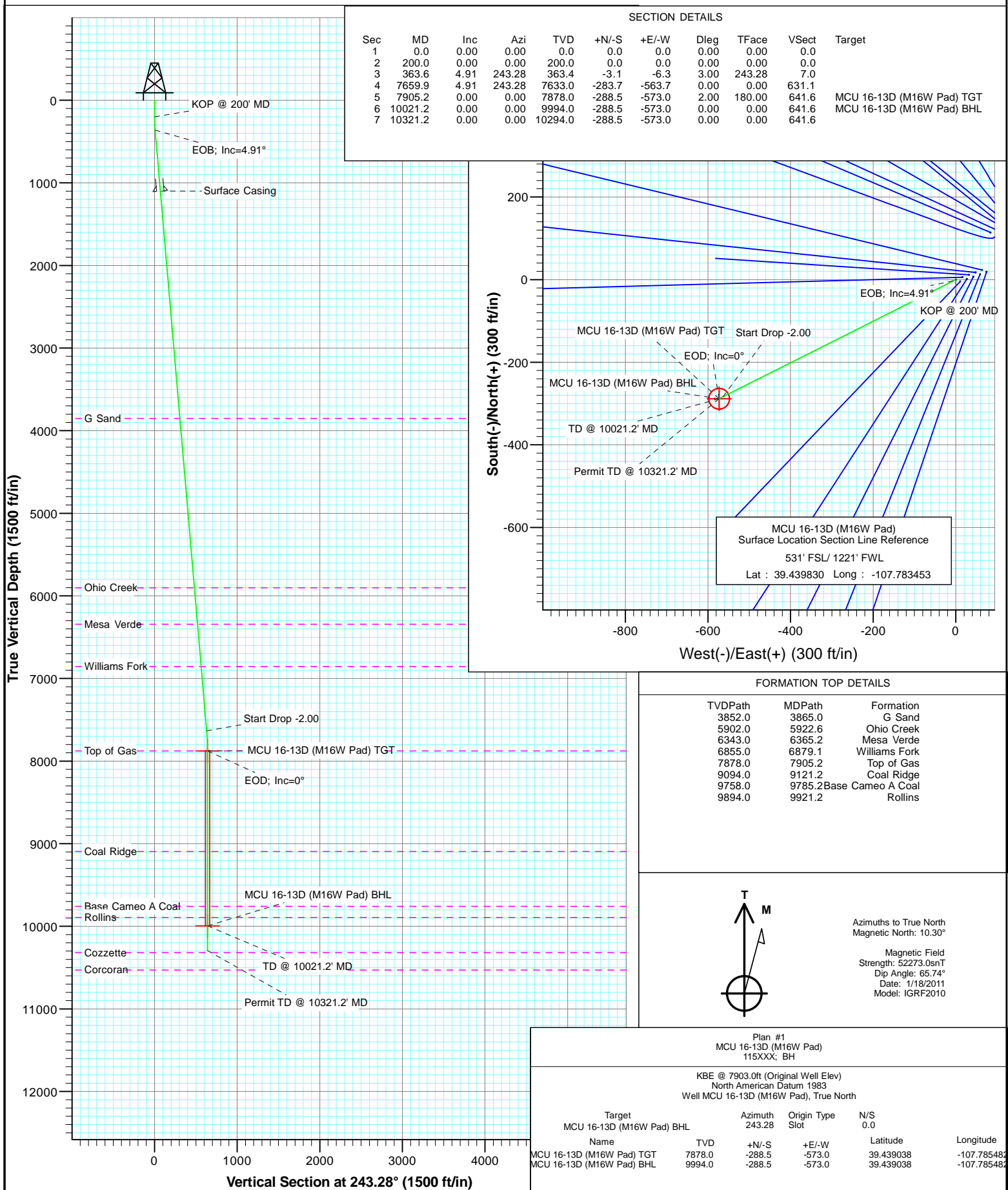


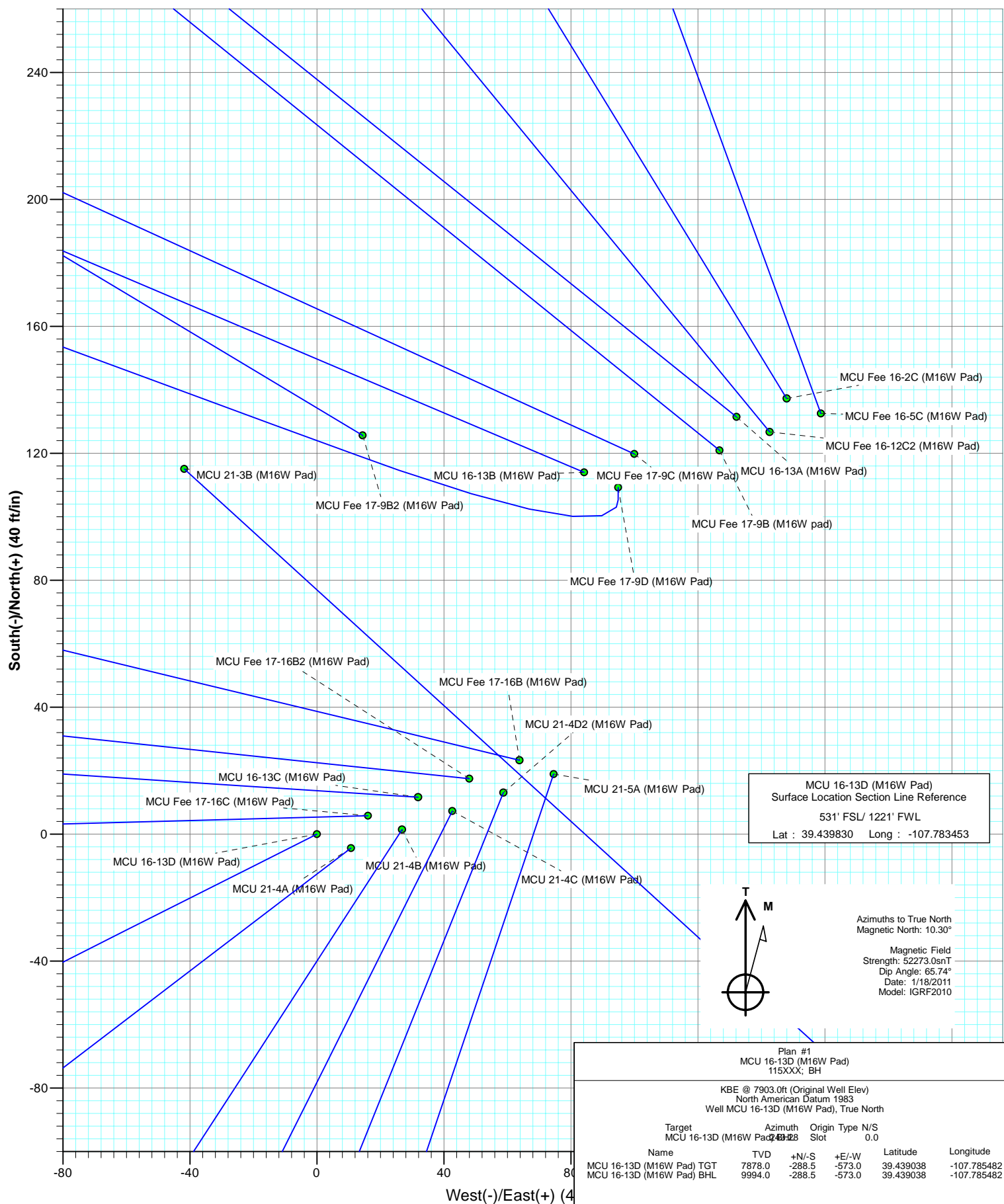


Project: Mamm Creek
Site: SWSW S16-T7S-R93W (M16W Pad)
Well: MCU 16-13D (M16W Pad)
Wellbore: DD
Plan: Plan #1



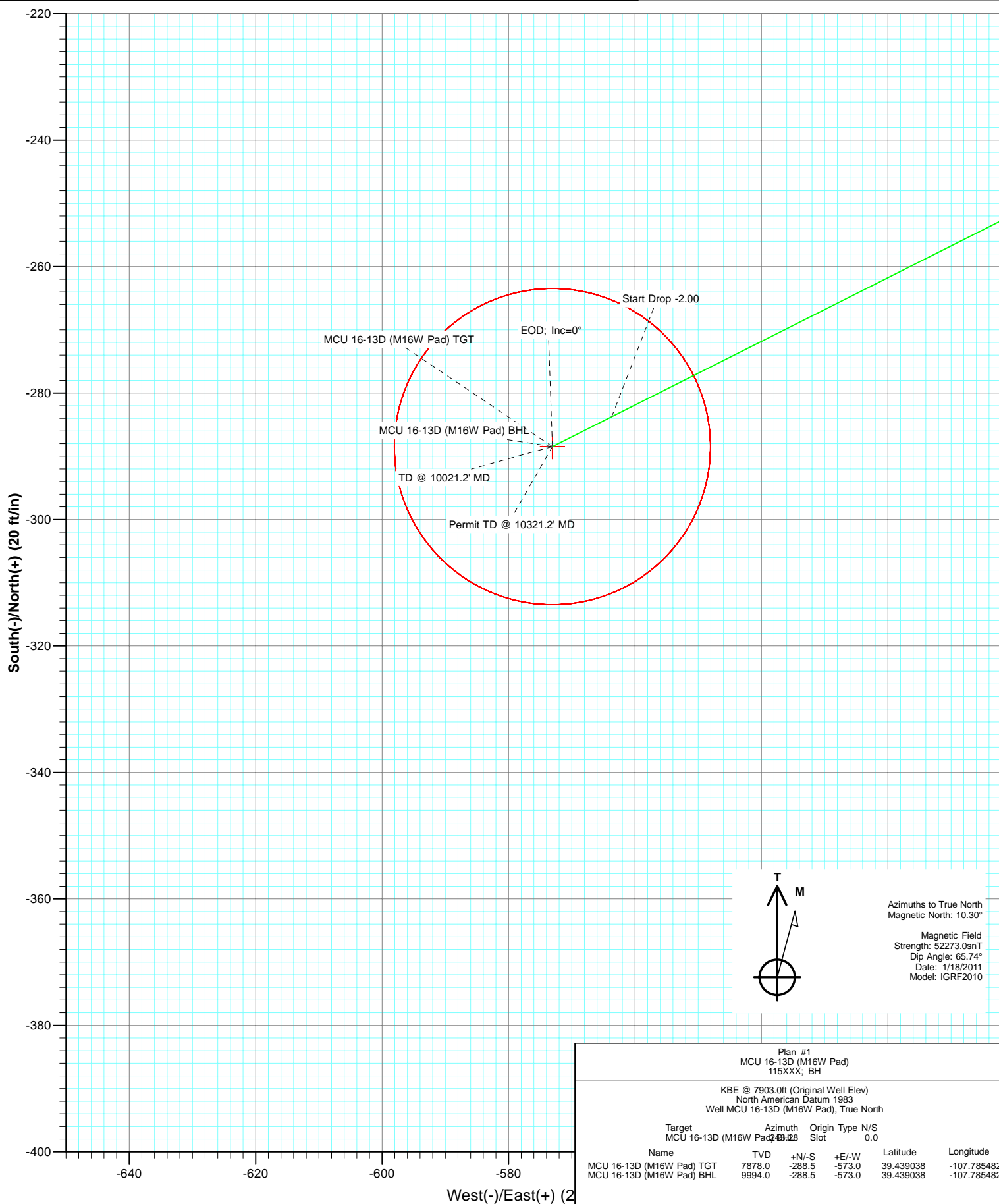


Project: Mamm Creek
Site: SWSW S16-T7S-R93W (M16W Pad)
Well: MCU 16-13D (M16W Pad)
Wellbore: DD
Plan: Plan #1





Project: Mamm Creek
 Site: SWSW S16-T7S-R93W (M16W Pad)
 Well: MCU 16-13D (M16W Pad)
 Wellbore: DD
 Plan: Plan #1



Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	SWSW S16-T7S-R93W (M16W Pad)	North Reference:	True
Well:	MCU 16-13D (M16W Pad)	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		SWSW S16-T7S-R93W (M16W Pad)			
Site Position:		Northing:	1,593,196.17 ft	Latitude:	39.439834
From:	Lat/Long	Easting:	2,355,193.71 ft	Longitude:	-107.783358
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.44 °

Well	MCU 16-13D (M16W Pad)					
Well Position	+N/-S	0.0 ft	Northing:	1,593,195.38 ft	Latitude:	39.439830
	+E/-W	0.0 ft	Easting:	2,355,166.85 ft	Longitude:	-107.783453
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,881.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/18/2011	10.30	65.74	52,273

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	243.28	

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
363.6	4.91	243.28	363.4	-3.1	-6.3	3.00	3.00	0.00	243.28	
7,659.9	4.91	243.28	7,633.0	-283.7	-563.7	0.00	0.00	0.00	0.00	
7,905.2	0.00	0.00	7,878.0	-288.5	-573.0	2.00	-2.00	0.00	180.00	MCU 16-13D (M16W)
10,021.2	0.00	0.00	9,994.0	-288.5	-573.0	0.00	0.00	0.00	0.00	MCU 16-13D (M16W)
10,321.2	0.00	0.00	10,294.0	-288.5	-573.0	0.00	0.00	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	SWSW S16-T7S-R93W (M16W Pad)	North Reference:	True
Well:	MCU 16-13D (M16W Pad)	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	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200' MD
300.0	3.00	243.28	300.0	-1.2	-2.3	2.6	3.00	3.00	
363.6	4.91	243.28	363.4	-3.1	-6.3	7.0	3.00	3.00	EOB; Inc=4.91°
400.0	4.91	243.28	399.7	-4.5	-9.0	10.1	0.00	0.00	
500.0	4.91	243.28	499.3	-8.4	-16.7	18.7	0.00	0.00	
600.0	4.91	243.28	598.9	-12.2	-24.3	27.2	0.00	0.00	
700.0	4.91	243.28	698.6	-16.1	-32.0	35.8	0.00	0.00	
800.0	4.91	243.28	798.2	-19.9	-39.6	44.3	0.00	0.00	
900.0	4.91	243.28	897.8	-23.8	-47.2	52.9	0.00	0.00	
1,000.0	4.91	243.28	997.5	-27.6	-54.9	61.4	0.00	0.00	
1,100.0	4.91	243.28	1,097.1	-31.5	-62.5	70.0	0.00	0.00	
1,101.9	4.91	243.28	1,099.0	-31.5	-62.7	70.2	0.00	0.00	Surface Casing
1,200.0	4.91	243.28	1,196.7	-35.3	-70.2	78.5	0.00	0.00	
1,300.0	4.91	243.28	1,296.4	-39.2	-77.8	87.1	0.00	0.00	
1,400.0	4.91	243.28	1,396.0	-43.0	-85.4	95.6	0.00	0.00	
1,500.0	4.91	243.28	1,495.6	-46.9	-93.1	104.2	0.00	0.00	
1,600.0	4.91	243.28	1,595.3	-50.7	-100.7	112.8	0.00	0.00	
1,700.0	4.91	243.28	1,694.9	-54.5	-108.4	121.3	0.00	0.00	
1,800.0	4.91	243.28	1,794.5	-58.4	-116.0	129.9	0.00	0.00	
1,900.0	4.91	243.28	1,894.2	-62.2	-123.6	138.4	0.00	0.00	
2,000.0	4.91	243.28	1,993.8	-66.1	-131.3	147.0	0.00	0.00	
2,100.0	4.91	243.28	2,093.4	-69.9	-138.9	155.5	0.00	0.00	
2,200.0	4.91	243.28	2,193.1	-73.8	-146.6	164.1	0.00	0.00	
2,300.0	4.91	243.28	2,292.7	-77.6	-154.2	172.6	0.00	0.00	
2,400.0	4.91	243.28	2,392.3	-81.5	-161.8	181.2	0.00	0.00	
2,500.0	4.91	243.28	2,492.0	-85.3	-169.5	189.7	0.00	0.00	
2,600.0	4.91	243.28	2,591.6	-89.2	-177.1	198.3	0.00	0.00	
2,700.0	4.91	243.28	2,691.2	-93.0	-184.7	206.8	0.00	0.00	
2,800.0	4.91	243.28	2,790.9	-96.8	-192.4	215.4	0.00	0.00	
2,900.0	4.91	243.28	2,890.5	-100.7	-200.0	223.9	0.00	0.00	
3,000.0	4.91	243.28	2,990.1	-104.5	-207.7	232.5	0.00	0.00	
3,100.0	4.91	243.28	3,089.8	-108.4	-215.3	241.0	0.00	0.00	
3,200.0	4.91	243.28	3,189.4	-112.2	-222.9	249.6	0.00	0.00	
3,300.0	4.91	243.28	3,289.0	-116.1	-230.6	258.2	0.00	0.00	
3,400.0	4.91	243.28	3,388.7	-119.9	-238.2	266.7	0.00	0.00	
3,500.0	4.91	243.28	3,488.3	-123.8	-245.9	275.3	0.00	0.00	
3,600.0	4.91	243.28	3,587.9	-127.6	-253.5	283.8	0.00	0.00	
3,700.0	4.91	243.28	3,687.6	-131.5	-261.1	292.4	0.00	0.00	
3,800.0	4.91	243.28	3,787.2	-135.3	-268.8	300.9	0.00	0.00	
3,865.0	4.91	243.28	3,852.0	-137.8	-273.8	306.5	0.00	0.00	G Sand
3,900.0	4.91	243.28	3,886.8	-139.1	-276.4	309.5	0.00	0.00	
4,000.0	4.91	243.28	3,986.5	-143.0	-284.1	318.0	0.00	0.00	
4,100.0	4.91	243.28	4,086.1	-146.8	-291.7	326.6	0.00	0.00	
4,200.0	4.91	243.28	4,185.7	-150.7	-299.3	335.1	0.00	0.00	
4,300.0	4.91	243.28	4,285.4	-154.5	-307.0	343.7	0.00	0.00	
4,400.0	4.91	243.28	4,385.0	-158.4	-314.6	352.2	0.00	0.00	
4,500.0	4.91	243.28	4,484.6	-162.2	-322.3	360.8	0.00	0.00	
4,600.0	4.91	243.28	4,584.3	-166.1	-329.9	369.3	0.00	0.00	
4,700.0	4.91	243.28	4,683.9	-169.9	-337.5	377.9	0.00	0.00	
4,800.0	4.91	243.28	4,783.5	-173.8	-345.2	386.4	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	SWSW S16-T7S-R93W (M16W Pad)	North Reference:	True
Well:	MCU 16-13D (M16W Pad)	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
4,900.0	4.91	243.28	4,883.2	-177.6	-352.8	395.0	0.00	0.00	
5,000.0	4.91	243.28	4,982.8	-181.4	-360.5	403.6	0.00	0.00	
5,100.0	4.91	243.28	5,082.4	-185.3	-368.1	412.1	0.00	0.00	
5,200.0	4.91	243.28	5,182.1	-189.1	-375.7	420.7	0.00	0.00	
5,300.0	4.91	243.28	5,281.7	-193.0	-383.4	429.2	0.00	0.00	
5,400.0	4.91	243.28	5,381.3	-196.8	-391.0	437.8	0.00	0.00	
5,500.0	4.91	243.28	5,481.0	-200.7	-398.7	446.3	0.00	0.00	
5,600.0	4.91	243.28	5,580.6	-204.5	-406.3	454.9	0.00	0.00	
5,700.0	4.91	243.28	5,680.2	-208.4	-413.9	463.4	0.00	0.00	
5,800.0	4.91	243.28	5,779.9	-212.2	-421.6	472.0	0.00	0.00	
5,900.0	4.91	243.28	5,879.5	-216.1	-429.2	480.5	0.00	0.00	
5,922.6	4.91	243.28	5,902.0	-216.9	-430.9	482.5	0.00	0.00	Ohio Creek
6,000.0	4.91	243.28	5,979.1	-219.9	-436.9	489.1	0.00	0.00	
6,100.0	4.91	243.28	6,078.8	-223.7	-444.5	497.6	0.00	0.00	
6,200.0	4.91	243.28	6,178.4	-227.6	-452.1	506.2	0.00	0.00	
6,300.0	4.91	243.28	6,278.0	-231.4	-459.8	514.7	0.00	0.00	
6,365.2	4.91	243.28	6,343.0	-233.9	-464.8	520.3	0.00	0.00	Mesa Verde
6,400.0	4.91	243.28	6,377.7	-235.3	-467.4	523.3	0.00	0.00	
6,500.0	4.91	243.28	6,477.3	-239.1	-475.1	531.9	0.00	0.00	
6,600.0	4.91	243.28	6,576.9	-243.0	-482.7	540.4	0.00	0.00	
6,700.0	4.91	243.28	6,676.6	-246.8	-490.3	549.0	0.00	0.00	
6,800.0	4.91	243.28	6,776.2	-250.7	-498.0	557.5	0.00	0.00	
6,879.1	4.91	243.28	6,855.0	-253.7	-504.0	564.3	0.00	0.00	Williams Fork
6,900.0	4.91	243.28	6,875.8	-254.5	-505.6	566.1	0.00	0.00	
7,000.0	4.91	243.28	6,975.5	-258.4	-513.3	574.6	0.00	0.00	
7,100.0	4.91	243.28	7,075.1	-262.2	-520.9	583.2	0.00	0.00	
7,200.0	4.91	243.28	7,174.7	-266.1	-528.5	591.7	0.00	0.00	
7,300.0	4.91	243.28	7,274.4	-269.9	-536.2	600.3	0.00	0.00	
7,400.0	4.91	243.28	7,374.0	-273.7	-543.8	608.8	0.00	0.00	
7,500.0	4.91	243.28	7,473.6	-277.6	-551.5	617.4	0.00	0.00	
7,600.0	4.91	243.28	7,573.3	-281.4	-559.1	625.9	0.00	0.00	
7,659.9	4.91	243.28	7,633.0	-283.7	-563.7	631.1	0.00	0.00	Start Drop -2.00
7,700.0	4.10	243.28	7,672.9	-285.2	-566.5	634.2	2.00	-2.00	
7,800.0	2.10	243.28	7,772.8	-287.6	-571.3	639.6	2.00	-2.00	
7,900.0	0.10	243.28	7,872.8	-288.5	-573.0	641.6	2.00	-2.00	
7,905.2	0.00	0.00	7,878.0	-288.5	-573.0	641.6	2.00	-2.00	EOD; Inc=0° - Top of Gas - MCU 16-13D (M16W)
8,000.0	0.00	0.00	7,972.8	-288.5	-573.0	641.6	0.00	0.00	
8,100.0	0.00	0.00	8,072.8	-288.5	-573.0	641.6	0.00	0.00	
8,200.0	0.00	0.00	8,172.8	-288.5	-573.0	641.6	0.00	0.00	
8,300.0	0.00	0.00	8,272.8	-288.5	-573.0	641.6	0.00	0.00	
8,400.0	0.00	0.00	8,372.8	-288.5	-573.0	641.6	0.00	0.00	
8,500.0	0.00	0.00	8,472.8	-288.5	-573.0	641.6	0.00	0.00	
8,600.0	0.00	0.00	8,572.8	-288.5	-573.0	641.6	0.00	0.00	
8,700.0	0.00	0.00	8,672.8	-288.5	-573.0	641.6	0.00	0.00	
8,800.0	0.00	0.00	8,772.8	-288.5	-573.0	641.6	0.00	0.00	
8,900.0	0.00	0.00	8,872.8	-288.5	-573.0	641.6	0.00	0.00	
9,000.0	0.00	0.00	8,972.8	-288.5	-573.0	641.6	0.00	0.00	
9,100.0	0.00	0.00	9,072.8	-288.5	-573.0	641.6	0.00	0.00	
9,121.2	0.00	0.00	9,094.0	-288.5	-573.0	641.6	0.00	0.00	Coal Ridge
9,200.0	0.00	0.00	9,172.8	-288.5	-573.0	641.6	0.00	0.00	
9,300.0	0.00	0.00	9,272.8	-288.5	-573.0	641.6	0.00	0.00	
9,400.0	0.00	0.00	9,372.8	-288.5	-573.0	641.6	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	SWSW S16-T7S-R93W (M16W Pad)	North Reference:	True
Well:	MCU 16-13D (M16W Pad)	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
9,500.0	0.00	0.00	9,472.8	-288.5	-573.0	641.6	0.00	0.00	
9,600.0	0.00	0.00	9,572.8	-288.5	-573.0	641.6	0.00	0.00	
9,700.0	0.00	0.00	9,672.8	-288.5	-573.0	641.6	0.00	0.00	
9,785.2	0.00	0.00	9,758.0	-288.5	-573.0	641.6	0.00	0.00	Base Cameo A Coal
9,800.0	0.00	0.00	9,772.8	-288.5	-573.0	641.6	0.00	0.00	
9,900.0	0.00	0.00	9,872.8	-288.5	-573.0	641.6	0.00	0.00	
9,921.2	0.00	0.00	9,894.0	-288.5	-573.0	641.6	0.00	0.00	Rollins
10,000.0	0.00	0.00	9,972.8	-288.5	-573.0	641.6	0.00	0.00	
10,021.2	0.00	0.00	9,994.0	-288.5	-573.0	641.6	0.00	0.00	TD @ 10021.2' MD - MCU 16-13D (M16W Pad)
10,100.0	0.00	0.00	10,072.8	-288.5	-573.0	641.6	0.00	0.00	
10,200.0	0.00	0.00	10,172.8	-288.5	-573.0	641.6	0.00	0.00	
10,300.0	0.00	0.00	10,272.8	-288.5	-573.0	641.6	0.00	0.00	
10,321.2	0.00	0.00	10,294.0	-288.5	-573.0	641.6	0.00	0.00	Permit TD @ 10321.2' MD

Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
MCU 16-13D (M16W Pa - plan hits target center - Circle (radius 25.0)	0.00	0.00	9,994.0	-288.5	-573.0	1,592,921.41	2,354,586.74	39.439038	-107.785482
MCU 16-13D (M16W Pa - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,878.0	-288.5	-573.0	1,592,921.41	2,354,586.74	39.439038	-107.785482

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,101.9	1,099.0	Surface Casing	0.000	0.000	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,865.0	3,852.0	G Sand		0.00		
5,922.6	5,902.0	Ohio Creek		0.00		
6,365.2	6,343.0	Mesa Verde		0.00		
6,879.1	6,855.0	Williams Fork		0.00		
7,905.2	7,878.0	Top of Gas		0.00		
9,121.2	9,094.0	Coal Ridge		0.00		
9,785.2	9,758.0	Base Cameo A Coal		0.00		
9,921.2	9,894.0	Rollins		0.00		

Cathedral Energy Services

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Project:	Mamm Creek	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	SWSW S16-T7S-R93W (M16W Pad)	North Reference:	True
Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200' MD
363.6	363.4	-3.1	-6.3	EOB; Inc=4.91°
7,659.9	7,633.0	-283.7	-563.7	Start Drop -2.00
7,905.2	7,878.0	-288.5	-573.0	EOD; Inc=0°
10,021.2	9,994.0	-288.5	-573.0	TD @ 10021.2' MD
10,321.2	10,294.0	-288.5	-573.0	Permit TD @ 10321.2' MD

EnCana Oil & Gas (USA) Inc

Mamm Creek

SWSW S16-T7S-R93W (M16W Pad)

MCU 16-13D (M16W Pad)

DD

Plan #1

Anticollision Report

28 January, 2011

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 500.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	Systematic Ellipse
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program	Date	1/20/2011
From (ft)	To (ft)	Survey (Wellbore)
0.0	10,321.2	Plan #1 (DD)
		Tool Name
		MWD
		Description
		Geolink MWD

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth	Offset Measured Depth	Distance		Separation Factor	Warning
	(ft)	(ft)	Between Centres (ft)	Between Ellipses (ft)		
SWSW S16-T7S-R93W (M16W Pad)						
MCU 16-13A (M16W Pad) - DD - Plan #1	200.0	200.0	186.4	185.8	300.061	CC, ES
MCU 16-13A (M16W Pad) - DD - Plan #1	3,300.0	3,281.0	488.7	473.8	32.797	SF
MCU 16-13B (M16W Pad) - DD - Plan #1	100.0	100.0	141.7	141.4	520.458	CC
MCU 16-13B (M16W Pad) - DD - Plan #1	200.0	200.0	141.7	141.1	228.066	ES
MCU 16-13B (M16W Pad) - DD - Plan #1	5,300.0	5,287.9	499.5	475.9	21.168	SF
MCU 16-13C (M16W Pad) - DD - Plan #1	200.0	200.0	34.0	33.4	54.682	CC
MCU 16-13C (M16W Pad) - DD - Plan #1	300.0	301.6	34.2	33.2	35.067	ES
MCU 16-13C (M16W Pad) - DD - Plan #1	10,321.2	10,319.0	339.9	298.4	8.178	SF
MCU 21-3B (M16W Pad) - DD - Plan #1	200.0	200.0	159.7	159.1	257.013	CC, ES
MCU 21-3B (M16W Pad) - DD - Plan #1	1,500.0	1,455.2	383.4	376.7	57.145	SF
MCU 21-4A (M16W Pad) - DD - Plan #1	200.0	200.0	11.6	11.0	18.650	CC, ES
MCU 21-4A (M16W Pad) - DD - Plan #1	10,321.2	10,340.3	319.9	278.5	7.729	SF
MCU 21-4B (M16W Pad) - DD - Plan #1	200.0	200.0	26.9	26.2	43.246	CC, ES
MCU 21-4B (M16W Pad) - DD - Plan #1	900.0	900.3	52.7	48.8	13.475	SF
MCU 21-4C (M16W Pad) - DD - Plan #1	200.0	200.0	43.3	42.6	69.631	CC, ES
MCU 21-4C (M16W Pad) - DD - Plan #1	900.0	900.5	72.5	68.4	17.746	SF
MCU 21-4D2 (M16W Pad) - DD - Plan #1	100.0	100.0	60.2	59.9	221.063	CC
MCU 21-4D2 (M16W Pad) - DD - Plan #1	200.0	200.0	60.2	59.6	96.871	ES
MCU 21-4D2 (M16W Pad) - DD - Plan #1	900.0	900.2	92.1	87.8	21.633	SF
MCU 21-5A (M16W Pad) - DD - Plan #1	200.0	200.0	76.9	76.3	123.811	CC, ES
MCU 21-5A (M16W Pad) - DD - Plan #1	900.0	899.9	109.7	105.3	24.870	SF
MCU Fee 16-12C2 (M16W Pad) - DD - Plan #1	200.0	200.0	190.8	190.2	307.095	CC, ES
MCU Fee 16-12C2 (M16W Pad) - DD - Plan #1	2,500.0	2,469.2	486.4	475.0	42.624	SF
MCU Fee 16-2C (M16W Pad) - DD - Plan #1	200.0	200.0	201.9	201.3	324.918	CC, ES
MCU Fee 16-2C (M16W Pad) - DD - Plan #1	2,000.0	1,954.5	489.5	480.4	53.275	SF
MCU Fee 16-5C (M16W Pad) - DD - Plan #1	200.0	200.0	206.8	206.2	332.848	CC, ES
MCU Fee 16-5C (M16W Pad) - DD - Plan #1	1,500.0	1,411.2	493.7	486.7	70.955	SF
MCU Fee 17-16B (M16W Pad) - DD - Plan #1	701.3	710.3	63.1	60.0	20.432	CC, ES
MCU Fee 17-16B (M16W Pad) - DD - Plan #1	800.0	806.7	66.5	62.6	16.940	SF
MCU Fee 17-16B2 (M16W Pad) - DD - Plan #1	696.6	703.7	42.8	39.7	13.884	CC
MCU Fee 17-16B2 (M16W Pad) - DD - Plan #1	700.0	707.0	42.8	39.7	13.748	ES
MCU Fee 17-16B2 (M16W Pad) - DD - Plan #1	800.0	804.4	47.9	44.0	12.222	SF
MCU Fee 17-16C (M16W Pad) - DD - Plan #1	545.5	547.5	15.9	13.7	7.486	CC, ES
MCU Fee 17-16C (M16W Pad) - DD - Plan #1	600.0	601.6	17.0	14.5	6.804	SF
MCU Fee 17-9B (M16W pad) - DD - Plan #1	200.0	200.0	175.2	174.6	282.007	CC, ES
MCU Fee 17-9B (M16W pad) - DD - Plan #1	1,300.0	1,256.9	333.2	326.1	47.349	SF
MCU Fee 17-9B2 (M16W Pad) - DD - Plan #1	200.0	200.0	171.1	170.4	275.308	CC, ES
MCU Fee 17-9B2 (M16W Pad) - DD - Plan #1	1,300.0	1,267.1	306.5	299.3	42.257	SF
MCU Fee 17-9C (M16W Pad) - DD - Plan #1	100.0	100.0	156.1	155.8	573.152	CC
MCU Fee 17-9C (M16W Pad) - DD - Plan #1	200.0	200.0	156.1	155.4	251.157	ES
MCU Fee 17-9C (M16W Pad) - DD - Plan #1	1,200.0	1,179.4	256.3	249.7	38.612	SF
MCU Fee 17-9D (M16W Pad) - DD - Plan #1	200.0	200.0	144.7	144.1	232.924	CC, ES
MCU Fee 17-9D (M16W Pad) - DD - Plan #1	1,400.0	1,394.6	211.6	204.2	28.774	SF

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 16-13A (M16W Pad) - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	45.15	131.5	132.2	186.4						
100.0	100.0	100.0	100.0	0.1	0.1	45.15	131.5	132.2	186.4	186.2	0.27	684.754			
200.0	200.0	200.0	200.0	0.3	0.3	45.15	131.5	132.2	186.4	185.8	0.62	300.061	CC, ES		
300.0	300.0	301.0	301.0	0.5	0.5	161.29	133.2	130.1	188.6	187.7	0.98	192.264			
400.0	399.7	401.5	401.2	0.7	0.7	159.64	138.1	123.9	195.0	193.6	1.38	141.239			
500.0	499.3	501.1	500.0	0.9	1.0	157.02	145.8	114.4	202.4	200.6	1.82	111.246			
600.0	598.9	600.4	598.5	1.1	1.2	154.49	153.7	104.6	210.1	207.8	2.27	92.493			
700.0	698.6	699.7	697.0	1.4	1.5	152.13	161.5	94.8	218.2	215.5	2.73	79.869			
800.0	798.2	799.0	795.4	1.6	1.8	149.95	169.4	85.0	226.7	223.5	3.20	70.884			
900.0	897.8	898.2	893.9	1.8	2.1	147.93	177.3	75.2	235.5	231.8	3.67	64.211			
1,000.0	997.5	997.5	992.4	2.1	2.3	146.05	185.2	65.5	244.5	240.4	4.14	59.088			
1,100.0	1,097.1	1,096.8	1,090.9	2.3	2.6	144.31	193.1	55.7	253.8	249.2	4.61	55.050			
1,200.0	1,196.7	1,196.1	1,189.4	2.5	2.9	142.69	200.9	45.9	263.3	258.2	5.08	51.799			
1,300.0	1,296.4	1,295.4	1,287.8	2.7	3.2	141.18	208.8	36.1	273.0	267.5	5.56	49.135			
1,400.0	1,396.0	1,394.6	1,386.3	3.0	3.5	139.78	216.7	26.3	282.9	276.9	6.03	46.918			
1,500.0	1,495.6	1,493.9	1,484.8	3.2	3.7	138.47	224.6	16.5	292.9	286.4	6.50	45.050			
1,600.0	1,595.3	1,593.2	1,583.3	3.4	4.0	137.25	232.5	6.7	303.1	296.1	6.97	43.459			
1,700.0	1,694.9	1,692.5	1,681.8	3.7	4.3	136.11	240.4	-3.1	313.4	305.9	7.45	42.089			
1,800.0	1,794.5	1,791.8	1,780.3	3.9	4.6	135.05	248.2	-12.9	323.8	315.9	7.92	40.901			
1,900.0	1,894.2	1,891.0	1,878.7	4.1	4.8	134.05	256.1	-22.7	334.3	325.9	8.39	39.862			
2,000.0	1,993.8	1,990.3	1,977.2	4.3	5.1	133.10	264.0	-32.5	344.9	336.1	8.86	38.947			
2,100.0	2,093.4	2,089.6	2,075.7	4.6	5.4	132.22	271.9	-42.3	355.6	346.3	9.33	38.136			
2,200.0	2,193.1	2,188.9	2,174.2	4.8	5.7	131.39	279.8	-52.1	366.4	356.6	9.79	37.414			
2,300.0	2,292.7	2,288.2	2,272.7	5.0	6.0	130.60	287.6	-61.9	377.3	367.0	10.26	36.767			
2,400.0	2,392.3	2,387.4	2,371.1	5.3	6.2	129.86	295.5	-71.6	388.2	377.5	10.73	36.186			
2,500.0	2,492.0	2,486.7	2,469.6	5.5	6.5	129.16	303.4	-81.4	399.2	388.0	11.19	35.660			
2,600.0	2,591.6	2,586.0	2,568.1	5.7	6.8	128.50	311.3	-91.2	410.2	398.6	11.66	35.183			
2,700.0	2,691.2	2,685.3	2,666.6	6.0	7.1	127.87	319.2	-101.0	421.3	409.2	12.12	34.749			
2,800.0	2,790.9	2,784.6	2,765.1	6.2	7.4	127.28	327.0	-110.8	432.4	419.8	12.59	34.352			
2,900.0	2,890.5	2,883.8	2,863.5	6.4	7.6	126.71	334.9	-120.6	443.6	430.6	13.05	33.988			
3,000.0	2,990.1	2,983.1	2,962.0	6.6	7.9	126.17	342.8	-130.4	454.8	441.3	13.52	33.654			
3,100.0	3,089.8	3,082.4	3,060.5	6.9	8.2	125.66	350.7	-140.2	466.1	452.1	13.98	33.345			
3,200.0	3,189.4	3,181.7	3,159.0	7.1	8.5	125.17	358.6	-150.0	477.4	462.9	14.44	33.061			
3,300.0	3,289.0	3,281.0	3,257.5	7.3	8.8	124.71	366.5	-159.8	488.7	473.8	14.90	32.797	SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 16-13B (M16W Pad) - 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	36.44	114.0	84.2	141.7					
100.0	100.0	100.0	100.0	0.1	0.1	36.44	114.0	84.2	141.7	141.4	0.27	520.458 CC		
200.0	200.0	200.0	200.0	0.3	0.3	36.44	114.0	84.2	141.7	141.1	0.62	228.066 ES		
300.0	300.0	301.7	301.7	0.5	0.5	152.56	115.1	81.7	143.4	142.4	0.98	145.864		
400.0	399.7	402.9	402.5	0.7	0.7	150.85	118.2	74.3	148.4	147.0	1.38	107.258		
500.0	499.3	502.6	501.7	0.9	0.9	148.81	122.0	65.3	154.1	152.3	1.80	85.520		
600.0	598.9	602.3	600.9	1.1	1.2	146.92	125.9	56.3	159.9	157.7	2.23	71.708		
700.0	698.6	702.0	700.1	1.4	1.4	145.16	129.7	47.2	165.9	163.2	2.67	62.246		
800.0	798.2	801.7	799.4	1.6	1.7	143.53	133.5	38.2	172.1	168.9	3.11	55.400		
900.0	897.8	901.4	898.6	1.8	1.9	142.01	137.3	29.2	178.3	174.8	3.55	50.237		
1,000.0	997.5	1,001.0	997.8	2.1	2.1	140.59	141.2	20.2	184.7	180.7	4.00	46.218		
1,100.0	1,097.1	1,100.7	1,097.0	2.3	2.4	139.27	145.0	11.2	191.2	186.8	4.45	43.009		
1,200.0	1,196.7	1,200.4	1,196.2	2.5	2.6	138.04	148.8	2.1	197.8	192.9	4.90	40.394		
1,300.0	1,296.4	1,300.1	1,295.4	2.7	2.9	136.89	152.7	-6.9	204.5	199.2	5.35	38.225		
1,400.0	1,396.0	1,399.8	1,394.6	3.0	3.1	135.81	156.5	-15.9	211.3	205.5	5.80	36.401		
1,500.0	1,495.6	1,499.5	1,493.8	3.2	3.4	134.79	160.3	-24.9	218.1	211.9	6.26	34.847		
1,600.0	1,595.3	1,599.2	1,593.0	3.4	3.6	133.84	164.2	-33.9	225.0	218.3	6.71	33.510		
1,700.0	1,694.9	1,698.9	1,692.3	3.7	3.9	132.95	168.0	-43.0	232.0	224.8	7.17	32.348		
1,800.0	1,794.5	1,798.6	1,791.5	3.9	4.1	132.10	171.8	-52.0	239.0	231.3	7.63	31.331		
1,900.0	1,894.2	1,898.3	1,890.7	4.1	4.3	131.31	175.7	-61.0	246.0	237.9	8.08	30.433		
2,000.0	1,993.8	1,998.0	1,989.9	4.3	4.6	130.56	179.5	-70.0	253.1	244.6	8.54	29.636		
2,100.0	2,093.4	2,097.7	2,089.1	4.6	4.8	129.85	183.3	-79.1	260.3	251.3	9.00	28.923		
2,200.0	2,193.1	2,197.4	2,188.3	4.8	5.1	129.18	187.2	-88.1	267.4	258.0	9.46	28.284		
2,300.0	2,292.7	2,297.1	2,287.5	5.0	5.3	128.55	191.0	-97.1	274.7	264.7	9.91	27.706		
2,400.0	2,392.3	2,396.8	2,386.7	5.3	5.6	127.94	194.8	-106.1	281.9	271.5	10.37	27.183		
2,500.0	2,492.0	2,496.5	2,485.9	5.5	5.8	127.37	198.6	-115.1	289.2	278.3	10.83	26.706		
2,600.0	2,591.6	2,596.2	2,585.2	5.7	6.0	126.82	202.5	-124.2	296.5	285.2	11.29	26.271		
2,700.0	2,691.2	2,695.9	2,684.4	6.0	6.3	126.31	206.3	-133.2	303.8	292.1	11.74	25.872		
2,800.0	2,790.9	2,795.5	2,783.6	6.2	6.5	125.81	210.1	-142.2	311.1	298.9	12.20	25.505		
2,900.0	2,890.5	2,895.2	2,882.8	6.4	6.8	125.34	214.0	-151.2	318.5	305.9	12.66	25.166		
3,000.0	2,990.1	2,994.9	2,982.0	6.6	7.0	124.89	217.8	-160.2	325.9	312.8	13.11	24.852		
3,100.0	3,089.8	3,094.6	3,081.2	6.9	7.3	124.46	221.6	-169.3	333.3	319.8	13.57	24.562		
3,200.0	3,189.4	3,194.3	3,180.4	7.1	7.5	124.05	225.5	-178.3	340.8	326.7	14.03	24.291		
3,300.0	3,289.0	3,294.0	3,279.6	7.3	7.8	123.66	229.3	-187.3	348.2	333.7	14.48	24.040		
3,400.0	3,388.7	3,393.7	3,378.8	7.6	8.0	123.28	233.1	-196.3	355.7	340.7	14.94	23.804		
3,500.0	3,488.3	3,493.4	3,478.1	7.8	8.2	122.92	237.0	-205.3	363.1	347.7	15.40	23.584		
3,600.0	3,587.9	3,593.1	3,577.3	8.0	8.5	122.57	240.8	-214.4	370.6	354.8	15.85	23.378		
3,700.0	3,687.6	3,692.8	3,676.5	8.2	8.7	122.24	244.6	-223.4	378.1	361.8	16.31	23.184		
3,800.0	3,787.2	3,792.5	3,775.7	8.5	9.0	121.92	248.5	-232.4	385.6	368.9	16.77	23.001		
3,900.0	3,886.8	3,892.2	3,874.9	8.7	9.2	121.61	252.3	-241.4	393.2	376.0	17.22	22.829		
4,000.0	3,986.5	3,991.9	3,974.1	8.9	9.5	121.31	256.1	-250.4	400.7	383.0	17.68	22.667		
4,100.0	4,086.1	4,091.6	4,073.3	9.2	9.7	121.03	260.0	-259.5	408.3	390.1	18.13	22.513		
4,200.0	4,185.7	4,191.3	4,172.5	9.4	10.0	120.75	263.8	-268.5	415.8	397.2	18.59	22.368		
4,300.0	4,285.4	4,291.0	4,271.8	9.6	10.2	120.48	267.6	-277.5	423.4	404.3	19.05	22.230		
4,400.0	4,385.0	4,390.7	4,371.0	9.9	10.4	120.23	271.4	-286.5	431.0	411.5	19.50	22.100		
4,500.0	4,484.6	4,490.4	4,470.2	10.1	10.7	119.98	275.3	-295.6	438.5	418.6	19.96	21.975		
4,600.0	4,584.3	4,590.0	4,569.4	10.3	10.9	119.74	279.1	-304.6	446.1	425.7	20.41	21.857		
4,700.0	4,683.9	4,689.7	4,668.6	10.5	11.2	119.51	282.9	-313.6	453.7	432.9	20.87	21.744		
4,800.0	4,783.5	4,789.4	4,767.8	10.8	11.4	119.29	286.8	-322.6	461.3	440.0	21.32	21.637		
4,900.0	4,883.2	4,889.1	4,867.0	11.0	11.7	119.07	290.6	-331.6	469.0	447.2	21.78	21.535		
5,000.0	4,982.8	4,988.8	4,966.2	11.2	11.9	118.86	294.4	-340.7	476.6	454.3	22.23	21.437		
5,100.0	5,082.4	5,088.5	5,065.4	11.5	12.2	118.66	298.3	-349.7	484.2	461.5	22.69	21.343		

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 MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design											SWSW S16-T7S-R93W (M16W Pad) - MCU 16-13B (M16W Pad) - DD - Plan #1		Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)					
5,200.0	5,182.1	5,188.2	5,164.7	11.7	12.4	118.46	302.1	-358.7	491.8	468.7	23.14	21.254			
5,300.0	5,281.7	5,287.9	5,263.9	11.9	12.6	118.27	305.9	-367.7	499.5	475.9	23.60	21.168 SF			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 16-13C (M16W Pad) - DD - Plan #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	69.94	11.7	31.9	34.0						
100.0	100.0	100.0	100.0	0.1	0.1	69.94	11.7	31.9	34.0	33.7	0.27	124.787			
200.0	200.0	200.0	200.0	0.3	0.3	69.94	11.7	31.9	34.0	33.4	0.62	54.682 CC			
300.0	300.0	301.6	301.6	0.5	0.5	-175.69	11.8	29.2	34.2	33.2	0.97	35.067 ES			
400.0	399.7	402.4	402.1	0.7	0.7	178.02	12.3	21.8	35.2	33.9	1.33	26.379			
500.0	499.3	502.3	501.7	0.9	0.9	171.68	12.8	13.6	37.0	35.3	1.71	21.709			
600.0	598.9	602.2	601.2	1.1	1.1	166.00	13.4	5.4	39.3	37.2	2.09	18.777			
700.0	698.6	702.1	700.8	1.4	1.4	160.98	13.9	-2.8	41.9	39.4	2.49	16.801			
800.0	798.2	802.0	800.4	1.6	1.6	156.58	14.4	-10.9	44.8	41.9	2.91	15.404			
900.0	897.8	901.9	899.9	1.8	1.8	152.72	15.0	-19.1	47.9	44.6	3.33	14.381			
1,000.0	997.5	1,001.9	999.5	2.1	2.0	149.36	15.5	-27.3	51.2	47.5	3.76	13.611			
1,100.0	1,097.1	1,101.8	1,099.1	2.3	2.3	146.41	16.0	-35.4	54.7	50.5	4.20	13.018			
1,200.0	1,196.7	1,201.7	1,198.6	2.5	2.5	143.81	16.5	-43.6	58.3	53.6	4.64	12.552			
1,300.0	1,296.4	1,301.6	1,298.2	2.7	2.7	141.52	17.1	-51.8	62.0	56.9	5.09	12.181			
1,400.0	1,396.0	1,401.5	1,397.8	3.0	2.9	139.50	17.6	-60.0	65.8	60.2	5.54	11.881			
1,500.0	1,495.6	1,501.4	1,497.3	3.2	3.2	137.69	18.1	-68.1	69.6	63.6	5.98	11.635			
1,600.0	1,595.3	1,601.3	1,596.9	3.4	3.4	136.08	18.7	-76.3	73.5	67.1	6.43	11.430			
1,700.0	1,694.9	1,701.2	1,696.5	3.7	3.6	134.63	19.2	-84.5	77.5	70.6	6.88	11.259			
1,800.0	1,794.5	1,801.1	1,796.0	3.9	3.8	133.32	19.7	-92.7	81.5	74.2	7.34	11.114			
1,900.0	1,894.2	1,901.0	1,895.6	4.1	4.1	132.13	20.2	-100.8	85.6	77.8	7.79	10.991			
2,000.0	1,993.8	2,000.9	1,995.2	4.3	4.3	131.06	20.8	-109.0	89.7	81.4	8.24	10.884			
2,100.0	2,093.4	2,100.8	2,094.7	4.6	4.5	130.07	21.3	-117.2	93.8	85.1	8.69	10.792			
2,200.0	2,193.1	2,200.7	2,194.3	4.8	4.7	129.17	21.8	-125.3	97.9	88.8	9.14	10.712			
2,300.0	2,292.7	2,300.6	2,293.9	5.0	5.0	128.35	22.4	-133.5	102.1	92.5	9.59	10.642			
2,400.0	2,392.3	2,400.5	2,393.4	5.3	5.2	127.58	22.9	-141.7	106.3	96.2	10.05	10.580			
2,500.0	2,492.0	2,500.4	2,493.0	5.5	5.4	126.88	23.4	-149.9	110.5	100.0	10.50	10.525			
2,600.0	2,591.6	2,600.3	2,592.6	5.7	5.6	126.23	23.9	-158.0	114.7	103.8	10.95	10.476			
2,700.0	2,691.2	2,700.2	2,692.1	6.0	5.9	125.62	24.5	-166.2	118.9	107.5	11.40	10.432			
2,800.0	2,790.9	2,800.1	2,791.7	6.2	6.1	125.06	25.0	-174.4	123.2	111.3	11.85	10.393			
2,900.0	2,890.5	2,900.0	2,891.3	6.4	6.3	124.53	25.5	-182.5	127.4	115.1	12.30	10.357			
3,000.0	2,990.1	2,999.9	2,990.8	6.6	6.5	124.04	26.1	-190.7	131.7	118.9	12.75	10.325			
3,100.0	3,089.8	3,099.8	3,090.4	6.9	6.8	123.58	26.6	-198.9	136.0	122.8	13.21	10.296			
3,200.0	3,189.4	3,199.7	3,190.0	7.1	7.0	123.14	27.1	-207.1	140.3	126.6	13.66	10.270			
3,300.0	3,289.0	3,299.6	3,289.5	7.3	7.2	122.73	27.7	-215.2	144.5	130.4	14.11	10.246			
3,400.0	3,388.7	3,399.5	3,389.1	7.6	7.4	122.35	28.2	-223.4	148.8	134.3	14.56	10.223			
3,500.0	3,488.3	3,499.4	3,488.7	7.8	7.7	121.99	28.7	-231.6	153.1	138.1	15.01	10.203			
3,600.0	3,587.9	3,599.3	3,588.2	8.0	7.9	121.64	29.2	-239.8	157.4	142.0	15.46	10.184			
3,700.0	3,687.6	3,699.2	3,687.8	8.2	8.1	121.32	29.8	-247.9	161.8	145.9	15.91	10.167			
3,800.0	3,787.2	3,799.1	3,787.4	8.5	8.3	121.01	30.3	-256.1	166.1	149.7	16.36	10.151			
3,900.0	3,886.8	3,899.0	3,886.9	8.7	8.6	120.72	30.8	-264.3	170.4	153.6	16.81	10.136			
4,000.0	3,986.5	3,998.9	3,986.5	8.9	8.8	120.44	31.4	-272.4	174.7	157.5	17.26	10.123			
4,100.0	4,086.1	4,098.8	4,086.1	9.2	9.0	120.18	31.9	-280.6	179.1	161.4	17.71	10.110			
4,200.0	4,185.7	4,198.7	4,185.6	9.4	9.2	119.92	32.4	-288.8	183.4	165.2	18.16	10.098			
4,300.0	4,285.4	4,298.6	4,285.2	9.6	9.5	119.68	32.9	-297.0	187.7	169.1	18.61	10.087			
4,400.0	4,385.0	4,398.5	4,384.8	9.9	9.7	119.46	33.5	-305.1	192.1	173.0	19.06	10.076			
4,500.0	4,484.6	4,498.5	4,484.3	10.1	9.9	119.24	34.0	-313.3	196.4	176.9	19.51	10.067			
4,600.0	4,584.3	4,598.4	4,583.9	10.3	10.1	119.03	34.5	-321.5	200.8	180.8	19.96	10.058			
4,700.0	4,683.9	4,698.3	4,683.5	10.5	10.4	118.83	35.1	-329.7	205.1	184.7	20.41	10.049			
4,800.0	4,783.5	4,798.2	4,783.0	10.8	10.6	118.63	35.6	-337.8	209.5	188.6	20.86	10.041			
4,900.0	4,883.2	4,898.1	4,882.6	11.0	10.8	118.45	36.1	-346.0	213.8	192.5	21.31	10.033			
5,000.0	4,982.8	4,998.0	4,982.2	11.2	11.1	118.27	36.6	-354.2	218.2	196.4	21.76	10.026			
5,100.0	5,082.4	5,097.9	5,081.7	11.5	11.3	118.10	37.2	-362.3	222.5	200.3	22.21	10.019			

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 MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 16-13C (M16W Pad) - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: O-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,200.0	5,182.1	5,197.8	5,181.3	11.7	11.5	117.94	37.7	-370.5	226.9	204.2	22.66	10.013		
5,300.0	5,281.7	5,297.7	5,280.9	11.9	11.7	117.78	38.2	-378.7	231.3	208.2	23.11	10.007		
5,400.0	5,381.3	5,397.6	5,380.4	12.2	12.0	117.63	38.8	-386.9	235.6	212.1	23.56	10.001		
5,500.0	5,481.0	5,497.5	5,480.0	12.4	12.2	117.48	39.3	-395.0	240.0	216.0	24.01	9.996		
5,600.0	5,580.6	5,597.4	5,579.6	12.6	12.4	117.34	39.8	-403.2	244.4	219.9	24.46	9.991		
5,700.0	5,680.2	5,697.3	5,679.1	12.8	12.6	117.20	40.3	-411.4	248.7	223.8	24.91	9.986		
5,800.0	5,779.9	5,797.2	5,778.7	13.1	12.9	117.07	40.9	-419.6	253.1	227.7	25.36	9.981		
5,900.0	5,879.5	5,897.1	5,878.3	13.3	13.1	116.95	41.4	-427.7	257.5	231.7	25.81	9.977		
6,000.0	5,979.1	5,997.0	5,977.8	13.5	13.3	116.82	41.9	-435.9	261.8	235.6	26.26	9.972		
6,100.0	6,078.8	6,096.9	6,077.4	13.8	13.5	116.71	42.5	-444.1	266.2	239.5	26.71	9.968		
6,200.0	6,178.4	6,196.8	6,177.0	14.0	13.8	116.59	43.0	-452.2	270.6	243.4	27.16	9.964		
6,300.0	6,278.0	6,296.7	6,276.5	14.2	14.0	116.48	43.5	-460.4	275.0	247.4	27.60	9.961		
6,400.0	6,377.7	6,396.6	6,376.1	14.5	14.2	116.37	44.0	-468.6	279.3	251.3	28.05	9.957		
6,500.0	6,477.3	6,496.5	6,475.7	14.7	14.4	116.27	44.6	-476.8	283.7	255.2	28.50	9.954		
6,600.0	6,576.9	6,596.4	6,575.2	14.9	14.7	116.17	45.1	-484.9	288.1	259.1	28.95	9.951		
6,700.0	6,676.6	6,696.3	6,674.8	15.1	14.9	116.07	45.6	-493.1	292.5	263.1	29.40	9.948		
6,800.0	6,776.2	6,796.2	6,774.4	15.4	15.1	115.97	46.2	-501.3	296.9	267.0	29.85	9.945		
6,900.0	6,875.8	6,896.1	6,873.9	15.6	15.3	115.88	46.7	-509.4	301.2	270.9	30.30	9.942		
7,000.0	6,975.5	6,996.0	6,973.5	15.8	15.6	115.79	47.2	-517.6	305.6	274.9	30.75	9.939		
7,100.0	7,075.1	7,095.9	7,073.1	16.1	15.8	115.70	47.7	-525.8	310.0	278.8	31.20	9.937		
7,200.0	7,174.7	7,195.8	7,172.6	16.3	16.0	115.62	48.3	-534.0	314.4	282.7	31.65	9.934		
7,300.0	7,274.4	7,295.7	7,272.2	16.5	16.2	115.54	48.8	-542.1	318.8	286.7	32.10	9.932		
7,400.0	7,374.0	7,395.6	7,371.8	16.8	16.5	115.46	49.3	-550.3	323.2	290.6	32.55	9.929		
7,500.0	7,473.6	7,495.5	7,471.3	17.0	16.7	115.38	49.9	-558.5	327.5	294.5	32.99	9.927		
7,600.0	7,573.3	7,595.4	7,570.9	17.2	16.9	115.30	50.4	-566.7	331.9	298.5	33.44	9.925		
7,700.0	7,672.9	7,695.7	7,670.8	17.4	17.1	115.24	50.9	-574.7	336.2	302.3	33.89	9.921		
7,800.0	7,772.8	7,796.7	7,771.7	17.6	17.3	115.23	51.3	-580.0	339.0	304.7	34.24	9.899		
7,900.0	7,872.8	7,897.8	7,872.8	17.7	17.5	115.24	51.4	-581.8	339.9	305.4	34.52	9.847		
8,000.0	7,972.8	7,997.8	7,972.8	17.9	17.6	-1.47	51.4	-581.8	339.9	305.1	34.80	9.768		
8,100.0	8,072.8	8,097.8	8,072.8	18.0	17.7	-1.47	51.4	-581.8	339.9	304.9	35.08	9.691		
8,200.0	8,172.8	8,197.8	8,172.8	18.2	17.9	-1.47	51.4	-581.8	339.9	304.6	35.36	9.613		
8,300.0	8,272.8	8,297.8	8,272.8	18.3	18.0	-1.47	51.4	-581.8	339.9	304.3	35.64	9.537		
8,400.0	8,372.8	8,397.8	8,372.8	18.4	18.2	-1.47	51.4	-581.8	339.9	304.0	35.93	9.462		
8,500.0	8,472.8	8,497.8	8,472.8	18.6	18.3	-1.47	51.4	-581.8	339.9	303.7	36.21	9.388		
8,600.0	8,572.8	8,597.8	8,572.8	18.7	18.4	-1.47	51.4	-581.8	339.9	303.4	36.50	9.314		
8,700.0	8,672.8	8,697.8	8,672.8	18.9	18.6	-1.47	51.4	-581.8	339.9	303.2	36.78	9.241		
8,800.0	8,772.8	8,797.8	8,772.8	19.0	18.7	-1.47	51.4	-581.8	339.9	302.9	37.07	9.170		
8,900.0	8,872.8	8,897.8	8,872.8	19.1	18.9	-1.47	51.4	-581.8	339.9	302.6	37.36	9.099		
9,000.0	8,972.8	8,997.8	8,972.8	19.3	19.0	-1.47	51.4	-581.8	339.9	302.3	37.65	9.029		
9,100.0	9,072.8	9,097.8	9,072.8	19.4	19.2	-1.47	51.4	-581.8	339.9	302.0	37.94	8.959		
9,200.0	9,172.8	9,197.8	9,172.8	19.6	19.3	-1.47	51.4	-581.8	339.9	301.7	38.23	8.891		
9,300.0	9,272.8	9,297.8	9,272.8	19.7	19.4	-1.47	51.4	-581.8	339.9	301.4	38.53	8.823		
9,400.0	9,372.8	9,397.8	9,372.8	19.8	19.6	-1.47	51.4	-581.8	339.9	301.1	38.82	8.757		
9,500.0	9,472.8	9,497.8	9,472.8	20.0	19.7	-1.47	51.4	-581.8	339.9	300.8	39.12	8.691		
9,600.0	9,572.8	9,597.8	9,572.8	20.1	19.9	-1.47	51.4	-581.8	339.9	300.5	39.41	8.625		
9,700.0	9,672.8	9,697.8	9,672.8	20.3	20.0	-1.47	51.4	-581.8	339.9	300.2	39.71	8.561		
9,800.0	9,772.8	9,797.8	9,772.8	20.4	20.2	-1.47	51.4	-581.8	339.9	299.9	40.01	8.497		
9,900.0	9,872.8	9,897.8	9,872.8	20.6	20.3	-1.47	51.4	-581.8	339.9	299.6	40.30	8.435		
10,000.0	9,972.8	9,997.8	9,972.8	20.7	20.5	-1.47	51.4	-581.8	339.9	299.3	40.60	8.372		
10,100.0	10,072.8	10,097.8	10,072.8	20.9	20.6	-1.47	51.4	-581.8	339.9	299.0	40.90	8.311		
10,200.0	10,172.8	10,197.8	10,172.8	21.0	20.8	-1.47	51.4	-581.8	339.9	298.7	41.20	8.250		
10,300.0	10,272.8	10,297.8	10,272.8	21.2	20.9	-1.47	51.4	-581.8	339.9	298.4	41.50	8.190		

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 MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 16-13C (M16W Pad) - 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 +N/-S	+E/-W	Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)			
10,321.2	10,294.0	10,319.0	10,294.0	21.2	20.9	-1.47	51.4	-581.8	339.9	298.4	41.57	8.178 SF	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-3B (M16W Pad) - 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	43.89	115.1	110.7	159.7					
100.0	100.0	100.0	100.0	0.1	0.1	43.89	115.1	110.7	159.7	159.4	0.27	586.516		
200.0	200.0	200.0	200.0	0.3	0.3	43.89	115.1	110.7	159.7	159.1	0.62	257.013 CC, ES		
300.0	300.0	300.1	300.0	0.5	0.5	161.82	113.2	112.5	162.1	161.1	0.98	165.556		
400.0	399.7	399.1	398.8	0.7	0.7	165.20	107.7	118.0	169.5	168.1	1.37	123.475		
500.0	499.3	496.8	495.6	0.9	1.0	169.94	98.6	126.8	179.0	177.2	1.82	98.341		
600.0	598.9	592.6	589.9	1.1	1.3	175.55	86.3	138.8	190.8	188.5	2.32	82.086		
700.0	698.6	686.9	681.7	1.4	1.7	-178.38	71.0	153.8	205.8	203.0	2.86	72.025		
800.0	798.2	783.0	774.9	1.6	2.2	-172.70	54.3	170.1	223.6	220.2	3.39	66.003		
900.0	897.8	879.0	868.1	1.8	2.6	-167.86	37.7	186.3	243.3	239.4	3.90	62.372		
1,000.0	997.5	975.1	961.2	2.1	3.0	-163.74	21.1	202.6	264.5	260.1	4.40	60.143		
1,100.0	1,097.1	1,071.1	1,054.4	2.3	3.5	-160.23	4.4	218.8	286.8	281.9	4.88	58.773		
1,200.0	1,196.7	1,167.1	1,147.6	2.5	3.9	-157.22	-12.2	235.1	310.0	304.7	5.35	57.947		
1,300.0	1,296.4	1,263.2	1,240.8	2.7	4.3	-154.63	-28.9	251.4	334.0	328.2	5.81	57.473		
1,400.0	1,396.0	1,359.2	1,333.9	3.0	4.8	-152.38	-45.5	267.6	358.5	352.2	6.26	57.231		
1,500.0	1,495.6	1,455.2	1,427.1	3.2	5.2	-150.42	-62.2	283.9	383.4	376.7	6.71	57.145 SF		
1,600.0	1,595.3	1,551.3	1,520.3	3.4	5.7	-148.70	-78.8	300.1	408.8	401.6	7.15	57.164		
1,700.0	1,694.9	1,647.3	1,613.5	3.7	6.1	-147.17	-95.5	316.4	434.4	426.8	7.59	57.253		
1,800.0	1,794.5	1,743.3	1,706.6	3.9	6.5	-145.82	-112.1	332.7	460.3	452.3	8.02	57.389		
1,900.0	1,894.2	1,839.4	1,799.8	4.1	7.0	-144.61	-128.8	348.9	486.5	478.0	8.45	57.556		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-4A (M16W Pad) - 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	112.16	-4.4	10.7	11.6					
100.0	100.0	100.0	100.0	0.1	0.1	112.16	-4.4	10.7	11.6	11.3	0.27	42.561		
200.0	200.0	200.0	200.0	0.3	0.3	112.16	-4.4	10.7	11.6	11.0	0.62	18.650 CC, ES		
300.0	300.0	300.2	300.2	0.5	0.5	-128.93	-6.3	8.9	12.4	11.4	0.98	12.566		
400.0	399.7	400.4	400.0	0.7	0.7	-122.63	-12.0	3.5	14.6	13.2	1.40	10.378		
500.0	499.3	500.3	499.3	0.9	1.0	-110.20	-20.0	-4.2	17.0	15.2	1.87	9.120		
600.0	598.9	600.2	598.6	1.1	1.2	-101.11	-28.1	-11.9	20.1	17.8	2.34	8.587		
700.0	698.6	700.1	697.9	1.4	1.5	-94.56	-36.2	-19.7	23.6	20.8	2.82	8.378		
800.0	798.2	800.0	797.2	1.6	1.7	-89.72	-44.3	-27.4	27.3	24.0	3.28	8.316		
900.0	897.8	899.9	896.4	1.8	2.0	-86.05	-52.4	-35.1	31.1	27.4	3.74	8.321		
1,000.0	997.5	999.9	995.7	2.1	2.2	-83.20	-60.5	-42.8	35.0	30.8	4.19	8.358		
1,100.0	1,097.1	1,099.8	1,095.0	2.3	2.5	-80.92	-68.6	-50.6	39.0	34.4	4.64	8.408		
1,200.0	1,196.7	1,199.7	1,194.3	2.5	2.8	-79.07	-76.7	-58.3	43.1	38.0	5.09	8.464		
1,300.0	1,296.4	1,299.6	1,293.6	2.7	3.0	-77.54	-84.8	-66.0	47.2	41.6	5.54	8.520		
1,400.0	1,396.0	1,399.5	1,392.9	3.0	3.3	-76.26	-92.8	-73.7	51.3	45.3	5.98	8.575		
1,500.0	1,495.6	1,499.4	1,492.1	3.2	3.5	-75.17	-100.9	-81.4	55.4	49.0	6.43	8.627		
1,600.0	1,595.3	1,599.3	1,591.4	3.4	3.8	-74.22	-109.0	-89.2	59.6	52.7	6.87	8.675		
1,700.0	1,694.9	1,699.2	1,690.7	3.7	4.1	-73.40	-117.1	-96.9	63.8	56.4	7.31	8.721		
1,800.0	1,794.5	1,799.1	1,790.0	3.9	4.3	-72.69	-125.2	-104.6	67.9	60.2	7.75	8.764		
1,900.0	1,894.2	1,899.0	1,889.3	4.1	4.6	-72.05	-133.3	-112.3	72.1	63.9	8.19	8.804		
2,000.0	1,993.8	1,998.9	1,988.5	4.3	4.8	-71.49	-141.4	-120.1	76.3	67.7	8.63	8.841		
2,100.0	2,093.4	2,098.9	2,087.8	4.6	5.1	-70.98	-149.5	-127.8	80.5	71.5	9.07	8.875		
2,200.0	2,193.1	2,198.8	2,187.1	4.8	5.4	-70.52	-157.6	-135.5	84.7	75.2	9.51	8.907		
2,300.0	2,292.7	2,298.7	2,286.4	5.0	5.6	-70.11	-165.7	-143.2	89.0	79.0	9.95	8.937		
2,400.0	2,392.3	2,398.6	2,385.7	5.3	5.9	-69.74	-173.8	-151.0	93.2	82.8	10.39	8.965		
2,500.0	2,492.0	2,498.5	2,484.9	5.5	6.2	-69.39	-181.8	-158.7	97.4	86.6	10.83	8.992		
2,600.0	2,591.6	2,598.4	2,584.2	5.7	6.4	-69.08	-189.9	-166.4	101.6	90.4	11.27	9.016		
2,700.0	2,691.2	2,698.3	2,683.5	6.0	6.7	-68.79	-198.0	-174.1	105.8	94.1	11.71	9.039		
2,800.0	2,790.9	2,798.2	2,782.8	6.2	6.9	-68.52	-206.1	-181.9	110.1	97.9	12.15	9.061		
2,900.0	2,890.5	2,898.1	2,882.1	6.4	7.2	-68.28	-214.2	-189.6	114.3	101.7	12.59	9.081		
3,000.0	2,990.1	2,998.0	2,981.3	6.6	7.5	-68.05	-222.3	-197.3	118.5	105.5	13.03	9.101		
3,100.0	3,089.8	3,098.0	3,080.6	6.9	7.7	-67.83	-230.4	-205.0	122.8	109.3	13.46	9.119		
3,200.0	3,189.4	3,197.9	3,179.9	7.1	8.0	-67.63	-238.5	-212.7	127.0	113.1	13.90	9.136		
3,300.0	3,289.0	3,297.8	3,279.2	7.3	8.3	-67.45	-246.6	-220.5	131.3	116.9	14.34	9.153		
3,400.0	3,388.7	3,397.7	3,378.5	7.6	8.5	-67.27	-254.7	-228.2	135.5	120.7	14.78	9.168		
3,500.0	3,488.3	3,497.6	3,477.8	7.8	8.8	-67.11	-262.8	-235.9	139.8	124.5	15.22	9.183		
3,600.0	3,587.9	3,597.5	3,577.0	8.0	9.0	-66.95	-270.8	-243.6	144.0	128.3	15.66	9.197		
3,700.0	3,687.6	3,697.4	3,676.3	8.2	9.3	-66.81	-278.9	-251.4	148.2	132.1	16.10	9.210		
3,800.0	3,787.2	3,797.3	3,775.6	8.5	9.6	-66.67	-287.0	-259.1	152.5	136.0	16.53	9.223		
3,900.0	3,886.8	3,897.2	3,874.9	8.7	9.8	-66.54	-295.1	-266.8	156.7	139.8	16.97	9.235		
4,000.0	3,986.5	3,997.1	3,974.2	8.9	10.1	-66.42	-303.2	-274.5	161.0	143.6	17.41	9.247		
4,100.0	4,086.1	4,097.0	4,073.4	9.2	10.4	-66.30	-311.3	-282.3	165.2	147.4	17.85	9.258		
4,200.0	4,185.7	4,197.0	4,172.7	9.4	10.6	-66.19	-319.4	-290.0	169.5	151.2	18.29	9.268		
4,300.0	4,285.4	4,296.9	4,272.0	9.6	10.9	-66.08	-327.5	-297.7	173.7	155.0	18.72	9.278		
4,400.0	4,385.0	4,396.8	4,371.3	9.9	11.1	-65.98	-335.6	-305.4	178.0	158.8	19.16	9.288		
4,500.0	4,484.6	4,496.7	4,470.6	10.1	11.4	-65.89	-343.7	-313.1	182.2	162.6	19.60	9.297		
4,600.0	4,584.3	4,596.6	4,569.8	10.3	11.7	-65.80	-351.8	-320.9	186.5	166.4	20.04	9.306		
4,700.0	4,683.9	4,696.5	4,669.1	10.5	11.9	-65.71	-359.9	-328.6	190.7	170.3	20.48	9.315		
4,800.0	4,783.5	4,796.4	4,768.4	10.8	12.2	-65.62	-367.9	-336.3	195.0	174.1	20.91	9.323		
4,900.0	4,883.2	4,896.3	4,867.7	11.0	12.4	-65.54	-376.0	-344.0	199.2	177.9	21.35	9.331		
5,000.0	4,982.8	4,996.2	4,967.0	11.2	12.7	-65.47	-384.1	-351.8	203.5	181.7	21.79	9.339		
5,100.0	5,082.4	5,096.1	5,066.3	11.5	13.0	-65.39	-392.2	-359.5	207.7	185.5	22.23	9.346		

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 MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-4A (M16W Pad) - DD - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-MWDD													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	5,182.1	5,196.0	5,165.5	11.7	13.2	-65.32	-400.3	-367.2	212.0	189.3	22.66	9.353		
5,300.0	5,281.7	5,296.0	5,264.8	11.9	13.5	-65.26	-408.4	-374.9	216.2	193.1	23.10	9.360		
5,400.0	5,381.3	5,395.9	5,364.1	12.2	13.8	-65.19	-416.5	-382.7	220.5	197.0	23.54	9.367		
5,500.0	5,481.0	5,495.8	5,463.4	12.4	14.0	-65.13	-424.6	-390.4	224.7	200.8	23.98	9.373		
5,600.0	5,580.6	5,595.7	5,562.7	12.6	14.3	-65.07	-432.7	-398.1	229.0	204.6	24.42	9.379		
5,700.0	5,680.2	5,695.6	5,661.9	12.8	14.5	-65.01	-440.8	-405.8	233.3	208.4	24.85	9.385		
5,800.0	5,779.9	5,795.5	5,761.2	13.1	14.8	-64.95	-448.9	-413.6	237.5	212.2	25.29	9.391		
5,900.0	5,879.5	5,895.4	5,860.5	13.3	15.1	-64.90	-456.9	-421.3	241.8	216.0	25.73	9.397		
6,000.0	5,979.1	5,995.3	5,959.8	13.5	15.3	-64.85	-465.0	-429.0	246.0	219.9	26.17	9.402		
6,100.0	6,078.8	6,095.2	6,059.1	13.8	15.6	-64.80	-473.1	-436.7	250.3	223.7	26.60	9.407		
6,200.0	6,178.4	6,195.1	6,158.3	14.0	15.9	-64.75	-481.2	-444.4	254.5	227.5	27.04	9.412		
6,300.0	6,278.0	6,295.0	6,257.6	14.2	16.1	-64.70	-489.3	-452.2	258.8	231.3	27.48	9.417		
6,400.0	6,377.7	6,395.0	6,356.9	14.5	16.4	-64.65	-497.4	-459.9	263.0	235.1	27.92	9.422		
6,500.0	6,477.3	6,494.9	6,456.2	14.7	16.6	-64.61	-505.5	-467.6	267.3	238.9	28.36	9.427		
6,600.0	6,576.9	6,594.8	6,555.5	14.9	16.9	-64.57	-513.6	-475.3	271.6	242.8	28.79	9.431		
6,700.0	6,676.6	6,694.7	6,654.7	15.1	17.2	-64.53	-521.7	-483.1	275.8	246.6	29.23	9.436		
6,800.0	6,776.2	6,794.6	6,754.0	15.4	17.4	-64.49	-529.8	-490.8	280.1	250.4	29.67	9.440		
6,900.0	6,875.8	6,894.5	6,853.3	15.6	17.7	-64.45	-537.9	-498.5	284.3	254.2	30.11	9.444		
7,000.0	6,975.5	6,994.4	6,952.6	15.8	18.0	-64.41	-545.9	-506.2	288.6	258.0	30.54	9.448		
7,100.0	7,075.1	7,094.3	7,051.9	16.1	18.2	-64.37	-554.0	-514.0	292.8	261.9	30.98	9.452		
7,200.0	7,174.7	7,194.2	7,151.2	16.3	18.5	-64.34	-562.1	-521.7	297.1	265.7	31.42	9.456		
7,300.0	7,274.4	7,294.1	7,250.4	16.5	18.7	-64.30	-570.2	-529.4	301.4	269.5	31.86	9.460		
7,400.0	7,374.0	7,394.0	7,349.7	16.8	19.0	-64.27	-578.3	-537.1	305.6	273.3	32.29	9.463		
7,500.0	7,473.6	7,494.0	7,449.0	17.0	19.3	-64.23	-586.4	-544.9	309.9	277.1	32.73	9.467		
7,600.0	7,573.3	7,593.9	7,548.3	17.2	19.5	-64.20	-594.5	-552.6	314.1	281.0	33.17	9.470		
7,700.0	7,672.9	7,701.5	7,655.4	17.4	19.8	-64.35	-602.0	-559.7	317.4	283.8	33.62	9.441		
7,800.0	7,772.8	7,810.1	7,763.8	17.6	19.9	-64.53	-606.6	-564.1	319.2	285.2	34.00	9.390		
7,900.0	7,872.8	7,918.6	7,872.3	17.7	20.1	-64.59	-608.3	-565.7	319.9	285.6	34.29	9.328		
8,000.0	7,972.8	8,019.1	7,972.8	17.9	20.2	178.69	-608.3	-565.7	319.9	285.3	34.57	9.252		
8,100.0	8,072.8	8,119.1	8,072.8	18.0	20.3	178.69	-608.3	-565.7	319.9	285.0	34.86	9.177		
8,200.0	8,172.8	8,219.1	8,172.8	18.2	20.5	178.69	-608.3	-565.7	319.9	284.7	35.14	9.103		
8,300.0	8,272.8	8,319.1	8,272.8	18.3	20.6	178.69	-608.3	-565.7	319.9	284.5	35.42	9.030		
8,400.0	8,372.8	8,419.1	8,372.8	18.4	20.7	178.69	-608.3	-565.7	319.9	284.2	35.71	8.958		
8,500.0	8,472.8	8,519.1	8,472.8	18.6	20.8	178.69	-608.3	-565.7	319.9	283.9	36.00	8.887		
8,600.0	8,572.8	8,619.1	8,572.8	18.7	20.9	178.69	-608.3	-565.7	319.9	283.6	36.28	8.816		
8,700.0	8,672.8	8,719.1	8,672.8	18.9	21.1	178.69	-608.3	-565.7	319.9	283.3	36.57	8.747		
8,800.0	8,772.8	8,819.1	8,772.8	19.0	21.2	178.69	-608.3	-565.7	319.9	283.0	36.86	8.678		
8,900.0	8,872.8	8,919.1	8,872.8	19.1	21.3	178.69	-608.3	-565.7	319.9	282.7	37.15	8.610		
9,000.0	8,972.8	9,019.1	8,972.8	19.3	21.5	178.69	-608.3	-565.7	319.9	282.4	37.45	8.543		
9,100.0	9,072.8	9,119.1	9,072.8	19.4	21.6	178.69	-608.3	-565.7	319.9	282.1	37.74	8.476		
9,200.0	9,172.8	9,219.1	9,172.8	19.6	21.7	178.69	-608.3	-565.7	319.9	281.8	38.03	8.411		
9,300.0	9,272.8	9,319.1	9,272.8	19.7	21.8	178.69	-608.3	-565.7	319.9	281.6	38.33	8.346		
9,400.0	9,372.8	9,419.1	9,372.8	19.8	22.0	178.69	-608.3	-565.7	319.9	281.3	38.62	8.282		
9,500.0	9,472.8	9,519.1	9,472.8	20.0	22.1	178.69	-608.3	-565.7	319.9	281.0	38.92	8.219		
9,600.0	9,572.8	9,619.1	9,572.8	20.1	22.2	178.69	-608.3	-565.7	319.9	280.7	39.22	8.157		
9,700.0	9,672.8	9,719.1	9,672.8	20.3	22.4	178.69	-608.3	-565.7	319.9	280.4	39.52	8.095		
9,800.0	9,772.8	9,819.1	9,772.8	20.4	22.5	178.69	-608.3	-565.7	319.9	280.1	39.81	8.034		
9,900.0	9,872.8	9,919.1	9,872.8	20.6	22.6	178.69	-608.3	-565.7	319.9	279.8	40.11	7.974		
10,000.0	9,972.8	10,019.1	9,972.8	20.7	22.8	178.69	-608.3	-565.7	319.9	279.5	40.41	7.915		
10,100.0	10,072.8	10,119.1	10,072.8	20.9	22.9	178.69	-608.3	-565.7	319.9	279.2	40.72	7.856		
10,200.0	10,172.8	10,219.1	10,172.8	21.0	23.0	178.69	-608.3	-565.7	319.9	278.9	41.02	7.798		
10,300.0	10,272.8	10,319.1	10,272.8	21.2	23.2	178.69	-608.3	-565.7	319.9	278.6	41.32	7.741		

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 MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-4A (M16W Pad) - 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 +N/-S	+E/-W	Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)			
10,321.2	10,294.0	10,340.3	10,294.0	21.2	23.2	178.69	-608.3	-565.7	319.9	278.5	41.39	7.729 SF	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-4B (M16W Pad) - 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	86.87	1.5	26.8	26.9					
100.0	100.0	100.0	100.0	0.1	0.1	86.87	1.5	26.8	26.9	26.6	0.27	98.690		
200.0	200.0	200.0	200.0	0.3	0.3	86.87	1.5	26.8	26.9	26.2	0.62	43.246	CC, ES	
300.0	300.0	300.8	300.8	0.5	0.5	-154.13	-0.8	25.4	27.7	26.8	0.98	28.332		
400.0	399.7	401.5	401.1	0.7	0.7	-147.80	-7.5	21.1	30.3	28.9	1.38	21.976		
500.0	499.3	501.8	500.5	0.9	1.0	-135.21	-18.4	14.0	32.3	30.4	1.86	17.338		
600.0	598.9	601.4	599.1	1.1	1.3	-122.00	-30.6	6.1	35.5	33.1	2.39	14.865		
700.0	698.6	701.0	697.7	1.4	1.6	-111.44	-42.9	-1.8	40.3	37.4	2.92	13.822		
800.0	798.2	800.7	796.2	1.6	1.9	-103.33	-55.1	-9.8	46.2	42.8	3.43	13.481		
900.0	897.8	900.3	894.8	1.8	2.2	-97.13	-67.4	-17.7	52.7	48.8	3.91	13.475	SF	
1,000.0	997.5	1,000.0	993.4	2.1	2.5	-92.35	-79.6	-25.6	59.8	55.4	4.39	13.625		
1,100.0	1,097.1	1,099.6	1,091.9	2.3	2.8	-88.59	-91.8	-33.5	67.2	62.3	4.85	13.843		
1,200.0	1,196.7	1,199.2	1,190.5	2.5	3.1	-85.59	-104.1	-41.4	74.8	69.5	5.31	14.086		
1,300.0	1,296.4	1,298.9	1,289.1	2.7	3.4	-83.14	-116.3	-49.3	82.5	76.8	5.76	14.333		
1,400.0	1,396.0	1,398.5	1,387.7	3.0	3.7	-81.12	-128.5	-57.2	90.4	84.2	6.21	14.572		
1,500.0	1,495.6	1,498.2	1,486.2	3.2	4.0	-79.42	-140.8	-65.1	98.4	91.8	6.65	14.799		
1,600.0	1,595.3	1,597.8	1,584.8	3.4	4.3	-77.98	-153.0	-73.0	106.5	99.4	7.09	15.012		
1,700.0	1,694.9	1,697.4	1,683.4	3.7	4.6	-76.75	-165.2	-81.0	114.6	107.1	7.54	15.211		
1,800.0	1,794.5	1,797.1	1,781.9	3.9	4.9	-75.67	-177.5	-88.9	122.8	114.8	7.98	15.395		
1,900.0	1,894.2	1,896.7	1,880.5	4.1	5.3	-74.74	-189.7	-96.8	131.0	122.6	8.41	15.567		
2,000.0	1,993.8	1,996.4	1,979.1	4.3	5.6	-73.91	-201.9	-104.7	139.2	130.4	8.85	15.726		
2,100.0	2,093.4	2,096.0	2,077.6	4.6	5.9	-73.17	-214.2	-112.6	147.5	138.2	9.29	15.873		
2,200.0	2,193.1	2,195.7	2,176.2	4.8	6.2	-72.51	-226.4	-120.5	155.8	146.0	9.73	16.010		
2,300.0	2,292.7	2,295.3	2,274.8	5.0	6.5	-71.92	-238.6	-128.4	164.1	153.9	10.17	16.138		
2,400.0	2,392.3	2,394.9	2,373.4	5.3	6.8	-71.39	-250.9	-136.3	172.4	161.8	10.60	16.257		
2,500.0	2,492.0	2,494.6	2,471.9	5.5	7.1	-70.90	-263.1	-144.2	180.7	169.7	11.04	16.368		
2,600.0	2,591.6	2,594.2	2,570.5	5.7	7.4	-70.46	-275.4	-152.1	189.0	177.6	11.48	16.472		
2,700.0	2,691.2	2,693.9	2,669.1	6.0	7.7	-70.06	-287.6	-160.1	197.4	185.5	11.91	16.570		
2,800.0	2,790.9	2,793.5	2,767.6	6.2	8.0	-69.69	-299.8	-168.0	205.8	193.4	12.35	16.662		
2,900.0	2,890.5	2,893.1	2,866.2	6.4	8.3	-69.34	-312.1	-175.9	214.1	201.3	12.79	16.748		
3,000.0	2,990.1	2,992.8	2,964.8	6.6	8.6	-69.03	-324.3	-183.8	222.5	209.3	13.22	16.829		
3,100.0	3,089.8	3,092.4	3,063.3	6.9	8.9	-68.73	-336.5	-191.7	230.9	217.2	13.66	16.905		
3,200.0	3,189.4	3,192.1	3,161.9	7.1	9.3	-68.46	-348.8	-199.6	239.3	225.2	14.09	16.977		
3,300.0	3,289.0	3,291.7	3,260.5	7.3	9.6	-68.20	-361.0	-207.5	247.7	233.1	14.53	17.046		
3,400.0	3,388.7	3,391.4	3,359.1	7.6	9.9	-67.96	-373.2	-215.4	256.1	241.1	14.97	17.110		
3,500.0	3,488.3	3,491.0	3,457.6	7.8	10.2	-67.74	-385.5	-223.3	264.5	249.1	15.40	17.172		
3,600.0	3,587.9	3,590.6	3,556.2	8.0	10.5	-67.53	-397.7	-231.3	272.9	257.0	15.84	17.230		
3,700.0	3,687.6	3,690.3	3,654.8	8.2	10.8	-67.34	-409.9	-239.2	281.3	265.0	16.27	17.285		
3,800.0	3,787.2	3,789.9	3,753.3	8.5	11.1	-67.15	-422.2	-247.1	289.7	273.0	16.71	17.338		
3,900.0	3,886.8	3,889.6	3,851.9	8.7	11.4	-66.98	-434.4	-255.0	298.1	281.0	17.14	17.388		
4,000.0	3,986.5	3,989.2	3,950.5	8.9	11.7	-66.81	-446.6	-262.9	306.5	288.9	17.58	17.436		
4,100.0	4,086.1	4,088.8	4,049.1	9.2	12.0	-66.65	-458.9	-270.8	314.9	296.9	18.01	17.482		
4,200.0	4,185.7	4,188.5	4,147.6	9.4	12.3	-66.51	-471.1	-278.7	323.4	304.9	18.45	17.526		
4,300.0	4,285.4	4,288.1	4,246.2	9.6	12.7	-66.36	-483.4	-286.6	331.8	312.9	18.89	17.568		
4,400.0	4,385.0	4,387.8	4,344.8	9.9	13.0	-66.23	-495.6	-294.5	340.2	320.9	19.32	17.608		
4,500.0	4,484.6	4,487.4	4,443.3	10.1	13.3	-66.10	-507.8	-302.5	348.6	328.9	19.76	17.646		
4,600.0	4,584.3	4,587.1	4,541.9	10.3	13.6	-65.98	-520.1	-310.4	357.1	336.9	20.19	17.683		
4,700.0	4,683.9	4,686.7	4,640.5	10.5	13.9	-65.87	-532.3	-318.3	365.5	344.9	20.63	17.718		
4,800.0	4,783.5	4,786.3	4,739.0	10.8	14.2	-65.76	-544.5	-326.2	373.9	352.9	21.06	17.752		
4,900.0	4,883.2	4,886.0	4,837.6	11.0	14.5	-65.65	-556.8	-334.1	382.3	360.9	21.50	17.785		
5,000.0	4,982.8	4,985.6	4,936.2	11.2	14.8	-65.55	-569.0	-342.0	390.8	368.8	21.93	17.816		
5,100.0	5,082.4	5,085.3	5,034.8	11.5	15.1	-65.45	-581.2	-349.9	399.2	376.8	22.37	17.847		

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

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design		SWSW S16-T7S-R93W (M16W Pad) - MCU 21-4B (M16W Pad) - 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	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore	Centre	Between	Between	Total	Separation	Warning				
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W	Centres	Ellipses	Uncertainty	Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	Axis						
5,200.0	5,182.1	5,184.9	5,133.3	11.7	15.4	-65.36	-593.5	-357.8	407.7	384.8	22.80	17.876					
5,300.0	5,281.7	5,284.5	5,231.9	11.9	15.7	-65.27	-605.7	-365.7	416.1	392.9	23.24	17.904					
5,400.0	5,381.3	5,384.2	5,330.5	12.2	16.0	-65.18	-617.9	-373.6	424.5	400.9	23.68	17.931					
5,500.0	5,481.0	5,483.8	5,429.0	12.4	16.4	-65.10	-630.2	-381.6	433.0	408.9	24.11	17.957					
5,600.0	5,580.6	5,583.5	5,527.6	12.6	16.7	-65.02	-642.4	-389.5	441.4	416.9	24.55	17.983					
5,700.0	5,680.2	5,683.1	5,626.2	12.8	17.0	-64.95	-654.6	-397.4	449.8	424.9	24.98	18.007					
5,800.0	5,779.9	5,782.7	5,724.7	13.1	17.3	-64.87	-666.9	-405.3	458.3	432.9	25.42	18.031					
5,900.0	5,879.5	5,882.4	5,823.3	13.3	17.6	-64.80	-679.1	-413.2	466.7	440.9	25.85	18.054					
6,000.0	5,979.1	5,982.0	5,921.9	13.5	17.9	-64.74	-691.4	-421.1	475.2	448.9	26.29	18.076					
6,100.0	6,078.8	6,081.7	6,020.5	13.8	18.2	-64.67	-703.6	-429.0	483.6	456.9	26.72	18.097					
6,200.0	6,178.4	6,181.3	6,119.0	14.0	18.5	-64.61	-715.8	-436.9	492.1	464.9	27.16	18.118					

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-4C (M16W Pad) - 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	80.31	7.3	42.6	43.3						
100.0	100.0	100.0	100.0	0.1	0.1	80.31	7.3	42.6	43.3	43.0	0.27	158.900			
200.0	200.0	200.0	200.0	0.3	0.3	80.31	7.3	42.6	43.3	42.6	0.62	69.631 CC, ES			
300.0	300.0	301.3	301.3	0.5	0.5	-161.16	4.9	41.4	44.2	43.2	0.98	45.159			
400.0	399.7	402.5	402.1	0.7	0.7	-156.04	-2.3	37.9	47.0	45.6	1.37	34.231			
500.0	499.3	503.2	501.9	0.9	1.0	-146.51	-14.2	31.9	49.0	47.2	1.85	26.484			
600.0	598.9	602.8	600.0	1.1	1.3	-133.11	-30.0	24.1	51.5	49.1	2.42	21.307			
700.0	698.6	702.1	697.5	1.4	1.7	-120.95	-46.2	16.0	56.6	53.6	3.00	18.862			
800.0	798.2	801.3	795.1	1.6	2.0	-111.13	-62.4	7.9	63.8	60.2	3.56	17.925			
900.0	897.8	900.5	892.6	1.8	2.4	-103.46	-78.7	-0.2	72.5	68.4	4.08	17.746 SF			
1,000.0	997.5	999.7	990.1	2.1	2.7	-97.49	-94.9	-8.3	82.1	77.6	4.58	17.937			
1,100.0	1,097.1	1,098.9	1,087.7	2.3	3.1	-92.82	-111.1	-16.4	92.5	87.5	5.06	18.299			
1,200.0	1,196.7	1,198.1	1,185.2	2.5	3.5	-89.10	-127.4	-24.5	103.4	97.9	5.52	18.732			
1,300.0	1,296.4	1,297.3	1,282.7	2.7	3.8	-86.10	-143.6	-32.6	114.6	108.6	5.97	19.186			
1,400.0	1,396.0	1,396.5	1,380.3	3.0	4.2	-83.63	-159.8	-40.7	126.1	119.6	6.42	19.634			
1,500.0	1,495.6	1,495.7	1,477.8	3.2	4.5	-81.58	-176.0	-48.8	137.7	130.9	6.86	20.064			
1,600.0	1,595.3	1,594.9	1,575.3	3.4	4.9	-79.85	-192.3	-56.9	149.5	142.2	7.31	20.470			
1,700.0	1,694.9	1,694.1	1,672.9	3.7	5.3	-78.38	-208.5	-65.0	161.5	153.7	7.74	20.850			
1,800.0	1,794.5	1,793.3	1,770.4	3.9	5.6	-77.11	-224.7	-73.1	173.5	165.3	8.18	21.204			
1,900.0	1,894.2	1,892.5	1,867.9	4.1	6.0	-76.00	-241.0	-81.2	185.6	176.9	8.62	21.534			
2,000.0	1,993.8	1,991.7	1,965.5	4.3	6.3	-75.03	-257.2	-89.3	197.7	188.7	9.05	21.841			
2,100.0	2,093.4	2,090.9	2,063.0	4.6	6.7	-74.17	-273.4	-97.4	209.9	200.4	9.49	22.126			
2,200.0	2,193.1	2,190.2	2,160.6	4.8	7.1	-73.41	-289.7	-105.5	222.2	212.2	9.92	22.391			
2,300.0	2,292.7	2,289.4	2,258.1	5.0	7.4	-72.72	-305.9	-113.6	234.4	224.1	10.36	22.638			
2,400.0	2,392.3	2,388.6	2,355.6	5.3	7.8	-72.10	-322.1	-121.7	246.7	235.9	10.79	22.868			
2,500.0	2,492.0	2,487.8	2,453.2	5.5	8.1	-71.55	-338.4	-129.8	259.1	247.8	11.22	23.083			
2,600.0	2,591.6	2,587.0	2,550.7	5.7	8.5	-71.04	-354.6	-137.9	271.4	259.8	11.66	23.285			
2,700.0	2,691.2	2,686.2	2,648.2	6.0	8.9	-70.58	-370.8	-146.0	283.8	271.7	12.09	23.474			
2,800.0	2,790.9	2,785.4	2,745.8	6.2	9.2	-70.15	-387.0	-154.1	296.2	283.6	12.52	23.651			
2,900.0	2,890.5	2,884.6	2,843.3	6.4	9.6	-69.76	-403.3	-162.2	308.6	295.6	12.96	23.818			
3,000.0	2,990.1	2,983.8	2,940.8	6.6	9.9	-69.40	-419.5	-170.3	321.0	307.6	13.39	23.975			
3,100.0	3,089.8	3,083.0	3,038.4	6.9	10.3	-69.07	-435.7	-178.4	333.4	319.6	13.82	24.123			
3,200.0	3,189.4	3,182.2	3,135.9	7.1	10.7	-68.76	-452.0	-186.5	345.9	331.6	14.25	24.263			
3,300.0	3,289.0	3,281.4	3,233.4	7.3	11.0	-68.47	-468.2	-194.6	358.3	343.6	14.69	24.395			
3,400.0	3,388.7	3,380.6	3,331.0	7.6	11.4	-68.20	-484.4	-202.7	370.8	355.6	15.12	24.521			
3,500.0	3,488.3	3,479.8	3,428.5	7.8	11.8	-67.95	-500.7	-210.8	383.2	367.7	15.55	24.639			
3,600.0	3,587.9	3,579.1	3,526.0	8.0	12.1	-67.72	-516.9	-218.9	395.7	379.7	15.99	24.752			
3,700.0	3,687.6	3,678.3	3,623.6	8.2	12.5	-67.50	-533.1	-227.0	408.2	391.7	16.42	24.859			
3,800.0	3,787.2	3,777.5	3,721.1	8.5	12.8	-67.29	-549.3	-235.1	420.6	403.8	16.85	24.962			
3,900.0	3,886.8	3,876.7	3,818.6	8.7	13.2	-67.09	-565.6	-243.2	433.1	415.8	17.28	25.059			
4,000.0	3,986.5	3,975.9	3,916.2	8.9	13.6	-66.91	-581.8	-251.3	445.6	427.9	17.72	25.152			
4,100.0	4,086.1	4,075.1	4,013.7	9.2	13.9	-66.73	-598.0	-259.4	458.1	440.0	18.15	25.240			
4,200.0	4,185.7	4,174.3	4,111.2	9.4	14.3	-66.57	-614.3	-267.5	470.6	452.0	18.58	25.325			
4,300.0	4,285.4	4,273.5	4,208.8	9.6	14.6	-66.41	-630.5	-275.6	483.1	464.1	19.02	25.406			
4,400.0	4,385.0	4,372.7	4,306.3	9.9	15.0	-66.26	-646.7	-283.7	495.6	476.2	19.45	25.484			

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

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Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-4D2 (M16W Pad) - 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	77.42	13.1	58.7	60.2						
100.0	100.0	100.0	100.0	0.1	0.1	77.42	13.1	58.7	60.2	59.9	0.27	221.063 CC			
200.0	200.0	200.0	200.0	0.3	0.3	77.42	13.1	58.7	60.2	59.6	0.62	96.871 ES			
300.0	300.0	301.8	301.7	0.5	0.5	-164.37	10.6	57.7	61.2	60.3	0.98	62.485			
400.0	399.7	403.3	403.0	0.7	0.7	-160.11	3.1	54.7	64.3	62.9	1.37	46.800			
500.0	499.3	504.4	503.1	0.9	1.0	-152.49	-9.4	49.7	66.5	64.7	1.85	36.058			
600.0	598.9	604.5	601.5	1.1	1.4	-141.31	-26.5	42.9	68.7	66.3	2.43	28.284			
700.0	698.6	703.2	697.7	1.4	1.8	-128.31	-46.9	34.7	73.4	70.4	3.07	23.898			
800.0	798.2	801.7	793.7	1.6	2.2	-117.19	-67.5	26.4	81.5	77.8	3.69	22.093			
900.0	897.8	900.2	889.7	1.8	2.6	-108.31	-88.1	18.2	92.1	87.8	4.26	21.633 SF			
1,000.0	997.5	998.8	985.7	2.1	3.0	-101.36	-108.6	9.9	104.4	99.6	4.78	21.845			
1,100.0	1,097.1	1,097.3	1,081.7	2.3	3.4	-95.92	-129.2	1.7	117.9	112.7	5.27	22.376			
1,200.0	1,196.7	1,195.8	1,177.7	2.5	3.8	-91.62	-149.8	-6.6	132.3	126.6	5.74	23.048			
1,300.0	1,296.4	1,294.3	1,273.7	2.7	4.3	-88.17	-170.3	-14.8	147.3	141.1	6.20	23.766			
1,400.0	1,396.0	1,392.8	1,369.7	3.0	4.7	-85.36	-190.9	-23.0	162.7	156.0	6.64	24.483			
1,500.0	1,495.6	1,491.4	1,465.7	3.2	5.1	-83.04	-211.5	-31.3	178.4	171.3	7.08	25.176			
1,600.0	1,595.3	1,589.9	1,561.7	3.4	5.5	-81.10	-232.0	-39.5	194.3	186.8	7.52	25.833			
1,700.0	1,694.9	1,688.4	1,657.7	3.7	6.0	-79.45	-252.6	-47.8	210.5	202.5	7.96	26.450			
1,800.0	1,794.5	1,786.9	1,753.7	3.9	6.4	-78.04	-273.2	-56.0	226.7	218.3	8.39	27.026			
1,900.0	1,894.2	1,885.5	1,849.7	4.1	6.8	-76.81	-293.8	-64.3	243.1	234.3	8.82	27.563			
2,000.0	1,993.8	1,984.0	1,945.7	4.3	7.2	-75.74	-314.3	-72.5	259.6	250.4	9.25	28.063			
2,100.0	2,093.4	2,082.5	2,041.7	4.6	7.6	-74.80	-334.9	-80.8	276.2	266.5	9.68	28.528			
2,200.0	2,193.1	2,181.0	2,137.6	4.8	8.1	-73.97	-355.5	-89.0	292.8	282.7	10.11	28.960			
2,300.0	2,292.7	2,279.5	2,233.6	5.0	8.5	-73.22	-376.0	-97.3	309.5	299.0	10.54	29.364			
2,400.0	2,392.3	2,378.1	2,329.6	5.3	8.9	-72.55	-396.6	-105.5	326.2	315.3	10.97	29.740			
2,500.0	2,492.0	2,476.6	2,425.6	5.5	9.3	-71.95	-417.2	-113.8	343.0	331.6	11.40	30.092			
2,600.0	2,591.6	2,575.1	2,521.6	5.7	9.8	-71.40	-437.8	-122.0	359.8	348.0	11.83	30.421			
2,700.0	2,691.2	2,673.6	2,617.6	6.0	10.2	-70.90	-458.3	-130.3	376.6	364.4	12.26	30.730			
2,800.0	2,790.9	2,772.2	2,713.6	6.2	10.6	-70.45	-478.9	-138.5	393.5	380.8	12.69	31.019			
2,900.0	2,890.5	2,870.7	2,809.6	6.4	11.0	-70.03	-499.5	-146.8	410.4	397.3	13.11	31.292			
3,000.0	2,990.1	2,969.2	2,905.6	6.6	11.5	-69.64	-520.0	-155.0	427.3	413.7	13.54	31.548			
3,100.0	3,089.8	3,067.7	3,001.6	6.9	11.9	-69.29	-540.6	-163.3	444.2	430.2	13.97	31.790			
3,200.0	3,189.4	3,166.2	3,097.6	7.1	12.3	-68.96	-561.2	-171.5	461.1	446.7	14.40	32.019			
3,300.0	3,289.0	3,264.8	3,193.6	7.3	12.7	-68.65	-581.8	-179.7	478.1	463.2	14.83	32.235			
3,400.0	3,388.7	3,363.3	3,289.6	7.6	13.2	-68.36	-602.3	-188.0	495.0	479.8	15.26	32.440			

Cathedral Energy Services

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Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU 21-5A (M16W Pad) - 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	75.75	18.9	74.6	76.9					
100.0	100.0	100.0	100.0	0.1	0.1	75.75	18.9	74.6	76.9	76.7	0.27	282.543		
200.0	200.0	200.0	200.0	0.3	0.3	75.75	18.9	74.6	76.9	76.3	0.62	123.811	CC, ES	
300.0	300.0	302.2	302.1	0.5	0.5	-166.26	16.3	73.7	78.1	77.1	0.98	79.564		
400.0	399.7	404.1	403.7	0.7	0.7	-162.62	8.6	71.1	81.3	79.9	1.38	59.115		
500.0	499.3	505.5	504.2	0.9	1.0	-156.21	-4.2	66.8	83.7	81.9	1.84	45.418		
600.0	598.9	605.9	602.8	1.1	1.4	-146.91	-21.8	60.9	85.8	83.4	2.42	35.458		
700.0	698.6	704.7	698.8	1.4	1.8	-135.15	-43.9	53.4	89.8	86.7	3.10	28.929		
800.0	798.2	802.3	792.8	1.6	2.3	-123.01	-68.7	45.1	97.9	94.1	3.79	25.829		
900.0	897.8	899.9	886.8	1.8	2.8	-113.00	-93.6	36.7	109.7	105.3	4.41	24.870	SF	
1,000.0	997.5	997.5	980.8	2.1	3.2	-105.08	-118.5	28.4	124.3	119.4	4.97	25.002		
1,100.0	1,097.1	1,095.1	1,074.8	2.3	3.7	-98.88	-143.3	20.0	140.8	135.3	5.48	25.669		
1,200.0	1,196.7	1,192.6	1,168.8	2.5	4.2	-93.99	-168.2	11.6	158.5	152.6	5.96	26.580		
1,300.0	1,296.4	1,290.2	1,262.8	2.7	4.7	-90.10	-193.1	3.3	177.2	170.8	6.42	27.584		
1,400.0	1,396.0	1,387.8	1,356.8	3.0	5.2	-86.95	-218.0	-5.1	196.5	189.6	6.87	28.602		
1,500.0	1,495.6	1,485.4	1,450.8	3.2	5.7	-84.37	-242.9	-13.5	216.3	208.9	7.31	29.595		
1,600.0	1,595.3	1,583.0	1,544.8	3.4	6.2	-82.22	-267.7	-21.8	236.4	228.6	7.74	30.542		
1,700.0	1,694.9	1,680.6	1,638.8	3.7	6.6	-80.40	-292.6	-30.2	256.8	248.6	8.17	31.435		
1,800.0	1,794.5	1,778.2	1,732.9	3.9	7.1	-78.86	-317.5	-38.6	277.4	268.8	8.60	32.271		
1,900.0	1,894.2	1,875.8	1,826.9	4.1	7.6	-77.53	-342.4	-46.9	298.2	289.1	9.02	33.052		
2,000.0	1,993.8	1,973.4	1,920.9	4.3	8.1	-76.37	-367.3	-55.3	319.1	309.6	9.45	33.780		
2,100.0	2,093.4	2,071.0	2,014.9	4.6	8.6	-75.35	-392.1	-63.7	340.1	330.2	9.87	34.459		
2,200.0	2,193.1	2,168.6	2,108.9	4.8	9.1	-74.45	-417.0	-72.0	361.2	350.9	10.29	35.091		
2,300.0	2,292.7	2,266.2	2,202.9	5.0	9.6	-73.65	-441.9	-80.4	382.4	371.7	10.72	35.681		
2,400.0	2,392.3	2,363.8	2,296.9	5.3	10.1	-72.94	-466.8	-88.7	403.6	392.5	11.14	36.232		
2,500.0	2,492.0	2,461.4	2,390.9	5.5	10.6	-72.29	-491.6	-97.1	424.9	413.4	11.56	36.748		
2,600.0	2,591.6	2,559.0	2,484.9	5.7	11.0	-71.71	-516.5	-105.5	446.3	434.3	11.99	37.230		
2,700.0	2,691.2	2,656.6	2,578.9	6.0	11.5	-71.18	-541.4	-113.8	467.7	455.3	12.41	37.683		
2,800.0	2,790.9	2,754.2	2,672.9	6.2	12.0	-70.70	-566.3	-122.2	489.1	476.3	12.83	38.108		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design		SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 16-12C2 (M16W Pad) - 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	48.37	126.8	142.6	190.8					
100.0	100.0	100.0	100.0	0.1	0.1	48.37	126.8	142.6	190.8	190.5	0.27	700.806		
200.0	200.0	200.0	200.0	0.3	0.3	48.37	126.8	142.6	190.8	190.2	0.62	307.095 CC, ES		
300.0	300.0	299.5	299.5	0.5	0.5	164.50	128.8	141.0	193.4	192.5	0.98	197.825		
400.0	399.7	398.4	398.1	0.7	0.7	162.83	134.7	136.1	201.1	199.8	1.37	146.637		
500.0	499.3	496.4	495.2	0.9	1.0	160.05	144.5	128.0	210.6	208.7	1.83	114.964		
600.0	598.9	594.9	592.4	1.1	1.3	156.71	156.7	118.0	221.0	218.7	2.31	95.539		
700.0	698.6	693.5	689.8	1.4	1.6	153.67	168.9	108.0	232.1	229.3	2.80	82.790		
800.0	798.2	792.2	787.2	1.6	1.9	150.90	181.1	98.0	243.8	240.5	3.30	73.958		
900.0	897.8	890.8	884.5	1.8	2.2	148.40	193.3	87.9	256.1	252.3	3.79	67.559		
1,000.0	997.5	989.5	981.9	2.1	2.6	146.12	205.5	77.9	268.7	264.5	4.28	62.755		
1,100.0	1,097.1	1,088.1	1,079.3	2.3	2.9	144.05	217.8	67.8	281.8	277.0	4.77	59.046		
1,200.0	1,196.7	1,186.8	1,176.6	2.5	3.2	142.16	230.0	57.8	295.2	289.9	5.26	56.116		
1,300.0	1,296.4	1,285.4	1,274.0	2.7	3.5	140.43	242.2	47.7	308.9	303.1	5.75	53.756		
1,400.0	1,396.0	1,384.0	1,371.4	3.0	3.9	138.86	254.4	37.7	322.8	316.6	6.23	51.825		
1,500.0	1,495.6	1,482.7	1,468.8	3.2	4.2	137.41	266.6	27.6	337.0	330.3	6.71	50.223		
1,600.0	1,595.3	1,581.3	1,566.1	3.4	4.5	136.08	278.8	17.6	351.3	344.2	7.19	48.879		
1,700.0	1,694.9	1,680.0	1,663.5	3.7	4.8	134.86	291.1	7.6	365.9	358.2	7.66	47.738		
1,800.0	1,794.5	1,778.6	1,760.9	3.9	5.2	133.72	303.3	-2.5	380.6	372.4	8.14	46.760		
1,900.0	1,894.2	1,877.3	1,858.2	4.1	5.5	132.68	315.5	-12.5	395.4	386.8	8.61	45.917		
2,000.0	1,993.8	1,975.9	1,955.6	4.3	5.8	131.70	327.7	-22.6	410.3	401.2	9.08	45.183		
2,100.0	2,093.4	2,074.6	2,053.0	4.6	6.1	130.80	339.9	-32.6	425.4	415.8	9.55	44.540		
2,200.0	2,193.1	2,173.2	2,150.3	4.8	6.5	129.96	352.2	-42.7	440.5	430.5	10.02	43.973		
2,300.0	2,292.7	2,271.9	2,247.7	5.0	6.8	129.17	364.4	-52.7	455.7	445.2	10.48	43.471		
2,400.0	2,392.3	2,370.5	2,345.1	5.3	7.1	128.43	376.6	-62.7	471.0	460.1	10.95	43.024		
2,500.0	2,492.0	2,469.2	2,442.4	5.5	7.4	127.75	388.8	-72.8	486.4	475.0	11.41	42.624 SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 16-2C (M16W Pad) - 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 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	47.14	137.3	148.0	201.9					
100.0	100.0	100.0	100.0	0.1	0.1	47.14	137.3	148.0	201.9	201.6	0.27	741.480		
200.0	200.0	200.0	200.0	0.3	0.3	47.14	137.3	148.0	201.9	201.3	0.62	324.918	CC, ES	
300.0	300.0	297.8	297.8	0.5	0.5	163.35	139.5	146.7	204.9	203.9	0.97	210.272		
400.0	399.7	395.0	394.6	0.7	0.7	161.90	145.8	142.8	213.7	212.4	1.36	156.954		
500.0	499.3	491.1	490.0	0.9	1.0	159.51	156.2	136.4	225.0	223.2	1.80	124.720		
600.0	598.9	585.9	583.3	1.1	1.3	156.28	170.5	127.7	238.2	235.9	2.30	103.662		
700.0	698.6	683.6	679.0	1.4	1.7	152.79	187.2	117.5	253.1	250.2	2.82	89.871		
800.0	798.2	781.4	774.8	1.6	2.0	149.69	203.9	107.3	268.7	265.4	3.33	80.626		
900.0	897.8	879.2	870.6	1.8	2.4	146.94	220.6	97.1	285.1	281.3	3.85	74.115		
1,000.0	997.5	976.9	966.4	2.1	2.8	144.48	237.3	86.9	302.1	297.7	4.36	69.353		
1,100.0	1,097.1	1,074.7	1,062.1	2.3	3.2	142.28	254.0	76.7	319.5	314.7	4.86	65.762		
1,200.0	1,196.7	1,172.4	1,157.9	2.5	3.5	140.31	270.7	66.5	337.4	332.0	5.36	62.986		
1,300.0	1,296.4	1,270.2	1,253.7	2.7	3.9	138.54	287.4	56.3	355.6	349.7	5.85	60.795		
1,400.0	1,396.0	1,367.9	1,349.5	3.0	4.3	136.94	304.1	46.1	374.1	367.8	6.34	59.035		
1,500.0	1,495.6	1,465.7	1,445.2	3.2	4.7	135.49	320.8	35.8	392.9	386.1	6.82	57.600		
1,600.0	1,595.3	1,563.4	1,541.0	3.4	5.1	134.17	337.5	25.6	411.9	404.6	7.30	56.416		
1,700.0	1,694.9	1,661.2	1,636.8	3.7	5.4	132.97	354.2	15.4	431.1	423.3	7.78	55.427		
1,800.0	1,794.5	1,759.0	1,732.6	3.9	5.8	131.87	371.0	5.2	450.4	442.2	8.25	54.593		
1,900.0	1,894.2	1,856.7	1,828.3	4.1	6.2	130.86	387.7	-5.0	469.9	461.2	8.72	53.884		
2,000.0	1,993.8	1,954.5	1,924.1	4.3	6.6	129.93	404.4	-15.2	489.5	480.4	9.19	53.275	SF	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 16-5C (M16W Pad) - 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	50.13	132.6	158.7	206.8						
100.0	100.0	100.0	100.0	0.1	0.1	50.13	132.6	158.7	206.8	206.5	0.27	759.576			
200.0	200.0	200.0	200.0	0.3	0.3	50.13	132.6	158.7	206.8	206.2	0.62	332.848	CC, ES		
300.0	300.0	296.3	296.3	0.5	0.5	166.36	134.9	157.9	210.2	209.3	0.97	216.535			
400.0	399.7	391.8	391.5	0.7	0.7	164.99	141.6	155.4	220.2	218.8	1.35	163.176			
500.0	499.3	486.2	485.1	0.9	1.0	162.79	152.7	151.4	233.2	231.5	1.77	131.451			
600.0	598.9	579.1	576.6	1.1	1.3	159.89	167.8	145.9	248.8	246.5	2.25	110.689			
700.0	698.6	670.2	665.4	1.4	1.7	156.53	186.7	139.0	267.3	264.5	2.76	96.772			
800.0	798.2	759.0	751.0	1.6	2.1	152.96	208.9	130.9	289.2	285.9	3.30	87.510			
900.0	897.8	847.2	834.9	1.8	2.6	149.28	234.5	121.5	314.9	311.0	3.85	81.761			
1,000.0	997.5	941.2	923.9	2.1	3.1	145.76	263.0	111.2	342.7	338.3	4.41	77.732			
1,100.0	1,097.1	1,035.2	1,012.9	2.3	3.7	142.75	291.4	100.8	371.5	366.6	4.95	75.106			
1,200.0	1,196.7	1,129.2	1,101.8	2.5	4.2	140.17	319.9	90.4	401.2	395.7	5.47	73.367			
1,300.0	1,296.4	1,223.2	1,190.8	2.7	4.8	137.94	348.4	80.0	431.5	425.6	5.98	72.211			
1,400.0	1,396.0	1,317.2	1,279.8	3.0	5.3	136.00	376.8	69.6	462.4	455.9	6.47	71.448			
1,500.0	1,495.6	1,411.2	1,368.8	3.2	5.9	134.30	405.3	59.3	493.7	486.7	6.96	70.955	SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 17-16B (M16W Pad) - 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	69.94	23.3	63.8	68.0					
100.0	100.0	100.0	100.0	0.1	0.1	69.94	23.3	63.8	68.0	67.7	0.27	249.574		
200.0	200.0	200.0	200.0	0.3	0.3	69.94	23.3	63.8	68.0	67.3	0.62	109.364		
300.0	300.0	303.0	303.0	0.5	0.5	-174.89	24.0	61.1	68.3	67.4	0.98	69.846		
400.0	399.7	405.8	405.4	0.7	0.7	-179.41	25.9	53.1	69.4	68.0	1.35	51.282		
500.0	499.3	508.1	506.8	0.9	1.0	173.13	29.1	39.7	68.1	66.4	1.78	38.205		
600.0	598.9	609.4	606.3	1.1	1.4	161.74	33.5	21.3	65.1	62.7	2.34	27.859		
700.0	698.6	709.1	703.1	1.4	1.9	145.52	39.1	-1.7	63.1	60.0	3.08	20.507		
701.3	699.8	710.3	704.3	1.4	1.9	145.28	39.2	-2.1	63.1	60.0	3.09	20.432 CC, ES		
800.0	798.2	806.7	796.5	1.6	2.4	125.64	45.7	-29.1	66.5	62.6	3.92	16.940 SF		
900.0	897.8	902.5	887.0	1.8	3.0	106.65	53.1	-59.9	78.7	74.1	4.62	17.038		
1,000.0	997.5	998.5	977.3	2.1	3.6	93.20	60.7	-91.4	97.7	92.6	5.10	19.151		
1,100.0	1,097.1	1,094.5	1,067.7	2.3	4.2	84.31	68.3	-122.9	120.3	114.8	5.49	21.891		
1,200.0	1,196.7	1,190.5	1,158.0	2.5	4.8	78.27	75.9	-154.4	144.8	138.9	5.86	24.698		
1,300.0	1,296.4	1,286.5	1,248.3	2.7	5.4	73.98	83.5	-185.9	170.4	164.2	6.23	27.360		
1,400.0	1,396.0	1,382.4	1,338.7	3.0	6.0	70.81	91.1	-217.5	196.7	190.1	6.60	29.810		
1,500.0	1,495.6	1,478.4	1,429.0	3.2	6.7	68.39	98.7	-249.0	223.4	216.4	6.97	32.039		
1,600.0	1,595.3	1,574.4	1,519.4	3.4	7.3	66.49	106.3	-280.5	250.4	243.1	7.35	34.057		
1,700.0	1,694.9	1,670.4	1,609.7	3.7	7.9	64.95	113.8	-312.0	277.6	269.9	7.74	35.885		
1,800.0	1,794.5	1,766.4	1,700.1	3.9	8.5	63.69	121.4	-343.5	305.0	296.9	8.12	37.541		
1,900.0	1,894.2	1,862.4	1,790.4	4.1	9.1	62.64	129.0	-375.0	332.5	323.9	8.51	39.047		
2,000.0	1,993.8	1,958.3	1,880.8	4.3	9.7	61.74	136.6	-406.5	360.0	351.1	8.91	40.420		
2,100.0	2,093.4	2,054.3	1,971.1	4.6	10.3	60.98	144.2	-438.0	387.7	378.4	9.30	41.674		
2,200.0	2,193.1	2,150.3	2,061.5	4.8	11.0	60.31	151.8	-469.5	415.4	405.7	9.70	42.825		
2,300.0	2,292.7	2,246.3	2,151.8	5.0	11.6	59.73	159.4	-501.1	443.1	433.0	10.10	43.884		
2,400.0	2,392.3	2,342.3	2,242.2	5.3	12.2	59.22	167.0	-532.6	470.9	460.4	10.50	44.860		
2,500.0	2,492.0	2,438.3	2,332.5	5.5	12.8	58.76	174.6	-564.1	498.7	487.8	10.90	45.764		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 17-16B2 (M16W Pad) - 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	69.99	17.5	48.0	51.1					
100.0	100.0	100.0	100.0	0.1	0.1	69.99	17.5	48.0	51.1	50.8	0.27	187.668		
200.0	200.0	200.0	200.0	0.3	0.3	69.99	17.5	48.0	51.1	50.5	0.62	82.236		
300.0	300.0	302.4	302.4	0.5	0.5	-174.98	17.8	45.3	51.3	50.3	0.98	52.562		
400.0	399.7	404.7	404.3	0.7	0.7	-179.95	18.6	37.1	51.8	50.5	1.34	38.579		
500.0	499.3	506.6	505.3	0.9	1.0	171.54	20.0	23.6	49.7	47.9	1.76	28.183		
600.0	598.9	607.5	604.5	1.1	1.4	157.37	22.0	4.9	45.4	43.1	2.32	19.569		
696.6	695.2	703.7	697.9	1.4	1.8	136.02	24.4	-17.7	42.8	39.7	3.08	13.884 CC		
700.0	698.6	707.0	701.0	1.4	1.9	135.15	24.5	-18.5	42.8	39.7	3.11	13.748 ES		
800.0	798.2	804.4	794.4	1.6	2.4	108.20	27.4	-46.3	47.9	44.0	3.92	12.222 SF		
900.0	897.8	900.4	885.1	1.8	3.0	86.49	30.7	-77.7	63.7	59.3	4.40	14.488		
1,000.0	997.5	996.7	975.8	2.1	3.6	73.87	34.0	-109.7	85.3	80.6	4.71	18.109		
1,100.0	1,097.1	1,093.0	1,066.6	2.3	4.2	66.48	37.4	-141.8	109.4	104.3	5.02	21.780		
1,200.0	1,196.7	1,189.4	1,157.3	2.5	4.8	61.76	40.8	-173.8	134.5	129.1	5.35	25.151		
1,300.0	1,296.4	1,285.7	1,248.1	2.7	5.4	58.53	44.1	-205.8	160.2	154.5	5.69	28.159		
1,400.0	1,396.0	1,382.0	1,338.9	3.0	6.0	56.20	47.5	-237.9	186.3	180.2	6.04	30.822		
1,500.0	1,495.6	1,478.3	1,429.6	3.2	6.6	54.44	50.9	-269.9	212.5	206.1	6.41	33.179		
1,600.0	1,595.3	1,574.6	1,520.4	3.4	7.2	53.06	54.2	-301.9	239.0	232.2	6.77	35.273		
1,700.0	1,694.9	1,670.9	1,611.1	3.7	7.8	51.96	57.6	-334.0	265.5	258.4	7.15	37.140		
1,800.0	1,794.5	1,767.2	1,701.9	3.9	8.5	51.06	60.9	-366.0	292.1	284.6	7.53	38.814		
1,900.0	1,894.2	1,863.5	1,792.6	4.1	9.1	50.31	64.3	-398.0	318.8	310.9	7.91	40.321		
2,000.0	1,993.8	1,959.8	1,883.4	4.3	9.7	49.68	67.7	-430.1	345.5	337.2	8.29	41.685		
2,100.0	2,093.4	2,056.1	1,974.2	4.6	10.3	49.13	71.0	-462.1	372.2	363.5	8.67	42.924		
2,200.0	2,193.1	2,152.4	2,064.9	4.8	10.9	48.66	74.4	-494.1	399.0	389.9	9.06	44.055		
2,300.0	2,292.7	2,248.7	2,155.7	5.0	11.5	48.25	77.8	-526.1	425.8	416.3	9.44	45.090		
2,400.0	2,392.3	2,345.0	2,246.4	5.3	12.1	47.89	81.1	-558.2	452.6	442.7	9.83	46.041		
2,500.0	2,492.0	2,441.3	2,337.2	5.5	12.8	47.56	84.5	-590.2	479.4	469.2	10.22	46.918		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 17-16C (M16W Pad) - 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	70.10	5.8	16.1	17.1					
100.0	100.0	100.0	100.0	0.1	0.1	70.10	5.8	16.1	17.1	16.8	0.27	62.881		
200.0	200.0	200.0	200.0	0.3	0.3	70.10	5.8	16.1	17.1	16.5	0.62	27.555		
300.0	300.0	300.8	300.8	0.5	0.5	-177.01	5.8	13.4	17.3	16.3	0.97	17.740		
400.0	399.7	401.6	401.2	0.7	0.7	171.94	5.5	5.5	17.7	16.4	1.34	13.248		
500.0	499.3	502.0	500.8	0.9	1.0	150.25	5.2	-7.7	16.3	14.5	1.81	9.020		
545.5	544.6	547.5	545.6	1.0	1.2	134.22	5.0	-15.4	15.9	13.7	2.12	7.486 CC, ES		
600.0	598.9	601.6	598.7	1.1	1.4	111.02	4.7	-26.0	17.0	14.5	2.50	6.804 SF		
700.0	698.6	700.0	694.3	1.4	1.8	75.83	4.1	-49.0	26.7	23.7	2.96	9.029		
800.0	798.2	796.2	786.6	1.6	2.4	58.12	3.3	-76.2	44.9	41.6	3.25	13.823		
900.0	897.8	892.1	877.4	1.8	2.9	49.32	2.5	-107.1	68.5	65.0	3.54	19.358		
1,000.0	997.5	988.8	968.7	2.1	3.5	44.92	1.6	-138.8	93.4	89.5	3.87	24.106		
1,100.0	1,097.1	1,085.5	1,060.1	2.3	4.1	42.37	0.7	-170.4	118.5	114.3	4.22	28.048		
1,200.0	1,196.7	1,182.2	1,151.4	2.5	4.7	40.71	-0.1	-202.0	143.8	139.2	4.59	31.352		
1,300.0	1,296.4	1,278.9	1,242.8	2.7	5.3	39.55	-1.0	-233.6	169.1	164.2	4.95	34.153		
1,400.0	1,396.0	1,375.6	1,334.2	3.0	5.9	38.69	-1.8	-265.2	194.5	189.2	5.32	36.556		
1,500.0	1,495.6	1,472.2	1,425.5	3.2	6.5	38.03	-2.7	-296.8	220.0	214.3	5.69	38.638		
1,600.0	1,595.3	1,568.9	1,516.9	3.4	7.1	37.51	-3.6	-328.4	245.4	239.3	6.07	40.460		
1,700.0	1,694.9	1,665.6	1,608.3	3.7	7.7	37.08	-4.4	-360.1	270.9	264.4	6.44	42.066		
1,800.0	1,794.5	1,762.3	1,699.6	3.9	8.3	36.73	-5.3	-391.7	296.4	289.5	6.81	43.493		
1,900.0	1,894.2	1,859.0	1,791.0	4.1	8.9	36.44	-6.1	-423.3	321.8	314.7	7.19	44.769		
2,000.0	1,993.8	1,955.7	1,882.4	4.3	9.5	36.18	-7.0	-454.9	347.3	339.8	7.56	45.917		
2,100.0	2,093.4	2,052.3	1,973.7	4.6	10.1	35.96	-7.9	-486.5	372.8	364.9	7.94	46.954		
2,200.0	2,193.1	2,149.0	2,065.1	4.8	10.7	35.77	-8.7	-518.1	398.3	390.0	8.32	47.897		
2,300.0	2,292.7	2,245.7	2,156.5	5.0	11.3	35.61	-9.6	-549.8	423.9	415.2	8.69	48.758		
2,400.0	2,392.3	2,342.4	2,247.8	5.3	11.9	35.46	-10.4	-581.4	449.4	440.3	9.07	49.546		
2,500.0	2,492.0	2,439.1	2,339.2	5.5	12.5	35.33	-11.3	-613.0	474.9	465.4	9.45	50.271		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 17-9B (M16W pad) - 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	46.36	120.9	126.8	175.2						
100.0	100.0	100.0	100.0	0.1	0.1	46.36	120.9	126.8	175.2	174.9	0.27	643.554			
200.0	200.0	200.0	200.0	0.3	0.3	46.36	120.9	126.8	175.2	174.6	0.62	282.007	CC, ES		
300.0	300.0	301.1	301.1	0.5	0.5	162.45	122.6	124.7	177.4	176.4	0.98	180.784			
400.0	399.7	401.7	401.4	0.7	0.7	160.65	127.6	118.5	183.7	182.3	1.38	132.998			
500.0	499.3	501.6	500.3	0.9	1.0	157.57	135.9	108.3	190.9	189.0	1.85	103.237			
600.0	598.9	600.0	597.1	1.1	1.4	153.28	147.2	94.4	198.7	196.3	2.40	82.934			
700.0	698.6	697.0	691.4	1.4	1.8	148.05	161.4	76.8	208.3	205.2	3.03	68.829			
800.0	798.2	791.6	782.2	1.6	2.3	142.20	178.1	56.1	220.5	216.8	3.72	59.326			
900.0	897.8	883.6	869.1	1.8	2.9	136.10	197.1	32.7	236.6	232.2	4.44	53.251			
1,000.0	997.5	975.5	954.6	2.1	3.5	129.99	218.3	6.5	257.0	251.9	5.15	49.920			
1,100.0	1,097.1	1,069.3	1,041.7	2.3	4.1	124.57	240.2	-20.6	280.4	274.6	5.82	48.177			
1,200.0	1,196.7	1,163.1	1,128.7	2.5	4.8	119.96	262.2	-47.8	306.0	299.5	6.45	47.455			
1,300.0	1,296.4	1,256.9	1,215.8	2.7	5.4	116.05	284.1	-74.9	333.2	326.1	7.04	47.349	SF		
1,400.0	1,396.0	1,350.7	1,302.8	3.0	6.1	112.71	306.1	-102.0	361.7	354.1	7.59	47.620			
1,500.0	1,495.6	1,444.5	1,389.9	3.2	6.7	109.85	328.0	-129.2	391.2	383.0	8.13	48.122			
1,600.0	1,595.3	1,538.2	1,476.9	3.4	7.4	107.39	350.0	-156.3	421.4	412.8	8.64	48.763			
1,700.0	1,694.9	1,632.0	1,564.0	3.7	8.0	105.25	371.9	-183.4	452.4	443.2	9.14	49.484			
1,800.0	1,794.5	1,725.8	1,651.0	3.9	8.7	103.38	393.9	-210.6	483.8	474.2	9.63	50.245			

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 17-9B2 (M16W Pad) - 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	42.73	125.6	116.1	171.1					
100.0	100.0	100.0	100.0	0.1	0.1	42.73	125.6	116.1	171.1	170.8	0.27	628.266		
200.0	200.0	200.0	200.0	0.3	0.3	42.73	125.6	116.1	171.1	170.4	0.62	275.308	CC, ES	
300.0	300.0	302.0	301.9	0.5	0.5	158.86	127.0	113.7	172.9	171.9	0.98	175.887		
400.0	399.7	403.5	403.2	0.7	0.7	157.16	131.1	106.7	178.3	176.9	1.39	128.573		
500.0	499.3	504.4	503.1	0.9	1.0	154.09	137.7	95.1	184.0	182.1	1.86	98.845		
600.0	598.9	604.1	601.1	1.1	1.4	149.69	146.9	79.2	189.8	187.4	2.42	78.327		
700.0	698.6	702.2	696.4	1.4	1.8	144.17	158.4	59.2	196.9	193.8	3.07	64.025		
800.0	798.2	798.0	788.3	1.6	2.4	137.85	172.0	35.6	206.4	202.6	3.80	54.297		
900.0	897.8	891.3	876.3	1.8	3.0	131.12	187.4	8.8	219.6	215.0	4.57	48.032		
1,000.0	997.5	984.4	962.8	2.1	3.6	124.35	204.5	-20.9	237.2	231.8	5.32	44.617		
1,100.0	1,097.1	1,078.6	1,050.3	2.3	4.2	118.37	222.0	-51.3	258.0	252.0	6.01	42.912		
1,200.0	1,196.7	1,172.8	1,137.8	2.5	4.9	113.28	239.5	-81.7	281.3	274.7	6.66	42.265		
1,300.0	1,296.4	1,267.1	1,225.2	2.7	5.5	108.95	257.0	-112.1	306.5	299.3	7.25	42.257	SF	
1,400.0	1,396.0	1,361.3	1,312.7	3.0	6.2	105.26	274.5	-142.4	333.2	325.4	7.81	42.638		
1,500.0	1,495.6	1,455.5	1,400.1	3.2	6.8	102.11	292.0	-172.8	361.0	352.6	8.35	43.254		
1,600.0	1,595.3	1,549.8	1,487.6	3.4	7.5	99.41	309.5	-203.2	389.7	380.8	8.85	44.008		
1,700.0	1,694.9	1,644.0	1,575.1	3.7	8.2	97.06	327.0	-233.6	419.1	409.7	9.35	44.841		
1,800.0	1,794.5	1,738.2	1,662.5	3.9	8.8	95.02	344.5	-264.0	449.0	439.2	9.82	45.710		
1,900.0	1,894.2	1,832.4	1,750.0	4.1	9.5	93.24	362.0	-294.4	479.5	469.2	10.29	46.592		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 17-9C (M16W Pad) - 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	39.84	119.8	100.0	156.1					
100.0	100.0	100.0	100.0	0.1	0.1	39.84	119.8	100.0	156.1	155.8	0.27	573.152 CC		
200.0	200.0	200.0	200.0	0.3	0.3	39.84	119.8	100.0	156.1	155.4	0.62	251.157 ES		
300.0	300.0	302.1	302.1	0.5	0.5	155.97	121.0	97.5	157.8	156.8	0.98	160.366		
400.0	399.7	404.0	403.6	0.7	0.7	154.25	124.3	90.1	162.6	161.3	1.39	117.108		
500.0	499.3	505.2	503.9	0.9	1.0	151.04	129.9	77.9	167.6	165.7	1.87	89.792		
600.0	598.9	605.3	602.2	1.1	1.4	146.33	137.6	61.0	172.5	170.1	2.44	70.833		
700.0	698.6	703.7	697.9	1.4	1.8	140.35	147.3	39.9	178.5	175.4	3.10	57.612		
800.0	798.2	800.0	790.2	1.6	2.4	133.45	158.7	15.0	187.0	183.1	3.84	48.726		
900.0	897.8	894.0	878.8	1.8	3.0	126.06	171.7	-13.4	199.3	194.7	4.61	43.221		
1,000.0	997.5	989.1	967.9	2.1	3.6	118.99	185.6	-43.9	215.6	210.2	5.34	40.349		
1,100.0	1,097.1	1,084.3	1,056.9	2.3	4.2	112.93	199.6	-74.3	234.8	228.8	6.02	39.023		
1,200.0	1,196.7	1,179.4	1,146.0	2.5	4.8	107.79	213.5	-104.8	256.3	249.7	6.64	38.612 SF		
1,300.0	1,296.4	1,274.5	1,235.0	2.7	5.5	103.44	227.4	-135.2	279.5	272.3	7.21	38.750		
1,400.0	1,396.0	1,369.7	1,324.1	3.0	6.1	99.74	241.4	-165.7	304.1	296.4	7.75	39.217		
1,500.0	1,495.6	1,464.8	1,413.1	3.2	6.7	96.60	255.3	-196.2	329.7	321.5	8.27	39.881		
1,600.0	1,595.3	1,559.9	1,502.1	3.4	7.3	93.90	269.2	-226.6	356.2	347.4	8.76	40.657		
1,700.0	1,694.9	1,655.1	1,591.2	3.7	8.0	91.57	283.2	-257.1	383.3	374.1	9.24	41.491		
1,800.0	1,794.5	1,750.2	1,680.2	3.9	8.6	89.54	297.1	-287.5	410.9	401.2	9.70	42.349		
1,900.0	1,894.2	1,845.4	1,769.3	4.1	9.2	87.77	311.0	-318.0	439.0	428.8	10.16	43.209		
2,000.0	1,993.8	1,940.5	1,858.3	4.3	9.9	86.20	325.0	-348.4	467.4	456.8	10.61	44.058		
2,100.0	2,093.4	2,035.6	1,947.4	4.6	10.5	84.82	338.9	-378.9	496.1	485.0	11.05	44.885		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design SWSW S16-T7S-R93W (M16W Pad) - MCU Fee 17-9D (M16W Pad) - 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	40.97	109.3	94.9	144.7					
100.0	100.0	100.0	100.0	0.1	0.1	40.97	109.3	94.9	144.7	144.5	0.27	531.543		
200.0	200.0	200.0	200.0	0.3	0.3	40.97	109.3	94.9	144.7	144.1	0.62	232.924 CC, ES		
300.0	300.0	303.9	303.9	0.5	0.5	158.57	107.4	94.9	145.8	144.8	0.98	148.820		
400.0	399.7	406.6	406.4	0.7	0.7	160.60	102.8	94.2	149.0	147.7	1.34	111.298		
500.0	499.3	508.7	508.4	0.9	0.9	161.00	100.2	89.1	151.9	150.2	1.69	89.716		
600.0	598.9	610.7	609.9	1.1	1.1	159.42	100.3	79.3	153.3	151.3	2.07	74.078		
700.0	698.6	712.0	710.1	1.4	1.4	155.93	102.9	64.9	153.9	151.3	2.52	61.158		
800.0	798.2	812.1	808.3	1.6	1.7	150.59	108.1	46.1	154.4	151.3	3.06	50.465		
900.0	897.8	910.4	903.6	1.8	2.2	143.57	115.6	23.3	156.3	152.5	3.74	41.782		
1,000.0	997.5	1,007.1	996.2	2.1	2.6	135.36	125.1	-3.0	161.3	156.8	4.51	35.731		
1,100.0	1,097.1	1,104.0	1,088.7	2.3	3.2	127.48	135.1	-30.0	169.9	164.6	5.29	32.110		
1,200.0	1,196.7	1,200.8	1,181.2	2.5	3.7	120.44	145.0	-57.0	181.5	175.4	6.03	30.098		
1,300.0	1,296.4	1,297.7	1,273.7	2.7	4.2	114.29	155.0	-84.0	195.5	188.8	6.72	29.110		
1,400.0	1,396.0	1,394.6	1,366.2	3.0	4.7	108.98	164.9	-111.0	211.6	204.2	7.35	28.774 SF		
1,500.0	1,495.6	1,491.4	1,458.6	3.2	5.3	104.43	174.9	-138.0	229.2	221.3	7.95	28.850		
1,600.0	1,595.3	1,588.3	1,551.1	3.4	5.8	100.53	184.8	-165.0	248.1	239.6	8.50	29.188		
1,700.0	1,694.9	1,685.2	1,643.6	3.7	6.3	97.19	194.8	-192.0	267.9	258.9	9.03	29.688		
1,800.0	1,794.5	1,782.0	1,736.1	3.9	6.9	94.30	204.7	-219.0	288.6	279.0	9.53	30.285		
1,900.0	1,894.2	1,878.9	1,828.6	4.1	7.4	91.80	214.7	-246.1	309.8	299.8	10.01	30.939		
2,000.0	1,993.8	1,975.8	1,921.1	4.3	8.0	89.62	224.6	-273.1	331.5	321.0	10.48	31.620		
2,100.0	2,093.4	2,072.6	2,013.6	4.6	8.5	87.70	234.6	-300.1	353.7	342.7	10.95	32.309		
2,200.0	2,193.1	2,169.5	2,106.1	4.8	9.1	86.01	244.5	-327.1	376.1	364.7	11.40	32.995		
2,300.0	2,292.7	2,266.4	2,198.6	5.0	9.6	84.51	254.5	-354.1	398.9	387.1	11.85	33.670		
2,400.0	2,392.3	2,363.2	2,291.1	5.3	10.1	83.17	264.5	-381.1	421.9	409.6	12.29	34.328		
2,500.0	2,492.0	2,460.1	2,383.6	5.5	10.7	81.96	274.4	-408.1	445.1	432.4	12.73	34.966		
2,600.0	2,591.6	2,557.0	2,476.1	5.7	11.2	80.88	284.4	-435.1	468.4	455.3	13.17	35.581		
2,700.0	2,691.2	2,653.8	2,568.5	6.0	11.8	79.90	294.3	-462.1	491.9	478.4	13.60	36.174		

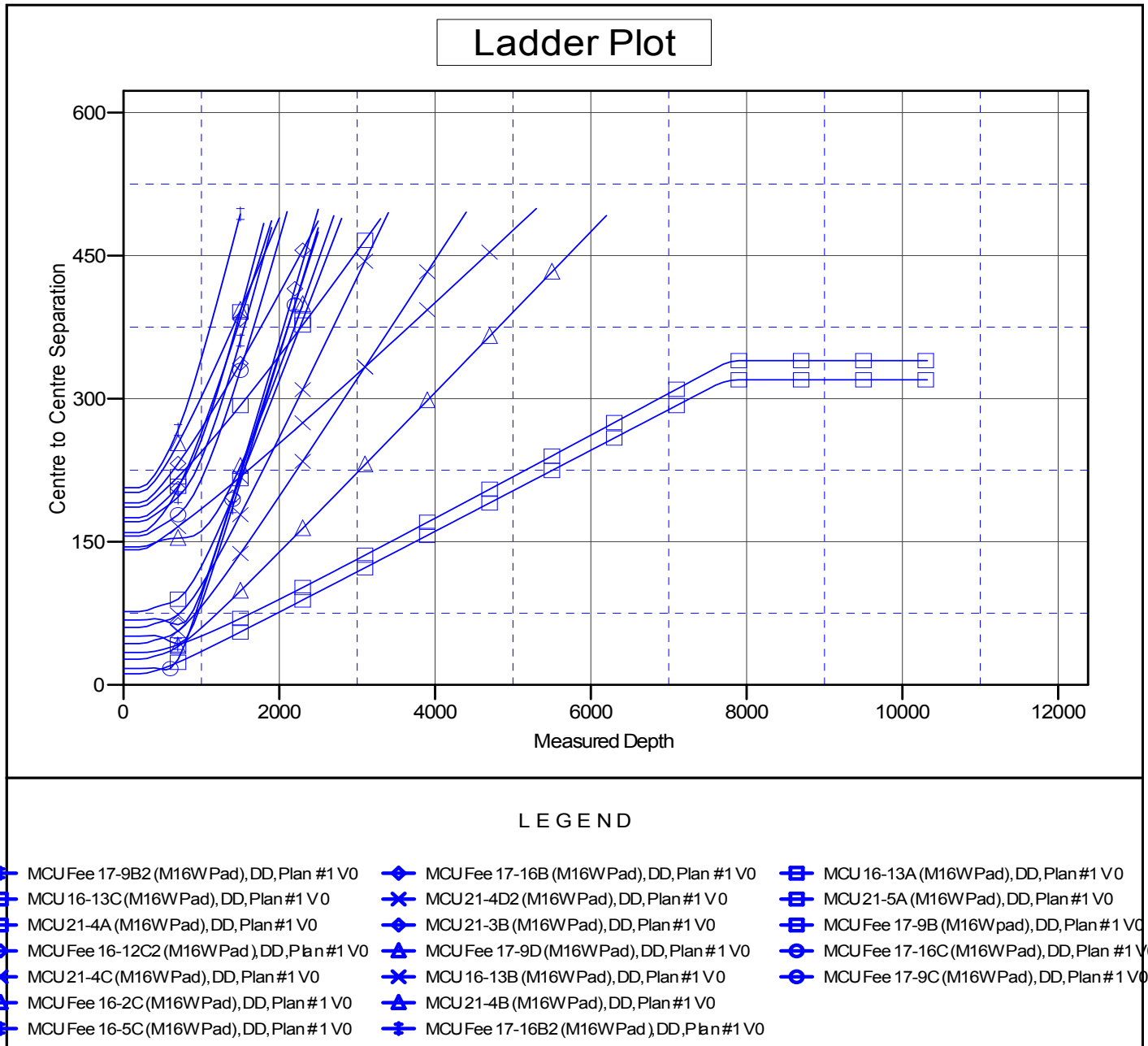
Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13D (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Reference Site:	SWSW S16-T7S-R93W (M16W Pad)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MCU 16-13D (M16W Pad)	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	DD	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KBE @ 7903.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: MCU 16-13D (M16W Pad)
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