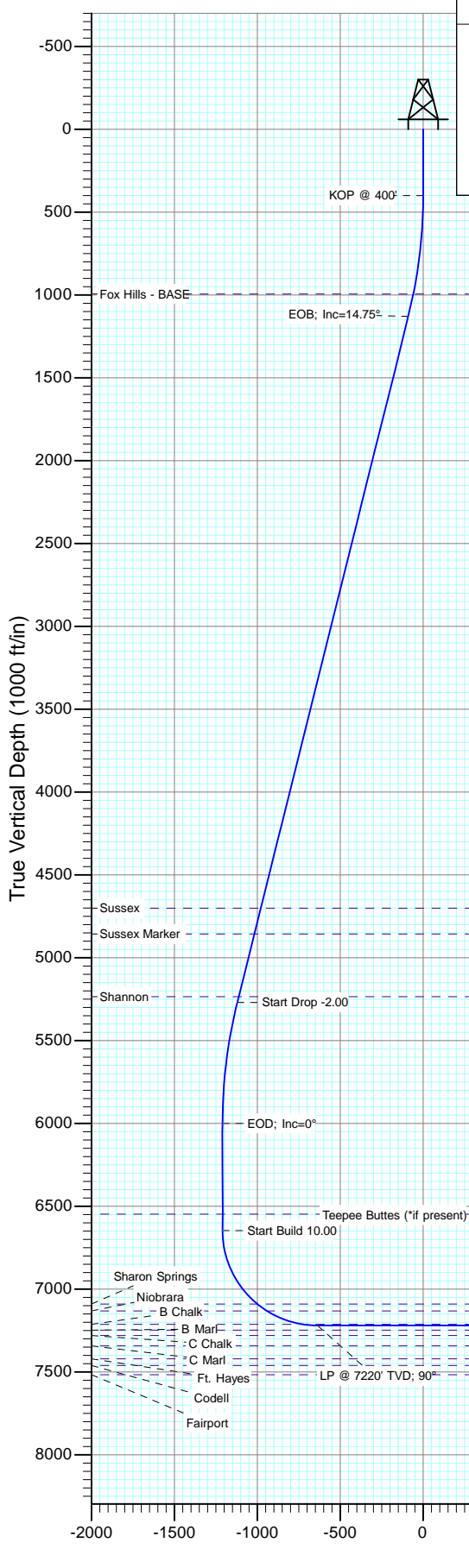
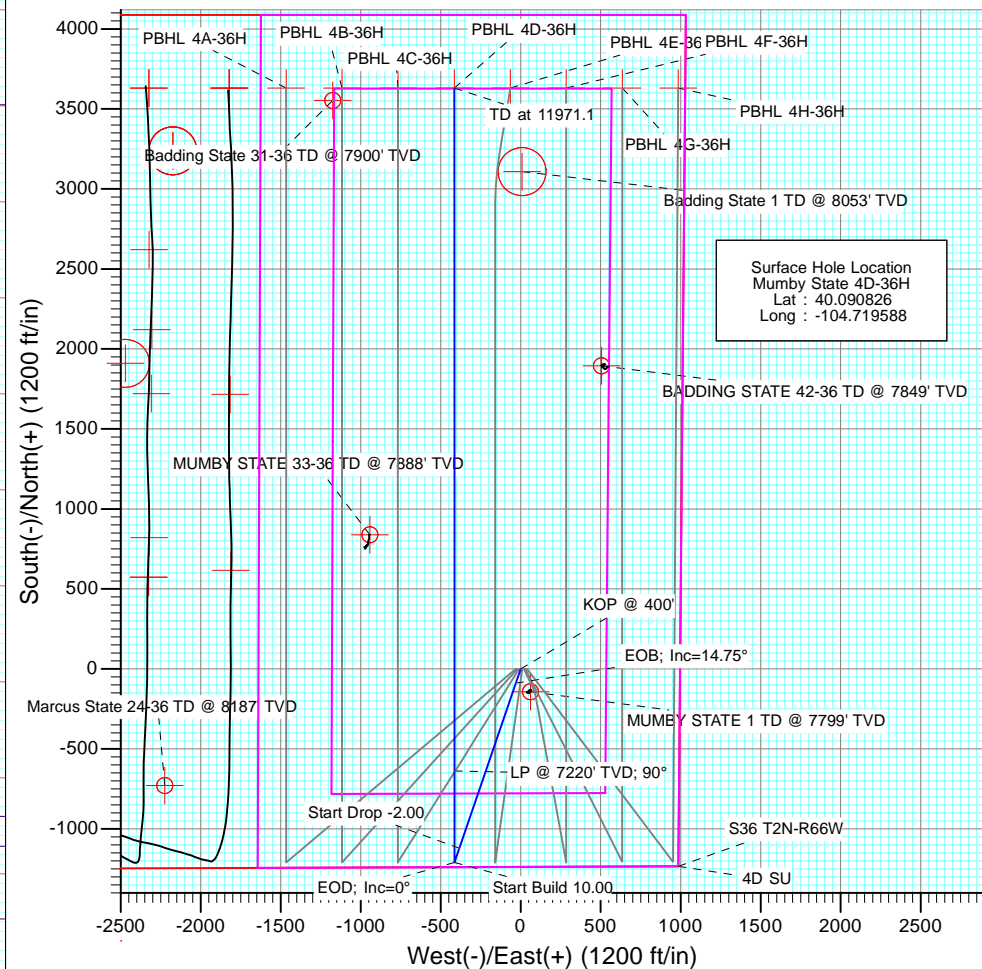




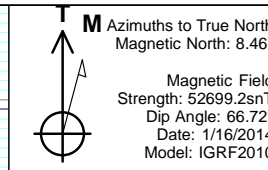
Project: DJ Wattenberg
Site: S36 T2N-R66W (Marcus State, Mumby State)
Well: Mumby State 4D-36H
Wellbore: HZ
Design: Plan #1



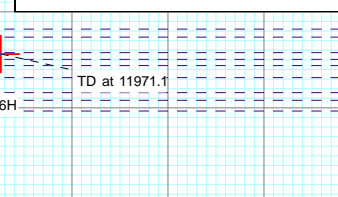
SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		KOP @ 400'
2	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0		EOB; Inc=14.75°
3	1137.3	14.75	198.89	1129.2	-89.3	-30.5	2.00	198.89	-89.3		Start Drop -2.00
4	5420.0	14.75	198.89	5270.8	-1120.7	-383.5	0.00	0.00	-1120.7		EOD; Inc=0°
5	6157.3	0.00	0.00	6000.0	-1210.0	-414.0	2.00	180.00	-1210.0		Start Build 10.00
6	6804.3	0.00	0.00	6647.0	-1210.0	-414.0	0.00	0.00	-1210.0		LP @ 7220' TVD; 90°
7	7704.3	90.00	359.99	7220.0	-637.0	-414.1	10.00	359.99	-637.0	PBHL 4D-36H	TD at 11971.1
8	11971.1	90.00	359.99	7220.0	3629.7	-414.6	0.00	0.00	3629.7		



DESIGN TARGET DETAILS					
Name	+N/-S	+E/-W	Northing	Easting	Latitude
PBHL 4D-36H	3629.7	-414.6	1280521.77	3217901.16	40.100790
					Longitude -104.721070



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
994.0	998.3	Fox Hills - BASE
4701.0	4830.8	Sussex
4857.0	4992.1	Sussex Marker
5235.0	5383.0	Shannon
6548.0	6705.3	Teepee Buttes (*if present)
7090.0	7310.7	Sharon Springs
7132.0	7382.6	Niobrara
7213.0	7614.7	B Chalk



Plan #1
Mumby State 4D-36H
WELL @ 5048.0ft (Original Well Elev)
Ground Elevation @ 5018.0
North American Datum 1983
Well Mumby State 4D-36H, True North

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Project	DJ Wattenberg		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S36 T2N-R66W (Marcus State, Mumby State)			
Site Position:		Northing:	1,275,942.66 ft	Latitude:	40.088280
From:	Lat/Long	Easting:	3,215,403.58 ft	Longitude:	-104.730140
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.50 °

Well	Mumby State 4D-36H					
Well Position	+N/-S	0.0 ft	Northing:	1,276,895.87 ft	Latitude:	40.090826
	+E/-W	0.0 ft	Easting:	3,218,347.66 ft	Longitude:	-104.719588
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,018.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/16/2014	8.47	66.72	52,699

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	0.00

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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,137.3	14.75	198.89	1,129.2	-89.3	-30.5	2.00	2.00	0.00	198.89	
5,420.0	14.75	198.89	5,270.8	-1,120.7	-383.5	0.00	0.00	0.00	0.00	
6,157.3	0.00	0.00	6,000.0	-1,210.0	-414.0	2.00	-2.00	0.00	180.00	
6,804.3	0.00	0.00	6,647.0	-1,210.0	-414.0	0.00	0.00	0.00	0.00	
7,704.3	90.00	359.99	7,220.0	-637.0	-414.1	10.00	10.00	0.00	359.99	
11,971.1	90.00	359.99	7,220.0	3,629.7	-414.6	0.00	0.00	0.00	0.00	PBHL 4D-36H

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
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	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	KOP @ 400'
500.0	2.00	198.89	500.0	-1.7	-0.6	-1.7	2.00	2.00	
600.0	4.00	198.89	599.8	-6.6	-2.3	-6.6	2.00	2.00	
700.0	6.00	198.89	699.5	-14.8	-5.1	-14.8	2.00	2.00	
800.0	8.00	198.89	798.7	-26.4	-9.0	-26.4	2.00	2.00	
900.0	10.00	198.89	897.5	-41.2	-14.1	-41.2	2.00	2.00	
998.3	11.97	198.89	994.0	-58.9	-20.2	-58.9	2.00	2.00	Fox Hills - BASE
1,000.0	12.00	198.89	995.6	-59.2	-20.3	-59.2	2.00	2.00	
1,100.0	14.00	198.89	1,093.1	-80.5	-27.5	-80.5	2.00	2.00	
1,137.3	14.75	198.89	1,129.2	-89.3	-30.5	-89.3	2.00	2.00	EOB; Inc=14.75°
1,200.0	14.75	198.89	1,189.8	-104.4	-35.7	-104.4	0.00	0.00	
1,300.0	14.75	198.89	1,286.5	-128.5	-44.0	-128.5	0.00	0.00	
1,400.0	14.75	198.89	1,383.2	-152.5	-52.2	-152.5	0.00	0.00	
1,500.0	14.75	198.89	1,479.9	-176.6	-60.4	-176.6	0.00	0.00	
1,600.0	14.75	198.89	1,576.6	-200.7	-68.7	-200.7	0.00	0.00	
1,700.0	14.75	198.89	1,673.4	-224.8	-76.9	-224.8	0.00	0.00	
1,800.0	14.75	198.89	1,770.1	-248.9	-85.2	-248.9	0.00	0.00	
1,900.0	14.75	198.89	1,866.8	-273.0	-93.4	-273.0	0.00	0.00	
2,000.0	14.75	198.89	1,963.5	-297.0	-101.6	-297.0	0.00	0.00	
2,100.0	14.75	198.89	2,060.2	-321.1	-109.9	-321.1	0.00	0.00	
2,200.0	14.75	198.89	2,156.9	-345.2	-118.1	-345.2	0.00	0.00	
2,300.0	14.75	198.89	2,253.6	-369.3	-126.4	-369.3	0.00	0.00	
2,400.0	14.75	198.89	2,350.3	-393.4	-134.6	-393.4	0.00	0.00	
2,500.0	14.75	198.89	2,447.0	-417.5	-142.8	-417.5	0.00	0.00	
2,600.0	14.75	198.89	2,543.7	-441.6	-151.1	-441.6	0.00	0.00	
2,700.0	14.75	198.89	2,640.4	-465.6	-159.3	-465.6	0.00	0.00	
2,800.0	14.75	198.89	2,737.1	-489.7	-167.6	-489.7	0.00	0.00	
2,900.0	14.75	198.89	2,833.8	-513.8	-175.8	-513.8	0.00	0.00	
3,000.0	14.75	198.89	2,930.5	-537.9	-184.0	-537.9	0.00	0.00	
3,100.0	14.75	198.89	3,027.2	-562.0	-192.3	-562.0	0.00	0.00	
3,200.0	14.75	198.89	3,123.9	-586.1	-200.5	-586.1	0.00	0.00	
3,300.0	14.75	198.89	3,220.6	-610.1	-208.8	-610.1	0.00	0.00	
3,400.0	14.75	198.89	3,317.4	-634.2	-217.0	-634.2	0.00	0.00	
3,500.0	14.75	198.89	3,414.1	-658.3	-225.2	-658.3	0.00	0.00	
3,600.0	14.75	198.89	3,510.8	-682.4	-233.5	-682.4	0.00	0.00	
3,700.0	14.75	198.89	3,607.5	-706.5	-241.7	-706.5	0.00	0.00	
3,800.0	14.75	198.89	3,704.2	-730.6	-250.0	-730.6	0.00	0.00	
3,900.0	14.75	198.89	3,800.9	-754.6	-258.2	-754.6	0.00	0.00	
4,000.0	14.75	198.89	3,897.6	-778.7	-266.4	-778.7	0.00	0.00	
4,100.0	14.75	198.89	3,994.3	-802.8	-274.7	-802.8	0.00	0.00	
4,200.0	14.75	198.89	4,091.0	-826.9	-282.9	-826.9	0.00	0.00	
4,300.0	14.75	198.89	4,187.7	-851.0	-291.2	-851.0	0.00	0.00	
4,400.0	14.75	198.89	4,284.4	-875.1	-299.4	-875.1	0.00	0.00	
4,500.0	14.75	198.89	4,381.1	-899.2	-307.6	-899.2	0.00	0.00	
4,600.0	14.75	198.89	4,477.8	-923.2	-315.9	-923.2	0.00	0.00	
4,700.0	14.75	198.89	4,574.5	-947.3	-324.1	-947.3	0.00	0.00	
4,800.0	14.75	198.89	4,671.2	-971.4	-332.4	-971.4	0.00	0.00	
4,830.8	14.75	198.89	4,701.0	-978.8	-334.9	-978.8	0.00	0.00	Sussex

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,900.0	14.75	198.89	4,767.9	-995.5	-340.6	-995.5	0.00	0.00	
4,992.1	14.75	198.89	4,857.0	-1,017.7	-348.2	-1,017.7	0.00	0.00	Sussex Marker
5,000.0	14.75	198.89	4,864.7	-1,019.6	-348.8	-1,019.6	0.00	0.00	
5,100.0	14.75	198.89	4,961.4	-1,043.7	-357.1	-1,043.7	0.00	0.00	
5,200.0	14.75	198.89	5,058.1	-1,067.7	-365.3	-1,067.7	0.00	0.00	
5,300.0	14.75	198.89	5,154.8	-1,091.8	-373.6	-1,091.8	0.00	0.00	
5,383.0	14.75	198.89	5,235.0	-1,111.8	-380.4	-1,111.8	0.00	0.00	Shannon
5,400.0	14.75	198.89	5,251.5	-1,115.9	-381.8	-1,115.9	0.00	0.00	
5,420.0	14.75	198.89	5,270.8	-1,120.7	-383.5	-1,120.7	0.00	0.00	Start Drop -2.00
5,500.0	13.15	198.89	5,348.5	-1,139.0	-389.7	-1,139.0	2.00	-2.00	
5,600.0	11.15	198.89	5,446.2	-1,158.9	-396.5	-1,158.9	2.00	-2.00	
5,700.0	9.15	198.89	5,544.6	-1,175.5	-402.2	-1,175.5	2.00	-2.00	
5,800.0	7.15	198.89	5,643.6	-1,188.9	-406.8	-1,188.9	2.00	-2.00	
5,900.0	5.15	198.89	5,743.0	-1,199.1	-410.3	-1,199.1	2.00	-2.00	
6,000.0	3.15	198.89	5,842.8	-1,205.9	-412.6	-1,205.9	2.00	-2.00	
6,100.0	1.15	198.89	5,942.7	-1,209.5	-413.8	-1,209.5	2.00	-2.00	
6,157.3	0.00	0.00	6,000.0	-1,210.0	-414.0	-1,210.0	2.00	-2.00	EOD; Inc=0°
6,200.0	0.00	0.00	6,042.7	-1,210.0	-414.0	-1,210.0	0.00	0.00	
6,300.0	0.00	0.00	6,142.7	-1,210.0	-414.0	-1,210.0	0.00	0.00	
6,400.0	0.00	0.00	6,242.7	-1,210.0	-414.0	-1,210.0	0.00	0.00	
6,500.0	0.00	0.00	6,342.7	-1,210.0	-414.0	-1,210.0	0.00	0.00	
6,600.0	0.00	0.00	6,442.7	-1,210.0	-414.0	-1,210.0	0.00	0.00	
6,700.0	0.00	0.00	6,542.7	-1,210.0	-414.0	-1,210.0	0.00	0.00	
6,705.3	0.00	0.00	6,548.0	-1,210.0	-414.0	-1,210.0	0.00	0.00	Teepee Buttes (*if present)
6,800.0	0.00	0.00	6,642.7	-1,210.0	-414.0	-1,210.0	0.00	0.00	
6,804.3	0.00	0.00	6,647.0	-1,210.0	-414.0	-1,210.0	0.00	0.00	Start Build 10.00
6,900.0	9.57	359.99	6,742.3	-1,202.0	-414.0	-1,202.0	10.00	10.00	
7,000.0	19.57	359.99	6,838.9	-1,176.9	-414.0	-1,176.9	10.00	10.00	
7,100.0	29.57	359.99	6,929.8	-1,135.4	-414.0	-1,135.4	10.00	10.00	
7,200.0	39.57	359.99	7,012.0	-1,078.7	-414.0	-1,078.7	10.00	10.00	
7,300.0	49.57	359.99	7,083.2	-1,008.6	-414.0	-1,008.6	10.00	10.00	
7,310.7	50.63	359.99	7,090.0	-1,000.5	-414.0	-1,000.5	10.00	10.00	Sharon Springs
7,382.6	57.82	359.99	7,132.0	-942.2	-414.0	-942.2	10.00	10.00	Niobrara
7,400.0	59.57	359.99	7,141.1	-927.3	-414.0	-927.3	10.00	10.00	
7,500.0	69.57	359.99	7,183.9	-837.1	-414.0	-837.1	10.00	10.00	
7,600.0	79.57	359.99	7,210.5	-740.8	-414.1	-740.8	10.00	10.00	
7,614.7	81.03	359.99	7,213.0	-726.3	-414.1	-726.3	10.00	10.00	B Chalk
7,700.0	89.57	359.99	7,220.0	-641.4	-414.1	-641.4	10.00	10.00	
7,704.3	90.00	359.99	7,220.0	-637.0	-414.1	-637.0	10.00	10.00	LP @ 7220' TVD; 90°
7,800.0	90.00	359.99	7,220.0	-541.4	-414.1	-541.4	0.00	0.00	
7,900.0	90.00	359.99	7,220.0	-441.4	-414.1	-441.4	0.00	0.00	
8,000.0	90.00	359.99	7,220.0	-341.4	-414.1	-341.4	0.00	0.00	
8,100.0	90.00	359.99	7,220.0	-241.4	-414.1	-241.4	0.00	0.00	
8,200.0	90.00	359.99	7,220.0	-141.4	-414.1	-141.4	0.00	0.00	
8,300.0	90.00	359.99	7,220.0	-41.4	-414.1	-41.4	0.00	0.00	
8,400.0	90.00	359.99	7,220.0	58.6	-414.2	58.6	0.00	0.00	
8,500.0	90.00	359.99	7,220.0	158.6	-414.2	158.6	0.00	0.00	
8,600.0	90.00	359.99	7,220.0	258.6	-414.2	258.6	0.00	0.00	
8,700.0	90.00	359.99	7,220.0	358.6	-414.2	358.6	0.00	0.00	
8,800.0	90.00	359.99	7,220.0	458.6	-414.2	458.6	0.00	0.00	
8,900.0	90.00	359.99	7,220.0	558.6	-414.2	558.6	0.00	0.00	
9,000.0	90.00	359.99	7,220.0	658.6	-414.2	658.6	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
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
9,100.0	90.00	359.99	7,220.0	758.6	-414.2	758.6	0.00	0.00	
9,200.0	90.00	359.99	7,220.0	858.6	-414.2	858.6	0.00	0.00	
9,300.0	90.00	359.99	7,220.0	958.6	-414.3	958.6	0.00	0.00	
9,400.0	90.00	359.99	7,220.0	1,058.6	-414.3	1,058.6	0.00	0.00	
9,500.0	90.00	359.99	7,220.0	1,158.6	-414.3	1,158.6	0.00	0.00	
9,600.0	90.00	359.99	7,220.0	1,258.6	-414.3	1,258.6	0.00	0.00	
9,700.0	90.00	359.99	7,220.0	1,358.6	-414.3	1,358.6	0.00	0.00	
9,800.0	90.00	359.99	7,220.0	1,458.6	-414.3	1,458.6	0.00	0.00	
9,900.0	90.00	359.99	7,220.0	1,558.6	-414.3	1,558.6	0.00	0.00	
10,000.0	90.00	359.99	7,220.0	1,658.6	-414.3	1,658.6	0.00	0.00	
10,100.0	90.00	359.99	7,220.0	1,758.6	-414.4	1,758.6	0.00	0.00	
10,200.0	90.00	359.99	7,220.0	1,858.6	-414.4	1,858.6	0.00	0.00	
10,300.0	90.00	359.99	7,220.0	1,958.6	-414.4	1,958.6	0.00	0.00	
10,400.0	90.00	359.99	7,220.0	2,058.6	-414.4	2,058.6	0.00	0.00	
10,500.0	90.00	359.99	7,220.0	2,158.6	-414.4	2,158.6	0.00	0.00	
10,600.0	90.00	359.99	7,220.0	2,258.6	-414.4	2,258.6	0.00	0.00	
10,700.0	90.00	359.99	7,220.0	2,358.6	-414.4	2,358.6	0.00	0.00	
10,800.0	90.00	359.99	7,220.0	2,458.6	-414.4	2,458.6	0.00	0.00	
10,900.0	90.00	359.99	7,220.0	2,558.6	-414.4	2,558.6	0.00	0.00	
11,000.0	90.00	359.99	7,220.0	2,658.6	-414.5	2,658.6	0.00	0.00	
11,100.0	90.00	359.99	7,220.0	2,758.6	-414.5	2,758.6	0.00	0.00	
11,200.0	90.00	359.99	7,220.0	2,858.6	-414.5	2,858.6	0.00	0.00	
11,300.0	90.00	359.99	7,220.0	2,958.6	-414.5	2,958.6	0.00	0.00	
11,400.0	90.00	359.99	7,220.0	3,058.6	-414.5	3,058.6	0.00	0.00	
11,500.0	90.00	359.99	7,220.0	3,158.6	-414.5	3,158.6	0.00	0.00	
11,600.0	90.00	359.99	7,220.0	3,258.6	-414.5	3,258.6	0.00	0.00	
11,700.0	90.00	359.99	7,220.0	3,358.6	-414.5	3,358.6	0.00	0.00	
11,800.0	90.00	359.99	7,220.0	3,458.6	-414.6	3,458.6	0.00	0.00	
11,900.0	90.00	359.99	7,220.0	3,558.6	-414.6	3,558.6	0.00	0.00	
11,971.1	90.00	359.99	7,220.0	3,629.7	-414.6	3,629.7	0.00	0.00	TD at 11971.1

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL 4D-36H	0.00	0.00	7,220.0	3,629.7	-414.6	1,280,521.77	3,217,901.16	40.100790	-104.721070
- plan hits target center									
- Point									

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Project:	DJ Wattenberg	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	North Reference:	True
Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
998.3	994.0	Fox Hills - BASE			
4,830.8	4,701.0	Sussex			
4,992.1	4,857.0	Sussex Marker			
5,383.0	5,235.0	Shannon			
6,705.3	6,548.0	Teepee Buttes (*if present)			
7,310.7	7,090.0	Sharon Springs			
7,382.6	7,132.0	Niobrara			
7,614.7	7,213.0	B Chalk			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
400.0	400.0	0.0	0.0	KOP @ 400'
1,137.3	1,129.2	-89.3	-30.5	EOB; Inc=14.75°
5,420.0	5,270.8	-1,120.7	-383.5	Start Drop -2.00
6,157.3	6,000.0	-1,210.0	-414.0	EOD; Inc=0°
6,804.3	6,647.0	-1,210.0	-414.0	Start Build 10.00
7,704.3	7,220.0	-637.0	-414.1	LP @ 7220' TVD; 90°
11,971.1	7,220.0	3,629.7	-414.6	TD at 11971.1

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S36 T2N-R66W (Marcus State, Mumby State)

Mumby State 4D-36H

HZ

Plan #1

Anticollision Report

16 January, 2014

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 500.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	1/16/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,971.1	Plan #1 (HZ)	Geolink MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S36 T2N-R66W (Marcus State, Mumby State)						
BADDING STATE 1 (EXISTING) - PDC WELL - NO SUR	11,449.4	7,225.0	423.2	352.4	5.977	CC, ES
BADDING STATE 1 (EXISTING) - PDC WELL - NO SUR	11,500.0	7,225.0	426.2	354.5	5.948	SF
BADDING STATE 31-36 (EXISTING) - ENCANA WELL -						Out of range
BADDING STATE 42-36 (EXISTING) - ENCANA WELL -						Out of range
BALLANTYNE WW 01-18D (EXISTING) - NOBLE WELL						Out of range
Marcus State 3A-36H - HZ - FINAL						Out of range
Marcus State 3B-36H - HZ - FINAL						Out of range
Marcus State 3C-36H - HZ - FINAL						Out of range
Marcus State 3D-36H - HZ - FINAL						Out of range
Marcus State 3E-36H - HZ - FINAL						Out of range
Marcus State 3F-36H - HZ - FINAL						Out of range
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	1,235.5	1,227.6	94.7	90.5	22.672	CC, ES
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	1,400.0	1,387.8	102.9	98.0	20.845	SF
MUMBY STATE 33-36 (EXISTING) - ENCANA WELL - G						Out of range
Mumby State 4A-36H - HZ - Plan #1	166.3	167.3	29.9	29.5	62.682	CC
Mumby State 4A-36H - HZ - Plan #1	200.0	201.0	29.9	29.3	50.304	ES
Mumby State 4A-36H - HZ - Plan #1	3,200.0	3,143.3	483.9	460.1	20.326	SF
Mumby State 4B-36H - HZ - Plan #1	233.9	233.9	19.9	19.2	27.911	CC, ES
Mumby State 4B-36H - HZ - Plan #1	4,500.0	4,461.8	487.9	451.8	13.507	SF
Mumby State 4C-36H - HZ - Plan #1	266.3	267.3	10.1	9.3	12.192	CC
Mumby State 4C-36H - HZ - Plan #1	300.0	301.0	10.1	9.1	10.674	ES
Mumby State 4C-36H - HZ - Plan #1	11,971.1	12,249.2	431.6	319.8	3.863	SF
Mumby State 4E-36H - HZ - Plan #1	400.0	400.0	10.1	8.8	7.799	CC, ES
Mumby State 4E-36H - HZ - Plan #1	11,971.1	12,193.8	429.9	318.4	3.855	SF
Mumby State 4F-36H - HZ - Plan #1	400.0	400.0	20.1	18.9	15.597	CC, ES
Mumby State 4F-36H - HZ - Plan #1	700.0	699.3	28.6	26.1	11.717	SF
Mumby State 4G-36H - HZ - Plan #1	300.0	300.0	29.9	29.0	31.764	CC, ES
Mumby State 4G-36H - HZ - Plan #1	600.0	597.9	39.9	37.8	19.516	SF
Mumby State 4H-36H - HZ - Plan #1	200.0	200.0	40.0	39.4	67.424	CC, ES
Mumby State 4H-36H - HZ - Plan #1	700.0	691.7	74.1	71.6	29.722	SF

CC - Min centre to center distance or covergent 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 Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - BADDING STATE 1 (EXISTING) - PDC WELL - NO SU													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		
11,200.0	7,220.0	7,225.0	7,225.0	54.5	12.6	90.00	3,108.0	8.7	491.2	424.6	66.57	7.378		
11,300.0	7,220.0	7,225.0	7,225.0	56.1	12.6	90.00	3,108.0	8.7	448.8	380.5	68.26	6.574		
11,400.0	7,220.0	7,225.0	7,225.0	57.8	12.6	90.00	3,108.0	8.7	426.1	356.1	69.96	6.090		
11,449.4	7,220.0	7,225.0	7,225.0	58.7	12.6	90.00	3,108.0	8.7	423.2	352.4	70.80	5.977 CC, ES		
11,500.0	7,220.0	7,225.0	7,225.0	59.5	12.6	90.00	3,108.0	8.7	426.2	354.5	71.66	5.948 SF		
11,600.0	7,220.0	7,225.0	7,225.0	61.2	12.6	90.00	3,108.0	8.7	449.2	375.8	73.36	6.123		
11,700.0	7,220.0	7,225.0	7,225.0	62.9	12.6	90.00	3,108.0	8.7	491.8	416.8	75.06	6.552		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYR											Offset Site Error:		0.0 ft	
Survey Program: 100-Gyro											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	4.9	4.9	0.0	0.0	165.85	-145.4	36.7	149.9					
100.0	100.0	103.3	103.3	0.1	0.1	165.66	-145.9	37.3	150.6	150.4	0.20	748.784		
200.0	200.0	205.6	205.6	0.3	0.2	165.28	-145.9	38.3	150.9	150.4	0.47	324.207		
224.2	224.2	229.2	229.2	0.3	0.2	165.19	-145.8	38.6	150.8	150.3	0.53	285.461		
300.0	300.0	303.3	303.3	0.5	0.3	164.82	-146.0	39.6	151.3	150.5	0.73	208.480		
400.0	400.0	402.5	402.5	0.6	0.3	164.36	-147.0	41.1	152.7	151.7	0.99	154.711		
500.0	500.0	502.5	502.4	0.8	0.4	-35.27	-148.3	42.6	152.9	151.6	1.25	122.259		
600.0	599.8	602.6	602.5	1.0	0.5	-36.66	-149.7	43.5	150.2	148.7	1.52	99.054		
700.0	699.5	702.8	702.7	1.2	0.6	-39.06	-150.8	44.6	144.7	142.9	1.79	80.639		
800.0	798.7	804.2	804.1	1.5	0.7	-42.93	-150.8	45.7	135.9	133.8	2.10	64.814		
900.0	897.5	902.3	902.2	1.8	0.8	-48.10	-150.6	46.1	124.9	122.5	2.44	51.210		
1,000.0	995.6	1,001.4	1,001.3	2.1	0.9	-55.70	-150.2	46.2	112.7	109.8	2.86	39.454		
1,100.0	1,093.1	1,097.9	1,097.8	2.5	1.0	-66.77	-149.3	46.9	101.4	98.0	3.38	29.988		
1,200.0	1,189.8	1,193.4	1,193.3	3.0	1.0	-80.89	-149.1	48.2	95.1	91.1	3.97	23.948		
1,235.5	1,224.1	1,227.6	1,227.5	3.1	1.1	-86.14	-149.3	48.8	94.7	90.5	4.18	22.672 CC, ES		
1,300.0	1,286.5	1,290.1	1,289.9	3.4	1.1	-95.55	-149.9	49.7	96.1	91.6	4.51	21.279		
1,400.0	1,383.2	1,387.8	1,387.6	3.9	1.2	-109.05	-151.0	50.7	102.9	98.0	4.94	20.845 SF		
1,500.0	1,479.9	1,484.8	1,484.6	4.3	1.3	-120.66	-151.6	51.1	114.3	109.1	5.23	21.846		
1,600.0	1,576.6	1,581.6	1,581.4	4.8	1.4	-130.37	-151.2	51.2	129.7	124.3	5.43	23.872		
1,700.0	1,673.4	1,678.2	1,678.1	5.3	1.5	-138.13	-150.3	51.0	148.0	142.4	5.59	26.481		
1,800.0	1,770.1	1,774.5	1,774.4	5.7	1.5	-144.21	-149.3	50.6	168.4	162.6	5.73	29.379		
1,900.0	1,866.8	1,870.9	1,870.7	6.2	1.6	-148.73	-148.8	50.8	190.3	184.4	5.89	32.293		
2,000.0	1,963.5	1,969.7	1,969.6	6.7	1.7	-152.12	-149.3	51.5	212.8	206.7	6.08	35.010		
2,100.0	2,060.2	2,066.6	2,066.4	7.1	1.8	-155.00	-149.8	51.0	235.0	228.8	6.26	37.517		
2,200.0	2,156.9	2,162.0	2,161.9	7.6	1.9	-157.52	-149.5	50.3	258.2	251.8	6.45	40.036		
2,300.0	2,253.6	2,259.3	2,259.1	8.1	2.0	-159.72	-148.7	49.5	282.1	275.4	6.64	42.485		
2,400.0	2,350.3	2,356.8	2,356.7	8.6	2.0	-161.54	-148.6	48.6	305.8	298.9	6.84	44.697		
2,500.0	2,447.0	2,451.6	2,451.5	9.0	2.1	-163.05	-148.3	47.8	329.8	322.8	7.05	46.781		
2,600.0	2,543.7	2,549.0	2,548.8	9.5	2.2	-164.36	-147.6	47.5	354.7	347.4	7.27	48.807		
2,700.0	2,640.4	2,648.4	2,648.2	10.0	2.3	-165.45	-148.0	47.0	378.7	371.3	7.49	50.535		
2,800.0	2,737.1	2,742.6	2,742.5	10.5	2.4	-166.40	-148.2	46.3	403.0	395.3	7.72	52.184		
2,900.0	2,833.8	2,837.1	2,837.0	10.9	2.5	-167.25	-147.6	46.1	428.2	420.2	7.95	53.841		
3,000.0	2,930.5	2,934.5	2,934.3	11.4	2.6	-168.09	-146.9	45.4	453.3	445.1	8.18	55.397		
3,100.0	3,027.2	3,030.8	3,030.6	11.9	2.6	-168.83	-146.1	44.8	478.7	470.3	8.42	56.877		
8,100.0	7,220.0	7,226.2	7,225.5	16.3	6.3	90.06	-138.2	63.9	489.0	468.1	20.97	23.324		
8,200.0	7,220.0	7,224.8	7,224.0	16.2	6.3	89.88	-138.1	63.9	478.0	457.3	20.78	22.999		
8,203.2	7,220.0	7,224.7	7,223.9	16.2	6.3	89.87	-138.1	63.9	478.0	457.2	20.79	22.998		
8,300.0	7,220.0	7,223.3	7,222.5	16.2	6.3	89.70	-138.1	63.9	487.7	466.9	20.81	23.433		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4A-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink 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	1.0	1.0	0.0	0.0	-89.30	0.4	-29.9	29.9					
100.0	100.0	101.0	101.0	0.1	0.1	-89.30	0.4	-29.9	29.9	29.7	0.25	121.657		
166.3	166.3	167.3	167.3	0.2	0.2	-89.30	0.4	-29.9	29.9	29.5	0.48	62.682 CC		
200.0	200.0	201.0	201.0	0.3	0.3	-89.30	0.4	-29.9	29.9	29.3	0.60	50.304 ES		
300.0	300.0	300.0	300.0	0.5	0.5	-91.39	-0.8	-31.3	31.3	30.4	0.94	33.191		
400.0	400.0	399.1	398.9	0.6	0.7	-96.62	-4.1	-35.2	35.5	34.2	1.29	27.502		
500.0	500.0	497.7	497.2	0.8	0.9	60.06	-9.6	-41.8	42.1	40.5	1.66	25.419		
600.0	599.8	596.0	594.7	1.0	1.2	58.40	-17.2	-50.8	50.1	48.1	2.03	24.644		
700.0	699.5	693.9	691.5	1.2	1.5	58.50	-27.0	-62.4	59.3	56.9	2.44	24.289		
800.0	798.7	791.4	787.2	1.5	1.8	59.64	-38.8	-76.5	69.7	66.8	2.90	24.016		
900.0	897.5	888.5	881.9	1.8	2.2	61.34	-52.7	-92.9	81.4	77.9	3.44	23.671		
1,000.0	995.6	985.1	975.3	2.1	2.7	63.32	-68.5	-111.7	94.3	90.3	4.07	23.205		
1,100.0	1,093.1	1,081.1	1,067.3	2.5	3.2	65.37	-86.3	-132.8	108.7	103.9	4.80	22.638		
1,200.0	1,189.8	1,176.6	1,157.8	3.0	3.8	67.30	-105.9	-156.0	124.8	119.1	5.62	22.184		
1,300.0	1,286.5	1,274.4	1,249.8	3.4	4.4	68.45	-127.2	-181.4	142.6	136.1	6.47	22.020		
1,400.0	1,383.2	1,372.8	1,342.3	3.9	5.0	69.34	-148.8	-207.0	160.4	153.1	7.34	21.844		
1,500.0	1,479.9	1,471.2	1,434.8	4.3	5.6	70.05	-170.3	-232.6	178.3	170.1	8.23	21.674		
1,600.0	1,576.6	1,569.5	1,527.3	4.8	6.2	70.63	-191.9	-258.1	196.2	187.1	9.12	21.518		
1,700.0	1,673.4	1,667.9	1,619.8	5.3	6.9	71.12	-213.4	-283.7	214.2	204.1	10.02	21.376		
1,800.0	1,770.1	1,766.2	1,712.3	5.7	7.5	71.53	-234.9	-309.3	232.1	221.2	10.92	21.248		
1,900.0	1,866.8	1,864.6	1,804.9	6.2	8.1	71.88	-256.5	-334.9	250.1	238.2	11.83	21.133		
2,000.0	1,963.5	1,963.0	1,897.4	6.7	8.7	72.18	-278.0	-360.4	268.0	255.3	12.75	21.030		
2,100.0	2,060.2	2,061.3	1,989.9	7.1	9.3	72.45	-299.6	-386.0	286.0	272.3	13.66	20.937		
2,200.0	2,156.9	2,159.7	2,082.4	7.6	10.0	72.68	-321.1	-411.6	304.0	289.4	14.58	20.854		
2,300.0	2,253.6	2,258.1	2,174.9	8.1	10.6	72.89	-342.6	-437.2	322.0	306.5	15.50	20.778		
2,400.0	2,350.3	2,356.4	2,267.4	8.6	11.2	73.07	-364.2	-462.7	339.9	323.5	16.42	20.709		
2,500.0	2,447.0	2,454.8	2,359.9	9.0	11.8	73.24	-385.7	-488.3	357.9	340.6	17.34	20.646		
2,600.0	2,543.7	2,553.2	2,452.4	9.5	12.5	73.39	-407.3	-513.9	375.9	357.7	18.26	20.588		
2,700.0	2,640.4	2,651.5	2,544.9	10.0	13.1	73.53	-428.8	-539.4	393.9	374.7	19.18	20.536		
2,800.0	2,737.1	2,749.9	2,637.4	10.5	13.7	73.65	-450.3	-565.0	411.9	391.8	20.11	20.487		
2,900.0	2,833.8	2,848.2	2,729.9	10.9	14.3	73.77	-471.9	-590.6	429.9	408.9	21.03	20.442		
3,000.0	2,930.5	2,946.6	2,822.4	11.4	15.0	73.87	-493.4	-616.2	447.9	425.9	21.96	20.400		
3,100.0	3,027.2	3,045.0	2,914.9	11.9	15.6	73.97	-515.0	-641.7	465.9	443.0	22.88	20.362		
3,200.0	3,123.9	3,143.3	3,007.4	12.4	16.2	74.06	-536.5	-667.3	483.9	460.1	23.81	20.326 SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4B-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink 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	-88.95	0.4	-19.9	19.9					
100.0	100.0	100.0	100.0	0.1	0.1	-88.95	0.4	-19.9	19.9	19.6	0.24	81.310		
200.0	200.0	200.0	200.0	0.3	0.3	-88.95	0.4	-19.9	19.9	19.3	0.59	33.481		
233.9	233.9	233.9	233.9	0.4	0.4	-88.95	0.4	-19.9	19.9	19.2	0.71	27.911	CC, ES	
300.0	300.0	299.8	299.8	0.5	0.5	-89.87	0.0	-20.2	20.2	19.2	0.94	21.394		
400.0	400.0	399.2	399.1	0.6	0.7	-96.38	-2.5	-22.5	22.6	21.3	1.29	17.523		
500.0	500.0	498.4	498.0	0.8	0.9	58.35	-7.6	-27.1	27.3	25.6	1.65	16.491		
600.0	599.8	597.3	596.5	1.0	1.1	55.65	-15.2	-34.0	33.0	31.0	2.03	16.301		
700.0	699.5	696.0	694.2	1.2	1.4	55.23	-25.3	-43.1	39.8	37.4	2.43	16.362		
800.0	798.7	794.5	791.2	1.5	1.7	56.14	-37.9	-54.5	47.5	44.6	2.89	16.439		
900.0	897.5	892.6	887.2	1.8	2.1	57.76	-52.8	-68.1	56.2	52.7	3.42	16.424		
1,000.0	995.6	990.4	982.2	2.1	2.5	59.74	-70.1	-83.8	65.8	61.8	4.04	16.281		
1,100.0	1,093.1	1,087.9	1,076.0	2.5	3.0	61.84	-89.8	-101.6	76.5	71.7	4.77	16.026		
1,200.0	1,189.8	1,186.4	1,170.0	3.0	3.5	63.95	-111.6	-121.3	88.2	82.6	5.59	15.770		
1,300.0	1,286.5	1,285.6	1,264.6	3.4	4.1	65.66	-133.8	-141.4	100.0	93.6	6.45	15.515		
1,400.0	1,383.2	1,384.9	1,359.2	3.9	4.6	67.01	-155.9	-161.5	112.0	104.6	7.32	15.287		
1,500.0	1,479.9	1,484.1	1,453.9	4.3	5.2	68.10	-178.1	-181.6	123.9	115.7	8.21	15.088		
1,600.0	1,576.6	1,583.4	1,548.5	4.8	5.7	68.99	-200.3	-201.7	135.9	126.8	9.12	14.915		
1,700.0	1,673.4	1,682.6	1,643.2	5.3	6.3	69.75	-222.4	-221.8	148.0	138.0	10.02	14.765		
1,800.0	1,770.1	1,781.9	1,737.8	5.7	6.8	70.38	-244.6	-241.9	160.0	149.1	10.94	14.634		
1,900.0	1,866.8	1,881.1	1,832.4	6.2	7.4	70.93	-266.8	-261.9	172.1	160.3	11.85	14.520		
2,000.0	1,963.5	1,980.4	1,927.1	6.7	7.9	71.41	-288.9	-282.0	184.2	171.4	12.78	14.419		
2,100.0	2,060.2	2,079.7	2,021.7	7.1	8.5	71.83	-311.1	-302.1	196.3	182.6	13.70	14.330		
2,200.0	2,156.9	2,178.9	2,116.4	7.6	9.1	72.19	-333.3	-322.2	208.4	193.8	14.63	14.251		
2,300.0	2,253.6	2,278.2	2,211.0	8.1	9.6	72.52	-355.4	-342.3	220.5	205.0	15.55	14.180		
2,400.0	2,350.3	2,377.4	2,305.6	8.6	10.2	72.82	-377.6	-362.4	232.7	216.2	16.48	14.117		
2,500.0	2,447.0	2,476.7	2,400.3	9.0	10.7	73.08	-399.8	-382.5	244.8	227.4	17.41	14.059		
2,600.0	2,543.7	2,575.9	2,494.9	9.5	11.3	73.32	-421.9	-402.6	256.9	238.6	18.34	14.007		
2,700.0	2,640.4	2,675.2	2,589.6	10.0	11.8	73.54	-444.1	-422.7	269.1	249.8	19.28	13.959		
2,800.0	2,737.1	2,774.4	2,684.2	10.5	12.4	73.74	-466.3	-442.8	281.2	261.0	20.21	13.916		
2,900.0	2,833.8	2,873.7	2,778.8	10.9	13.0	73.92	-488.4	-462.8	293.4	272.2	21.14	13.876		
3,000.0	2,930.5	2,973.0	2,873.5	11.4	13.5	74.09	-510.6	-482.9	305.5	283.4	22.08	13.839		
3,100.0	3,027.2	3,072.2	2,968.1	11.9	14.1	74.25	-532.8	-503.0	317.7	294.7	23.01	13.805		
3,200.0	3,123.9	3,171.5	3,062.8	12.4	14.6	74.39	-554.9	-523.1	329.8	305.9	23.95	13.773		
3,300.0	3,220.6	3,270.7	3,157.4	12.8	15.2	74.53	-577.1	-543.2	342.0	317.1	24.88	13.744		
3,400.0	3,317.4	3,370.0	3,252.0	13.3	15.8	74.65	-599.3	-563.3	354.1	328.3	25.82	13.717		
3,500.0	3,414.1	3,469.2	3,346.7	13.8	16.3	74.77	-621.4	-583.4	366.3	339.5	26.75	13.691		
3,600.0	3,510.8	3,568.5	3,441.3	14.3	16.9	74.88	-643.6	-603.5	378.4	350.8	27.69	13.667		
3,700.0	3,607.5	3,667.7	3,536.0	14.8	17.4	74.98	-665.8	-623.6	390.6	362.0	28.63	13.645		
3,800.0	3,704.2	3,767.0	3,630.6	15.2	18.0	75.07	-687.9	-643.6	402.8	373.2	29.56	13.624		
3,900.0	3,800.9	3,866.3	3,725.2	15.7	18.5	75.17	-710.1	-663.7	414.9	384.4	30.50	13.604		
4,000.0	3,897.6	3,965.5	3,819.9	16.2	19.1	75.25	-732.3	-683.8	427.1	395.7	31.44	13.586		
4,100.0	3,994.3	4,064.8	3,914.5	16.7	19.7	75.33	-754.4	-703.9	439.3	406.9	32.37	13.568		
4,200.0	4,091.0	4,164.0	4,009.2	17.1	20.2	75.41	-776.6	-724.0	451.4	418.1	33.31	13.552		
4,300.0	4,187.7	4,263.3	4,103.8	17.6	20.8	75.48	-798.8	-744.1	463.6	429.3	34.25	13.536		
4,400.0	4,284.4	4,362.5	4,198.4	18.1	21.3	75.55	-820.9	-764.2	475.8	440.6	35.19	13.521		
4,500.0	4,381.1	4,461.8	4,293.1	18.6	21.9	75.61	-843.1	-784.3	487.9	451.8	36.13	13.507	SF	

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

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4C-36H - HZ - Plan #1												Offset Site Error: 0.0 ft		
Survey Program: 0-Geolink 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	1.0	1.0	0.0	0.0	-87.93	0.4	-10.1	10.1					
100.0	100.0	101.0	101.0	0.1	0.1	-87.93	0.4	-10.1	10.1	9.8	0.25	40.955		
200.0	200.0	201.0	201.0	0.3	0.3	-87.93	0.4	-10.1	10.1	9.5	0.60	16.935		
266.3	266.3	267.3	267.3	0.4	0.4	-87.93	0.4	-10.1	10.1	9.3	0.83	12.192 CC		
300.0	300.0	301.0	301.0	0.5	0.5	-87.93	0.4	-10.1	10.1	9.1	0.94	10.674 ES		
400.0	400.0	400.8	400.8	0.6	0.6	-95.90	-1.1	-11.0	11.1	9.8	1.29	8.559		
500.0	500.0	500.4	500.3	0.8	0.8	54.52	-5.6	-13.8	13.8	12.2	1.65	8.365		
600.0	599.8	600.0	599.5	1.0	1.1	49.52	-12.9	-18.4	17.4	15.4	2.02	8.604		
700.0	699.5	699.3	698.0	1.2	1.3	47.88	-23.2	-24.8	21.6	19.1	2.42	8.922		
800.0	798.7	798.5	796.0	1.5	1.6	48.09	-36.3	-33.0	26.2	23.4	2.85	9.194		
900.0	897.5	897.5	893.2	1.8	2.0	49.32	-52.3	-43.0	31.4	28.1	3.36	9.369		
1,000.0	995.6	996.4	989.6	2.1	2.4	51.07	-71.0	-54.8	37.2	33.2	3.94	9.429		
1,100.0	1,093.1	1,095.3	1,085.2	2.5	2.8	53.11	-92.6	-68.3	43.4	38.8	4.63	9.381		
1,200.0	1,189.8	1,195.1	1,181.3	3.0	3.3	56.40	-115.3	-82.5	49.0	43.6	5.43	9.022		
1,300.0	1,286.5	1,294.9	1,277.4	3.4	3.8	59.26	-138.0	-96.8	54.6	48.3	6.29	8.686		
1,400.0	1,383.2	1,394.8	1,373.6	3.9	4.3	61.59	-160.8	-111.0	60.4	53.2	7.17	8.413		
1,500.0	1,479.9	1,494.6	1,469.7	4.3	4.8	63.51	-183.5	-125.3	66.2	58.1	8.08	8.192		
1,600.0	1,576.6	1,594.4	1,565.8	4.8	5.3	65.11	-206.3	-139.5	72.0	63.0	8.99	8.010		
1,700.0	1,673.4	1,694.2	1,662.0	5.3	5.8	66.48	-229.0	-153.8	77.9	68.0	9.92	7.860		
1,800.0	1,770.1	1,794.0	1,758.1	5.7	6.3	67.65	-251.7	-168.0	83.9	73.1	10.85	7.735		
1,900.0	1,866.8	1,893.8	1,854.2	6.2	6.8	68.66	-274.5	-182.2	89.9	78.1	11.78	7.629		
2,000.0	1,963.5	1,993.6	1,950.4	6.7	7.3	69.55	-297.2	-196.5	95.9	83.2	12.72	7.539		
2,100.0	2,060.2	2,093.4	2,046.5	7.1	7.8	70.34	-320.0	-210.7	101.9	88.3	13.66	7.461		
2,200.0	2,156.9	2,193.2	2,142.6	7.6	8.3	71.03	-342.7	-225.0	108.0	93.4	14.60	7.393		
2,300.0	2,253.6	2,293.0	2,238.8	8.1	8.8	71.65	-365.4	-239.2	114.0	98.5	15.55	7.334		
2,400.0	2,350.3	2,392.8	2,334.9	8.6	9.3	72.21	-388.2	-253.5	120.1	103.6	16.50	7.282		
2,500.0	2,447.0	2,492.7	2,431.0	9.0	9.8	72.72	-410.9	-267.7	126.2	108.8	17.44	7.235		
2,600.0	2,543.7	2,592.5	2,527.2	9.5	10.3	73.18	-433.7	-282.0	132.3	113.9	18.39	7.194		
2,700.0	2,640.4	2,692.3	2,623.3	10.0	10.8	73.60	-456.4	-296.2	138.4	119.1	19.34	7.157		
2,800.0	2,737.1	2,792.1	2,719.4	10.5	11.3	73.98	-479.1	-310.5	144.5	124.2	20.29	7.123		
2,900.0	2,833.8	2,891.9	2,815.6	10.9	11.8	74.33	-501.9	-324.7	150.6	129.4	21.24	7.093		
3,000.0	2,930.5	2,991.7	2,911.7	11.4	12.3	74.66	-524.6	-338.9	156.7	134.5	22.18	7.065		
3,100.0	3,027.2	3,091.5	3,007.8	11.9	12.8	74.96	-547.4	-353.2	162.9	139.7	23.13	7.040		
3,200.0	3,123.9	3,191.3	3,104.0	12.4	13.3	75.23	-570.1	-367.4	169.0	144.9	24.08	7.016		
3,300.0	3,220.6	3,291.1	3,200.1	12.8	13.8	75.49	-592.8	-381.7	175.1	150.1	25.03	6.995		
3,400.0	3,317.4	3,390.9	3,296.3	13.3	14.3	75.74	-615.6	-395.9	181.2	155.3	25.98	6.975		
3,500.0	3,414.1	3,490.7	3,392.4	13.8	14.8	75.96	-638.3	-410.2	187.4	160.5	26.94	6.957		
3,600.0	3,510.8	3,590.6	3,488.5	14.3	15.3	76.17	-661.1	-424.4	193.5	165.6	27.89	6.940		
3,700.0	3,607.5	3,690.4	3,584.7	14.8	15.8	76.37	-683.8	-438.7	199.7	170.8	28.84	6.924		
3,800.0	3,704.2	3,790.2	3,680.8	15.2	16.3	76.56	-706.5	-452.9	205.8	176.0	29.79	6.909		
3,900.0	3,800.9	3,890.0	3,776.9	15.7	16.8	76.73	-729.3	-467.2	212.0	181.2	30.74	6.896		
4,000.0	3,897.6	3,989.8	3,873.1	16.2	17.3	76.90	-752.0	-481.4	218.1	186.4	31.69	6.883		
4,100.0	3,994.3	4,089.6	3,969.2	16.7	17.8	77.05	-774.8	-495.6	224.3	191.6	32.64	6.871		
4,200.0	4,091.0	4,189.4	4,065.3	17.1	18.3	77.20	-797.5	-509.9	230.4	196.8	33.59	6.859		
4,300.0	4,187.7	4,289.2	4,161.5	17.6	18.8	77.34	-820.2	-524.1	236.6	202.0	34.54	6.849		
4,400.0	4,284.4	4,389.0	4,257.6	18.1	19.3	77.48	-843.0	-538.4	242.7	207.2	35.49	6.838		
4,500.0	4,381.1	4,488.8	4,353.7	18.6	19.8	77.60	-865.7	-552.6	248.9	212.4	36.45	6.829		
4,600.0	4,477.8	4,588.6	4,449.9	19.1	20.3	77.72	-888.5	-566.9	255.0	217.6	37.40	6.820		
4,700.0	4,574.5	4,688.5	4,546.0	19.5	20.8	77.84	-911.2	-581.1	261.2	222.8	38.35	6.811		
4,800.0	4,671.2	4,788.3	4,642.1	20.0	21.3	77.95	-933.9	-595.4	267.4	228.1	39.30	6.803		
4,900.0	4,767.9	4,888.1	4,738.3	20.5	21.8	78.05	-956.7	-609.6	273.5	233.3	40.25	6.795		
5,000.0	4,864.7	4,987.9	4,834.4	21.0	22.3	78.15	-979.4	-623.9	279.7	238.5	41.20	6.788		

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 Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4C-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,100.0	4,961.4	5,087.7	4,930.5	21.4	22.9	78.25	-1,002.2	-638.1	285.8	243.7	42.15	6.781		
5,200.0	5,058.1	5,187.5	5,026.7	21.9	23.4	78.34	-1,024.9	-652.3	292.0	248.9	43.10	6.774		
5,300.0	5,154.8	5,287.3	5,122.8	22.4	23.9	78.43	-1,047.6	-666.6	298.2	254.1	44.06	6.768		
5,400.0	5,251.5	5,387.1	5,218.9	22.9	24.4	78.51	-1,070.4	-680.8	304.3	259.3	45.01	6.762		
5,500.0	5,348.5	5,486.9	5,315.1	23.3	24.9	78.49	-1,093.1	-695.1	310.7	264.8	45.90	6.770		
5,600.0	5,446.2	5,586.6	5,411.0	23.7	25.4	77.91	-1,115.8	-709.3	317.8	271.2	46.59	6.821		
5,700.0	5,544.6	5,690.2	5,511.2	24.0	25.8	76.91	-1,138.4	-723.5	325.2	278.1	47.11	6.904		
5,800.0	5,643.6	5,795.2	5,613.5	24.3	26.3	75.90	-1,158.2	-735.9	332.0	284.5	47.49	6.990		
5,900.0	5,743.0	5,900.6	5,717.0	24.5	26.6	74.89	-1,174.9	-746.3	338.0	290.2	47.76	7.077		
6,000.0	5,842.8	6,006.3	5,821.6	24.7	26.9	73.88	-1,188.4	-754.7	343.3	295.4	47.89	7.168		
6,100.0	5,942.7	6,112.3	5,926.9	24.8	27.2	72.86	-1,198.6	-761.1	347.9	300.0	47.91	7.261		
6,200.0	6,042.7	6,218.8	6,033.0	24.8	27.3	-89.27	-1,205.5	-765.5	351.7	303.8	47.84	7.351		
6,300.0	6,142.7	6,325.6	6,139.8	24.9	27.4	-89.85	-1,209.1	-767.7	353.8	305.9	47.85	7.393		
6,400.0	6,242.7	6,429.5	6,243.7	25.0	27.5	-89.94	-1,209.6	-768.1	354.1	306.1	47.99	7.378		
6,500.0	6,342.7	6,529.5	6,343.7	25.1	27.6	-89.94	-1,209.6	-768.1	354.1	305.9	48.15	7.353		
6,600.0	6,442.7	6,629.5	6,443.7	25.2	27.7	-89.94	-1,209.6	-768.1	354.1	305.8	48.32	7.328		
6,700.0	6,542.7	6,729.5	6,543.7	25.2	27.7	-89.94	-1,209.6	-768.1	354.1	305.6	48.49	7.303		
6,800.0	6,642.7	6,829.5	6,643.7	25.3	27.8	-89.94	-1,209.6	-768.1	354.1	305.4	48.65	7.277		
6,833.4	6,676.1	6,863.0	6,677.1	25.3	27.8	-90.09	-1,209.6	-768.1	354.1	305.5	48.60	7.285		
6,900.0	6,742.3	6,929.1	6,743.3	25.2	27.9	-91.21	-1,209.6	-768.1	354.2	305.9	48.24	7.342		
7,000.0	6,838.9	7,025.8	6,839.9	24.9	28.0	-94.97	-1,209.6	-768.1	355.6	308.8	46.74	7.608		
7,100.0	6,929.8	7,121.6	6,935.7	24.3	28.0	-100.53	-1,208.3	-768.1	361.5	317.2	44.31	8.159		
7,200.0	7,012.0	7,229.9	7,042.4	23.6	27.8	-106.54	-1,190.9	-768.1	372.6	331.2	41.32	9.016		
7,300.0	7,083.2	7,350.0	7,154.6	22.7	27.3	-112.17	-1,148.5	-768.1	387.1	348.9	38.22	10.127		
7,400.0	7,141.1	7,484.3	7,266.4	21.7	26.4	-117.19	-1,074.7	-768.0	403.1	367.9	35.25	11.436		
7,500.0	7,183.9	7,634.6	7,367.4	20.7	25.2	-121.30	-963.9	-768.0	417.9	385.2	32.68	12.788		
7,600.0	7,210.5	7,799.8	7,441.0	19.7	23.7	-124.07	-816.7	-768.0	428.6	397.8	30.79	13.919		
7,700.0	7,220.0	7,974.7	7,469.9	18.7	22.3	-125.13	-644.9	-768.0	432.7	402.9	29.76	14.539		
7,800.0	7,220.0	8,078.2	7,470.0	17.9	21.5	-125.13	-541.3	-767.9	432.7	404.1	28.54	15.158		
7,900.0	7,220.0	8,178.2	7,470.0	17.2	21.0	-125.14	-441.3	-767.9	432.7	405.1	27.53	15.714		
8,000.0	7,220.0	8,278.2	7,470.0	16.7	20.5	-125.14	-341.3	-767.9	432.6	405.8	26.79	16.147		
8,100.0	7,220.0	8,378.2	7,470.0	16.3	20.2	-125.14	-241.3	-767.9	432.6	406.2	26.35	16.418		
8,200.0	7,220.0	8,478.2	7,470.0	16.2	20.0	-125.14	-141.3	-767.8	432.6	406.4	26.22	16.501		
8,300.0	7,220.0	8,578.2	7,470.0	16.2	20.0	-125.15	-41.3	-767.8	432.5	406.1	26.40	16.387		
8,400.0	7,220.0	8,678.2	7,470.0	16.4	20.2	-125.15	58.7	-767.8	432.5	405.6	26.88	16.088		
8,500.0	7,220.0	8,778.2	7,470.0	16.8	20.5	-125.15	158.7	-767.8	432.5	404.8	27.67	15.633		
8,600.0	7,220.0	8,878.2	7,470.0	17.4	20.9	-125.15	258.7	-767.8	432.5	403.7	28.71	15.061		
8,700.0	7,220.0	8,978.2	7,470.0	18.1	21.5	-125.16	358.7	-767.7	432.4	402.4	30.00	14.413		
8,800.0	7,220.0	9,078.2	7,470.0	18.9	22.3	-125.16	458.7	-767.7	432.4	400.9	31.50	13.727		
8,900.0	7,220.0	9,178.2	7,470.0	19.9	23.1	-125.16	558.7	-767.7	432.4	399.2	33.18	13.030		
9,000.0	7,220.0	9,278.2	7,470.0	21.0	24.1	-125.16	658.7	-767.7	432.4	397.3	35.02	12.346		
9,100.0	7,220.0	9,378.2	7,470.0	22.2	25.1	-125.17	758.7	-767.7	432.3	395.3	36.99	11.688		
9,200.0	7,220.0	9,478.2	7,470.0	23.4	26.2	-125.17	858.7	-767.6	432.3	393.2	39.07	11.064		
9,300.0	7,220.0	9,578.2	7,470.0	24.7	27.4	-125.17	958.7	-767.6	432.3	391.0	41.25	10.479		
9,400.0	7,220.0	9,678.2	7,470.0	26.1	28.6	-125.17	1,058.7	-767.6	432.2	388.7	43.51	9.935		
9,500.0	7,220.0	9,778.2	7,470.0	27.5	29.9	-125.18	1,158.7	-767.6	432.2	386.4	45.84	9.430		
9,600.0	7,220.0	9,878.2	7,470.0	28.9	31.2	-125.18	1,258.7	-767.5	432.2	384.0	48.22	8.962		
9,700.0	7,220.0	9,978.2	7,470.0	30.4	32.6	-125.18	1,358.7	-767.5	432.2	381.5	50.66	8.531		
9,800.0	7,220.0	10,078.2	7,470.0	31.9	34.0	-125.18	1,458.7	-767.5	432.1	379.0	53.14	8.132		
9,900.0	7,220.0	10,178.2	7,470.0	33.4	35.4	-125.19	1,558.7	-767.5	432.1	376.5	55.66	7.763		
10,000.0	7,220.0	10,278.2	7,470.0	34.9	36.9	-125.19	1,658.7	-767.5	432.1	373.9	58.21	7.423		
10,100.0	7,220.0	10,378.2	7,470.0	36.5	38.4	-125.19	1,758.7	-767.4	432.1	371.3	60.79	7.107		

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 Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4C-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink 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	
10,200.0	7,220.0	10,478.2	7,470.0	38.1	39.9	-125.19	1,858.7	-767.4	432.0	368.6	63.40	6.815		
10,300.0	7,220.0	10,578.2	7,470.0	39.7	41.4	-125.20	1,958.7	-767.4	432.0	366.0	66.02	6.543		
10,400.0	7,220.0	10,678.2	7,470.0	41.3	43.0	-125.20	2,058.7	-767.4	432.0	363.3	68.67	6.290		
10,500.0	7,220.0	10,778.2	7,470.0	42.9	44.5	-125.20	2,158.7	-767.4	432.0	360.6	71.34	6.055		
10,600.0	7,220.0	10,878.2	7,470.0	44.5	46.1	-125.20	2,258.7	-767.3	431.9	357.9	74.02	5.835		
10,700.0	7,220.0	10,978.2	7,470.0	46.2	47.7	-125.21	2,358.7	-767.3	431.9	355.2	76.71	5.630		
10,800.0	7,220.0	11,078.2	7,470.0	47.8	49.3	-125.21	2,458.7	-767.3	431.9	352.5	79.42	5.438		
10,900.0	7,220.0	11,178.2	7,470.0	49.5	50.9	-125.21	2,558.7	-767.3	431.8	349.7	82.13	5.258		
11,000.0	7,220.0	11,278.2	7,470.0	51.1	52.5	-125.21	2,658.7	-767.3	431.8	347.0	84.86	5.088		
11,100.0	7,220.0	11,378.2	7,470.0	52.8	54.1	-125.22	2,758.7	-767.2	431.8	344.2	87.60	4.929		
11,200.0	7,220.0	11,478.2	7,470.0	54.5	55.8	-125.22	2,858.7	-767.2	431.8	341.4	90.34	4.779		
11,300.0	7,220.0	11,578.2	7,470.0	56.1	57.4	-125.22	2,958.7	-767.2	431.7	338.6	93.10	4.638		
11,400.0	7,220.0	11,678.2	7,470.0	57.8	59.1	-125.22	3,058.7	-767.2	431.7	335.9	95.86	4.504		
11,500.0	7,220.0	11,778.2	7,470.0	59.5	60.7	-125.23	3,158.7	-767.1	431.7	333.1	98.62	4.377		
11,600.0	7,220.0	11,878.2	7,470.0	61.2	62.4	-125.23	3,258.7	-767.1	431.7	330.3	101.39	4.257		
11,700.0	7,220.0	11,978.2	7,470.0	62.9	64.0	-125.23	3,358.7	-767.1	431.6	327.5	104.17	4.144		
11,800.0	7,220.0	12,078.2	7,470.0	64.6	65.7	-125.23	3,458.7	-767.1	431.6	324.6	106.95	4.036		
11,900.0	7,220.0	12,178.2	7,470.0	66.3	67.4	-125.24	3,558.7	-767.1	431.6	321.8	109.74	3.933		
11,971.1	7,220.0	12,249.2	7,470.0	67.5	68.6	-125.24	3,629.7	-767.0	431.6	319.8	111.72	3.863 SF		

Cathedral Energy Services

Anticollision Report

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Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4E-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink 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	90.00	0.0	10.1	10.1					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	10.1	10.1	9.8	0.24	41.221		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	10.1	10.1	9.5	0.59	16.973		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	10.1	10.1	9.1	0.94	10.687		
400.0	400.0	400.0	400.0	0.6	0.6	90.00	0.0	10.1	10.1	8.8	1.29	7.799	CC, ES	
500.0	500.0	500.0	500.0	0.8	0.8	-117.70	0.0	10.1	10.8	9.1	1.64	6.555		
600.0	599.8	600.1	600.0	1.0	1.0	-130.55	-1.7	10.0	13.2	11.2	2.00	6.578		
700.0	699.5	700.2	700.1	1.2	1.2	-137.01	-7.0	9.6	16.7	14.3	2.37	7.039		
800.0	798.7	800.5	799.9	1.5	1.4	-139.40	-15.7	9.1	21.1	18.3	2.77	7.595		
900.0	897.5	900.8	899.5	1.8	1.6	-139.53	-27.9	8.3	26.1	22.9	3.22	8.110		
1,000.0	995.6	1,001.2	998.7	2.1	1.9	-138.46	-43.7	7.3	31.9	28.1	3.74	8.525		
1,100.0	1,093.1	1,101.7	1,097.3	2.5	2.3	-136.78	-62.8	6.2	38.3	33.9	4.34	8.815		
1,200.0	1,189.8	1,201.7	1,194.8	3.0	2.6	-135.08	-84.6	4.8	45.3	40.3	5.02	9.027		
1,300.0	1,286.5	1,301.4	1,292.1	3.4	3.0	-133.85	-106.6	3.4	52.5	46.7	5.73	9.154		
1,400.0	1,383.2	1,401.2	1,389.4	3.9	3.4	-132.92	-128.6	2.1	59.6	53.2	6.46	9.227		
1,500.0	1,479.9	1,500.9	1,486.7	4.3	3.8	-132.19	-150.5	0.7	66.8	59.6	7.21	9.268		
1,600.0	1,576.6	1,600.6	1,584.0	4.8	4.2	-131.60	-172.5	-0.7	74.0	66.0	7.96	9.292		
1,700.0	1,673.4	1,700.4	1,681.3	5.3	4.6	-131.11	-194.4	-2.1	81.2	72.4	8.72	9.303		
1,800.0	1,770.1	1,800.1	1,778.5	5.7	5.0	-130.70	-216.4	-3.4	88.4	78.9	9.49	9.308		
1,900.0	1,866.8	1,899.9	1,875.8	6.2	5.4	-130.36	-238.4	-4.8	95.5	85.3	10.26	9.308		
2,000.0	1,963.5	1,999.6	1,973.1	6.7	5.9	-130.06	-260.3	-6.2	102.7	91.7	11.04	9.306		
2,100.0	2,060.2	2,099.3	2,070.4	7.1	6.3	-129.80	-282.3	-7.5	109.9	98.1	11.82	9.302		
2,200.0	2,156.9	2,199.1	2,167.7	7.6	6.7	-129.57	-304.2	-8.9	117.1	104.5	12.60	9.296		
2,300.0	2,253.6	2,298.8	2,265.0	8.1	7.1	-129.37	-326.2	-10.3	124.3	111.0	13.38	9.291		
2,400.0	2,350.3	2,398.6	2,362.2	8.6	7.5	-129.19	-348.2	-11.7	131.5	117.4	14.17	9.284		
2,500.0	2,447.0	2,498.3	2,459.5	9.0	7.9	-129.03	-370.1	-13.0	138.7	123.8	14.95	9.278		
2,600.0	2,543.7	2,598.0	2,556.8	9.5	8.3	-128.89	-392.1	-14.4	146.0	130.2	15.74	9.272		
2,700.0	2,640.4	2,697.8	2,654.1	10.0	8.8	-128.76	-414.0	-15.8	153.2	136.6	16.53	9.266		
2,800.0	2,737.1	2,797.5	2,751.4	10.5	9.2	-128.64	-436.0	-17.1	160.4	143.0	17.32	9.260		
2,900.0	2,833.8	2,897.2	2,848.6	10.9	9.6	-128.53	-458.0	-18.5	167.6	149.5	18.11	9.254		
3,000.0	2,930.5	2,997.0	2,945.9	11.4	10.0	-128.43	-479.9	-19.9	174.8	155.9	18.90	9.248		
3,100.0	3,027.2	3,096.7	3,043.2	11.9	10.4	-128.34	-501.9	-21.2	182.0	162.3	19.69	9.243		
3,200.0	3,123.9	3,196.5	3,140.5	12.4	10.9	-128.25	-523.8	-22.6	189.2	168.7	20.48	9.237		
3,300.0	3,220.6	3,296.2	3,237.8	12.8	11.3	-128.17	-545.8	-24.0	196.4	175.1	21.27	9.232		
3,400.0	3,317.4	3,395.9	3,335.1	13.3	11.7	-128.10	-567.8	-25.4	203.6	181.5	22.07	9.228		
3,500.0	3,414.1	3,495.7	3,432.3	13.8	12.1	-128.03	-589.7	-26.7	210.8	188.0	22.86	9.223		
3,600.0	3,510.8	3,595.4	3,529.6	14.3	12.5	-127.97	-611.7	-28.1	218.0	194.4	23.65	9.218		
3,700.0	3,607.5	3,695.2	3,626.9	14.8	13.0	-127.91	-633.6	-29.5	225.2	200.8	24.45	9.214		
3,800.0	3,704.2	3,794.9	3,724.2	15.2	13.4	-127.85	-655.6	-30.8	232.5	207.2	25.24	9.210		
3,900.0	3,800.9	3,894.6	3,821.5	15.7	13.8	-127.80	-677.6	-32.2	239.7	213.6	26.03	9.206		
4,000.0	3,897.6	3,994.4	3,918.7	16.2	14.2	-127.75	-699.5	-33.6	246.9	220.0	26.83	9.203		
4,100.0	3,994.3	4,094.1	4,016.0	16.7	14.6	-127.71	-721.5	-34.9	254.1	226.5	27.62	9.199		
4,200.0	4,091.0	4,193.9	4,113.3	17.1	15.1	-127.66	-743.5	-36.3	261.3	232.9	28.42	9.196		
4,300.0	4,187.7	4,293.6	4,210.6	17.6	15.5	-127.62	-765.4	-37.7	268.5	239.3	29.21	9.192		
4,400.0	4,284.4	4,393.3	4,307.9	18.1	15.9	-127.58	-787.4	-39.1	275.7	245.7	30.00	9.189		
4,500.0	4,381.1	4,493.1	4,405.2	18.6	16.3	-127.54	-809.3	-40.4	282.9	252.1	30.80	9.186		
4,600.0	4,477.8	4,592.8	4,502.4	19.1	16.7	-127.51	-831.3	-41.8	290.1	258.5	31.60	9.183		
4,700.0	4,574.5	4,692.6	4,599.7	19.5	17.2	-127.47	-853.3	-43.2	297.4	265.0	32.39	9.180		
4,800.0	4,671.2	4,792.3	4,697.0	20.0	17.6	-127.44	-875.2	-44.5	304.6	271.4	33.19	9.178		
4,900.0	4,767.9	4,892.0	4,794.3	20.5	18.0	-127.41	-897.2	-45.9	311.8	277.8	33.98	9.175		
5,000.0	4,864.7	4,991.8	4,891.6	21.0	18.4	-127.38	-919.1	-47.3	319.0	284.2	34.78	9.173		
5,100.0	4,961.4	5,091.5	4,988.9	21.4	18.8	-127.35	-941.1	-48.6	326.2	290.6	35.57	9.170		

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 Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4E-36H - HZ - Plan #1											Offset Site Error: 0.0 ft		
Survey Program: 0-Geolink MWD											Offset Well Error: 0.0 ft		
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
5,200.0	5,058.1	5,191.3	5,086.1	21.9	19.3	-127.33	-963.1	-50.0	333.4	297.0	36.37	9.168	
5,300.0	5,154.8	5,291.0	5,183.4	22.4	19.7	-127.30	-985.0	-51.4	340.6	303.5	37.16	9.166	
5,400.0	5,251.5	5,390.7	5,280.7	22.9	20.1	-127.28	-1,007.0	-52.8	347.8	309.9	37.96	9.163	
5,500.0	5,348.5	5,490.5	5,378.0	23.3	20.5	-127.19	-1,028.9	-54.1	354.4	315.6	38.77	9.141	
5,600.0	5,446.2	5,590.3	5,475.4	23.7	20.9	-126.66	-1,050.9	-55.5	358.9	319.2	39.67	9.047	
5,700.0	5,544.6	5,690.1	5,572.7	24.0	21.4	-125.68	-1,072.9	-56.9	361.4	320.7	40.65	8.889	
5,800.0	5,643.6	5,789.7	5,669.8	24.3	21.8	-124.22	-1,094.8	-58.2	362.0	320.3	41.73	8.675	
5,900.0	5,743.0	5,888.9	5,766.6	24.5	22.2	-122.29	-1,116.7	-59.6	361.0	318.1	42.87	8.420	
6,000.0	5,842.8	5,987.7	5,863.0	24.7	22.6	-119.87	-1,138.4	-61.0	358.6	314.6	44.06	8.140	
6,100.0	5,942.7	6,083.6	5,956.8	24.8	23.0	-117.23	-1,158.1	-62.2	355.6	310.5	45.14	7.878	
6,200.0	6,042.7	6,180.0	6,051.7	24.8	23.3	84.27	-1,174.8	-63.2	352.6	306.6	46.07	7.654	
6,300.0	6,142.7	6,277.3	6,148.1	24.9	23.6	86.46	-1,188.3	-64.1	350.6	303.8	46.82	7.489	
6,400.0	6,242.7	6,375.4	6,245.6	25.0	23.8	88.15	-1,198.7	-64.7	349.5	302.1	47.39	7.374	
6,500.0	6,342.7	6,474.2	6,344.1	25.1	23.9	89.30	-1,205.8	-65.2	348.9	301.1	47.81	7.298	
6,600.0	6,442.7	6,573.3	6,443.1	25.2	24.0	89.91	-1,209.4	-65.4	348.6	300.5	48.08	7.250	
6,676.8	6,519.5	6,649.6	6,519.5	25.2	24.1	90.00	-1,210.0	-65.4	348.6	300.3	48.23	7.228	
6,700.0	6,542.7	6,672.8	6,542.7	25.2	24.1	90.00	-1,210.0	-65.4	348.6	300.3	48.27	7.222	
6,800.0	6,642.7	6,772.8	6,642.7	25.3	24.2	90.00	-1,210.0	-65.4	348.6	300.1	48.43	7.197	
6,830.1	6,672.8	6,802.9	6,672.8	25.3	24.2	90.13	-1,210.0	-65.4	348.6	300.1	48.45	7.195	
6,900.0	6,742.3	6,872.4	6,742.3	25.2	24.3	91.30	-1,210.0	-65.4	348.7	300.1	48.58	7.177	
7,000.0	6,838.9	6,969.0	6,838.9	24.9	24.4	95.12	-1,210.0	-65.4	350.1	301.5	48.64	7.199	
7,100.0	6,929.8	7,064.7	6,934.6	24.3	24.4	100.76	-1,208.8	-65.4	356.3	308.1	48.16	7.397	
7,200.0	7,012.0	7,173.0	7,041.3	23.6	24.2	106.87	-1,191.5	-65.4	367.6	320.9	46.63	7.883	
7,300.0	7,083.2	7,293.2	7,153.6	22.7	23.6	112.57	-1,149.4	-65.4	382.5	338.4	44.05	8.683	
7,400.0	7,141.1	7,427.7	7,265.7	21.7	22.6	117.65	-1,075.6	-65.4	398.9	358.2	40.64	9.814	
7,500.0	7,183.9	7,578.3	7,367.0	20.7	21.2	121.80	-964.8	-65.4	414.0	377.2	36.81	11.246	
7,600.0	7,210.5	7,743.9	7,441.0	19.7	19.4	124.59	-817.1	-65.4	424.9	391.7	33.14	12.819	
7,700.0	7,220.0	7,919.4	7,469.9	18.7	17.6	125.64	-644.8	-65.4	429.1	398.8	30.27	14.174	
7,800.0	7,220.0	8,022.8	7,470.0	17.9	16.7	125.64	-541.4	-65.4	429.1	400.1	29.02	14.785	
7,900.0	7,220.0	8,122.8	7,470.0	17.2	16.0	125.63	-441.4	-65.3	429.1	401.1	28.05	15.299	
8,000.0	7,220.0	8,222.8	7,470.0	16.7	15.4	125.63	-341.4	-65.3	429.1	401.8	27.34	15.696	
8,100.0	7,220.0	8,322.8	7,470.0	16.3	15.0	125.63	-241.4	-65.3	429.1	402.2	26.92	15.942	
8,200.0	7,220.0	8,422.8	7,470.0	16.2	14.9	125.63	-141.4	-65.3	429.2	402.4	26.80	16.015	
8,300.0	7,220.0	8,522.8	7,470.0	16.2	14.9	125.63	-41.4	-65.3	429.2	402.2	26.98	15.908	
8,400.0	7,220.0	8,622.8	7,470.0	16.4	15.1	125.63	58.6	-65.3	429.2	401.7	27.46	15.630	
8,500.0	7,220.0	8,722.8	7,470.0	16.8	15.6	125.62	158.6	-65.3	429.2	401.0	28.22	15.208	
8,600.0	7,220.0	8,822.8	7,470.0	17.4	16.2	125.62	258.6	-65.3	429.2	400.0	29.25	14.676	
8,700.0	7,220.0	8,922.8	7,470.0	18.1	17.0	125.62	358.6	-65.3	429.2	398.7	30.51	14.071	
8,800.0	7,220.0	9,022.8	7,470.0	18.9	17.9	125.62	458.6	-65.2	429.3	397.3	31.97	13.426	
8,900.0	7,220.0	9,122.8	7,470.0	19.9	18.9	125.62	558.6	-65.2	429.3	395.7	33.62	12.769	
9,000.0	7,220.0	9,222.8	7,470.0	21.0	20.0	125.62	658.6	-65.2	429.3	393.9	35.42	12.120	
9,100.0	7,220.0	9,322.8	7,470.0	22.2	21.3	125.61	758.6	-65.2	429.3	392.0	37.35	11.493	
9,200.0	7,220.0	9,422.8	7,470.0	23.4	22.5	125.61	858.6	-65.2	429.3	389.9	39.40	10.896	
9,300.0	7,220.0	9,522.8	7,470.0	24.7	23.9	125.61	958.6	-65.2	429.4	387.8	41.55	10.335	
9,400.0	7,220.0	9,622.8	7,470.0	26.1	25.3	125.61	1,058.6	-65.2	429.4	385.6	43.77	9.809	
9,500.0	7,220.0	9,722.8	7,470.0	27.5	26.7	125.61	1,158.6	-65.2	429.4	383.3	46.07	9.321	
9,600.0	7,220.0	9,822.8	7,470.0	28.9	28.2	125.60	1,258.6	-65.2	429.4	381.0	48.43	8.868	
9,700.0	7,220.0	9,922.8	7,470.0	30.4	29.7	125.60	1,358.6	-65.1	429.4	378.6	50.83	8.448	
9,800.0	7,220.0	10,022.8	7,470.0	31.9	31.2	125.60	1,458.6	-65.1	429.4	376.2	53.29	8.059	
9,900.0	7,220.0	10,122.8	7,470.0	33.4	32.8	125.60	1,558.6	-65.1	429.5	373.7	55.78	7.699	
10,000.0	7,220.0	10,222.8	7,470.0	34.9	34.4	125.60	1,658.6	-65.1	429.5	371.2	58.31	7.366	
10,100.0	7,220.0	10,322.8	7,470.0	36.5	36.0	125.60	1,758.6	-65.1	429.5	368.6	60.86	7.057	

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 Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4E-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
10,200.0	7,220.0	10,422.8	7,470.0	38.1	37.6	125.59	1,858.6	-65.1	429.5	366.1	63.45	6.770		
10,300.0	7,220.0	10,522.8	7,470.0	39.7	39.2	125.59	1,958.6	-65.1	429.5	363.5	66.05	6.503		
10,400.0	7,220.0	10,622.8	7,470.0	41.3	40.8	125.59	2,058.6	-65.1	429.6	360.9	68.68	6.255		
10,500.0	7,220.0	10,722.8	7,470.0	42.9	42.4	125.59	2,158.6	-65.1	429.6	358.3	71.33	6.023		
10,600.0	7,220.0	10,822.8	7,470.0	44.5	44.1	125.59	2,258.6	-65.0	429.6	355.6	73.99	5.806		
10,700.0	7,220.0	10,922.8	7,470.0	46.2	45.7	125.59	2,358.6	-65.0	429.6	353.0	76.66	5.604		
10,800.0	7,220.0	11,022.8	7,470.0	47.8	47.4	125.58	2,458.6	-65.0	429.6	350.3	79.35	5.414		
10,900.0	7,220.0	11,122.8	7,470.0	49.5	49.1	125.58	2,558.6	-65.0	429.7	347.6	82.05	5.236		
11,000.0	7,220.0	11,222.8	7,470.0	51.1	50.8	125.58	2,658.6	-65.0	429.7	344.9	84.77	5.069		
11,100.0	7,220.0	11,322.8	7,470.0	52.8	52.4	125.58	2,758.6	-65.0	429.7	342.2	87.49	4.911		
11,200.0	7,220.0	11,422.8	7,470.0	54.5	54.1	125.58	2,858.6	-65.0	429.7	339.5	90.22	4.763		
11,300.0	7,220.0	11,522.8	7,470.0	56.1	55.8	125.57	2,958.6	-65.0	429.7	336.8	92.96	4.623		
11,400.0	7,220.0	11,622.8	7,470.0	57.8	57.5	125.57	3,058.6	-65.0	429.7	334.0	95.70	4.490		
11,500.0	7,220.0	11,722.8	7,470.0	59.5	59.2	125.57	3,158.6	-65.0	429.8	331.3	98.46	4.365		
11,600.0	7,220.0	11,822.8	7,470.0	61.2	60.9	125.57	3,258.6	-64.9	429.8	328.6	101.22	4.246		
11,700.0	7,220.0	11,922.8	7,470.0	62.9	62.6	125.57	3,358.6	-64.9	429.8	325.8	103.98	4.133		
11,800.0	7,220.0	12,022.8	7,470.0	64.6	64.3	125.57	3,458.6	-64.9	429.8	323.1	106.75	4.026		
11,900.0	7,220.0	12,122.8	7,470.0	66.3	66.0	125.56	3,558.6	-64.9	429.8	320.3	109.53	3.925		
11,971.1	7,220.0	12,193.8	7,470.0	67.5	67.2	125.56	3,629.6	-64.9	429.9	318.4	111.50	3.855 SF		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4F-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	20.1	20.1					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	20.1	20.1	19.9	0.24	82.441		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	20.1	20.1	19.6	0.59	33.946		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	20.1	20.1	19.2	0.94	21.374		
400.0	400.0	400.0	400.0	0.6	0.6	90.00	0.0	20.1	20.1	18.9	1.29	15.597 CC, ES		
500.0	500.0	499.8	499.8	0.8	0.8	-108.73	-1.7	20.5	21.1	19.4	1.64	12.821		
600.0	599.8	599.6	599.5	1.0	1.0	-108.34	-6.8	21.6	23.9	21.9	2.02	11.834		
700.0	699.5	699.3	698.8	1.2	1.2	-107.84	-15.3	23.5	28.6	26.1	2.44	11.717 SF		
800.0	798.7	798.8	797.6	1.5	1.5	-107.34	-27.1	26.1	35.1	32.2	2.93	12.005		
900.0	897.5	898.2	895.7	1.8	1.8	-106.90	-42.2	29.4	43.6	40.1	3.50	12.447		
1,000.0	995.6	997.2	992.9	2.1	2.1	-106.51	-60.6	33.5	53.8	49.6	4.17	12.910		
1,100.0	1,093.1	1,096.0	1,089.2	2.5	2.5	-106.17	-82.2	38.2	65.9	60.9	4.94	13.337		
1,200.0	1,189.8	1,195.0	1,185.1	3.0	2.9	-106.40	-105.9	43.4	79.3	73.5	5.76	13.755		
1,300.0	1,286.5	1,294.1	1,281.2	3.4	3.4	-106.76	-129.7	48.6	92.7	86.1	6.61	14.034		
1,400.0	1,383.2	1,393.2	1,377.2	3.9	3.8	-107.02	-153.5	53.9	106.2	98.8	7.47	14.223		
1,500.0	1,479.9	1,492.3	1,473.3	4.3	4.2	-107.23	-177.3	59.1	119.7	111.4	8.34	14.357		
1,600.0	1,576.6	1,591.3	1,569.3	4.8	4.7	-107.39	-201.1	64.3	133.2	124.0	9.21	14.456		
1,700.0	1,673.4	1,690.4	1,665.4	5.3	5.1	-107.52	-224.9	69.5	146.7	136.6	10.09	14.530		
1,800.0	1,770.1	1,789.5	1,761.4	5.7	5.6	-107.63	-248.6	74.8	160.2	149.2	10.98	14.587		
1,900.0	1,866.8	1,888.6	1,857.5	6.2	6.0	-107.73	-272.4	80.0	173.6	161.8	11.87	14.632		
2,000.0	1,963.5	1,987.7	1,953.5	6.7	6.5	-107.81	-296.2	85.2	187.1	174.4	12.76	14.668		
2,100.0	2,060.2	2,086.8	2,049.6	7.1	6.9	-107.88	-320.0	90.4	200.6	187.0	13.65	14.697		
2,200.0	2,156.9	2,185.9	2,145.6	7.6	7.4	-107.94	-343.8	95.7	214.1	199.5	14.54	14.722		
2,300.0	2,253.6	2,284.9	2,241.6	8.1	7.8	-107.99	-367.6	100.9	227.6	212.1	15.44	14.742		
2,400.0	2,350.3	2,384.0	2,337.7	8.6	8.3	-108.04	-391.4	106.1	241.1	224.7	16.33	14.759		
2,500.0	2,447.0	2,483.1	2,433.7	9.0	8.8	-108.08	-415.2	111.3	254.5	237.3	17.23	14.773		
2,600.0	2,543.7	2,582.2	2,529.8	9.5	9.2	-108.12	-439.0	116.6	268.0	249.9	18.13	14.786		
2,700.0	2,640.4	2,681.3	2,625.8	10.0	9.7	-108.16	-462.8	121.8	281.5	262.5	19.03	14.797		
2,800.0	2,737.1	2,780.4	2,721.9	10.5	10.1	-108.19	-486.6	127.0	295.0	275.1	19.92	14.806		
2,900.0	2,833.8	2,879.5	2,817.9	10.9	10.6	-108.22	-510.4	132.3	308.5	287.7	20.82	14.814		
3,000.0	2,930.5	2,978.5	2,914.0	11.4	11.0	-108.24	-534.1	137.5	322.0	300.2	21.72	14.822		
3,100.0	3,027.2	3,077.6	3,010.0	11.9	11.5	-108.27	-557.9	142.7	335.5	312.8	22.62	14.828		
3,200.0	3,123.9	3,176.7	3,106.1	12.4	12.0	-108.29	-581.7	147.9	348.9	325.4	23.52	14.834		
3,300.0	3,220.6	3,275.8	3,202.1	12.8	12.4	-108.31	-605.5	153.2	362.4	338.0	24.42	14.839		
3,400.0	3,317.4	3,374.9	3,298.1	13.3	12.9	-108.33	-629.3	158.4	375.9	350.6	25.32	14.844		
3,500.0	3,414.1	3,474.0	3,394.2	13.8	13.3	-108.35	-653.1	163.6	389.4	363.2	26.23	14.848		
3,600.0	3,510.8	3,573.1	3,490.2	14.3	13.8	-108.36	-676.9	168.8	402.9	375.8	27.13	14.852		
3,700.0	3,607.5	3,672.2	3,586.3	14.8	14.2	-108.38	-700.7	174.1	416.4	388.3	28.03	14.855		
3,800.0	3,704.2	3,771.2	3,682.3	15.2	14.7	-108.39	-724.5	179.3	429.9	400.9	28.93	14.858		
3,900.0	3,800.9	3,870.3	3,778.4	15.7	15.2	-108.41	-748.3	184.5	443.3	413.5	29.83	14.861		
4,000.0	3,897.6	3,969.4	3,874.4	16.2	15.6	-108.42	-772.1	189.7	456.8	426.1	30.73	14.864		
4,100.0	3,994.3	4,068.5	3,970.5	16.7	16.1	-108.43	-795.9	195.0	470.3	438.7	31.64	14.866		
4,200.0	4,091.0	4,167.6	4,066.5	17.1	16.5	-108.44	-819.6	200.2	483.8	451.3	32.54	14.868		
4,300.0	4,187.7	4,266.7	4,162.6	17.6	17.0	-108.45	-843.4	205.4	497.3	463.8	33.44	14.870		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4G-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink 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	90.00	0.0	29.9	29.9					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	29.9	29.9	29.7	0.24	122.517		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	29.9	29.9	29.3	0.59	50.448		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	29.9	29.9	29.0	0.94	31.764 CC, ES		
400.0	400.0	399.5	399.5	0.6	0.6	92.88	-1.5	30.7	30.8	29.5	1.29	23.778		
500.0	500.0	498.8	498.7	0.8	0.8	-101.15	-6.2	33.0	33.9	32.3	1.65	20.504		
600.0	599.8	597.9	597.3	1.0	1.1	-98.15	-13.8	36.9	39.9	37.8	2.04	19.516 SF		
700.0	699.5	696.6	695.3	1.2	1.3	-96.81	-24.5	42.2	48.5	46.0	2.48	19.551		
800.0	798.7	794.8	792.3	1.5	1.6	-96.55	-38.1	49.0	59.6	56.6	2.98	20.001		
900.0	897.5	892.5	888.2	1.8	2.0	-96.89	-54.6	57.3	73.2	69.7	3.56	20.565		
1,000.0	995.6	989.5	982.9	2.1	2.4	-97.49	-73.8	66.9	89.3	85.1	4.23	21.127		
1,100.0	1,093.1	1,087.9	1,078.4	2.5	2.8	-98.97	-94.7	77.4	106.9	102.0	4.98	21.463		
1,200.0	1,189.8	1,186.1	1,173.8	3.0	3.2	-101.43	-115.6	87.9	125.1	119.3	5.79	21.611		
1,300.0	1,286.5	1,284.3	1,269.2	3.4	3.6	-103.46	-136.4	98.3	143.6	137.0	6.62	21.704		
1,400.0	1,383.2	1,382.4	1,364.5	3.9	4.0	-105.02	-157.3	108.8	162.2	154.7	7.45	21.770		
1,500.0	1,479.9	1,480.6	1,459.9	4.3	4.5	-106.27	-178.2	119.3	180.8	172.5	8.29	21.821		
1,600.0	1,576.6	1,578.8	1,555.3	4.8	4.9	-107.28	-199.0	129.7	199.6	190.4	9.13	21.861		
1,700.0	1,673.4	1,677.0	1,650.6	5.3	5.4	-108.12	-219.9	140.2	218.3	208.4	9.97	21.894		
1,800.0	1,770.1	1,775.1	1,746.0	5.7	5.8	-108.82	-240.7	150.6	237.2	226.3	10.82	21.921		
1,900.0	1,866.8	1,873.3	1,841.3	6.2	6.2	-109.42	-261.6	161.1	256.0	244.3	11.67	21.945		
2,000.0	1,963.5	1,971.5	1,936.7	6.7	6.7	-109.94	-282.4	171.6	274.9	262.4	12.51	21.966		
2,100.0	2,060.2	2,069.7	2,032.1	7.1	7.1	-110.40	-303.3	182.0	293.8	280.4	13.36	21.984		
2,200.0	2,156.9	2,167.8	2,127.4	7.6	7.6	-110.79	-324.2	192.5	312.7	298.5	14.21	22.000		
2,300.0	2,253.6	2,266.0	2,222.8	8.1	8.0	-111.15	-345.0	202.9	331.6	316.6	15.06	22.014		
2,400.0	2,350.3	2,364.2	2,318.1	8.6	8.4	-111.46	-365.9	213.4	350.5	334.6	15.91	22.027		
2,500.0	2,447.0	2,462.3	2,413.5	9.0	8.9	-111.74	-386.7	223.8	369.5	352.7	16.77	22.038		
2,600.0	2,543.7	2,560.5	2,508.9	9.5	9.3	-112.00	-407.6	234.3	388.4	370.8	17.62	22.049		
2,700.0	2,640.4	2,658.7	2,604.2	10.0	9.8	-112.23	-428.4	244.8	407.4	388.9	18.47	22.059		
2,800.0	2,737.1	2,756.9	2,699.6	10.5	10.2	-112.44	-449.3	255.2	426.4	407.0	19.32	22.068		
2,900.0	2,833.8	2,855.0	2,795.0	10.9	10.6	-112.63	-470.2	265.7	445.3	425.2	20.17	22.076		
3,000.0	2,930.5	2,953.2	2,890.3	11.4	11.1	-112.81	-491.0	276.1	464.3	443.3	21.02	22.084		
3,100.0	3,027.2	3,051.4	2,985.7	11.9	11.5	-112.97	-511.9	286.6	483.3	461.4	21.88	22.091		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4H-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink 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	90.52	-0.4	40.0	40.0					
100.0	100.0	100.0	100.0	0.1	0.1	90.52	-0.4	40.0	40.0	39.8	0.24	163.744		
200.0	200.0	200.0	200.0	0.3	0.3	90.52	-0.4	40.0	40.0	39.4	0.59	67.424 CC, ES		
300.0	300.0	299.1	299.1	0.5	0.5	92.39	-1.7	41.1	41.1	40.2	0.94	43.537		
400.0	400.0	398.0	397.8	0.6	0.7	97.41	-5.7	44.2	44.6	43.3	1.31	34.135		
500.0	500.0	496.4	495.9	0.8	0.9	-96.56	-12.4	49.4	51.3	49.7	1.67	30.765		
600.0	599.8	594.4	593.2	1.0	1.2	-94.07	-21.7	56.7	61.2	59.2	2.06	29.727		
700.0	699.5	691.7	689.3	1.2	1.5	-93.31	-33.5	65.9	74.1	71.6	2.49	29.722 SF		
800.0	798.7	788.3	784.1	1.5	1.8	-93.59	-47.8	77.1	89.9	86.9	2.99	30.079		
900.0	897.5	883.9	877.4	1.8	2.2	-94.38	-64.4	90.1	108.6	105.0	3.56	30.495		
1,000.0	995.6	978.5	968.9	2.1	2.7	-95.39	-83.2	104.8	130.1	125.9	4.22	30.854		
1,100.0	1,093.1	1,073.8	1,060.4	2.5	3.1	-96.57	-104.2	121.2	154.1	149.2	4.96	31.101		
1,200.0	1,189.8	1,170.5	1,153.1	3.0	3.6	-98.46	-125.8	138.1	179.0	173.2	5.77	31.036		
1,300.0	1,286.5	1,267.1	1,245.8	3.4	4.1	-100.09	-147.4	155.0	204.0	197.4	6.60	30.909		
1,400.0	1,383.2	1,363.8	1,338.5	3.9	4.6	-101.37	-169.0	171.9	229.1	221.7	7.44	30.782		
1,500.0	1,479.9	1,460.5	1,431.2	4.3	5.2	-102.40	-190.6	188.8	254.4	246.1	8.30	30.664		
1,600.0	1,576.6	1,557.2	1,523.9	4.8	5.7	-103.24	-212.2	205.7	279.7	270.5	9.15	30.558		
1,700.0	1,673.4	1,653.8	1,616.6	5.3	6.2	-103.94	-233.8	222.6	305.0	295.0	10.01	30.464		
1,800.0	1,770.1	1,750.5	1,709.3	5.7	6.7	-104.54	-255.4	239.6	330.4	319.5	10.88	30.381		
1,900.0	1,866.8	1,847.2	1,802.0	6.2	7.2	-105.04	-277.0	256.5	355.8	344.1	11.74	30.307		
2,000.0	1,963.5	1,943.8	1,894.7	6.7	7.7	-105.49	-298.6	273.4	381.2	368.6	12.61	30.241		
2,100.0	2,060.2	2,040.5	1,987.4	7.1	8.2	-105.87	-320.2	290.3	406.7	393.2	13.47	30.183		
2,200.0	2,156.9	2,137.2	2,080.1	7.6	8.7	-106.21	-341.8	307.2	432.2	417.8	14.34	30.130		
2,300.0	2,253.6	2,233.9	2,172.8	8.1	9.2	-106.52	-363.5	324.1	457.6	442.4	15.21	30.083		
2,400.0	2,350.3	2,330.5	2,265.5	8.6	9.7	-106.79	-385.1	341.0	483.1	467.0	16.08	30.040		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4D-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (Original Well Elev)
Reference Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Mumby State 4D-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5048.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Mumby State 4D-36H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.50°

