819		
5,000.0	4,966.0	4,944.4	4,911.7	13.2	12.7	-127.69	535.4	185.5	707.3	684.4	22.94	30.834		

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 16-9C
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 16-9C	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				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)				
5,100.0	5,065.2	5,043.2	5,009.8	13.5	13.0	-127.69	546.9	189.6	722.5	699.1	23.42	30.849		
5,200.0	5,164.5	5,142.1	5,107.9	13.8	13.3	-127.69	558.3	193.8	737.6	713.7	23.90	30.863		
5,300.0	5,263.7	5,240.9	5,206.0	14.0	13.6	-127.70	569.7	198.0	752.8	728.4	24.38	30.876		
5,400.0	5,363.0	5,339.8	5,304.1	14.3	13.8	-127.70	581.2	202.1	768.0	743.1	24.86	30.889		
5,500.0	5,462.2	5,438.6	5,402.2	14.6	14.1	-127.70	592.6	206.3	783.1	757.8	25.34	30.902		
5,600.0	5,561.5	5,537.4	5,500.3	14.9	14.4	-127.70	604.1	210.4	798.3	772.5	25.82	30.914		
5,700.0	5,660.7	5,636.3	5,598.4	15.1	14.7	-127.70	615.5	214.6	813.5	787.2	26.30	30.925		
5,800.0	5,760.0	5,735.1	5,696.5	15.4	14.9	-127.70	626.9	218.8	828.6	801.8	26.78	30.936		
5,900.0	5,859.2	5,834.0	5,794.5	15.7	15.2	-127.71	638.4	222.9	843.8	816.5	27.27	30.947		
6,000.0	5,958.5	5,932.8	5,892.6	16.0	15.5	-127.71	649.8	227.1	859.0	831.2	27.75	30.957		
6,100.0	6,057.8	6,031.7	5,990.7	16.2	15.7	-127.71	661.3	231.3	874.1	845.9	28.23	30.967		
6,200.0	6,157.0	6,130.5	6,088.8	16.5	16.0	-127.71	672.7	235.4	889.3	860.6	28.71	30.977		
6,300.0	6,256.3	6,229.4	6,186.9	16.8	16.3	-127.71	684.1	239.6	904.4	875.3	29.19	30.986		
6,400.0	6,355.5	6,328.2	6,285.0	17.1	16.6	-127.71	695.6	243.8	919.6	889.9	29.67	30.995		
6,500.0	6,454.8	6,427.0	6,383.1	17.3	16.8	-127.71	707.0	247.9	934.8	904.6	30.15	31.004		
6,600.0	6,554.0	6,525.9	6,481.2	17.6	17.1	-127.71	718.5	252.1	949.9	919.3	30.63	31.012		
6,700.0	6,653.3	6,624.7	6,579.3	17.9	17.4	-127.72	729.9	256.3	965.1	934.0	31.11	31.019		
6,800.0	6,752.7	6,723.7	6,677.5	18.1	17.7	-127.86	741.4	260.4	979.1	947.5	31.59	30.991		
6,900.0	6,852.5	6,822.9	6,776.0	18.3	17.9	-127.81	752.9	264.6	991.1	959.0	32.03	30.938		
7,000.0	6,952.4	6,922.2	6,874.5	18.4	18.2	-127.57	764.3	268.8	1,000.9	968.5	32.43	30.863		
7,100.0	7,052.4	7,021.4	6,973.0	18.6	18.5	-30.48	775.8	273.0	1,009.0	976.2	32.80	30.762		
7,200.0	7,152.4	7,120.7	7,071.4	18.7	18.8	-29.94	787.3	277.2	1,016.9	983.7	33.16	30.662		
7,300.0	7,252.4	7,219.9	7,169.9	18.8	19.0	-29.42	798.8	281.4	1,024.9	991.4	33.53	30.569		
7,400.0	7,352.4	7,319.1	7,268.4	18.9	19.3	-28.90	810.3	285.5	1,033.0	999.1	33.89	30.482		
7,500.0	7,452.4	7,446.9	7,395.5	19.0	19.6	-28.35	822.8	290.1	1,039.9	1,005.7	34.27	30.341		
7,600.0	7,552.4	7,578.8	7,527.1	19.2	19.8	-28.03	830.2	292.8	1,043.9	1,009.3	34.62	30.150		
7,700.0	7,652.4	7,704.1	7,652.4	19.3	20.0	-27.95	831.9	293.4	1,044.8	1,009.9	34.93	29.914		
7,800.0	7,752.4	7,804.1	7,752.4	19.4	20.1	-27.95	831.9	293.4	1,044.8	1,009.6	35.20	29.686		
7,900.0	7,852.4	7,904.1	7,852.4	19.5	20.2	-27.95	831.9	293.4	1,044.8	1,009.4	35.47	29.460		
8,000.0	7,952.4	8,004.1	7,952.4	19.6	20.3	-27.95	831.9	293.4	1,044.8	1,009.1	35.74	29.236		
8,100.0	8,052.4	8,104.1	8,052.4	19.8	20.5	-27.95	831.9	293.4	1,044.8	1,008.8	36.01	29.015		
8,200.0	8,152.4	8,204.1	8,152.4	19.9	20.6	-27.95	831.9	293.4	1,044.8	1,008.6	36.28	28.796		
8,300.0	8,252.4	8,304.1	8,252.4	20.0	20.7	-27.95	831.9	293.4	1,044.8	1,008.3	36.56	28.579		
8,400.0	8,352.4	8,404.1	8,352.4	20.1	20.8	-27.95	831.9	293.4	1,044.8	1,008.0	36.84	28.364		
8,500.0	8,452.4	8,504.1	8,452.4	20.3	20.9	-27.95	831.9	293.4	1,044.8	1,007.7	37.11	28.152		
8,600.0	8,552.4	8,604.1	8,552.4	20.4	21.1	-27.95	831.9	293.4	1,044.8	1,007.4	37.39	27.942		
8,700.0	8,652.4	8,704.1	8,652.4	20.5	21.2	-27.95	831.9	293.4	1,044.8	1,007.2	37.67	27.734		
8,800.0	8,752.4	8,804.1	8,752.4	20.7	21.3	-27.95	831.9	293.4	1,044.8	1,006.9	37.95	27.529		
8,900.0	8,852.4	8,904.1	8,852.4	20.8	21.4	-27.95	831.9	293.4	1,044.8	1,006.6	38.24	27.325		
9,000.0	8,952.4	9,004.1	8,952.4	20.9	21.6	-27.95	831.9	293.4	1,044.8	1,006.3	38.52	27.124		
9,100.0	9,052.4	9,104.1	9,052.4	21.0	21.7	-27.95	831.9	293.4	1,044.8	1,006.0	38.81	26.925		
9,200.0	9,152.4	9,204.1	9,152.4	21.2	21.8	-27.95	831.9	293.4	1,044.8	1,005.7	39.09	26.728		
9,300.0	9,252.4	9,304.1	9,252.4	21.3	22.0	-27.95	831.9	293.4	1,044.8	1,005.5	39.38	26.534		
9,400.0	9,352.4	9,404.1	9,352.4	21.4	22.1	-27.95	831.9	293.4	1,044.8	1,005.2	39.67	26.341		
9,500.0	9,452.4	9,504.1	9,452.4	21.6	22.2	-27.95	831.9	293.4	1,044.8	1,004.9	39.95	26.151		
9,600.0	9,552.4	9,604.1	9,552.4	21.7	22.3	-27.95	831.9	293.4	1,044.8	1,004.6	40.24	25.963		
9,700.0	9,652.4	9,704.1	9,652.4	21.8	22.5	-27.95	831.9	293.4	1,044.8	1,004.3	40.53	25.777		
9,800.0	9,752.4	9,804.1	9,752.4	22.0	22.6	-27.95	831.9	293.4	1,044.8	1,004.0	40.83	25.593		
9,900.0	9,852.4	9,904.1	9,852.4	22.1	22.7	-27.95	831.9	293.4	1,044.8	1,003.7	41.12	25.411		
10,000.0	9,952.4	10,004.1	9,952.4	22.3	22.9	-27.95	831.9	293.4	1,044.8	1,003.4	41.41	25.231		
10,084.6	10,037.0	10,088.7	10,037.0	22.4	23.0	-27.95	831.9	293.4	1,044.8	1,003.2	41.66	25.080		

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 16-9C
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 16-9C	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		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	-5.17	43.7	-4.0	43.9					
100.0	100.0	100.0	100.0	0.1	0.1	-5.17	43.7	-4.0	43.9	43.6	0.27	161.203		
200.0	200.0	200.0	200.0	0.3	0.3	-5.17	43.7	-4.0	43.9	43.3	0.62	70.640 CC, ES		
300.0	300.0	299.0	298.9	0.5	0.5	-8.14	44.6	-6.4	45.0	44.1	0.97	46.356		
400.0	400.0	397.1	396.8	0.7	0.7	-115.25	47.1	-13.5	50.1	48.8	1.35	37.055		
500.0	499.6	492.9	491.8	0.9	1.0	-130.08	51.1	-25.1	63.7	62.0	1.74	36.601 SF		
600.0	598.9	585.4	582.8	1.1	1.3	-142.36	56.5	-40.5	87.7	85.6	2.10	41.854		
700.0	698.2	676.6	671.8	1.4	1.7	-150.10	63.1	-59.6	118.5	116.0	2.42	48.888		
800.0	797.4	770.4	763.0	1.6	2.1	-154.89	70.3	-80.1	151.5	148.7	2.75	55.101		
900.0	896.7	864.2	854.2	1.9	2.5	-157.97	77.5	-100.7	185.1	182.1	3.08	60.202		
1,000.0	995.9	958.0	945.4	2.2	2.9	-160.11	84.7	-121.2	219.1	215.7	3.40	64.396		
1,100.0	1,095.2	1,051.8	1,036.7	2.4	3.3	-161.67	91.8	-141.7	253.3	249.6	3.73	67.881		
1,200.0	1,194.4	1,145.5	1,127.9	2.7	3.7	-162.86	99.0	-162.2	287.6	283.5	4.06	70.811		
1,300.0	1,293.7	1,239.3	1,219.1	3.0	4.2	-163.80	106.2	-182.8	322.0	317.6	4.39	73.303		
1,400.0	1,392.9	1,333.1	1,310.3	3.3	4.6	-164.56	113.3	-203.3	356.4	351.7	4.72	75.443		
1,500.0	1,492.2	1,426.9	1,401.6	3.5	5.0	-165.18	120.5	-223.8	390.9	385.9	5.06	77.301		
1,600.0	1,591.4	1,520.7	1,492.8	3.8	5.4	-165.70	127.7	-244.4	425.5	420.1	5.39	78.926		
1,700.0	1,690.7	1,614.5	1,584.0	4.1	5.8	-166.15	134.8	-264.9	460.0	454.3	5.72	80.359		
1,800.0	1,789.9	1,708.3	1,675.3	4.4	6.2	-166.53	142.0	-285.4	494.6	488.6	6.06	81.631		
1,900.0	1,889.2	1,802.0	1,766.5	4.6	6.7	-166.86	149.2	-305.9	529.2	522.8	6.39	82.768		
2,000.0	1,988.4	1,895.8	1,857.7	4.9	7.1	-167.15	156.3	-326.5	563.8	557.1	6.73	83.790		
2,100.0	2,087.7	1,989.6	1,948.9	5.2	7.5	-167.41	163.5	-347.0	598.4	591.4	7.06	84.714		
2,200.0	2,186.9	2,083.4	2,040.2	5.5	7.9	-167.64	170.7	-367.5	633.1	625.7	7.40	85.552		
2,300.0	2,286.2	2,177.2	2,131.4	5.7	8.3	-167.85	177.8	-388.1	667.7	660.0	7.74	86.316		
2,400.0	2,385.4	2,271.0	2,222.6	6.0	8.8	-168.03	185.0	-408.6	702.4	694.3	8.07	87.016		
2,500.0	2,484.7	2,364.7	2,313.9	6.3	9.2	-168.20	192.2	-429.1	737.0	728.6	8.41	87.658		
2,600.0	2,584.0	2,458.5	2,405.1	6.6	9.6	-168.36	199.4	-449.6	771.7	762.9	8.74	88.250		
2,700.0	2,683.2	2,552.3	2,496.3	6.8	10.0	-168.50	206.5	-470.2	806.3	797.2	9.08	88.798		
2,800.0	2,782.5	2,646.1	2,587.5	7.1	10.5	-168.62	213.7	-490.7	841.0	831.6	9.42	89.306		
2,900.0	2,881.7	2,739.9	2,678.8	7.4	10.9	-168.74	220.9	-511.2	875.7	865.9	9.75	89.778		
3,000.0	2,981.0	2,833.7	2,770.0	7.7	11.3	-168.85	228.0	-531.8	910.3	900.2	10.09	90.218		
3,100.0	3,080.2	2,927.4	2,861.2	7.9	11.7	-168.95	235.2	-552.3	945.0	934.6	10.43	90.629		
3,200.0	3,179.5	3,021.2	2,952.5	8.2	12.1	-169.05	242.4	-572.8	979.7	968.9	10.76	91.014		
3,300.0	3,278.7	3,115.0	3,043.7	8.5	12.6	-169.13	249.5	-593.3	1,014.4	1,003.3	11.10	91.376		
3,400.0	3,378.0	3,208.8	3,134.9	8.8	13.0	-169.22	256.7	-613.9	1,049.0	1,037.6	11.44	91.715		
3,500.0	3,477.2	3,302.6	3,226.1	9.1	13.4	-169.29	263.9	-634.4	1,083.7	1,071.9	11.77	92.035		
3,600.0	3,576.5	3,396.4	3,317.4	9.3	13.8	-169.36	271.0	-654.9	1,118.4	1,106.3	12.11	92.337		
3,700.0	3,675.7	3,490.1	3,408.6	9.6	14.2	-169.43	278.2	-675.5	1,153.1	1,140.6	12.45	92.623		
3,800.0	3,775.0	3,583.9	3,499.8	9.9	14.7	-169.50	285.4	-696.0	1,187.8	1,175.0	12.79	92.893		

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 16-9C
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 16-9C	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		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	-11.84	27.0	-5.6	27.5					
100.0	100.0	100.0	100.0	0.1	0.1	-11.84	27.0	-5.6	27.5	27.3	0.27	101.145		
200.0	200.0	200.0	200.0	0.3	0.3	-11.84	27.0	-5.6	27.5	26.9	0.62	44.322		
300.0	300.0	300.0	300.0	0.5	0.5	-11.84	27.0	-5.6	27.5	26.6	0.97	28.379 CC, ES		
400.0	400.0	399.9	399.9	0.7	0.7	-118.68	26.1	-8.1	28.5	27.2	1.33	21.455		
500.0	499.6	498.2	497.9	0.9	0.9	-142.25	23.8	-15.4	36.0	34.2	1.71	20.988 SF		
600.0	598.9	593.9	592.7	1.1	1.1	-161.71	19.9	-27.1	54.6	52.5	2.07	26.308		
700.0	698.2	689.1	686.5	1.4	1.4	-172.54	15.0	-42.3	79.8	77.4	2.42	32.998		
800.0	797.4	784.9	781.0	1.6	1.7	-178.26	9.9	-57.9	106.7	104.0	2.76	38.626		
900.0	896.7	880.8	875.5	1.9	2.1	178.34	4.8	-73.5	134.3	131.2	3.11	43.171		
1,000.0	995.9	976.7	970.0	2.2	2.4	176.09	-0.3	-89.1	162.1	158.6	3.46	46.867		
1,100.0	1,095.2	1,072.6	1,064.5	2.4	2.7	174.50	-5.4	-104.7	190.1	186.3	3.81	49.914		
1,200.0	1,194.4	1,168.5	1,158.9	2.7	3.0	173.32	-10.5	-120.2	218.2	214.0	4.16	52.463		
1,300.0	1,293.7	1,264.4	1,253.4	3.0	3.4	172.41	-15.6	-135.8	246.3	241.8	4.51	54.624		
1,400.0	1,392.9	1,360.3	1,347.9	3.3	3.7	171.69	-20.7	-151.4	274.5	269.7	4.86	56.476		
1,500.0	1,492.2	1,456.2	1,442.4	3.5	4.0	171.10	-25.8	-167.0	302.7	297.5	5.21	58.080		
1,600.0	1,591.4	1,552.1	1,536.8	3.8	4.3	170.61	-30.9	-182.6	331.0	325.4	5.56	59.483		
1,700.0	1,690.7	1,648.0	1,631.3	4.1	4.7	170.20	-36.0	-198.2	359.3	353.4	5.92	60.720		
1,800.0	1,789.9	1,743.9	1,725.8	4.4	5.0	169.85	-41.1	-213.8	387.6	381.3	6.27	61.818		
1,900.0	1,889.2	1,839.7	1,820.3	4.6	5.3	169.54	-46.2	-229.4	415.9	409.2	6.62	62.800		
2,000.0	1,988.4	1,935.6	1,914.7	4.9	5.7	169.28	-51.3	-245.0	444.2	437.2	6.97	63.682		
2,100.0	2,087.7	2,031.5	2,009.2	5.2	6.0	169.04	-56.4	-260.6	472.5	465.2	7.33	64.480		
2,200.0	2,186.9	2,127.4	2,103.7	5.5	6.3	168.84	-61.5	-276.2	500.8	493.1	7.68	65.204		
2,300.0	2,286.2	2,223.3	2,198.2	5.7	6.7	168.65	-66.6	-291.8	529.1	521.1	8.03	65.865		
2,400.0	2,385.4	2,319.2	2,292.6	6.0	7.0	168.48	-71.7	-307.4	557.5	549.1	8.39	66.470		
2,500.0	2,484.7	2,415.1	2,387.1	6.3	7.3	168.33	-76.8	-323.0	585.8	577.1	8.74	67.026		
2,600.0	2,584.0	2,511.0	2,481.6	6.6	7.7	168.20	-81.9	-338.6	614.1	605.1	9.09	67.538		
2,700.0	2,683.2	2,606.9	2,576.1	6.8	8.0	168.07	-87.0	-354.1	642.5	633.0	9.45	68.013		
2,800.0	2,782.5	2,702.8	2,670.6	7.1	8.3	167.96	-92.1	-369.7	670.8	661.0	9.80	68.453		
2,900.0	2,881.7	2,798.6	2,765.0	7.4	8.7	167.86	-97.2	-385.3	699.2	689.0	10.15	68.862		
3,000.0	2,981.0	2,894.5	2,859.5	7.7	9.0	167.76	-102.3	-400.9	727.5	717.0	10.51	69.244		
3,100.0	3,080.2	2,990.4	2,954.0	7.9	9.3	167.67	-107.4	-416.5	755.9	745.0	10.86	69.601		
3,200.0	3,179.5	3,086.3	3,048.5	8.2	9.7	167.59	-112.5	-432.1	784.2	773.0	11.21	69.935		
3,300.0	3,278.7	3,182.2	3,142.9	8.5	10.0	167.51	-117.6	-447.7	812.6	801.0	11.57	70.249		
3,400.0	3,378.0	3,278.1	3,237.4	8.8	10.4	167.44	-122.7	-463.3	840.9	829.0	11.92	70.545		
3,500.0	3,477.2	3,374.0	3,331.9	9.1	10.7	167.37	-127.8	-478.9	869.3	857.0	12.27	70.823		
3,600.0	3,576.5	3,469.9	3,426.4	9.3	11.0	167.31	-132.9	-494.5	897.7	885.0	12.63	71.086		
3,700.0	3,675.7	3,565.8	3,520.8	9.6	11.4	167.25	-138.0	-510.1	926.0	913.0	12.98	71.334		
3,800.0	3,775.0	3,661.7	3,615.3	9.9	11.7	167.19	-143.1	-525.7	954.4	941.0	13.34	71.569		
3,900.0	3,874.2	3,757.5	3,709.8	10.2	12.0	167.14	-148.2	-541.3	982.7	969.1	13.69	71.792		
4,000.0	3,973.5	3,853.4	3,804.3	10.4	12.4	167.09	-153.3	-556.9	1,011.1	997.1	14.04	72.004		
4,100.0	4,072.7	3,949.3	3,898.7	10.7	12.7	167.05	-158.4	-572.4	1,039.5	1,025.1	14.40	72.205		
4,200.0	4,172.0	4,045.2	3,993.2	11.0	13.0	167.00	-163.5	-588.0	1,067.8	1,053.1	14.75	72.397		
4,300.0	4,271.2	4,141.1	4,087.7	11.3	13.4	166.96	-168.6	-603.6	1,096.2	1,081.1	15.10	72.579		
4,400.0	4,370.5	4,237.0	4,182.2	11.5	13.7	166.92	-173.7	-619.2	1,124.6	1,109.1	15.46	72.754		
4,500.0	4,469.7	4,332.9	4,276.7	11.8	14.0	166.88	-178.8	-634.8	1,152.9	1,137.1	15.81	72.920		
4,600.0	4,569.0	4,428.8	4,371.1	12.1	14.4	166.85	-183.9	-650.4	1,181.3	1,165.1	16.16	73.079		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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							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				
0.0	0.0	0.0	0.0	0.0	0.0	-36.75	9.8	-7.3	12.3							
100.0	100.0	100.0	100.0	0.1	0.1	-36.75	9.8	-7.3	12.3	12.0	0.27	45.077				
200.0	200.0	200.0	200.0	0.3	0.3	-36.75	9.8	-7.3	12.3	11.7	0.62	19.753				
251.9	251.9	251.9	251.9	0.4	0.4	-40.04	9.4	-7.9	12.3	11.4	0.80	15.251 CC				
300.0	300.0	299.9	299.9	0.5	0.5	-48.90	8.2	-9.3	12.4	11.4	0.97	12.772 ES, SF				
400.0	400.0	399.1	398.8	0.7	0.7	-175.65	3.2	-15.3	18.3	16.9	1.35	13.522				
500.0	499.6	496.2	495.0	0.9	1.0	167.13	-4.9	-24.9	35.8	34.1	1.71	20.923				
600.0	598.9	592.7	590.2	1.1	1.3	161.10	-14.9	-36.8	60.9	58.9	2.08	29.364				
700.0	698.2	689.2	685.5	1.4	1.6	158.67	-25.0	-48.8	86.7	84.2	2.45	35.366				
800.0	797.4	785.8	780.8	1.6	1.9	157.36	-35.0	-60.7	112.5	109.7	2.83	39.748				
900.0	896.7	882.4	876.1	1.9	2.2	156.54	-45.1	-72.7	138.3	135.1	3.21	43.072				
1,000.0	995.9	979.0	971.5	2.2	2.5	155.97	-55.2	-84.7	164.2	160.6	3.60	45.674				
1,100.0	1,095.2	1,075.6	1,066.8	2.4	2.9	155.56	-65.2	-96.7	190.1	186.1	3.98	47.765				
1,200.0	1,194.4	1,172.2	1,162.1	2.7	3.2	155.25	-75.3	-108.6	216.0	211.6	4.36	49.479				
1,300.0	1,293.7	1,268.8	1,257.4	3.0	3.5	155.01	-85.4	-120.6	241.9	237.1	4.75	50.911				
1,400.0	1,392.9	1,365.3	1,352.7	3.3	3.8	154.81	-95.4	-132.6	267.8	262.6	5.14	52.123				
1,500.0	1,492.2	1,461.9	1,448.0	3.5	4.1	154.64	-105.5	-144.5	293.7	288.1	5.52	53.162				
1,600.0	1,591.4	1,558.5	1,543.3	3.8	4.5	154.51	-115.5	-156.5	319.5	313.6	5.91	54.063				
1,700.0	1,690.7	1,655.1	1,638.6	4.1	4.8	154.39	-125.6	-168.5	345.4	339.2	6.30	54.852				
1,800.0	1,789.9	1,751.7	1,733.9	4.4	5.1	154.29	-135.7	-180.4	371.3	364.7	6.69	55.547				
1,900.0	1,889.2	1,848.3	1,829.3	4.6	5.4	154.21	-145.7	-192.4	397.3	390.2	7.07	56.166				
2,000.0	1,988.4	1,944.9	1,924.6	4.9	5.7	154.13	-155.8	-204.4	423.2	415.7	7.46	56.719				
2,100.0	2,087.7	2,041.4	2,019.9	5.2	6.1	154.06	-165.8	-216.4	449.1	441.2	7.85	57.217				
2,200.0	2,186.9	2,138.0	2,115.2	5.5	6.4	154.00	-175.9	-228.3	475.0	466.7	8.24	57.667				
2,300.0	2,286.2	2,234.6	2,210.5	5.7	6.7	153.95	-186.0	-240.3	500.9	492.2	8.62	58.076				
2,400.0	2,385.4	2,331.2	2,305.8	6.0	7.0	153.90	-196.0	-252.3	526.8	517.8	9.01	58.450				
2,500.0	2,484.7	2,427.8	2,401.1	6.3	7.4	153.85	-206.1	-264.2	552.7	543.3	9.40	58.792				
2,600.0	2,584.0	2,524.4	2,496.4	6.6	7.7	153.81	-216.1	-276.2	578.6	568.8	9.79	59.107				
2,700.0	2,683.2	2,621.0	2,591.7	6.8	8.0	153.78	-226.2	-288.2	604.5	594.3	10.18	59.398				
2,800.0	2,782.5	2,717.5	2,687.1	7.1	8.3	153.74	-236.3	-300.1	630.4	619.8	10.57	59.667				
2,900.0	2,881.7	2,814.1	2,782.4	7.4	8.6	153.71	-246.3	-312.1	656.3	645.3	10.95	59.916				
3,000.0	2,981.0	2,910.7	2,877.7	7.7	9.0	153.69	-256.4	-324.1	682.2	670.9	11.34	60.149				
3,100.0	3,080.2	3,007.3	2,973.0	7.9	9.3	153.66	-266.5	-336.1	708.1	696.4	11.73	60.366				
3,200.0	3,179.5	3,103.9	3,068.3	8.2	9.6	153.63	-276.5	-348.0	734.0	721.9	12.12	60.569				
3,300.0	3,278.7	3,200.5	3,163.6	8.5	9.9	153.61	-286.6	-360.0	759.9	747.4	12.51	60.759				
3,400.0	3,378.0	3,297.1	3,258.9	8.8	10.3	153.59	-296.6	-372.0	785.8	772.9	12.90	60.937				
3,500.0	3,477.2	3,393.6	3,354.2	9.1	10.6	153.57	-306.7	-383.9	811.7	798.4	13.28	61.106				
3,600.0	3,576.5	3,490.2	3,449.5	9.3	10.9	153.55	-316.8	-395.9	837.6	824.0	13.67	61.264				
3,700.0	3,675.7	3,586.8	3,544.9	9.6	11.2	153.53	-326.8	-407.9	863.5	849.5	14.06	61.414				
3,800.0	3,775.0	3,683.4	3,640.2	9.9	11.5	153.52	-336.9	-419.8	889.5	875.0	14.45	61.555				
3,900.0	3,874.2	3,780.0	3,735.5	10.2	11.9	153.50	-346.9	-431.8	915.4	900.5	14.84	61.689				
4,000.0	3,973.5	3,876.6	3,830.8	10.4	12.2	153.49	-357.0	-443.8	941.3	926.0	15.23	61.816				
4,100.0	4,072.7	3,973.2	3,926.1	10.7	12.5	153.47	-367.1	-455.8	967.2	951.6	15.62	61.937				
4,200.0	4,172.0	4,069.7	4,021.4	11.0	12.8	153.46	-377.1	-467.7	993.1	977.1	16.00	62.052				
4,300.0	4,271.2	4,166.3	4,116.7	11.3	13.2	153.45	-387.2	-479.7	1,019.0	1,002.6	16.39	62.161				
4,400.0	4,370.5	4,262.9	4,212.0	11.5	13.5	153.43	-397.2	-491.7	1,044.9	1,028.1	16.78	62.265				
4,500.0	4,469.7	4,359.5	4,307.4	11.8	13.8	153.42	-407.3	-503.6	1,070.8	1,053.6	17.17	62.365				
4,600.0	4,569.0	4,456.1	4,402.7	12.1	14.1	153.41	-417.4	-515.6	1,096.7	1,079.1	17.56	62.460				
4,700.0	4,668.2	4,552.7	4,498.0	12.4	14.4	153.40	-427.4	-527.6	1,122.6	1,104.7	17.95	62.551				
4,800.0	4,767.5	4,649.3	4,593.3	12.6	14.8	153.39	-437.5	-539.5	1,148.5	1,130.2	18.34	62.638				
4,900.0	4,866.7	4,745.8	4,688.6	12.9	15.1	153.38	-447.6	-551.5	1,174.4	1,155.7	18.72	62.721				
5,000.0	4,966.0	4,842.4	4,783.9	13.2	15.4	153.37	-457.6	-563.5	1,200.3	1,181.2	19.11	62.801				

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 16-9C
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 16-9C	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 16-9C
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 16-9C	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						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		
0.0	0.0	0.0	0.0	0.0	0.0	-127.44	-6.9	-9.0	11.4					
100.0	100.0	100.0	100.0	0.1	0.1	-127.44	-6.9	-9.0	11.4	11.1	0.27	41.806		
200.0	200.0	200.0	200.0	0.3	0.3	-127.44	-6.9	-9.0	11.4	10.8	0.62	18.320		
300.0	300.0	300.0	300.0	0.5	0.5	-127.44	-6.9	-9.0	11.4	10.4	0.97	11.730 CC, ES		
400.0	400.0	400.0	400.0	0.7	0.7	143.70	-6.9	-9.0	13.4	12.1	1.32	10.135 SF		
500.0	499.6	499.6	499.6	0.9	0.8	156.87	-6.9	-9.0	20.3	18.6	1.67	12.123		
600.0	598.9	598.9	598.9	1.1	1.0	165.37	-6.9	-9.0	31.6	29.5	2.02	15.654		
700.0	698.2	698.2	698.2	1.4	1.2	169.43	-6.9	-9.0	43.5	41.1	2.36	18.405		
800.0	797.4	797.4	797.4	1.6	1.4	171.74	-6.9	-9.0	55.5	52.8	2.71	20.499		
900.0	896.7	896.7	896.7	1.9	1.5	173.23	-6.9	-9.0	67.7	64.6	3.06	22.135		
1,000.0	995.9	995.9	995.9	2.2	1.7	174.26	-6.9	-9.0	79.8	76.4	3.40	23.447		
1,100.0	1,095.2	1,092.3	1,092.3	2.4	1.9	173.92	-8.6	-10.5	93.4	89.7	3.75	24.915		
1,200.0	1,194.4	1,187.5	1,187.2	2.7	2.1	171.72	-14.0	-15.0	110.2	106.1	4.11	26.854		
1,300.0	1,293.7	1,281.2	1,280.2	3.0	2.3	168.60	-22.7	-22.3	130.6	126.1	4.48	29.143		
1,400.0	1,392.9	1,372.9	1,370.5	3.3	2.5	165.17	-34.7	-32.4	154.7	149.8	4.88	31.711		
1,500.0	1,492.2	1,466.0	1,461.6	3.5	2.8	161.83	-49.7	-44.9	182.2	176.9	5.29	34.419		
1,600.0	1,591.4	1,561.5	1,554.9	3.8	3.1	159.22	-65.3	-58.1	210.6	204.9	5.72	36.807		
1,700.0	1,690.7	1,657.0	1,648.2	4.1	3.4	157.23	-81.0	-71.2	239.2	233.1	6.15	38.913		
1,800.0	1,789.9	1,752.6	1,741.5	4.4	3.8	155.66	-96.7	-84.3	268.1	261.5	6.57	40.782		
1,900.0	1,889.2	1,848.1	1,834.8	4.6	4.1	154.40	-112.3	-97.5	297.1	290.1	7.00	42.449		
2,000.0	1,988.4	1,943.6	1,928.1	4.9	4.5	153.36	-128.0	-110.6	326.2	318.8	7.42	43.943		
2,100.0	2,087.7	2,039.1	2,021.4	5.2	4.8	152.49	-143.7	-123.8	355.4	347.6	7.85	45.291		
2,200.0	2,186.9	2,134.6	2,114.7	5.5	5.2	151.76	-159.3	-136.9	384.7	376.4	8.27	46.511		
2,300.0	2,286.2	2,230.1	2,208.0	5.7	5.6	151.12	-175.0	-150.0	414.0	405.3	8.69	47.622		
2,400.0	2,385.4	2,325.6	2,301.3	6.0	6.0	150.58	-190.6	-163.2	443.4	434.3	9.12	48.636		
2,500.0	2,484.7	2,421.1	2,394.6	6.3	6.3	150.09	-206.3	-176.3	472.8	463.2	9.54	49.565		
2,600.0	2,584.0	2,516.7	2,487.9	6.6	6.7	149.67	-222.0	-189.5	502.2	492.2	9.96	50.421		
2,700.0	2,683.2	2,612.2	2,581.2	6.8	7.1	149.29	-237.6	-202.6	531.6	521.2	10.38	51.210		
2,800.0	2,782.5	2,707.7	2,674.5	7.1	7.5	148.95	-253.3	-215.7	561.1	550.3	10.80	51.941		
2,900.0	2,881.7	2,803.2	2,767.8	7.4	7.9	148.65	-268.9	-228.9	590.5	579.3	11.22	52.620		
3,000.0	2,981.0	2,898.7	2,861.1	7.7	8.3	148.38	-284.6	-242.0	620.0	608.4	11.64	53.251		
3,100.0	3,080.2	2,994.2	2,954.4	7.9	8.7	148.12	-300.3	-255.2	649.5	637.5	12.06	53.840		
3,200.0	3,179.5	3,089.7	3,047.7	8.2	9.0	147.90	-315.9	-268.3	679.0	666.6	12.48	54.391		
3,300.0	3,278.7	3,185.3	3,141.0	8.5	9.4	147.69	-331.6	-281.5	708.6	695.6	12.90	54.908		
3,400.0	3,378.0	3,280.8	3,234.3	8.8	9.8	147.49	-347.3	-294.6	738.1	724.8	13.32	55.392		
3,500.0	3,477.2	3,376.3	3,327.6	9.1	10.2	147.32	-362.9	-307.7	767.6	753.9	13.74	55.849		
3,600.0	3,576.5	3,471.8	3,420.9	9.3	10.6	147.15	-378.6	-320.9	797.1	783.0	14.16	56.278		
3,700.0	3,675.7	3,567.3	3,514.2	9.6	11.0	147.00	-394.2	-334.0	826.7	812.1	14.58	56.684		
3,800.0	3,775.0	3,662.8	3,607.5	9.9	11.4	146.86	-409.9	-347.2	856.2	841.2	15.00	57.068		
3,900.0	3,874.2	3,758.3	3,700.8	10.2	11.8	146.72	-425.6	-360.3	885.8	870.4	15.42	57.432		
4,000.0	3,973.5	3,853.9	3,794.1	10.4	12.2	146.60	-441.2	-373.4	915.4	899.5	15.84	57.776		
4,100.0	4,072.7	3,949.4	3,887.4	10.7	12.6	146.48	-456.9	-386.6	944.9	928.7	16.26	58.104		
4,200.0	4,172.0	4,044.9	3,980.7	11.0	13.0	146.37	-472.5	-399.7	974.5	957.8	16.68	58.415		
4,300.0	4,271.2	4,140.4	4,074.0	11.3	13.3	146.27	-488.2	-412.9	1,004.0	986.9	17.10	58.711		
4,400.0	4,370.5	4,235.9	4,167.3	11.5	13.7	146.17	-503.9	-426.0	1,033.6	1,016.1	17.52	58.994		
4,500.0	4,469.7	4,331.4	4,260.6	11.8	14.1	146.08	-519.5	-439.1	1,063.2	1,045.3	17.94	59.263		
4,600.0	4,569.0	4,426.9	4,353.9	12.1	14.5	145.99	-535.2	-452.3	1,092.8	1,074.4	18.36	59.521		
4,700.0	4,668.2	4,522.4	4,447.2	12.4	14.9	145.91	-550.9	-465.4	1,122.3	1,103.6	18.78	59.767		
4,800.0	4,767.5	4,618.0	4,540.5	12.6	15.3	145.83	-566.5	-478.6	1,151.9	1,132.7	19.20	60.003		
4,900.0	4,866.7	4,713.5	4,633.8	12.9	15.7	145.76	-582.2	-491.7	1,181.5	1,161.9	19.62	60.229		

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 16-9C
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 16-9C	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		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	-156.51	-24.0	-10.4	26.2					
100.0	100.0	100.0	100.0	0.1	0.1	-156.51	-24.0	-10.4	26.2	25.9	96.273			
200.0	200.0	200.0	200.0	0.3	0.3	-156.51	-24.0	-10.4	26.2	25.6	42.187			
300.0	300.0	300.0	300.0	0.5	0.5	-156.51	-24.0	-10.4	26.2	25.2	27.012 CC, ES			
400.0	400.0	400.0	400.0	0.7	0.7	112.14	-24.0	-10.4	27.1	25.8	20.449			
500.0	499.6	499.6	499.6	0.9	0.8	125.61	-24.0	-10.4	30.9	29.2	18.232 SF			
600.0	598.9	598.9	598.9	1.1	1.0	139.87	-24.0	-10.4	39.1	37.0	18.980			
700.0	698.2	698.2	698.2	1.4	1.2	149.08	-24.0	-10.4	49.1	46.7	20.351			
800.0	797.4	797.4	797.4	1.6	1.4	155.08	-24.0	-10.4	59.9	57.2	21.716			
900.0	896.7	896.7	896.7	1.9	1.5	159.22	-24.0	-10.4	71.2	68.1	22.936			
1,000.0	995.9	995.9	995.9	2.2	1.7	162.22	-24.0	-10.4	82.7	79.3	23.994			
1,100.0	1,095.2	1,092.1	1,092.1	2.4	1.9	163.41	-25.9	-11.6	96.0	92.2	25.294			
1,200.0	1,194.4	1,187.2	1,186.9	2.7	2.0	162.46	-31.8	-15.4	112.6	108.4	27.073			
1,300.0	1,293.7	1,280.9	1,279.9	3.0	2.3	160.28	-41.5	-21.5	132.6	128.0	29.174			
1,400.0	1,392.9	1,372.7	1,370.3	3.3	2.5	157.53	-54.7	-29.9	156.3	151.3	31.520			
1,500.0	1,492.2	1,462.4	1,457.9	3.5	2.8	154.63	-71.1	-40.3	183.7	178.4	34.084			
1,600.0	1,591.4	1,554.6	1,547.1	3.8	3.1	151.81	-90.8	-52.8	214.4	208.6	36.694			
1,700.0	1,690.7	1,649.2	1,638.6	4.1	3.5	149.60	-111.2	-65.7	245.7	239.4	38.994			
1,800.0	1,789.9	1,743.8	1,730.0	4.4	3.9	147.89	-131.6	-78.6	277.3	270.5	41.033			
1,900.0	1,889.2	1,838.4	1,821.5	4.6	4.3	146.53	-152.0	-91.6	309.0	301.8	42.849			
2,000.0	1,988.4	1,933.0	1,913.0	4.9	4.7	145.42	-172.5	-104.5	340.9	333.2	44.477			
2,100.0	2,087.7	2,027.6	2,004.4	5.2	5.1	144.50	-192.9	-117.5	372.8	364.7	45.943			
2,200.0	2,186.9	2,122.2	2,095.9	5.5	5.5	143.72	-213.3	-130.4	404.9	396.3	47.269			
2,300.0	2,286.2	2,216.8	2,187.3	5.7	6.0	143.06	-233.7	-143.4	436.9	427.9	48.475			
2,400.0	2,385.4	2,311.4	2,278.8	6.0	6.4	142.49	-254.1	-156.3	469.1	459.6	49.574			
2,500.0	2,484.7	2,406.0	2,370.3	6.3	6.8	141.99	-274.5	-169.2	501.2	491.3	50.582			
2,600.0	2,584.0	2,500.6	2,461.7	6.6	7.3	141.55	-295.0	-182.2	533.4	523.1	51.508			
2,700.0	2,683.2	2,595.2	2,553.2	6.8	7.7	141.16	-315.4	-195.1	565.7	554.9	52.362			
2,800.0	2,782.5	2,689.8	2,644.6	7.1	8.2	140.82	-335.8	-208.1	597.9	586.6	53.151			
2,900.0	2,881.7	2,784.4	2,736.1	7.4	8.6	140.51	-356.2	-221.0	630.2	618.5	53.884			
3,000.0	2,981.0	2,879.0	2,827.6	7.7	9.1	140.22	-376.6	-233.9	662.4	650.3	54.565			
3,100.0	3,080.2	2,973.6	2,919.0	7.9	9.5	139.97	-397.0	-246.9	694.7	682.1	55.201			
3,200.0	3,179.5	3,068.2	3,010.5	8.2	10.0	139.74	-417.5	-259.8	727.0	714.0	55.795			
3,300.0	3,278.7	3,162.8	3,101.9	8.5	10.4	139.53	-437.9	-272.8	759.3	745.9	56.351			
3,400.0	3,378.0	3,257.4	3,193.4	8.8	10.9	139.33	-458.3	-285.7	791.6	777.7	56.873			
3,500.0	3,477.2	3,352.0	3,284.9	9.1	11.3	139.15	-478.7	-298.7	824.0	809.6	57.364			
3,600.0	3,576.5	3,446.6	3,376.3	9.3	11.8	138.98	-499.1	-311.6	856.3	841.5	57.827			
3,700.0	3,675.7	3,541.2	3,467.8	9.6	12.2	138.83	-519.5	-324.5	888.6	873.4	58.263			
3,800.0	3,775.0	3,635.8	3,559.2	9.9	12.7	138.69	-540.0	-337.5	921.0	905.3	58.675			
3,900.0	3,874.2	3,730.4	3,650.7	10.2	13.1	138.55	-560.4	-350.4	953.3	937.2	59.066			
4,000.0	3,973.5	3,825.0	3,742.2	10.4	13.6	138.43	-580.8	-363.4	985.7	969.1	59.436			
4,100.0	4,072.7	3,919.6	3,833.6	10.7	14.0	138.31	-601.2	-376.3	1,018.0	1,001.0	59.787			
4,200.0	4,172.0	4,014.3	3,925.1	11.0	14.5	138.20	-621.6	-389.2	1,050.4	1,032.9	60.121			
4,300.0	4,271.2	4,108.9	4,016.6	11.3	14.9	138.10	-642.0	-402.2	1,082.8	1,064.8	60.439			
4,400.0	4,370.5	4,203.5	4,108.0	11.5	15.4	138.00	-662.5	-415.1	1,115.1	1,096.8	60.742			
4,500.0	4,469.7	4,298.1	4,199.5	11.8	15.8	137.91	-682.9	-428.1	1,147.5	1,128.7	61.031			
4,600.0	4,569.0	4,392.7	4,290.9	12.1	16.3	137.82	-703.3	-441.0	1,179.9	1,160.6	61.307			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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	-163.20	-41.2	-12.4	43.0					
100.0	100.0	100.0	100.0	0.1	0.1	-163.20	-41.2	-12.4	43.0	42.7	157.906			
200.0	200.0	200.0	200.0	0.3	0.3	-163.20	-41.2	-12.4	43.0	42.4	69.195			
300.0	300.0	300.0	300.0	0.5	0.5	-163.20	-41.2	-12.4	43.0	42.0	44.305 CC, ES			
400.0	400.0	400.0	400.0	0.7	0.7	103.54	-41.2	-12.4	43.5	42.2	32.847			
500.0	499.6	499.6	499.6	0.9	0.8	112.99	-41.2	-12.4	46.0	44.3	26.990			
600.0	598.9	596.3	596.3	1.1	1.0	124.16	-43.3	-13.5	54.3	52.2	25.999 SF			
700.0	698.2	692.0	691.7	1.4	1.2	130.84	-49.8	-16.8	68.9	66.5	27.943			
800.0	797.4	786.4	785.3	1.6	1.4	133.82	-60.3	-22.1	88.7	85.8	31.053			
900.0	896.7	879.0	876.5	1.9	1.7	134.66	-74.6	-29.4	112.9	109.6	34.626			
1,000.0	995.9	969.4	964.7	2.2	2.1	134.41	-92.3	-38.4	141.3	137.6	38.400			
1,100.0	1,095.2	1,058.0	1,050.1	2.4	2.5	133.64	-113.3	-49.1	173.8	169.7	42.329			
1,200.0	1,194.4	1,152.0	1,140.2	2.7	2.9	132.86	-137.1	-61.2	207.9	203.4	45.676			
1,300.0	1,293.7	1,245.9	1,230.3	3.0	3.4	132.30	-160.9	-73.3	242.1	237.1	48.426			
1,400.0	1,392.9	1,339.9	1,320.4	3.3	3.8	131.88	-184.7	-85.4	276.2	270.8	50.708			
1,500.0	1,492.2	1,433.8	1,410.5	3.5	4.3	131.55	-208.5	-97.4	310.4	304.5	52.631			
1,600.0	1,591.4	1,527.8	1,500.6	3.8	4.8	131.29	-232.2	-109.5	344.6	338.3	54.272			
1,700.0	1,690.7	1,621.8	1,590.6	4.1	5.3	131.07	-256.0	-121.6	378.8	372.0	55.689			
1,800.0	1,789.9	1,715.7	1,680.7	4.4	5.8	130.89	-279.8	-133.7	413.0	405.8	56.923			
1,900.0	1,889.2	1,809.7	1,770.8	4.6	6.2	130.74	-303.6	-145.8	447.2	439.5	58.008			
2,000.0	1,988.4	1,903.6	1,860.9	4.9	6.7	130.61	-327.4	-157.9	481.5	473.3	58.968			
2,100.0	2,087.7	1,997.6	1,951.0	5.2	7.2	130.50	-351.2	-170.0	515.7	507.1	59.825			
2,200.0	2,186.9	2,091.6	2,041.1	5.5	7.7	130.40	-375.0	-182.1	549.9	540.8	60.593			
2,300.0	2,286.2	2,185.5	2,131.2	5.7	8.2	130.31	-398.8	-194.2	584.1	574.6	61.286			
2,400.0	2,385.4	2,279.5	2,221.3	6.0	8.7	130.23	-422.6	-206.3	618.3	608.3	61.914			
2,500.0	2,484.7	2,373.4	2,311.4	6.3	9.2	130.16	-446.4	-218.3	652.5	642.1	62.486			
2,600.0	2,584.0	2,467.4	2,401.5	6.6	9.7	130.10	-470.1	-230.4	686.8	675.9	63.010			
2,700.0	2,683.2	2,561.4	2,491.6	6.8	10.2	130.04	-493.9	-242.5	721.0	709.6	63.490			
2,800.0	2,782.5	2,655.3	2,581.7	7.1	10.7	129.99	-517.7	-254.6	755.2	743.4	63.932			
2,900.0	2,881.7	2,749.3	2,671.7	7.4	11.2	129.94	-541.5	-266.7	789.4	777.1	64.341			
3,000.0	2,981.0	2,843.3	2,761.8	7.7	11.7	129.90	-565.3	-278.8	823.6	810.9	64.720			
3,100.0	3,080.2	2,937.2	2,851.9	7.9	12.2	129.86	-589.1	-290.9	857.9	844.7	65.072			
3,200.0	3,179.5	3,031.2	2,942.0	8.2	12.7	129.82	-612.9	-303.0	892.1	878.4	65.400			
3,300.0	3,278.7	3,125.1	3,032.1	8.5	13.2	129.79	-636.7	-315.1	926.3	912.2	65.706			
3,400.0	3,378.0	3,219.1	3,122.2	8.8	13.6	129.76	-660.5	-327.1	960.5	946.0	65.993			
3,500.0	3,477.2	3,313.1	3,212.3	9.1	14.1	129.73	-684.2	-339.2	994.7	979.7	66.262			
3,600.0	3,576.5	3,407.0	3,302.4	9.3	14.6	129.70	-708.0	-351.3	1,029.0	1,013.5	66.515			
3,700.0	3,675.7	3,501.0	3,392.5	9.6	15.1	129.68	-731.8	-363.4	1,063.2	1,047.3	66.753			
3,800.0	3,775.0	3,594.9	3,482.6	9.9	15.6	129.65	-755.6	-375.5	1,097.4	1,081.0	66.977			
3,900.0	3,874.2	3,688.9	3,572.7	10.2	16.1	129.63	-779.4	-387.6	1,131.6	1,114.8	67.189			
4,000.0	3,973.5	3,782.9	3,662.8	10.4	16.6	129.61	-803.2	-399.7	1,165.9	1,148.6	67.390			
4,100.0	4,072.7	3,876.8	3,752.8	10.7	17.1	129.59	-827.0	-411.8	1,200.1	1,182.3	67.580			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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 16-16B - 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	-174.10	-16.4	-1.7	16.5					
100.0	100.0	100.0	100.0	0.1	0.1	-174.10	-16.4	-1.7	16.5	16.2	60.536			
200.0	200.0	200.0	200.0	0.3	0.3	-174.10	-16.4	-1.7	16.5	15.9	0.62	26.527 CC, ES		
300.0	300.0	299.5	299.4	0.5	0.5	178.71	-17.9	0.4	17.9	17.0	0.97	18.415		
400.0	400.0	398.6	398.3	0.7	0.7	72.79	-22.5	6.7	22.6	21.2	1.35	16.740		
500.0	499.6	497.3	496.1	0.9	1.0	69.85	-30.0	17.0	29.7	27.9	1.78	16.716		
600.0	598.9	596.9	594.4	1.1	1.3	70.96	-39.3	29.9	37.8	35.5	2.25	16.742		
700.0	698.2	696.6	692.8	1.4	1.6	72.06	-48.6	42.7	45.7	43.0	2.76	16.581		
800.0	797.4	796.3	791.2	1.6	1.9	72.84	-58.0	55.6	53.7	50.4	3.27	16.410		
900.0	896.7	895.9	889.6	1.9	2.3	73.42	-67.3	68.5	61.7	57.9	3.80	16.255		
1,000.0	995.9	995.6	988.0	2.2	2.6	73.86	-76.7	81.4	69.7	65.4	4.32	16.120		
1,100.0	1,095.2	1,095.3	1,086.4	2.4	2.9	74.22	-86.0	94.3	77.7	72.9	4.86	16.004		
1,200.0	1,194.4	1,195.0	1,184.8	2.7	3.2	74.50	-95.4	107.2	85.7	80.3	5.39	15.904		
1,300.0	1,293.7	1,294.7	1,283.2	3.0	3.6	74.74	-104.7	120.1	93.7	87.8	5.93	15.817		
1,400.0	1,392.9	1,394.3	1,381.6	3.3	3.9	74.94	-114.1	133.0	101.7	95.3	6.46	15.742		
1,500.0	1,492.2	1,494.0	1,480.0	3.5	4.2	75.11	-123.4	145.8	109.8	102.8	7.00	15.676		
1,600.0	1,591.4	1,593.7	1,578.4	3.8	4.5	75.26	-132.7	158.7	117.8	110.2	7.54	15.619		
1,700.0	1,690.7	1,693.4	1,676.8	4.1	4.9	75.39	-142.1	171.6	125.8	117.7	8.08	15.567		
1,800.0	1,789.9	1,793.0	1,775.2	4.4	5.2	75.50	-151.4	184.5	133.8	125.2	8.62	15.521		
1,900.0	1,889.2	1,892.7	1,873.6	4.6	5.5	75.61	-160.8	197.4	141.8	132.7	9.16	15.480		
2,000.0	1,988.4	1,992.4	1,972.0	4.9	5.9	75.70	-170.1	210.3	149.8	140.1	9.70	15.443		
2,100.0	2,087.7	2,092.1	2,070.4	5.2	6.2	75.78	-179.5	223.2	157.8	147.6	10.24	15.409		
2,200.0	2,186.9	2,191.8	2,168.8	5.5	6.5	75.85	-188.8	236.0	165.9	155.1	10.78	15.379		
2,300.0	2,286.2	2,291.4	2,267.2	5.7	6.9	75.92	-198.2	248.9	173.9	162.5	11.33	15.351		
2,400.0	2,385.4	2,391.1	2,365.6	6.0	7.2	75.98	-207.5	261.8	181.9	170.0	11.87	15.325		
2,500.0	2,484.7	2,490.8	2,464.0	6.3	7.5	76.03	-216.9	274.7	189.9	177.5	12.41	15.302		
2,600.0	2,584.0	2,590.5	2,562.4	6.6	7.8	76.08	-226.2	287.6	197.9	185.0	12.95	15.280		
2,700.0	2,683.2	2,690.1	2,660.8	6.8	8.2	76.13	-235.6	300.5	205.9	192.4	13.50	15.260		
2,800.0	2,782.5	2,789.8	2,759.2	7.1	8.5	76.17	-244.9	313.4	214.0	199.9	14.04	15.241		
2,900.0	2,881.7	2,889.5	2,857.6	7.4	8.8	76.21	-254.3	326.3	222.0	207.4	14.58	15.223		
3,000.0	2,981.0	2,989.2	2,956.0	7.7	9.2	76.25	-263.6	339.1	230.0	214.9	15.12	15.207		
3,100.0	3,080.2	3,088.9	3,054.4	7.9	9.5	76.28	-272.9	352.0	238.0	222.3	15.67	15.192		
3,200.0	3,179.5	3,188.5	3,152.8	8.2	9.8	76.32	-282.3	364.9	246.0	229.8	16.21	15.178		
3,300.0	3,278.7	3,288.2	3,251.2	8.5	10.1	76.35	-291.6	377.8	254.0	237.3	16.75	15.164		
3,400.0	3,378.0	3,387.9	3,349.6	8.8	10.5	76.38	-301.0	390.7	262.1	244.8	17.30	15.152		
3,500.0	3,477.2	3,487.6	3,448.0	9.1	10.8	76.40	-310.3	403.6	270.1	252.2	17.84	15.140		
3,600.0	3,576.5	3,587.3	3,546.4	9.3	11.1	76.43	-319.7	416.5	278.1	259.7	18.38	15.129		
3,700.0	3,675.7	3,686.9	3,644.8	9.6	11.5	76.45	-329.0	429.3	286.1	267.2	18.92	15.118		
3,800.0	3,775.0	3,786.6	3,743.2	9.9	11.8	76.48	-338.4	442.2	294.1	274.7	19.47	15.108		
3,900.0	3,874.2	3,886.3	3,841.6	10.2	12.1	76.50	-347.7	455.1	302.1	282.1	20.01	15.098		
4,000.0	3,973.5	3,986.0	3,940.0	10.4	12.5	76.52	-357.1	468.0	310.2	289.6	20.55	15.089		
4,100.0	4,072.7	4,085.6	4,038.4	10.7	12.8	76.54	-366.4	480.9	318.2	297.1	21.10	15.081		
4,200.0	4,172.0	4,185.3	4,136.8	11.0	13.1	76.56	-375.8	493.8	326.2	304.5	21.64	15.073		
4,300.0	4,271.2	4,285.0	4,235.2	11.3	13.4	76.57	-385.1	506.7	334.2	312.0	22.18	15.065		
4,400.0	4,370.5	4,384.7	4,333.6	11.5	13.8	76.59	-394.5	519.6	342.2	319.5	22.73	15.057		
4,500.0	4,469.7	4,484.4	4,432.0	11.8	14.1	76.61	-403.8	532.4	350.2	327.0	23.27	15.050		
4,600.0	4,569.0	4,584.0	4,530.4	12.1	14.4	76.62	-413.1	545.3	358.3	334.4	23.82	15.043		
4,700.0	4,668.2	4,683.7	4,628.8	12.4	14.8	76.64	-422.5	558.2	366.3	341.9	24.36	15.037		
4,800.0	4,767.5	4,783.4	4,727.2	12.6	15.1	76.65	-431.8	571.1	374.3	349.4	24.90	15.031		
4,900.0	4,866.7	4,883.1	4,825.6	12.9	15.4	76.66	-441.2	584.0	382.3	356.9	25.45	15.025		
5,000.0	4,966.0	4,982.7	4,924.0	13.2	15.7	76.68	-450.5	596.9	390.3	364.3	25.99	15.019		
5,100.0	5,065.2	5,082.4	5,022.4	13.5	16.1	76.69	-459.9	609.8	398.3	371.8	26.53	15.013		

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 16-9C
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 16-9C	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 16-16B - 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			
5,200.0	5,164.5	5,182.1	5,120.8	13.8	16.4	76.70	-469.2	622.6	406.4	379.3	27.08	15.008		
5,300.0	5,263.7	5,281.8	5,219.2	14.0	16.7	76.71	-478.6	635.5	414.4	386.8	27.62	15.003		
5,400.0	5,363.0	5,381.5	5,317.6	14.3	17.1	76.72	-487.9	648.4	422.4	394.2	28.16	14.998		
5,500.0	5,462.2	5,481.1	5,416.0	14.6	17.4	76.73	-497.3	661.3	430.4	401.7	28.71	14.993		
5,600.0	5,561.5	5,580.8	5,514.4	14.9	17.7	76.74	-506.6	674.2	438.4	409.2	29.25	14.989		
5,700.0	5,660.7	5,680.5	5,612.8	15.1	18.1	76.75	-516.0	687.1	446.4	416.7	29.79	14.984		
5,800.0	5,760.0	5,780.2	5,711.2	15.4	18.4	76.76	-525.3	700.0	454.5	424.1	30.34	14.980		
5,900.0	5,859.2	5,879.8	5,809.6	15.7	18.7	76.77	-534.7	712.9	462.5	431.6	30.88	14.976		
6,000.0	5,958.5	5,979.5	5,908.0	16.0	19.0	76.78	-544.0	725.7	470.5	439.1	31.43	14.972		
6,100.0	6,057.8	6,079.2	6,006.4	16.2	19.4	76.79	-553.3	738.6	478.5	446.6	31.97	14.968		
6,200.0	6,157.0	6,178.9	6,104.8	16.5	19.7	76.80	-562.7	751.5	486.5	454.0	32.51	14.964		
6,300.0	6,256.3	6,278.6	6,203.2	16.8	20.0	76.80	-572.0	764.4	494.6	461.5	33.06	14.961		
6,400.0	6,355.5	6,378.2	6,301.6	17.1	20.4	76.81	-581.4	777.3	502.6	469.0	33.60	14.957		
6,500.0	6,454.8	6,477.9	6,400.0	17.3	20.7	76.82	-590.7	790.2	510.6	476.4	34.14	14.954		
6,600.0	6,554.0	6,577.6	6,498.4	17.6	21.0	76.83	-600.1	803.1	518.6	483.9	34.69	14.951		
6,700.0	6,653.3	6,677.3	6,596.8	17.9	21.4	76.84	-609.4	815.9	526.6	491.4	35.23	14.947		
6,800.0	6,752.7	6,776.9	6,695.1	18.1	21.7	76.82	-618.8	828.8	535.1	499.4	35.71	14.982		
6,900.0	6,852.5	6,876.3	6,793.3	18.3	22.0	76.46	-628.1	841.7	544.3	508.2	36.08	15.085		
7,000.0	6,952.4	6,975.5	6,891.1	18.4	22.3	75.79	-637.4	854.5	554.5	518.1	36.34	15.258		
7,100.0	7,052.4	7,074.2	6,988.6	18.6	22.7	171.39	-646.6	867.3	565.6	529.1	36.49	15.497		
7,200.0	7,152.4	7,172.9	7,086.1	18.7	23.0	170.27	-655.9	880.0	576.9	540.3	36.62	15.754		
7,300.0	7,252.4	7,276.2	7,188.0	18.8	23.3	169.15	-665.5	893.2	588.5	551.7	36.75	16.013		
7,400.0	7,352.4	7,393.2	7,304.0	18.9	23.6	168.15	-674.4	905.5	598.0	561.1	36.89	16.210		
7,500.0	7,452.4	7,511.3	7,421.7	19.0	23.9	167.49	-680.5	913.9	604.6	567.5	37.06	16.312		
7,600.0	7,552.4	7,630.1	7,540.3	19.2	24.0	167.14	-683.8	918.5	608.1	570.8	37.28	16.314		
7,700.0	7,652.4	7,742.2	7,652.4	19.3	24.1	167.08	-684.4	919.3	608.8	571.2	37.52	16.223		
7,800.0	7,752.4	7,842.2	7,752.4	19.4	24.2	167.08	-684.4	919.3	608.8	571.0	37.78	16.115		
7,900.0	7,852.4	7,942.2	7,852.4	19.5	24.3	167.08	-684.4	919.3	608.8	570.7	38.03	16.008		
8,000.0	7,952.4	8,042.2	7,952.4	19.6	24.4	167.08	-684.4	919.3	608.8	570.5	38.28	15.902		
8,100.0	8,052.4	8,142.2	8,052.4	19.8	24.5	167.08	-684.4	919.3	608.8	570.2	38.54	15.797		
8,200.0	8,152.4	8,242.2	8,152.4	19.9	24.6	167.08	-684.4	919.3	608.8	570.0	38.79	15.692		
8,300.0	8,252.4	8,342.2	8,252.4	20.0	24.7	167.08	-684.4	919.3	608.8	569.7	39.05	15.588		
8,400.0	8,352.4	8,442.2	8,352.4	20.1	24.8	167.08	-684.4	919.3	608.8	569.4	39.31	15.485		
8,500.0	8,452.4	8,542.2	8,452.4	20.3	24.9	167.08	-684.4	919.3	608.8	569.2	39.57	15.383		
8,600.0	8,552.4	8,642.2	8,552.4	20.4	25.0	167.08	-684.4	919.3	608.8	568.9	39.83	15.282		
8,700.0	8,652.4	8,742.2	8,652.4	20.5	25.2	167.08	-684.4	919.3	608.8	568.7	40.10	15.181		
8,800.0	8,752.4	8,842.2	8,752.4	20.7	25.3	167.08	-684.4	919.3	608.8	568.4	40.36	15.082		
8,900.0	8,852.4	8,942.2	8,852.4	20.8	25.4	167.08	-684.4	919.3	608.8	568.1	40.63	14.983		
9,000.0	8,952.4	9,042.2	8,952.4	20.9	25.5	167.08	-684.4	919.3	608.8	567.9	40.90	14.885		
9,100.0	9,052.4	9,142.2	9,052.4	21.0	25.6	167.08	-684.4	919.3	608.8	567.6	41.17	14.788		
9,200.0	9,152.4	9,242.2	9,152.4	21.2	25.7	167.08	-684.4	919.3	608.8	567.3	41.44	14.691		
9,300.0	9,252.4	9,342.2	9,252.4	21.3	25.8	167.08	-684.4	919.3	608.8	567.0	41.71	14.596		
9,400.0	9,352.4	9,442.2	9,352.4	21.4	25.9	167.08	-684.4	919.3	608.8	566.8	41.98	14.501		
9,500.0	9,452.4	9,542.2	9,452.4	21.6	26.0	167.08	-684.4	919.3	608.8	566.5	42.25	14.407		
9,600.0	9,552.4	9,642.2	9,552.4	21.7	26.1	167.08	-684.4	919.3	608.8	566.2	42.53	14.315		
9,700.0	9,652.4	9,742.2	9,652.4	21.8	26.2	167.08	-684.4	919.3	608.8	566.0	42.80	14.222		
9,800.0	9,752.4	9,842.2	9,752.4	22.0	26.4	167.08	-684.4	919.3	608.8	565.7	43.08	14.131		
9,900.0	9,852.4	9,942.2	9,852.4	22.1	26.5	167.08	-684.4	919.3	608.8	565.4	43.36	14.041		
10,000.0	9,952.4	10,042.2	9,952.4	22.3	26.6	167.08	-684.4	919.3	608.8	565.1	43.64	13.951		
10,054.6	10,007.0	10,096.8	10,007.0	22.3	26.6	167.08	-684.4	919.3	608.8	565.0	43.79	13.902		
10,084.6	10,037.0	10,121.8	10,032.0	22.4	26.7	167.08	-684.4	919.3	608.8	564.9	43.87	13.878 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 16-9C
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 16-9C	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		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	-174.16	-33.1	-3.4	33.3					
100.0	100.0	100.0	100.0	0.1	0.1	-174.16	-33.1	-3.4	33.3	33.0	0.27	122.371		
200.0	200.0	200.0	200.0	0.3	0.3	-174.16	-33.1	-3.4	33.3	32.7	0.62	53.623		
300.0	300.0	300.0	300.0	0.5	0.5	-174.16	-33.1	-3.4	33.3	32.3	0.97	34.334 CC, ES		
400.0	400.0	398.7	398.6	0.7	0.7	90.56	-35.2	-1.9	35.2	33.9	1.33	26.540		
500.0	499.6	497.1	496.8	0.9	0.9	93.86	-41.3	2.6	41.0	39.2	1.73	23.669		
600.0	598.9	595.1	593.9	1.1	1.1	96.54	-51.5	10.1	50.6	48.4	2.20	23.000 SF		
700.0	698.2	692.3	689.6	1.4	1.5	95.12	-65.5	20.5	63.6	60.9	2.72	23.393		
800.0	797.4	789.6	784.4	1.6	1.9	91.76	-83.0	33.4	79.8	76.5	3.25	24.513		
900.0	896.7	888.1	880.2	1.9	2.3	89.18	-101.4	47.0	96.7	92.9	3.79	25.493		
1,000.0	995.9	986.6	976.0	2.2	2.7	87.37	-119.8	60.5	113.8	109.4	4.33	26.259		
1,100.0	1,095.2	1,085.1	1,071.8	2.4	3.1	86.03	-138.2	74.1	130.9	126.1	4.87	26.873		
1,200.0	1,194.4	1,183.5	1,167.5	2.7	3.5	85.00	-156.5	87.7	148.1	142.7	5.41	27.375		
1,300.0	1,293.7	1,282.0	1,263.3	3.0	4.0	84.19	-174.9	101.2	165.4	159.4	5.95	27.793		
1,400.0	1,392.9	1,380.5	1,359.1	3.3	4.4	83.53	-193.3	114.8	182.6	176.2	6.49	28.145		
1,500.0	1,492.2	1,479.0	1,454.9	3.5	4.8	82.98	-211.7	128.4	199.9	192.9	7.03	28.447		
1,600.0	1,591.4	1,577.4	1,550.7	3.8	5.3	82.52	-230.1	141.9	217.2	209.7	7.57	28.708		
1,700.0	1,690.7	1,675.9	1,646.5	4.1	5.7	82.13	-248.5	155.5	234.6	226.5	8.11	28.936		
1,800.0	1,789.9	1,774.4	1,742.3	4.4	6.1	81.79	-266.8	169.1	251.9	243.2	8.64	29.137		
1,900.0	1,889.2	1,872.9	1,838.1	4.6	6.6	81.50	-285.2	182.6	269.2	260.0	9.18	29.315		
2,000.0	1,988.4	1,971.4	1,933.9	4.9	7.0	81.24	-303.6	196.2	286.6	276.8	9.72	29.475		
2,100.0	2,087.7	2,069.8	2,029.7	5.2	7.4	81.01	-322.0	209.8	303.9	293.6	10.26	29.618		
2,200.0	2,186.9	2,168.3	2,125.5	5.5	7.9	80.81	-340.4	223.3	321.2	310.4	10.80	29.747		
2,300.0	2,286.2	2,266.8	2,221.2	5.7	8.3	80.62	-358.8	236.9	338.6	327.3	11.34	29.864		
2,400.0	2,385.4	2,365.3	2,317.0	6.0	8.7	80.46	-377.1	250.5	355.9	344.1	11.88	29.971		
2,500.0	2,484.7	2,463.7	2,412.8	6.3	9.2	80.31	-395.5	264.0	373.3	360.9	12.41	30.069		
2,600.0	2,584.0	2,562.2	2,508.6	6.6	9.6	80.17	-413.9	277.6	390.7	377.7	12.95	30.159		
2,700.0	2,683.2	2,660.7	2,604.4	6.8	10.0	80.05	-432.3	291.2	408.0	394.5	13.49	30.242		
2,800.0	2,782.5	2,759.2	2,700.2	7.1	10.5	79.93	-450.7	304.7	425.4	411.4	14.03	30.319		
2,900.0	2,881.7	2,857.7	2,796.0	7.4	10.9	79.83	-469.1	318.3	442.7	428.2	14.57	30.390		
3,000.0	2,981.0	2,956.1	2,891.8	7.7	11.4	79.73	-487.4	331.9	460.1	445.0	15.11	30.456		
3,100.0	3,080.2	3,054.6	2,987.6	7.9	11.8	79.64	-505.8	345.4	477.5	461.8	15.65	30.518		
3,200.0	3,179.5	3,153.1	3,083.4	8.2	12.2	79.55	-524.2	359.0	494.8	478.7	16.18	30.576		
3,300.0	3,278.7	3,251.6	3,179.2	8.5	12.7	79.47	-542.6	372.6	512.2	495.5	16.72	30.630		
3,400.0	3,378.0	3,350.0	3,274.9	8.8	13.1	79.40	-561.0	386.1	529.6	512.3	17.26	30.681		
3,500.0	3,477.2	3,448.5	3,370.7	9.1	13.5	79.33	-579.4	399.7	547.0	529.2	17.80	30.728		
3,600.0	3,576.5	3,547.0	3,466.5	9.3	14.0	79.27	-597.7	413.3	564.3	546.0	18.34	30.773		
3,700.0	3,675.7	3,645.5	3,562.3	9.6	14.4	79.21	-616.1	426.8	581.7	562.8	18.88	30.816		
3,800.0	3,775.0	3,744.0	3,658.1	9.9	14.9	79.15	-634.5	440.4	599.1	579.7	19.42	30.856		
3,900.0	3,874.2	3,842.4	3,753.9	10.2	15.3	79.09	-652.9	453.9	616.4	596.5	19.95	30.894		
4,000.0	3,973.5	3,940.9	3,849.7	10.4	15.7	79.04	-671.3	467.5	633.8	613.3	20.49	30.930		
4,100.0	4,072.7	4,039.4	3,945.5	10.7	16.2	79.00	-689.7	481.1	651.2	630.2	21.03	30.964		
4,200.0	4,172.0	4,137.9	4,041.3	11.0	16.6	78.95	-708.0	494.6	668.6	647.0	21.57	30.997		
4,300.0	4,271.2	4,236.3	4,137.1	11.3	17.0	78.91	-726.4	508.2	685.9	663.8	22.11	31.028		
4,400.0	4,370.5	4,334.8	4,232.9	11.5	17.5	78.86	-744.8	521.8	703.3	680.7	22.65	31.057		
4,500.0	4,469.7	4,433.3	4,328.6	11.8	17.9	78.83	-763.2	535.3	720.7	697.5	23.18	31.086		
4,600.0	4,569.0	4,531.8	4,424.4	12.1	18.3	78.79	-781.6	548.9	738.1	714.3	23.72	31.113		
4,700.0	4,668.2	4,630.3	4,520.2	12.4	18.8	78.75	-800.0	562.5	755.4	731.2	24.26	31.138		
4,800.0	4,767.5	4,728.7	4,616.0	12.6	19.2	78.72	-818.3	576.0	772.8	748.0	24.80	31.163		
4,900.0	4,866.7	4,827.2	4,711.8	12.9	19.7	78.69	-836.7	589.6	790.2	764.9	25.34	31.186		
5,000.0	4,966.0	4,925.7	4,807.6	13.2	20.1	78.65	-855.1	603.2	807.6	781.7	25.88	31.209		
5,100.0	5,065.2	5,024.2	4,903.4	13.5	20.5	78.62	-873.5	616.7	825.0	798.5	26.41	31.231		

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 16-9C
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 16-9C	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		
5,200.0	5,164.5	5,122.6	4,999.2	13.8	21.0	78.60	-891.9	630.3	842.3	815.4	26.95	31.252		
5,300.0	5,263.7	5,221.1	5,095.0	14.0	21.4	78.57	-910.3	643.9	859.7	832.2	27.49	31.272		
5,400.0	5,363.0	5,319.6	5,190.8	14.3	21.8	78.54	-928.6	657.4	877.1	849.1	28.03	31.291		
5,500.0	5,462.2	5,418.1	5,286.6	14.6	22.3	78.52	-947.0	671.0	894.5	865.9	28.57	31.310		
5,600.0	5,561.5	5,516.5	5,382.3	14.9	22.7	78.49	-965.4	684.6	911.8	882.7	29.11	31.327		
5,700.0	5,660.7	5,615.0	5,478.1	15.1	23.2	78.47	-983.8	698.1	929.2	899.6	29.65	31.345		
5,800.0	5,760.0	5,713.5	5,573.9	15.4	23.6	78.45	-1,002.2	711.7	946.6	916.4	30.18	31.361		
5,900.0	5,859.2	5,812.0	5,669.7	15.7	24.0	78.42	-1,020.6	725.3	964.0	933.3	30.72	31.377		
6,000.0	5,958.5	5,910.5	5,765.5	16.0	24.5	78.40	-1,039.0	738.8	981.4	950.1	31.26	31.393		
6,100.0	6,057.8	6,008.9	5,861.3	16.2	24.9	78.38	-1,057.3	752.4	998.7	966.9	31.80	31.408		
6,200.0	6,157.0	6,107.4	5,957.1	16.5	25.3	78.36	-1,075.7	766.0	1,016.1	983.8	32.34	31.422		
6,300.0	6,256.3	6,205.9	6,052.9	16.8	25.8	78.34	-1,094.1	779.5	1,033.5	1,000.6	32.88	31.436		
6,400.0	6,355.5	6,304.4	6,148.7	17.1	26.2	78.33	-1,112.5	793.1	1,050.9	1,017.5	33.41	31.450		
6,500.0	6,454.8	6,402.8	6,244.5	17.3	26.7	78.31	-1,130.9	806.7	1,068.2	1,034.3	33.95	31.463		
6,600.0	6,554.0	6,501.3	6,340.2	17.6	27.1	78.29	-1,149.3	820.2	1,085.6	1,051.1	34.49	31.476		
6,700.0	6,653.3	6,599.8	6,436.0	17.9	27.5	78.28	-1,167.6	833.8	1,103.0	1,068.0	35.03	31.486		
6,800.0	6,752.7	6,698.2	6,531.7	18.1	28.0	78.53	-1,186.0	847.4	1,120.8	1,085.2	35.59	31.491		
6,900.0	6,852.5	6,796.3	6,627.2	18.3	28.4	78.61	-1,204.3	860.9	1,139.2	1,103.1	36.06	31.595		
7,000.0	6,952.4	6,894.1	6,722.3	18.4	28.8	78.55	-1,222.6	874.3	1,158.4	1,121.9	36.43	31.794		
7,100.0	7,052.4	6,991.4	6,816.9	18.6	29.3	174.80	-1,240.7	887.7	1,178.2	1,141.5	36.69	32.117		
7,200.0	7,152.4	7,088.7	6,911.6	18.7	29.7	174.23	-1,258.9	901.1	1,198.3	1,161.4	36.87	32.496		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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			
0.0	0.0	0.0	0.0	0.0	0.0	-174.23	-50.3	-5.1	50.5							
100.0	100.0	100.0	100.0	0.1	0.1	-174.23	-50.3	-5.1	50.5	50.2	0.27	185.553				
200.0	200.0	200.0	200.0	0.3	0.3	-174.23	-50.3	-5.1	50.5	49.9	0.62	81.310	CC, ES			
300.0	300.0	297.8	297.8	0.5	0.5	-175.82	-52.4	-3.8	52.6	51.6	0.97	54.070				
400.0	400.0	395.2	394.9	0.7	0.7	85.75	-58.9	-0.1	58.9	57.5	1.33	44.165				
500.0	499.6	492.0	490.9	0.9	1.0	86.23	-69.5	6.1	69.0	67.3	1.75	39.509				
600.0	598.9	587.8	585.2	1.1	1.3	87.56	-84.2	14.6	83.1	80.9	2.22	37.396				
700.0	698.2	682.4	677.3	1.4	1.7	87.17	-102.7	25.3	101.3	98.6	2.74	37.029	SF			
800.0	797.4	779.1	770.7	1.6	2.2	85.97	-124.5	37.9	122.3	119.1	3.26	37.548				
900.0	896.7	876.9	865.0	1.9	2.6	85.09	-146.6	50.6	143.5	139.7	3.79	37.892				
1,000.0	995.9	974.6	959.4	2.2	3.1	84.43	-168.6	63.4	164.7	160.4	4.32	38.134				
1,100.0	1,095.2	1,072.3	1,053.7	2.4	3.6	83.92	-190.7	76.2	185.9	181.1	4.85	38.314				
1,200.0	1,194.4	1,170.0	1,148.0	2.7	4.1	83.52	-212.8	89.0	207.1	201.8	5.39	38.453				
1,300.0	1,293.7	1,267.7	1,242.3	3.0	4.5	83.19	-234.9	101.8	228.4	222.4	5.92	38.564				
1,400.0	1,392.9	1,365.4	1,336.6	3.3	5.0	82.92	-257.0	114.5	249.6	243.1	6.46	38.654				
1,500.0	1,492.2	1,463.1	1,431.0	3.5	5.5	82.69	-279.1	127.3	270.8	263.9	6.99	38.729				
1,600.0	1,591.4	1,560.9	1,525.3	3.8	6.0	82.49	-301.2	140.1	292.1	284.6	7.53	38.792				
1,700.0	1,690.7	1,658.6	1,619.6	4.1	6.4	82.32	-323.3	152.9	313.3	305.3	8.07	38.846				
1,800.0	1,789.9	1,756.3	1,713.9	4.4	6.9	82.17	-345.3	165.7	334.6	326.0	8.60	38.893				
1,900.0	1,889.2	1,854.0	1,808.3	4.6	7.4	82.04	-367.4	178.5	355.8	346.7	9.14	38.934				
2,000.0	1,988.4	1,951.7	1,902.6	4.9	7.9	81.93	-389.5	191.2	377.1	367.4	9.68	38.970				
2,100.0	2,087.7	2,049.4	1,996.9	5.2	8.4	81.82	-411.6	204.0	398.3	388.1	10.21	39.002				
2,200.0	2,186.9	2,147.1	2,091.2	5.5	8.8	81.73	-433.7	216.8	419.6	408.9	10.75	39.031				
2,300.0	2,286.2	2,244.8	2,185.5	5.7	9.3	81.65	-455.8	229.6	440.9	429.6	11.29	39.057				
2,400.0	2,385.4	2,342.6	2,279.9	6.0	9.8	81.57	-477.9	242.4	462.1	450.3	11.82	39.080				
2,500.0	2,484.7	2,440.3	2,374.2	6.3	10.3	81.50	-499.9	255.1	483.4	471.0	12.36	39.102				
2,600.0	2,584.0	2,538.0	2,468.5	6.6	10.8	81.44	-522.0	267.9	504.6	491.7	12.90	39.121				
2,700.0	2,683.2	2,635.7	2,562.8	6.8	11.2	81.38	-544.1	280.7	525.9	512.5	13.44	39.139				
2,800.0	2,782.5	2,733.4	2,657.1	7.1	11.7	81.32	-566.2	293.5	547.2	533.2	13.97	39.155				
2,900.0	2,881.7	2,831.1	2,751.5	7.4	12.2	81.27	-588.3	306.3	568.4	553.9	14.51	39.170				
3,000.0	2,981.0	2,928.8	2,845.8	7.7	12.7	81.23	-610.4	319.0	589.7	574.6	15.05	39.184				
3,100.0	3,080.2	3,026.5	2,940.1	7.9	13.2	81.18	-632.5	331.8	610.9	595.3	15.59	39.197				
3,200.0	3,179.5	3,124.3	3,034.4	8.2	13.6	81.14	-654.5	344.6	632.2	616.1	16.12	39.210				
3,300.0	3,278.7	3,222.0	3,128.8	8.5	14.1	81.11	-676.6	357.4	653.5	636.8	16.66	39.221				
3,400.0	3,378.0	3,319.7	3,223.1	8.8	14.6	81.07	-698.7	370.2	674.7	657.5	17.20	39.231				
3,500.0	3,477.2	3,417.4	3,317.4	9.1	15.1	81.04	-720.8	382.9	696.0	678.2	17.74	39.241				
3,600.0	3,576.5	3,515.1	3,411.7	9.3	15.6	81.01	-742.9	395.7	717.2	699.0	18.27	39.251				
3,700.0	3,675.7	3,612.8	3,506.0	9.6	16.0	80.98	-765.0	408.5	738.5	719.7	18.81	39.260				
3,800.0	3,775.0	3,710.5	3,600.4	9.9	16.5	80.95	-787.1	421.3	759.8	740.4	19.35	39.268				
3,900.0	3,874.2	3,808.2	3,694.7	10.2	17.0	80.92	-809.2	434.1	781.0	761.1	19.89	39.276				
4,000.0	3,973.5	3,906.0	3,789.0	10.4	17.5	80.90	-831.2	446.8	802.3	781.9	20.42	39.283				
4,100.0	4,072.7	4,003.7	3,883.3	10.7	18.0	80.88	-853.3	459.6	823.6	802.6	20.96	39.290				
4,200.0	4,172.0	4,101.4	3,977.7	11.0	18.4	80.85	-875.4	472.4	844.8	823.3	21.50	39.297				
4,300.0	4,271.2	4,199.1	4,072.0	11.3	18.9	80.83	-897.5	485.2	866.1	844.0	22.04	39.303				
4,400.0	4,370.5	4,296.8	4,166.3	11.5	19.4	80.81	-919.6	498.0	887.3	864.8	22.57	39.309				
4,500.0	4,469.7	4,394.5	4,260.6	11.8	19.9	80.79	-941.7	510.8	908.6	885.5	23.11	39.315				
4,600.0	4,569.0	4,492.2	4,354.9	12.1	20.4	80.77	-963.8	523.5	929.9	906.2	23.65	39.320				
4,700.0	4,668.2	4,589.9	4,449.3	12.4	20.8	80.76	-985.8	536.3	951.1	927.0	24.19	39.326				
4,800.0	4,767.5	4,687.7	4,543.6	12.6	21.3	80.74	-1,007.9	549.1	972.4	947.7	24.72	39.331				
4,900.0	4,866.7	4,785.4	4,637.9	12.9	21.8	80.72	-1,030.0	561.9	993.7	968.4	25.26	39.335				
5,000.0	4,966.0	4,883.1	4,732.2	13.2	22.3	80.71	-1,052.1	574.7	1,014.9	989.1	25.80	39.340				
5,100.0	5,065.2	4,980.8	4,826.6	13.5	22.8	80.69	-1,074.2	587.4	1,036.2	1,009.9	26.34	39.344				

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 16-9C
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 16-9C	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						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	5,164.5	5,078.5	4,920.9	13.8	23.2	80.68	-1,096.3	600.2	1,057.5	1,030.6	26.87	39.349		
5,300.0	5,263.7	5,176.2	5,015.2	14.0	23.7	80.67	-1,118.4	613.0	1,078.7	1,051.3	27.41	39.353		
5,400.0	5,363.0	5,273.9	5,109.5	14.3	24.2	80.65	-1,140.4	625.8	1,100.0	1,072.0	27.95	39.356		
5,500.0	5,462.2	5,371.6	5,203.8	14.6	24.7	80.64	-1,162.5	638.6	1,121.3	1,092.8	28.49	39.360		
5,600.0	5,561.5	5,469.4	5,298.2	14.9	25.2	80.63	-1,184.6	651.3	1,142.5	1,113.5	29.02	39.364		
5,700.0	5,660.7	5,567.1	5,392.5	15.1	25.6	80.62	-1,206.7	664.1	1,163.8	1,134.2	29.56	39.367		
5,800.0	5,760.0	5,664.8	5,486.8	15.4	26.1	80.61	-1,228.8	676.9	1,185.0	1,154.9	30.10	39.371		
5,900.0	5,859.2	5,762.5	5,581.1	15.7	26.6	80.59	-1,250.9	689.7	1,206.3	1,175.7	30.64	39.374		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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							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)				
0.0	0.0	0.0	0.0	0.0	0.0	-174.23	-67.0	-6.8	67.4					
100.0	100.0	100.0	100.0	0.1	0.1	-174.23	-67.0	-6.8	67.4	67.1	0.27	247.404		
200.0	200.0	200.0	200.0	0.3	0.3	-174.23	-67.0	-6.8	67.4	66.7	0.62	108.413		
300.0	300.0	300.0	300.0	0.5	0.5	-174.23	-67.0	-6.8	67.4	66.4	0.97	69.416	CC, ES	
400.0	400.0	397.1	397.0	0.7	0.7	90.08	-69.2	-5.7	69.5	68.2	1.32	52.530		
500.0	499.6	493.8	493.4	0.9	0.9	92.55	-75.8	-2.3	75.9	74.2	1.72	44.229		
600.0	598.9	589.9	588.8	1.1	1.1	95.30	-86.6	3.1	86.8	84.6	2.16	40.098		
700.0	698.2	685.2	682.6	1.4	1.4	95.86	-101.6	10.7	101.6	98.9	2.65	38.279		
800.0	797.4	779.2	774.2	1.6	1.8	94.81	-120.4	20.2	120.2	117.0	3.18	37.842	SF	
900.0	896.7	871.5	863.0	1.9	2.3	92.89	-142.7	31.6	142.6	138.9	3.72	38.370		
1,000.0	995.9	966.2	953.2	2.2	2.8	90.73	-168.7	44.7	168.1	163.8	4.26	39.468		
1,100.0	1,095.2	1,062.7	1,044.9	2.4	3.3	89.06	-195.3	58.2	194.0	189.1	4.80	40.383		
1,200.0	1,194.4	1,159.2	1,136.6	2.7	3.9	87.78	-222.0	71.7	219.9	214.6	5.34	41.153		
1,300.0	1,293.7	1,255.6	1,228.4	3.0	4.4	86.77	-248.6	85.2	246.0	240.1	5.88	41.808		
1,400.0	1,392.9	1,352.1	1,320.1	3.3	5.0	85.96	-275.2	98.7	272.1	265.7	6.42	42.373		
1,500.0	1,492.2	1,448.6	1,411.8	3.5	5.5	85.28	-301.8	112.1	298.2	291.3	6.96	42.863		
1,600.0	1,591.4	1,545.0	1,503.6	3.8	6.0	84.72	-328.5	125.6	324.4	316.9	7.49	43.293		
1,700.0	1,690.7	1,641.5	1,595.3	4.1	6.6	84.24	-355.1	139.1	350.6	342.6	8.03	43.673		
1,800.0	1,789.9	1,738.0	1,687.0	4.4	7.1	83.83	-381.7	152.6	376.9	368.3	8.56	44.010		
1,900.0	1,889.2	1,834.4	1,778.8	4.6	7.7	83.47	-408.3	166.1	403.1	394.0	9.10	44.312		
2,000.0	1,988.4	1,930.9	1,870.5	4.9	8.2	83.15	-435.0	179.6	429.4	419.7	9.63	44.584		
2,100.0	2,087.7	2,027.4	1,962.2	5.2	8.8	82.88	-461.6	193.1	455.6	445.5	10.16	44.830		
2,200.0	2,186.9	2,123.8	2,054.0	5.5	9.3	82.63	-488.2	206.5	481.9	471.2	10.70	45.054		
2,300.0	2,286.2	2,220.3	2,145.7	5.7	9.9	82.40	-514.9	220.0	508.2	496.9	11.23	45.258		
2,400.0	2,385.4	2,316.8	2,237.4	6.0	10.4	82.20	-541.5	233.5	534.5	522.7	11.76	45.445		
2,500.0	2,484.7	2,413.2	2,329.2	6.3	11.0	82.02	-568.1	247.0	560.8	548.5	12.29	45.617		
2,600.0	2,584.0	2,509.7	2,420.9	6.6	11.5	81.86	-594.7	260.5	587.1	574.2	12.82	45.775		
2,700.0	2,683.2	2,606.2	2,512.6	6.8	12.1	81.70	-621.4	274.0	613.4	600.0	13.36	45.922		
2,800.0	2,782.5	2,702.6	2,604.4	7.1	12.6	81.57	-648.0	287.4	639.7	625.8	13.89	46.058		
2,900.0	2,881.7	2,799.1	2,696.1	7.4	13.2	81.44	-674.6	300.9	666.0	651.6	14.42	46.185		
3,000.0	2,981.0	2,895.6	2,787.8	7.7	13.7	81.32	-701.2	314.4	692.3	677.4	14.95	46.303		
3,100.0	3,080.2	2,992.0	2,879.6	7.9	14.3	81.21	-727.9	327.9	718.6	703.1	15.48	46.414		
3,200.0	3,179.5	3,088.5	2,971.3	8.2	14.8	81.11	-754.5	341.4	744.9	728.9	16.01	46.517		
3,300.0	3,278.7	3,185.0	3,063.0	8.5	15.4	81.01	-781.1	354.9	771.3	754.7	16.55	46.615		
3,400.0	3,378.0	3,281.4	3,154.8	8.8	15.9	80.92	-807.8	368.4	797.6	780.5	17.08	46.706		
3,500.0	3,477.2	3,377.9	3,246.5	9.1	16.5	80.84	-834.4	381.8	823.9	806.3	17.61	46.792		
3,600.0	3,576.5	3,474.4	3,338.2	9.3	17.0	80.76	-861.0	395.3	850.2	832.1	18.14	46.874		
3,700.0	3,675.7	3,570.8	3,429.9	9.6	17.6	80.69	-887.6	408.8	876.6	857.9	18.67	46.951		
3,800.0	3,775.0	3,667.3	3,521.7	9.9	18.2	80.62	-914.3	422.3	902.9	883.7	19.20	47.024		
3,900.0	3,874.2	3,763.8	3,613.4	10.2	18.7	80.56	-940.9	435.8	929.2	909.5	19.73	47.093		
4,000.0	3,973.5	3,860.2	3,705.1	10.4	19.3	80.49	-967.5	449.3	955.6	935.3	20.26	47.158		
4,100.0	4,072.7	3,956.7	3,796.9	10.7	19.8	80.44	-994.2	462.8	981.9	961.1	20.79	47.221		
4,200.0	4,172.0	4,053.2	3,888.6	11.0	20.4	80.38	-1,020.8	476.2	1,008.2	986.9	21.32	47.280		
4,300.0	4,271.2	4,149.6	3,980.3	11.3	20.9	80.33	-1,047.4	489.7	1,034.6	1,012.7	21.86	47.337		
4,400.0	4,370.5	4,246.1	4,072.1	11.5	21.5	80.28	-1,074.0	503.2	1,060.9	1,038.5	22.39	47.391		
4,500.0	4,469.7	4,342.6	4,163.8	11.8	22.0	80.23	-1,100.7	516.7	1,087.2	1,064.3	22.92	47.442		
4,600.0	4,569.0	4,439.0	4,255.5	12.1	22.6	80.19	-1,127.3	530.2	1,113.6	1,090.1	23.45	47.492		
4,700.0	4,668.2	4,535.5	4,347.3	12.4	23.1	80.14	-1,153.9	543.7	1,139.9	1,115.9	23.98	47.539		
4,800.0	4,767.5	4,632.0	4,439.0	12.6	23.7	80.10	-1,180.5	557.2	1,166.2	1,141.7	24.51	47.584		
4,900.0	4,866.7	4,728.4	4,530.7	12.9	24.2	80.06	-1,207.2	570.6	1,192.6	1,167.5	25.04	47.628		

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 16-9C
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 16-9C	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	-166.56	-57.9	-13.8	59.5					
100.0	100.0	100.0	100.0	0.1	0.1	-166.56	-57.9	-13.8	59.5	59.3	0.27	218.692		
200.0	200.0	200.0	200.0	0.3	0.3	-166.56	-57.9	-13.8	59.5	58.9	0.62	95.832 CC, ES		
300.0	300.0	296.9	296.9	0.5	0.5	-166.18	-60.2	-14.8	62.0	61.1	0.97	63.790		
400.0	400.0	393.3	392.9	0.7	0.7	99.98	-66.9	-17.7	70.0	68.7	1.31	53.224		
500.0	499.6	488.1	487.0	0.9	1.0	105.53	-77.9	-22.3	84.3	82.6	1.69	49.935 SF		
600.0	598.9	580.7	578.1	1.1	1.3	111.36	-92.7	-28.7	105.6	103.5	2.08	50.682		
700.0	698.2	671.1	666.4	1.4	1.7	115.11	-111.1	-36.5	132.3	129.8	2.49	53.176		
800.0	797.4	759.2	751.2	1.6	2.1	117.26	-132.7	-45.7	163.8	160.9	2.90	56.445		
900.0	896.7	849.4	837.2	1.9	2.6	118.54	-157.9	-56.4	199.0	195.6	3.33	59.762		
1,000.0	995.9	942.8	926.1	2.2	3.1	119.44	-184.3	-67.7	234.6	230.8	3.77	62.221		
1,100.0	1,095.2	1,036.2	1,015.0	2.4	3.6	120.11	-210.7	-78.9	270.3	266.0	4.22	64.086		
1,200.0	1,194.4	1,129.6	1,103.8	2.7	4.2	120.62	-237.1	-90.1	305.9	301.3	4.67	65.540		
1,300.0	1,293.7	1,223.0	1,192.7	3.0	4.7	121.03	-263.5	-101.4	341.6	336.5	5.12	66.700		
1,400.0	1,392.9	1,316.4	1,281.6	3.3	5.2	121.35	-289.9	-112.6	377.3	371.8	5.58	67.644		
1,500.0	1,492.2	1,409.8	1,370.4	3.5	5.7	121.63	-316.3	-123.9	413.1	407.0	6.04	68.425		
1,600.0	1,591.4	1,503.1	1,459.3	3.8	6.3	121.85	-342.7	-135.1	448.8	442.3	6.50	69.081		
1,700.0	1,690.7	1,596.5	1,548.2	4.1	6.8	122.05	-369.1	-146.4	484.5	477.6	6.96	69.639		
1,800.0	1,789.9	1,689.9	1,637.0	4.4	7.3	122.22	-395.5	-157.6	520.3	512.8	7.42	70.118		
1,900.0	1,889.2	1,783.3	1,725.9	4.6	7.8	122.36	-421.9	-168.9	556.0	548.1	7.88	70.535		
2,000.0	1,988.4	1,876.7	1,814.8	4.9	8.4	122.49	-448.4	-180.1	591.8	583.4	8.35	70.899		
2,100.0	2,087.7	1,970.1	1,903.6	5.2	8.9	122.61	-474.8	-191.3	627.5	618.7	8.81	71.221		
2,200.0	2,186.9	2,063.5	1,992.5	5.5	9.4	122.71	-501.2	-202.6	663.2	654.0	9.28	71.508		
2,300.0	2,286.2	2,156.8	2,081.4	5.7	10.0	122.80	-527.6	-213.8	699.0	689.3	9.74	71.764		
2,400.0	2,385.4	2,250.2	2,170.2	6.0	10.5	122.88	-554.0	-225.1	734.7	724.5	10.21	71.994		
2,500.0	2,484.7	2,343.6	2,259.1	6.3	11.0	122.96	-580.4	-236.3	770.5	759.8	10.67	72.202		
2,600.0	2,584.0	2,437.0	2,348.0	6.6	11.5	123.02	-606.8	-247.6	806.2	795.1	11.14	72.391		
2,700.0	2,683.2	2,530.4	2,436.8	6.8	12.1	123.09	-633.2	-258.8	842.0	830.4	11.60	72.564		
2,800.0	2,782.5	2,623.8	2,525.7	7.1	12.6	123.14	-659.6	-270.1	877.8	865.7	12.07	72.721		
2,900.0	2,881.7	2,717.2	2,614.6	7.4	13.1	123.20	-686.0	-281.3	913.5	901.0	12.54	72.867		
3,000.0	2,981.0	2,810.6	2,703.4	7.7	13.7	123.24	-712.4	-292.5	949.3	936.3	13.00	73.000		
3,100.0	3,080.2	2,903.9	2,792.3	7.9	14.2	123.29	-738.8	-303.8	985.0	971.6	13.47	73.124		
3,200.0	3,179.5	2,997.3	2,881.2	8.2	14.7	123.33	-765.2	-315.0	1,020.8	1,006.8	13.94	73.239		
3,300.0	3,278.7	3,090.7	2,970.0	8.5	15.3	123.37	-791.6	-326.3	1,056.5	1,042.1	14.40	73.345		
3,400.0	3,378.0	3,184.1	3,058.9	8.8	15.8	123.41	-818.0	-337.5	1,092.3	1,077.4	14.87	73.445		
3,500.0	3,477.2	3,277.5	3,147.8	9.1	16.3	123.44	-844.4	-348.8	1,128.1	1,112.7	15.34	73.537		
3,600.0	3,576.5	3,370.9	3,236.6	9.3	16.8	123.47	-870.8	-360.0	1,163.8	1,148.0	15.81	73.624		
3,700.0	3,675.7	3,464.3	3,325.5	9.6	17.4	123.50	-897.2	-371.3	1,199.6	1,183.3	16.28	73.706		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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				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	4.62	17.5	1.4	17.5						
100.0	100.0	100.0	100.0	0.1	0.1	4.62	17.5	1.4	17.5	17.3	0.27	64.406			
200.0	200.0	200.0	200.0	0.3	0.3	4.62	17.5	1.4	17.5	16.9	0.62	28.223 CC, ES			
300.0	300.0	299.3	299.2	0.5	0.5	10.08	19.1	3.4	19.4	18.5	0.97	19.976			
400.0	400.0	398.2	397.8	0.7	0.7	-80.94	24.0	9.3	25.3	24.0	1.34	18.900 SF			
500.0	499.6	496.4	495.3	0.9	1.0	-81.29	32.1	19.1	34.7	33.0	1.76	19.708			
600.0	598.9	593.9	591.1	1.1	1.3	-82.80	43.3	32.6	47.7	45.4	2.25	21.172			
700.0	698.2	692.0	686.9	1.4	1.7	-81.89	56.9	49.0	63.7	60.9	2.76	23.069			
800.0	797.4	790.7	783.1	1.6	2.1	-81.25	70.7	65.7	79.8	76.5	3.28	24.348			
900.0	896.7	889.4	879.4	1.9	2.5	-80.82	84.6	82.4	96.0	92.2	3.80	25.237			
1,000.0	895.9	888.1	875.7	2.2	3.0	-80.51	98.4	99.1	112.2	107.9	4.33	25.887			
1,100.0	1,095.2	1,086.7	1,071.9	2.4	3.4	-80.29	112.2	115.9	128.4	123.5	4.87	26.381			
1,200.0	1,194.4	1,185.4	1,168.2	2.7	3.8	-80.11	126.1	132.6	144.6	139.2	5.40	26.768			
1,300.0	1,293.7	1,284.1	1,264.5	3.0	4.2	-79.97	139.9	149.3	160.8	154.8	5.94	27.080			
1,400.0	1,392.9	1,382.8	1,360.7	3.3	4.6	-79.85	153.7	166.0	176.9	170.5	6.47	27.336			
1,500.0	1,492.2	1,481.5	1,457.0	3.5	5.0	-79.76	167.6	182.7	193.1	186.1	7.01	27.550			
1,600.0	1,591.4	1,580.1	1,553.3	3.8	5.5	-79.68	181.4	199.4	209.3	201.8	7.55	27.730			
1,700.0	1,690.7	1,678.8	1,649.5	4.1	5.9	-79.61	195.2	216.1	225.5	217.4	8.09	27.886			
1,800.0	1,789.9	1,777.5	1,745.8	4.4	6.3	-79.55	209.1	232.8	241.7	233.1	8.63	28.020			
1,900.0	1,889.2	1,876.2	1,842.1	4.6	6.7	-79.50	222.9	249.5	257.9	248.7	9.17	28.138			
2,000.0	1,988.4	1,974.9	1,938.3	4.9	7.1	-79.45	236.7	266.2	274.1	264.4	9.71	28.242			
2,100.0	2,087.7	2,073.5	2,034.6	5.2	7.6	-79.41	250.6	282.9	290.3	280.0	10.24	28.334			
2,200.0	2,186.9	2,172.2	2,130.9	5.5	8.0	-79.37	264.4	299.6	306.5	295.7	10.79	28.416			
2,300.0	2,286.2	2,270.9	2,227.1	5.7	8.4	-79.34	278.2	316.3	322.7	311.3	11.33	28.491			
2,400.0	2,385.4	2,369.6	2,323.4	6.0	8.8	-79.31	292.1	333.0	338.9	327.0	11.87	28.558			
2,500.0	2,484.7	2,468.3	2,419.7	6.3	9.2	-79.28	305.9	349.7	355.0	342.6	12.41	28.619			
2,600.0	2,584.0	2,566.9	2,515.9	6.6	9.7	-79.26	319.7	366.4	371.2	358.3	12.95	28.674			
2,700.0	2,683.2	2,665.6	2,612.2	6.8	10.1	-79.23	333.6	383.2	387.4	373.9	13.49	28.725			
2,800.0	2,782.5	2,764.3	2,708.5	7.1	10.5	-79.21	347.4	399.9	403.6	389.6	14.03	28.772			
2,900.0	2,881.7	2,863.0	2,804.7	7.4	10.9	-79.19	361.2	416.6	419.8	405.2	14.57	28.815			
3,000.0	2,981.0	2,961.7	2,901.0	7.7	11.3	-79.17	375.1	433.3	436.0	420.9	15.11	28.855			
3,100.0	3,080.2	3,060.3	2,997.3	7.9	11.8	-79.16	388.9	450.0	452.2	436.5	15.65	28.893			
3,200.0	3,179.5	3,159.0	3,093.5	8.2	12.2	-79.14	402.7	466.7	468.4	452.2	16.19	28.927			
3,300.0	3,278.7	3,257.7	3,189.8	8.5	12.6	-79.13	416.6	483.4	484.6	467.9	16.73	28.959			
3,400.0	3,378.0	3,356.4	3,286.1	8.8	13.0	-79.11	430.4	500.1	500.8	483.5	17.27	28.990			
3,500.0	3,477.2	3,455.1	3,382.4	9.1	13.4	-79.10	444.2	516.8	517.0	499.2	17.82	29.018			
3,600.0	3,576.5	3,553.7	3,478.6	9.3	13.9	-79.09	458.1	533.5	533.2	514.8	18.36	29.044			
3,700.0	3,675.7	3,652.4	3,574.9	9.6	14.3	-79.08	471.9	550.2	549.4	530.5	18.90	29.069			
3,800.0	3,775.0	3,751.1	3,671.2	9.9	14.7	-79.07	485.7	566.9	565.5	546.1	19.44	29.093			
3,900.0	3,874.2	3,849.8	3,767.4	10.2	15.1	-79.06	499.6	583.6	581.7	561.8	19.98	29.115			
4,000.0	3,973.5	3,948.5	3,863.7	10.4	15.5	-79.05	513.4	600.3	597.9	577.4	20.52	29.136			
4,100.0	4,072.7	4,047.1	3,960.0	10.7	16.0	-79.04	527.2	617.0	614.1	593.1	21.06	29.156			
4,200.0	4,172.0	4,145.8	4,056.2	11.0	16.4	-79.03	541.1	633.7	630.3	608.7	21.60	29.175			
4,300.0	4,271.2	4,244.5	4,152.5	11.3	16.8	-79.02	554.9	650.4	646.5	624.4	22.15	29.193			
4,400.0	4,370.5	4,343.2	4,248.8	11.5	17.2	-79.02	568.7	667.2	662.7	640.0	22.69	29.210			
4,500.0	4,469.7	4,441.9	4,345.0	11.8	17.6	-79.01	582.6	683.9	678.9	655.7	23.23	29.226			
4,600.0	4,569.0	4,540.5	4,441.3	12.1	18.1	-79.00	596.4	700.6	695.1	671.3	23.77	29.241			
4,700.0	4,668.2	4,639.2	4,537.6	12.4	18.5	-79.00	610.2	717.3	711.3	687.0	24.31	29.256			
4,800.0	4,767.5	4,737.9	4,633.8	12.6	18.9	-78.99	624.1	734.0	727.5	702.6	24.85	29.270			
4,900.0	4,866.7	4,836.6	4,730.1	12.9	19.3	-78.98	637.9	750.7	743.7	718.3	25.40	29.284			
5,000.0	4,966.0	4,935.3	4,826.4	13.2	19.7	-78.98	651.7	767.4	759.9	733.9	25.94	29.297			
5,100.0	5,065.2	5,033.9	4,922.6	13.5	20.2	-78.97	665.6	784.1	776.1	749.6	26.48	29.309			

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 16-9C
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 16-9C	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				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		
5,200.0	5,164.5	5,132.6	5,018.9	13.8	20.6	-78.97	679.4	800.8	792.2	765.2	27.02	29.321		
5,300.0	5,263.7	5,231.3	5,115.2	14.0	21.0	-78.96	693.2	817.5	808.4	780.9	27.56	29.332		
5,400.0	5,363.0	5,330.0	5,211.4	14.3	21.4	-78.96	707.1	834.2	824.6	796.5	28.10	29.343		
5,500.0	5,462.2	5,428.7	5,307.7	14.6	21.8	-78.95	720.9	850.9	840.8	812.2	28.64	29.354		
5,600.0	5,561.5	5,527.3	5,404.0	14.9	22.3	-78.95	734.7	867.6	857.0	827.8	29.19	29.364		
5,700.0	5,660.7	5,626.0	5,500.2	15.1	22.7	-78.94	748.6	884.3	873.2	843.5	29.73	29.373		
5,800.0	5,760.0	5,724.7	5,596.5	15.4	23.1	-78.94	762.4	901.0	889.4	859.1	30.27	29.383		
5,900.0	5,859.2	5,823.4	5,692.8	15.7	23.5	-78.93	776.2	917.7	905.6	874.8	30.81	29.392		
6,000.0	5,958.5	5,922.1	5,789.0	16.0	23.9	-78.93	790.1	934.5	921.8	890.4	31.35	29.401		
6,100.0	6,057.8	6,020.7	5,885.3	16.2	24.4	-78.93	803.9	951.2	938.0	906.1	31.89	29.409		
6,200.0	6,157.0	6,119.4	5,981.6	16.5	24.8	-78.92	817.7	967.9	954.2	921.7	32.44	29.417		
6,300.0	6,256.3	6,218.1	6,077.8	16.8	25.2	-78.92	831.6	984.6	970.4	937.4	32.98	29.425		
6,400.0	6,355.5	6,316.8	6,174.1	17.1	25.6	-78.92	845.4	1,001.3	986.6	953.0	33.52	29.433		
6,500.0	6,454.8	6,415.5	6,270.4	17.3	26.1	-78.91	859.2	1,018.0	1,002.8	968.7	34.06	29.440		
6,600.0	6,554.0	6,514.1	6,366.6	17.6	26.5	-78.91	873.1	1,034.7	1,018.9	984.3	34.60	29.447		
6,700.0	6,653.3	6,612.8	6,462.9	17.9	26.9	-78.92	886.9	1,051.4	1,035.1	1,000.0	35.15	29.452		
6,800.0	6,752.7	6,711.4	6,559.1	18.1	27.3	-79.14	900.7	1,068.1	1,051.7	1,016.0	35.70	29.461		
6,900.0	6,852.5	6,809.8	6,655.0	18.3	27.7	-79.20	914.5	1,084.7	1,068.9	1,032.7	36.15	29.566		
7,000.0	6,952.4	6,907.8	6,750.7	18.4	28.2	-79.10	928.3	1,101.3	1,086.8	1,050.3	36.52	29.761		
7,100.0	7,052.4	7,005.4	6,845.9	18.6	28.6	17.95	941.9	1,117.9	1,105.3	1,068.6	36.76	30.068		
7,200.0	7,152.4	7,103.0	6,941.0	18.7	29.0	18.55	955.6	1,134.4	1,124.1	1,087.1	36.95	30.424		
7,300.0	7,252.4	7,219.2	7,054.6	18.8	29.5	19.22	971.6	1,153.7	1,142.6	1,105.5	37.14	30.762		
7,400.0	7,352.4	7,369.8	7,202.8	18.9	29.9	19.91	988.4	1,174.0	1,157.8	1,120.4	37.37	30.983		
7,500.0	7,452.4	7,522.9	7,354.7	19.0	30.3	20.37	1,000.5	1,188.5	1,168.4	1,130.8	37.62	31.063		
7,600.0	7,552.4	7,677.5	7,509.0	19.2	30.6	20.64	1,007.3	1,196.8	1,174.5	1,136.6	37.88	31.001		
7,700.0	7,652.4	7,821.0	7,652.4	19.3	30.7	20.70	1,009.0	1,198.8	1,175.9	1,137.8	38.17	30.810		
7,800.0	7,752.4	7,921.0	7,752.4	19.4	30.8	20.70	1,009.0	1,198.8	1,175.9	1,137.5	38.42	30.611		
7,900.0	7,852.4	8,021.0	7,852.4	19.5	30.8	20.70	1,009.0	1,198.8	1,175.9	1,137.3	38.66	30.413		
8,000.0	7,952.4	8,121.0	7,952.4	19.6	30.9	20.70	1,009.0	1,198.8	1,175.9	1,137.0	38.92	30.217		
8,100.0	8,052.4	8,221.0	8,052.4	19.8	31.0	20.70	1,009.0	1,198.8	1,175.9	1,136.8	39.17	30.022		
8,200.0	8,152.4	8,321.0	8,152.4	19.9	31.1	20.70	1,009.0	1,198.8	1,175.9	1,136.5	39.42	29.829		
8,300.0	8,252.4	8,421.0	8,252.4	20.0	31.2	20.70	1,009.0	1,198.8	1,175.9	1,136.2	39.68	29.637		
8,400.0	8,352.4	8,521.0	8,352.4	20.1	31.2	20.70	1,009.0	1,198.8	1,175.9	1,136.0	39.93	29.447		
8,500.0	8,452.4	8,621.0	8,452.4	20.3	31.3	20.70	1,009.0	1,198.8	1,175.9	1,135.7	40.19	29.257		
8,600.0	8,552.4	8,721.0	8,552.4	20.4	31.4	20.70	1,009.0	1,198.8	1,175.9	1,135.5	40.45	29.070		
8,700.0	8,652.4	8,821.0	8,652.4	20.5	31.5	20.70	1,009.0	1,198.8	1,175.9	1,135.2	40.71	28.883		
8,800.0	8,752.4	8,921.0	8,752.4	20.7	31.6	20.70	1,009.0	1,198.8	1,175.9	1,134.9	40.97	28.699		
8,900.0	8,852.4	9,021.0	8,852.4	20.8	31.7	20.70	1,009.0	1,198.8	1,175.9	1,134.7	41.24	28.515		
9,000.0	8,952.4	9,121.0	8,952.4	20.9	31.8	20.70	1,009.0	1,198.8	1,175.9	1,134.4	41.50	28.333		
9,100.0	9,052.4	9,221.0	9,052.4	21.0	31.8	20.70	1,009.0	1,198.8	1,175.9	1,134.2	41.77	28.153		
9,200.0	9,152.4	9,321.0	9,152.4	21.2	31.9	20.70	1,009.0	1,198.8	1,175.9	1,133.9	42.04	27.974		
9,300.0	9,252.4	9,421.0	9,252.4	21.3	32.0	20.70	1,009.0	1,198.8	1,175.9	1,133.6	42.30	27.797		
9,400.0	9,352.4	9,521.0	9,352.4	21.4	32.1	20.70	1,009.0	1,198.8	1,175.9	1,133.3	42.57	27.621		
9,500.0	9,452.4	9,621.0	9,452.4	21.6	32.2	20.70	1,009.0	1,198.8	1,175.9	1,133.1	42.84	27.446		
9,600.0	9,552.4	9,721.0	9,552.4	21.7	32.3	20.70	1,009.0	1,198.8	1,175.9	1,132.8	43.12	27.273		
9,700.0	9,652.4	9,821.0	9,652.4	21.8	32.4	20.70	1,009.0	1,198.8	1,175.9	1,132.5	43.39	27.101		
9,800.0	9,752.4	9,921.0	9,752.4	22.0	32.5	20.70	1,009.0	1,198.8	1,175.9	1,132.3	43.66	26.931		
9,900.0	9,852.4	10,021.0	9,852.4	22.1	32.6	20.70	1,009.0	1,198.8	1,175.9	1,132.0	43.94	26.763		
10,000.0	9,952.4	10,121.0	9,952.4	22.3	32.7	20.70	1,009.0	1,198.8	1,175.9	1,131.7	44.21	26.596		
10,084.6	10,037.0	10,205.6	10,037.0	22.4	32.7	20.70	1,009.0	1,198.8	1,175.9	1,131.5	44.45	26.455		

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

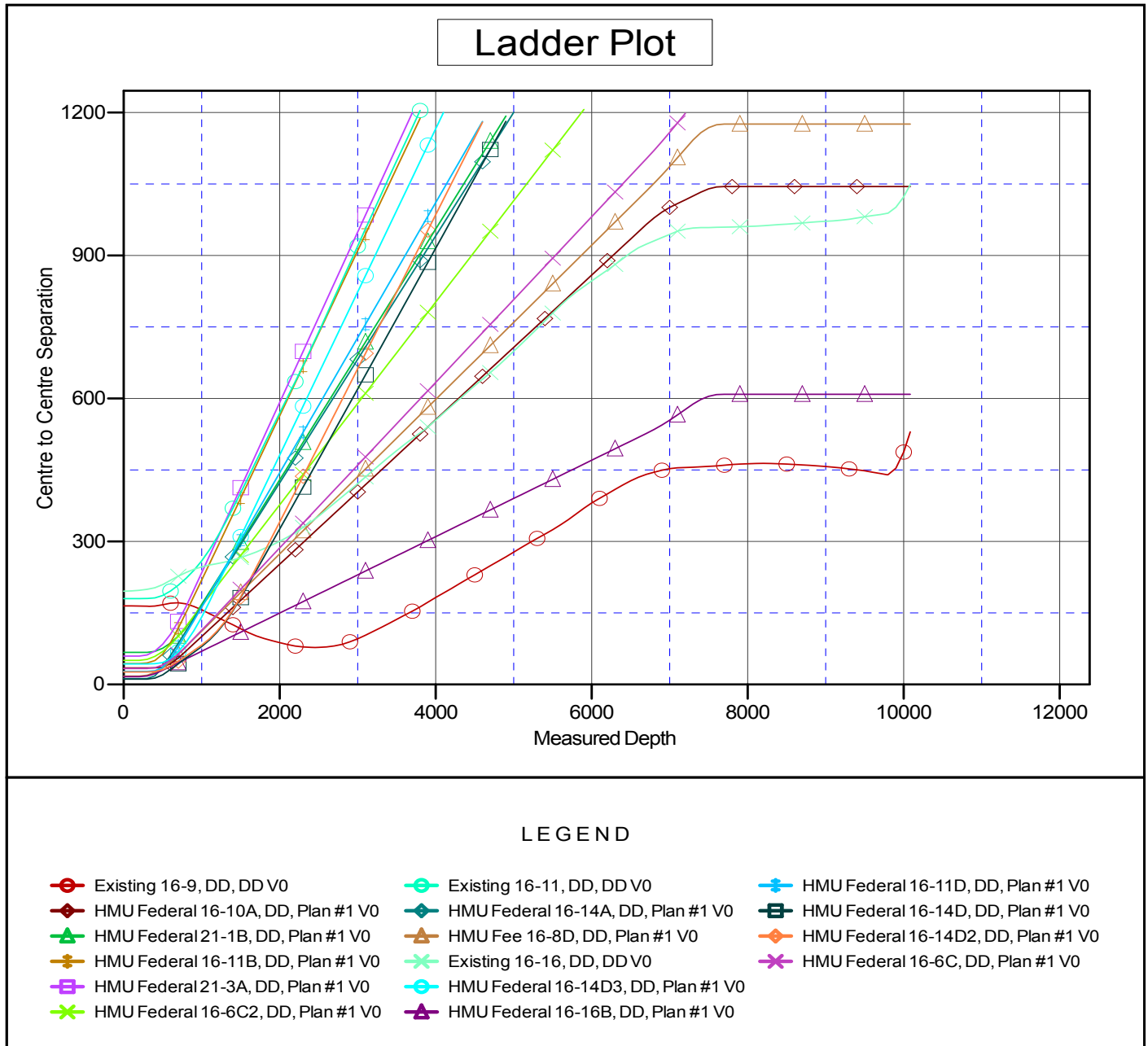
Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well HMU Federal 16-9C
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 16-9C	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 16-9C
 Coordinate System is US State Plane 1983, Colorado Central Zone
 Grid Convergence at Surface is: -1.44°



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