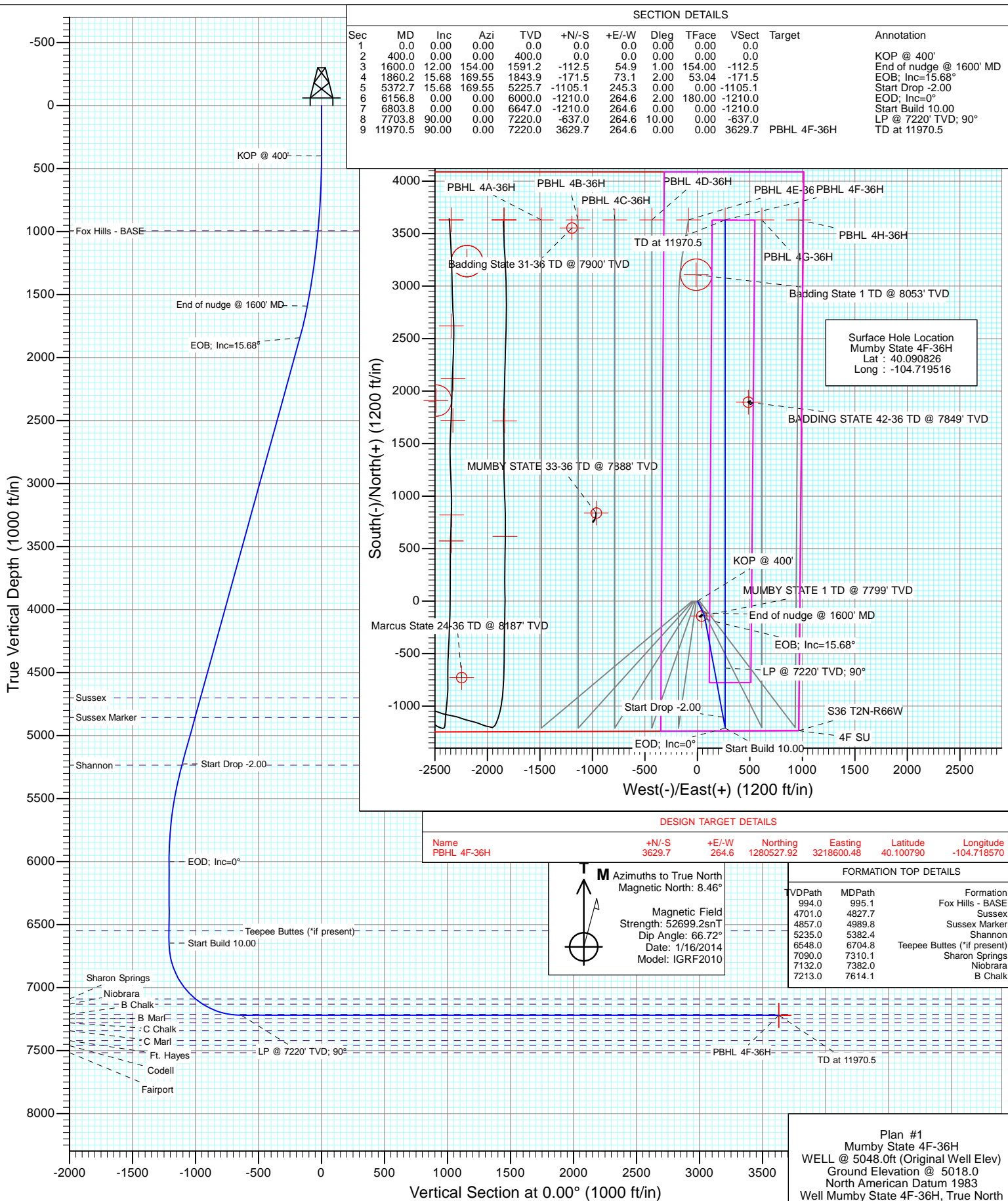




Project: DJ Wattenberg
Site: S36 T2N-R66W (Marcus State, Mumby State)
Well: Mumby State 4F-36H
Wellbore: HZ
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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 4F-36H					
Well Position	+N/-S	0.0 ft	Northing:	1,276,896.05 ft	Latitude:	40.090826
	+E/-W	0.0 ft	Easting:	3,218,367.80 ft	Longitude:	-104.719516
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	
1,600.0	12.00	154.00	1,591.2	-112.5	54.9	1.00	1.00	0.00	154.00	
1,860.2	15.68	169.55	1,843.9	-171.5	73.1	2.00	1.41	5.98	53.04	
5,372.7	15.68	169.55	5,225.7	-1,105.1	245.3	0.00	0.00	0.00	0.00	
6,156.8	0.00	0.00	6,000.0	-1,210.0	264.6	2.00	-2.00	0.00	180.00	
6,803.8	0.00	0.00	6,647.0	-1,210.0	264.6	0.00	0.00	0.00	0.00	
7,703.8	90.00	0.00	7,220.0	-637.0	264.6	10.00	10.00	0.00	0.00	
11,970.5	90.00	0.00	7,220.0	3,629.7	264.6	0.00	0.00	0.00	0.00	PBHL 4F-36H

Cathedral Energy Services

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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 4F-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	1.00	154.00	500.0	-0.8	0.4	-0.8	1.00	1.00	
600.0	2.00	154.00	600.0	-3.1	1.5	-3.1	1.00	1.00	
700.0	3.00	154.00	699.9	-7.1	3.4	-7.1	1.00	1.00	
800.0	4.00	154.00	799.7	-12.5	6.1	-12.5	1.00	1.00	
900.0	5.00	154.00	899.4	-19.6	9.6	-19.6	1.00	1.00	
995.1	5.95	154.00	994.0	-27.7	13.5	-27.7	1.00	1.00	Fox Hills - BASE
1,000.0	6.00	154.00	998.9	-28.2	13.8	-28.2	1.00	1.00	
1,100.0	7.00	154.00	1,098.3	-38.4	18.7	-38.4	1.00	1.00	
1,200.0	8.00	154.00	1,197.4	-50.1	24.4	-50.1	1.00	1.00	
1,300.0	9.00	154.00	1,296.3	-63.4	30.9	-63.4	1.00	1.00	
1,400.0	10.00	154.00	1,394.9	-78.2	38.2	-78.2	1.00	1.00	
1,500.0	11.00	154.00	1,493.3	-94.6	46.1	-94.6	1.00	1.00	
1,600.0	12.00	154.00	1,591.2	-112.5	54.9	-112.5	1.00	1.00	End of nudge @ 1600' MD
1,700.0	13.30	160.96	1,688.8	-132.8	63.2	-132.8	2.00	1.30	
1,800.0	14.75	166.65	1,785.8	-156.0	69.9	-156.0	2.00	1.45	
1,860.2	15.68	169.55	1,843.9	-171.5	73.1	-171.5	2.00	1.55	EOB; Inc=15.68°
1,900.0	15.68	169.55	1,882.3	-182.0	75.1	-182.0	0.00	0.00	
2,000.0	15.68	169.55	1,978.5	-208.6	80.0	-208.6	0.00	0.00	
2,100.0	15.68	169.55	2,074.8	-235.2	84.9	-235.2	0.00	0.00	
2,200.0	15.68	169.55	2,171.1	-261.8	89.8	-261.8	0.00	0.00	
2,300.0	15.68	169.55	2,267.4	-288.4	94.7	-288.4	0.00	0.00	
2,400.0	15.68	169.55	2,363.6	-315.0	99.6	-315.0	0.00	0.00	
2,500.0	15.68	169.55	2,459.9	-341.5	104.5	-341.5	0.00	0.00	
2,600.0	15.68	169.55	2,556.2	-368.1	109.4	-368.1	0.00	0.00	
2,700.0	15.68	169.55	2,652.5	-394.7	114.3	-394.7	0.00	0.00	
2,800.0	15.68	169.55	2,748.8	-421.3	119.2	-421.3	0.00	0.00	
2,900.0	15.68	169.55	2,845.0	-447.9	124.1	-447.9	0.00	0.00	
3,000.0	15.68	169.55	2,941.3	-474.4	129.0	-474.4	0.00	0.00	
3,100.0	15.68	169.55	3,037.6	-501.0	133.9	-501.0	0.00	0.00	
3,200.0	15.68	169.55	3,133.9	-527.6	138.8	-527.6	0.00	0.00	
3,300.0	15.68	169.55	3,230.1	-554.2	143.7	-554.2	0.00	0.00	
3,400.0	15.68	169.55	3,326.4	-580.8	148.6	-580.8	0.00	0.00	
3,500.0	15.68	169.55	3,422.7	-607.4	153.5	-607.4	0.00	0.00	
3,600.0	15.68	169.55	3,519.0	-633.9	158.4	-633.9	0.00	0.00	
3,700.0	15.68	169.55	3,615.3	-660.5	163.3	-660.5	0.00	0.00	
3,800.0	15.68	169.55	3,711.5	-687.1	168.2	-687.1	0.00	0.00	
3,900.0	15.68	169.55	3,807.8	-713.7	173.1	-713.7	0.00	0.00	
4,000.0	15.68	169.55	3,904.1	-740.3	178.0	-740.3	0.00	0.00	
4,100.0	15.68	169.55	4,000.4	-766.8	182.9	-766.8	0.00	0.00	
4,200.0	15.68	169.55	4,096.6	-793.4	187.8	-793.4	0.00	0.00	
4,300.0	15.68	169.55	4,192.9	-820.0	192.7	-820.0	0.00	0.00	
4,400.0	15.68	169.55	4,289.2	-846.6	197.6	-846.6	0.00	0.00	
4,500.0	15.68	169.55	4,385.5	-873.2	202.5	-873.2	0.00	0.00	
4,600.0	15.68	169.55	4,481.8	-899.7	207.4	-899.7	0.00	0.00	
4,700.0	15.68	169.55	4,578.0	-926.3	212.3	-926.3	0.00	0.00	
4,800.0	15.68	169.55	4,674.3	-952.9	217.2	-952.9	0.00	0.00	
4,827.7	15.68	169.55	4,701.0	-960.3	218.6	-960.3	0.00	0.00	Sussex

Cathedral Energy Services

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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 4F-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	15.68	169.55	4,770.6	-979.5	222.1	-979.5	0.00	0.00	
4,989.8	15.68	169.55	4,857.0	-1,003.3	226.5	-1,003.3	0.00	0.00	Sussex Marker
5,000.0	15.68	169.55	4,866.9	-1,006.1	227.0	-1,006.1	0.00	0.00	
5,100.0	15.68	169.55	4,963.1	-1,032.7	231.9	-1,032.7	0.00	0.00	
5,200.0	15.68	169.55	5,059.4	-1,059.2	236.8	-1,059.2	0.00	0.00	
5,300.0	15.68	169.55	5,155.7	-1,085.8	241.7	-1,085.8	0.00	0.00	
5,372.7	15.68	169.55	5,225.7	-1,105.1	245.3	-1,105.1	0.00	0.00	Start Drop -2.00
5,382.4	15.49	169.55	5,235.0	-1,107.7	245.7	-1,107.7	2.00	-2.00	Shannon
5,400.0	15.14	169.55	5,252.0	-1,112.3	246.6	-1,112.3	2.00	-2.00	
5,500.0	13.14	169.55	5,349.0	-1,136.3	251.0	-1,136.3	2.00	-2.00	
5,600.0	11.14	169.55	5,446.7	-1,157.0	254.8	-1,157.0	2.00	-2.00	
5,700.0	9.14	169.55	5,545.2	-1,174.3	258.0	-1,174.3	2.00	-2.00	
5,800.0	7.14	169.55	5,644.2	-1,188.2	260.6	-1,188.2	2.00	-2.00	
5,900.0	5.14	169.55	5,743.6	-1,198.7	262.5	-1,198.7	2.00	-2.00	
6,000.0	3.14	169.55	5,843.3	-1,205.8	263.8	-1,205.8	2.00	-2.00	
6,100.0	1.14	169.55	5,943.2	-1,209.4	264.5	-1,209.4	2.00	-2.00	
6,156.8	0.00	0.00	6,000.0	-1,210.0	264.6	-1,210.0	2.00	-2.00	EOD; Inc=0°
6,200.0	0.00	0.00	6,043.2	-1,210.0	264.6	-1,210.0	0.00	0.00	
6,300.0	0.00	0.00	6,143.2	-1,210.0	264.6	-1,210.0	0.00	0.00	
6,400.0	0.00	0.00	6,243.2	-1,210.0	264.6	-1,210.0	0.00	0.00	
6,500.0	0.00	0.00	6,343.2	-1,210.0	264.6	-1,210.0	0.00	0.00	
6,600.0	0.00	0.00	6,443.2	-1,210.0	264.6	-1,210.0	0.00	0.00	
6,700.0	0.00	0.00	6,543.2	-1,210.0	264.6	-1,210.0	0.00	0.00	
6,704.8	0.00	0.00	6,548.0	-1,210.0	264.6	-1,210.0	0.00	0.00	Teepee Buttes (*if present)
6,800.0	0.00	0.00	6,643.2	-1,210.0	264.6	-1,210.0	0.00	0.00	
6,803.8	0.00	0.00	6,647.0	-1,210.0	264.6	-1,210.0	0.00	0.00	Start Build 10.00
6,900.0	9.62	0.00	6,742.8	-1,201.9	264.6	-1,201.9	10.00	10.00	
7,000.0	19.62	0.00	6,839.4	-1,176.7	264.6	-1,176.7	10.00	10.00	
7,100.0	29.62	0.00	6,930.2	-1,135.1	264.6	-1,135.1	10.00	10.00	
7,200.0	39.62	0.00	7,012.4	-1,078.4	264.6	-1,078.4	10.00	10.00	
7,300.0	49.62	0.00	7,083.5	-1,008.2	264.6	-1,008.2	10.00	10.00	
7,310.1	50.63	0.00	7,090.0	-1,000.5	264.6	-1,000.5	10.00	10.00	Sharon Springs
7,382.0	57.82	0.00	7,132.0	-942.2	264.6	-942.2	10.00	10.00	Niobrara
7,400.0	59.62	0.00	7,141.3	-926.8	264.6	-926.8	10.00	10.00	
7,500.0	69.62	0.00	7,184.1	-836.6	264.6	-836.6	10.00	10.00	
7,600.0	79.62	0.00	7,210.6	-740.3	264.6	-740.3	10.00	10.00	
7,614.1	81.03	0.00	7,213.0	-726.3	264.6	-726.3	10.00	10.00	B Chalk
7,700.0	89.62	0.00	7,220.0	-640.8	264.6	-640.8	10.00	10.00	
7,703.8	90.00	0.00	7,220.0	-637.0	264.6	-637.0	10.00	10.00	LP @ 7220' TVD; 90°
7,800.0	90.00	0.00	7,220.0	-540.8	264.6	-540.8	0.00	0.00	
7,900.0	90.00	0.00	7,220.0	-440.8	264.6	-440.8	0.00	0.00	
8,000.0	90.00	0.00	7,220.0	-340.8	264.6	-340.8	0.00	0.00	
8,100.0	90.00	0.00	7,220.0	-240.8	264.6	-240.8	0.00	0.00	
8,200.0	90.00	0.00	7,220.0	-140.8	264.6	-140.8	0.00	0.00	
8,300.0	90.00	0.00	7,220.0	-40.8	264.6	-40.8	0.00	0.00	
8,400.0	90.00	0.00	7,220.0	59.2	264.6	59.2	0.00	0.00	
8,500.0	90.00	0.00	7,220.0	159.2	264.6	159.2	0.00	0.00	
8,600.0	90.00	0.00	7,220.0	259.2	264.6	259.2	0.00	0.00	
8,700.0	90.00	0.00	7,220.0	359.2	264.6	359.2	0.00	0.00	
8,800.0	90.00	0.00	7,220.0	459.2	264.6	459.2	0.00	0.00	
8,900.0	90.00	0.00	7,220.0	559.2	264.6	559.2	0.00	0.00	
9,000.0	90.00	0.00	7,220.0	659.2	264.6	659.2	0.00	0.00	

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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	0.00	7,220.0	759.2	264.6	759.2	0.00	0.00	
9,200.0	90.00	0.00	7,220.0	859.2	264.6	859.2	0.00	0.00	
9,300.0	90.00	0.00	7,220.0	959.2	264.6	959.2	0.00	0.00	
9,400.0	90.00	0.00	7,220.0	1,059.2	264.6	1,059.2	0.00	0.00	
9,500.0	90.00	0.00	7,220.0	1,159.2	264.6	1,159.2	0.00	0.00	
9,600.0	90.00	0.00	7,220.0	1,259.2	264.6	1,259.2	0.00	0.00	
9,700.0	90.00	0.00	7,220.0	1,359.2	264.6	1,359.2	0.00	0.00	
9,800.0	90.00	0.00	7,220.0	1,459.2	264.6	1,459.2	0.00	0.00	
9,900.0	90.00	0.00	7,220.0	1,559.2	264.6	1,559.2	0.00	0.00	
10,000.0	90.00	0.00	7,220.0	1,659.2	264.6	1,659.2	0.00	0.00	
10,100.0	90.00	0.00	7,220.0	1,759.2	264.6	1,759.2	0.00	0.00	
10,200.0	90.00	0.00	7,220.0	1,859.2	264.6	1,859.2	0.00	0.00	
10,300.0	90.00	0.00	7,220.0	1,959.2	264.6	1,959.2	0.00	0.00	
10,400.0	90.00	0.00	7,220.0	2,059.2	264.6	2,059.2	0.00	0.00	
10,500.0	90.00	0.00	7,220.0	2,159.2	264.6	2,159.2	0.00	0.00	
10,600.0	90.00	0.00	7,220.0	2,259.2	264.6	2,259.2	0.00	0.00	
10,700.0	90.00	0.00	7,220.0	2,359.2	264.6	2,359.2	0.00	0.00	
10,800.0	90.00	0.00	7,220.0	2,459.2	264.6	2,459.2	0.00	0.00	
10,900.0	90.00	0.00	7,220.0	2,559.2	264.6	2,559.2	0.00	0.00	
11,000.0	90.00	0.00	7,220.0	2,659.2	264.6	2,659.2	0.00	0.00	
11,100.0	90.00	0.00	7,220.0	2,759.2	264.6	2,759.2	0.00	0.00	
11,200.0	90.00	0.00	7,220.0	2,859.2	264.6	2,859.2	0.00	0.00	
11,300.0	90.00	0.00	7,220.0	2,959.2	264.6	2,959.2	0.00	0.00	
11,400.0	90.00	0.00	7,220.0	3,059.2	264.6	3,059.2	0.00	0.00	
11,500.0	90.00	0.00	7,220.0	3,159.2	264.6	3,159.2	0.00	0.00	
11,600.0	90.00	0.00	7,220.0	3,259.2	264.6	3,259.2	0.00	0.00	
11,700.0	90.00	0.00	7,220.0	3,359.2	264.6	3,359.2	0.00	0.00	
11,800.0	90.00	0.00	7,220.0	3,459.2	264.6	3,459.2	0.00	0.00	
11,900.0	90.00	0.00	7,220.0	3,559.2	264.6	3,559.2	0.00	0.00	
11,970.5	90.00	0.00	7,220.0	3,629.7	264.6	3,629.7	0.00	0.00	TD at 11970.5

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 4F-36H	0.00	0.00	7,220.0	3,629.7	264.6	1,280,527.92	3,218,600.48	40.100790	-104.718570
- plan hits target center									
- Point									

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-36H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
995.1	994.0	Fox Hills - BASE			
4,827.7	4,701.0	Sussex			
4,989.8	4,857.0	Sussex Marker			
5,382.4	5,235.0	Shannon			
6,704.8	6,548.0	Teepee Buttes (*if present)			
7,310.1	7,090.0	Sharon Springs			
7,382.0	7,132.0	Niobrara			
7,614.1	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'
1,600.0	1,591.2	-112.5	54.9	End of nudge @ 1600' MD
1,860.2	1,843.9	-171.5	73.1	EOB; Inc=15.68°
5,372.7	5,225.7	-1,105.1	245.3	Start Drop -2.00
6,156.8	6,000.0	-1,210.0	264.6	EOD; Inc=0°
6,803.8	6,647.0	-1,210.0	264.6	Start Build 10.00
7,703.8	7,220.0	-637.0	264.6	LP @ 7220' TVD; 90°
11,970.5	7,220.0	3,629.7	264.6	TD at 11970.5

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S36 T2N-R66W (Marcus State, Mumby State)

Mumby State 4F-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 4F-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 4F-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	11,970.5	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	11,448.9	7,225.0	276.1	205.3	3.901	CC, ES, SF
BADDING STATE 31-36 (EXISTING) - ENCANA WELL -						Out of range
BADDING STATE 42-36 (EXISTING) - ENCANA WELL -	10,236.7	7,226.4	219.5	175.2	4.959	CC, ES, SF
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	1,728.0	1,721.1	36.3	30.7	6.458	CC, ES, SF
MUMBY STATE 33-36 (EXISTING) - ENCANA WELL - G						Out of range
Mumby State 4A-36H - HZ - Plan #1	166.3	167.3	50.1	49.6	104.856	CC
Mumby State 4A-36H - HZ - Plan #1	200.0	201.0	50.1	49.5	84.150	ES
Mumby State 4A-36H - HZ - Plan #1	600.0	593.3	74.1	72.1	36.618	SF
Mumby State 4B-36H - HZ - Plan #1	233.6	233.6	40.0	39.3	56.291	CC, ES
Mumby State 4B-36H - HZ - Plan #1	600.0	595.2	57.0	55.0	28.213	SF
Mumby State 4C-36H - HZ - Plan #1	266.3	267.3	30.2	29.4	36.554	CC
Mumby State 4C-36H - HZ - Plan #1	300.0	301.0	30.2	29.3	32.003	ES
Mumby State 4C-36H - HZ - Plan #1	600.0	598.4	41.3	39.2	20.397	SF
Mumby State 4D-36H - HZ - Plan #1	400.0	400.0	20.1	18.9	15.597	CC, ES
Mumby State 4D-36H - HZ - Plan #1	600.0	599.4	24.2	22.2	12.055	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	11,971.5	12,203.0	429.9	318.4	3.857	SF
Mumby State 4G-36H - HZ - Plan #1	300.0	300.0	9.8	8.8	10.390	CC, ES
Mumby State 4G-36H - HZ - Plan #1	11,971.5	12,214.6	429.9	318.5	3.861	SF
Mumby State 4H-36H - HZ - Plan #1	200.0	200.0	19.9	19.3	33.481	CC, ES
Mumby State 4H-36H - HZ - Plan #1	4,500.0	4,451.8	496.9	462.4	14.425	SF

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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	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)							
11,100.0	7,220.0	7,225.0	7,225.0	52.5	12.6	-90.00	3,108.0	-11.5	444.9	380.0	64.88	6.858					
11,200.0	7,220.0	7,225.0	7,225.0	54.2	12.6	-90.00	3,108.0	-11.5	371.7	305.1	66.56	5.584					
11,300.0	7,220.0	7,225.0	7,225.0	55.9	12.6	-90.00	3,108.0	-11.5	313.7	245.4	68.26	4.596					
11,400.0	7,220.0	7,225.0	7,225.0	57.6	12.6	-90.00	3,108.0	-11.5	280.4	210.4	69.95	4.008					
11,448.9	7,220.0	7,225.0	7,225.0	58.4	12.6	-90.00	3,108.0	-11.5	276.1	205.3	70.78	3.901	CC, ES, SF				
11,500.0	7,220.0	7,225.0	7,225.0	59.2	12.6	-90.00	3,108.0	-11.5	280.8	209.1	71.65	3.919					
11,600.0	7,220.0	7,225.0	7,225.0	60.9	12.6	-90.00	3,108.0	-11.5	314.8	241.4	73.35	4.291					
11,700.0	7,220.0	7,225.0	7,225.0	62.6	12.6	-90.00	3,108.0	-11.5	373.2	298.2	75.06	4.973					
11,800.0	7,220.0	7,225.0	7,225.0	64.3	12.6	-90.00	3,108.0	-11.5	446.7	369.9	76.77	5.819					

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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 42-36 (EXISTING) - ENCANA WELL													Offset Site Error:	0.0 ft
Survey Program: 100-Gyro													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		
9,800.0	7,220.0	7,229.3	7,228.2	31.4	6.3	90.84	1,895.9	484.1	488.8	451.5	37.31	13.102		
9,900.0	7,220.0	7,228.6	7,227.6	32.9	6.3	90.68	1,895.9	484.1	402.0	363.1	38.87	10.341		
10,000.0	7,220.0	7,228.0	7,226.9	34.5	6.3	90.51	1,895.9	484.1	322.9	282.4	40.45	7.981		
10,100.0	7,220.0	7,227.3	7,226.3	36.1	6.3	90.33	1,895.9	484.1	258.6	216.6	42.05	6.150		
10,200.0	7,220.0	7,226.7	7,225.6	37.7	6.3	90.16	1,895.9	484.1	222.5	178.9	43.66	5.097		
10,236.7	7,220.0	7,226.4	7,225.4	38.2	6.3	90.10	1,895.9	484.1	219.5	175.2	44.26	4.959 CC, ES, SF		
10,300.0	7,220.0	7,226.0	7,225.0	39.3	6.3	89.99	1,895.9	484.1	228.4	183.1	45.29	5.043		
10,400.0	7,220.0	7,225.3	7,224.3	40.9	6.3	89.81	1,895.9	484.1	273.5	226.6	46.92	5.829		
10,500.0	7,220.0	7,224.6	7,223.6	42.5	6.3	89.63	1,895.9	484.1	342.7	294.2	48.57	7.057		
10,600.0	7,220.0	7,224.0	7,222.9	44.2	6.3	89.45	1,896.0	484.1	424.4	374.2	50.22	8.451		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty	Separation			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	Axis	Factor			
0.0	0.0	4.9	4.9	0.0	0.0	173.52	-145.4	16.5	146.3						
100.0	100.0	103.5	103.5	0.1	0.1	173.30	-145.9	17.1	146.9	146.7	0.20	727.357			
200.0	200.0	205.8	205.7	0.3	0.2	172.90	-145.9	18.2	147.0	146.6	0.47	315.698			
234.2	234.2	239.2	239.2	0.4	0.2	172.76	-145.8	18.5	147.0	146.4	0.56	264.768			
300.0	300.0	303.6	303.6	0.5	0.3	172.41	-146.0	19.5	147.3	146.5	0.73	202.599			
400.0	400.0	402.8	402.8	0.6	0.3	171.87	-147.0	21.0	148.5	147.5	0.99	150.104			
500.0	500.0	502.8	502.7	0.8	0.4	17.50	-148.3	22.4	149.2	147.9	1.25	119.267			
600.0	600.0	602.8	602.8	1.0	0.5	17.52	-149.7	23.4	148.2	146.7	1.51	97.962			
700.0	699.9	703.5	703.4	1.2	0.6	17.70	-150.8	24.4	145.3	143.5	1.78	81.773			
800.0	799.7	805.5	805.4	1.4	0.7	18.03	-150.8	25.6	139.6	137.6	2.04	68.374			
900.0	899.4	904.2	904.1	1.6	0.8	18.94	-150.6	25.9	132.1	129.8	2.31	57.272			
1,000.0	998.9	1,005.2	1,005.1	1.8	0.9	20.35	-150.2	26.1	122.6	120.0	2.58	47.596			
1,100.0	1,098.3	1,104.1	1,104.0	2.1	1.0	21.97	-149.2	26.9	111.2	108.3	2.85	39.012			
1,200.0	1,197.4	1,201.9	1,201.8	2.3	1.0	24.01	-149.2	28.2	99.1	96.0	3.13	31.656			
1,300.0	1,296.3	1,300.4	1,300.3	2.6	1.1	27.06	-150.0	29.7	86.6	83.2	3.43	25.262			
1,400.0	1,394.9	1,399.3	1,399.2	2.9	1.2	32.23	-151.2	30.6	73.3	69.5	3.77	19.464			
1,500.0	1,493.3	1,498.6	1,498.4	3.3	1.3	41.46	-151.6	31.0	58.9	54.7	4.19	14.059			
1,600.0	1,591.2	1,596.6	1,596.5	3.6	1.4	58.37	-151.1	31.0	45.3	40.5	4.79	9.460			
1,700.0	1,688.8	1,694.0	1,693.9	4.0	1.5	81.07	-150.2	30.7	36.8	31.3	5.49	6.712			
1,728.0	1,716.0	1,721.1	1,721.0	4.1	1.5	89.85	-149.8	30.6	36.3	30.7	5.62	6.458 CC, ES, SF			
1,800.0	1,785.8	1,790.9	1,790.7	4.5	1.6	112.50	-149.1	30.4	40.0	34.4	5.66	7.071			
1,900.0	1,882.3	1,887.9	1,887.8	4.9	1.6	136.36	-148.8	30.8	55.3	49.9	5.46	10.140			
2,000.0	1,978.5	1,984.0	1,983.8	5.4	1.7	150.16	-149.4	31.3	76.7	71.2	5.44	14.086			
2,100.0	2,074.8	2,079.5	2,079.4	5.8	1.8	157.29	-149.8	30.7	101.1	95.5	5.59	18.096			
2,200.0	2,171.1	2,174.9	2,174.7	6.3	1.9	161.76	-149.4	30.0	127.3	121.5	5.79	21.997			
2,300.0	2,267.4	2,271.5	2,271.3	6.8	2.0	164.76	-148.7	29.2	154.3	148.3	6.02	25.642			
2,400.0	2,363.6	2,367.9	2,367.7	7.3	2.1	166.77	-148.5	28.3	181.0	174.8	6.26	28.918			
2,500.0	2,459.9	2,463.4	2,463.2	7.8	2.1	168.30	-148.2	27.6	208.0	201.5	6.51	31.965			
2,600.0	2,556.2	2,561.1	2,560.9	8.3	2.2	169.64	-147.6	27.3	235.3	228.5	6.76	34.802			
2,700.0	2,652.5	2,658.1	2,657.9	8.8	2.3	170.57	-148.1	26.8	261.7	254.7	7.02	37.294			
2,800.0	2,748.8	2,752.7	2,752.5	9.2	2.4	171.30	-148.2	26.1	288.5	281.3	7.27	39.666			
2,900.0	2,845.0	2,847.6	2,847.4	9.7	2.5	172.03	-147.6	25.9	316.0	308.4	7.53	41.960			
3,000.0	2,941.3	2,943.2	2,943.0	10.2	2.6	172.57	-146.9	25.2	343.6	335.8	7.79	44.119			
3,100.0	3,037.6	3,039.4	3,039.2	10.7	2.6	173.06	-146.1	24.6	371.4	363.4	8.05	46.149			
3,200.0	3,133.9	3,135.8	3,135.6	11.2	2.7	173.42	-145.5	23.7	399.0	390.7	8.31	48.030			
3,300.0	3,230.1	3,232.2	3,232.0	11.7	2.8	173.74	-144.9	22.8	426.8	418.2	8.57	49.802			
3,400.0	3,326.4	3,329.2	3,328.9	12.2	2.9	174.03	-144.6	22.0	454.1	445.3	8.83	51.428			
3,500.0	3,422.7	3,422.9	3,422.6	12.7	3.0	174.29	-144.0	21.2	481.9	472.8	9.09	53.015			
7,800.0	7,220.0	7,232.2	7,231.5	17.0	6.3	-91.68	-138.2	43.8	459.2	436.6	22.62	20.302			
7,900.0	7,220.0	7,230.8	7,230.0	16.2	6.3	-91.30	-138.2	43.8	374.7	352.8	21.88	17.125			
8,000.0	7,220.0	7,229.3	7,228.5	15.7	6.3	-90.91	-138.2	43.8	299.7	278.4	21.30	14.070			
8,100.0	7,220.0	7,227.8	7,227.0	15.3	6.3	-90.53	-138.2	43.8	243.6	222.6	20.92	11.644			
8,200.0	7,220.0	7,226.3	7,225.5	15.2	6.3	-90.14	-138.2	43.8	220.9	200.1	20.73	10.652			
8,202.7	7,220.0	7,226.3	7,225.5	15.2	6.3	-90.13	-138.2	43.8	220.8	200.1	20.74	10.651			
8,300.0	7,220.0	7,224.8	7,224.0	15.2	6.3	-89.75	-138.1	43.8	241.3	220.6	20.76	11.623			
8,400.0	7,220.0	7,223.3	7,222.5	15.4	6.3	-89.36	-138.1	43.8	296.1	275.1	21.00	14.099			
8,500.0	7,220.0	7,221.8	7,221.0	15.8	6.3	-88.96	-138.1	43.7	370.3	348.9	21.44	17.270			
8,600.0	7,220.0	7,220.2	7,219.5	16.4	6.3	-88.56	-138.1	43.7	454.5	432.5	22.07	20.598			

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 4F-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 4F-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				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	1.0	1.0	0.0	0.0	-89.58	0.4	-50.1	50.1					
100.0	100.0	101.0	101.0	0.1	0.1	-89.58	0.4	-50.1	50.1	49.8	0.25	203.510		
166.3	166.3	167.3	167.3	0.2	0.2	-89.58	0.4	-50.1	50.1	49.6	0.48	104.856 CC		
200.0	200.0	201.0	201.0	0.3	0.3	-89.58	0.4	-50.1	50.1	49.5	0.60	84.150 ES		
300.0	300.0	300.0	300.0	0.5	0.5	-90.85	-0.8	-51.4	51.4	50.5	0.95	54.383		
400.0	400.0	398.0	397.9	0.6	0.7	-94.18	-4.0	-55.3	55.5	54.2	1.31	42.481		
500.0	500.0	496.0	495.5	0.8	0.9	107.95	-9.5	-61.8	63.0	61.3	1.66	38.037		
600.0	600.0	593.3	592.1	1.0	1.1	104.89	-17.0	-70.7	74.1	72.1	2.02	36.618 SF		
700.0	699.9	689.8	687.4	1.2	1.5	102.69	-26.5	-82.0	88.7	86.3	2.40	36.937		
800.0	799.7	785.2	781.2	1.4	1.8	101.19	-38.0	-95.6	106.7	103.9	2.79	38.183		
900.0	899.4	879.4	873.1	1.6	2.2	100.20	-51.3	-111.4	128.0	124.8	3.21	39.906		
1,000.0	998.9	972.2	962.9	1.8	2.6	99.55	-66.3	-129.2	152.5	148.9	3.64	41.844		
1,100.0	1,098.3	1,063.5	1,050.5	2.1	3.1	99.12	-82.8	-148.9	180.1	176.0	4.11	43.840		
1,200.0	1,197.4	1,153.1	1,135.7	2.3	3.7	98.83	-100.8	-170.2	210.7	206.1	4.60	45.806		
1,300.0	1,296.3	1,244.7	1,221.8	2.6	4.2	98.67	-120.7	-193.8	243.9	238.8	5.13	47.552		
1,400.0	1,394.9	1,338.8	1,310.3	2.9	4.8	98.81	-141.3	-218.3	277.6	271.9	5.70	48.694		
1,500.0	1,493.3	1,432.8	1,398.7	3.3	5.4	99.18	-161.9	-242.7	311.6	305.3	6.31	49.369		
1,600.0	1,591.2	1,526.6	1,486.9	3.6	6.0	99.70	-182.5	-267.1	345.9	339.0	6.96	49.687		
1,700.0	1,688.8	1,620.6	1,575.4	4.0	6.6	93.45	-203.0	-291.6	379.3	371.6	7.69	49.345		
1,800.0	1,785.8	1,715.2	1,664.3	4.5	7.2	88.72	-223.8	-316.2	410.6	402.2	8.48	48.421		
1,900.0	1,882.3	1,810.2	1,753.7	4.9	7.8	87.06	-244.6	-340.9	440.1	430.8	9.33	47.158		
2,000.0	1,978.5	1,905.3	1,843.1	5.4	8.4	88.36	-265.4	-365.6	469.4	459.2	10.21	45.992		
2,100.0	2,074.8	2,000.4	1,932.6	5.8	9.0	89.51	-286.2	-390.3	498.9	487.8	11.09	44.981		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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	-89.48	0.4	-40.0	40.0					
100.0	100.0	100.0	100.0	0.1	0.1	-89.48	0.4	-40.0	40.0	39.8	0.24	163.744		
200.0	200.0	200.0	200.0	0.3	0.3	-89.48	0.4	-40.0	40.0	39.4	0.59	67.424		
233.6	233.6	233.6	233.6	0.4	0.4	-89.48	0.4	-40.0	40.0	39.3	0.71	56.291	CC, ES	
300.0	300.0	299.5	299.5	0.5	0.5	-89.93	0.0	-40.3	40.3	39.4	0.94	42.785		
400.0	400.0	398.5	398.4	0.6	0.7	-93.34	-2.5	-42.6	42.7	41.4	1.30	32.929		
500.0	500.0	497.1	496.8	0.8	0.9	107.86	-7.5	-47.2	48.1	46.5	1.65	29.129		
600.0	600.0	595.2	594.4	1.0	1.1	103.70	-15.0	-54.0	57.0	55.0	2.02	28.213	SF	
700.0	699.9	692.6	690.9	1.2	1.4	100.53	-24.9	-62.9	69.3	66.9	2.40	28.846		
800.0	799.7	789.1	786.0	1.4	1.7	98.28	-37.1	-74.0	84.9	82.1	2.80	30.300		
900.0	899.4	884.6	879.4	1.6	2.1	96.71	-51.5	-87.0	103.6	100.4	3.22	32.169		
1,000.0	998.9	978.9	971.0	1.8	2.5	95.64	-68.0	-101.9	125.5	121.8	3.67	34.212		
1,100.0	1,098.3	1,071.8	1,060.6	2.1	2.9	94.89	-86.4	-118.6	150.3	146.1	4.14	36.283		
1,200.0	1,197.4	1,165.2	1,149.8	2.3	3.4	94.38	-106.9	-137.2	177.8	173.1	4.65	38.260		
1,300.0	1,296.3	1,261.2	1,241.3	2.6	4.0	94.35	-128.3	-156.6	205.9	200.7	5.20	39.633		
1,400.0	1,394.9	1,357.1	1,332.7	2.9	4.5	94.70	-149.7	-176.0	234.2	228.4	5.78	40.490		
1,500.0	1,493.3	1,452.9	1,424.1	3.3	5.0	95.30	-171.1	-195.4	262.6	256.2	6.41	40.947		
1,600.0	1,591.2	1,548.5	1,515.3	3.6	5.5	96.08	-192.5	-214.8	291.3	284.2	7.09	41.106		
1,700.0	1,688.8	1,644.4	1,606.7	4.0	6.1	90.16	-213.9	-234.2	319.0	311.2	7.84	40.710		
1,800.0	1,785.8	1,740.7	1,698.6	4.5	6.6	85.77	-235.4	-253.7	344.4	335.7	8.65	39.809		
1,900.0	1,882.3	1,837.4	1,790.8	4.9	7.1	84.41	-257.0	-273.2	367.9	358.3	9.52	38.627		
2,000.0	1,978.5	1,934.2	1,883.0	5.4	7.7	85.93	-278.6	-292.8	391.2	380.7	10.41	37.563		
2,100.0	2,074.8	2,030.9	1,975.3	5.8	8.2	87.28	-300.2	-312.4	414.7	403.4	11.31	36.652		
2,200.0	2,171.1	2,127.7	2,067.5	6.3	8.8	88.49	-321.8	-332.0	438.4	426.2	12.22	35.865		
2,300.0	2,267.4	2,224.4	2,159.7	6.8	9.3	89.58	-343.4	-351.6	462.3	449.2	13.14	35.184		
2,400.0	2,363.6	2,321.2	2,252.0	7.3	9.9	90.56	-365.0	-371.2	486.4	472.3	14.06	34.588		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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	-89.31	0.4	-30.2	30.2					
100.0	100.0	101.0	101.0	0.1	0.1	-89.31	0.4	-30.2	30.2	30.0	0.25	122.794		
200.0	200.0	201.0	201.0	0.3	0.3	-89.31	0.4	-30.2	30.2	29.6	0.60	50.774		
266.3	266.3	267.3	267.3	0.4	0.4	-89.31	0.4	-30.2	30.2	29.4	0.83	36.554 CC		
300.0	300.0	301.0	301.0	0.5	0.5	-89.31	0.4	-30.2	30.2	29.3	0.94	32.003 ES		
400.0	400.0	400.4	400.4	0.6	0.6	-92.07	-1.1	-31.2	31.2	29.9	1.30	24.072		
500.0	500.0	499.6	499.4	0.8	0.8	108.08	-5.5	-33.9	34.7	33.0	1.65	20.972		
600.0	600.0	598.4	597.9	1.0	1.1	102.27	-12.8	-38.5	41.3	39.2	2.02	20.397 SF		
700.0	699.9	696.7	695.4	1.2	1.3	97.51	-22.9	-44.8	51.0	48.6	2.41	21.195		
800.0	799.7	794.3	791.8	1.4	1.6	93.99	-35.7	-52.8	63.9	61.1	2.81	22.732		
900.0	899.4	891.0	886.8	1.6	2.0	91.50	-51.1	-62.5	79.8	76.5	3.24	24.642		
1,000.0	998.9	986.7	980.1	1.8	2.3	89.74	-69.0	-73.7	98.5	94.8	3.69	26.702		
1,100.0	1,098.3	1,081.3	1,071.6	2.1	2.8	88.48	-89.4	-86.4	120.1	115.9	4.17	28.800		
1,200.0	1,197.4	1,178.6	1,165.4	2.3	3.2	87.90	-111.5	-100.3	142.9	138.2	4.69	30.486		
1,300.0	1,296.3	1,276.0	1,259.2	2.6	3.7	88.03	-133.7	-114.2	165.7	160.5	5.25	31.584		
1,400.0	1,394.9	1,373.3	1,352.9	2.9	4.2	88.62	-155.9	-128.1	188.5	182.6	5.85	32.221		
1,500.0	1,493.3	1,470.6	1,446.6	3.3	4.7	89.51	-178.1	-142.0	211.3	204.8	6.50	32.510		
1,600.0	1,591.2	1,567.8	1,540.3	3.6	5.1	90.62	-200.2	-155.9	234.1	226.9	7.19	32.544		
1,700.0	1,688.8	1,665.2	1,634.1	4.0	5.6	85.11	-222.4	-169.8	255.8	247.8	7.96	32.120		
1,800.0	1,785.8	1,763.0	1,728.3	4.5	6.1	81.13	-244.7	-183.7	275.0	266.2	8.80	31.257		
1,900.0	1,882.3	1,861.1	1,822.7	4.9	6.6	80.16	-267.0	-197.7	292.1	282.4	9.69	30.150		
2,000.0	1,978.5	1,959.2	1,917.2	5.4	7.1	82.00	-289.4	-211.7	309.0	298.4	10.59	29.168		
2,100.0	2,074.8	2,057.3	2,011.7	5.8	7.6	83.65	-311.7	-225.7	326.3	314.7	11.51	28.338		
2,200.0	2,171.1	2,155.4	2,106.2	6.3	8.1	85.13	-334.1	-239.7	343.7	331.3	12.44	27.632		
2,300.0	2,267.4	2,253.4	2,200.6	6.8	8.6	86.47	-356.4	-253.7	361.4	348.0	13.37	27.026		
2,400.0	2,363.6	2,351.5	2,295.1	7.3	9.1	87.68	-378.8	-267.7	379.2	364.9	14.31	26.504		
2,500.0	2,459.9	2,449.6	2,389.6	7.8	9.6	88.79	-401.1	-281.7	397.2	382.0	15.25	26.050		
2,600.0	2,556.2	2,547.7	2,484.1	8.3	10.0	89.80	-423.5	-295.7	415.4	399.2	16.19	25.654		
2,700.0	2,652.5	2,645.8	2,578.6	8.8	10.5	90.72	-445.8	-309.7	433.6	416.5	17.13	25.306		
2,800.0	2,748.8	2,743.9	2,673.0	9.2	11.0	91.57	-468.2	-323.7	451.9	433.9	18.08	24.998		
2,900.0	2,845.0	2,842.0	2,767.5	9.7	11.5	92.36	-490.5	-337.7	470.4	451.4	19.02	24.724		
3,000.0	2,941.3	2,940.1	2,862.0	10.2	12.0	93.08	-512.9	-351.7	488.9	468.9	19.97	24.480		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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 4D-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	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	-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	499.7	499.7	0.8	0.8	113.65	-1.6	-20.7	21.1	19.5	1.64	12.851		
600.0	600.0	599.4	599.2	1.0	1.0	107.78	-6.6	-22.4	24.2	22.2	2.01	12.055 SF		
700.0	699.9	698.7	698.1	1.2	1.2	100.83	-14.7	-25.2	29.7	27.3	2.39	12.428		
800.0	799.7	797.6	796.3	1.4	1.5	94.61	-26.1	-29.1	37.8	35.0	2.79	13.542		
900.0	899.4	895.9	893.4	1.6	1.8	89.74	-40.5	-34.0	48.7	45.5	3.22	15.097		
1,000.0	998.9	993.6	989.3	1.8	2.1	86.11	-58.0	-40.0	62.2	58.5	3.68	16.881		
1,100.0	1,098.3	1,090.4	1,083.7	2.1	2.5	83.42	-78.3	-46.9	78.2	74.1	4.17	18.754		
1,200.0	1,197.4	1,187.6	1,177.9	2.3	2.9	81.54	-101.4	-54.8	96.4	91.7	4.69	20.569		
1,300.0	1,296.3	1,286.0	1,272.9	2.6	3.3	80.94	-125.1	-62.9	114.7	109.5	5.25	21.860		
1,400.0	1,394.9	1,384.3	1,368.1	2.9	3.8	81.21	-148.8	-71.0	132.7	126.9	5.86	22.672		
1,500.0	1,493.3	1,482.7	1,463.2	3.3	4.2	82.05	-172.5	-79.2	150.5	144.0	6.51	23.112		
1,600.0	1,591.2	1,581.0	1,558.3	3.6	4.7	83.27	-196.1	-87.3	168.2	160.9	7.23	23.275		
1,700.0	1,688.8	1,679.6	1,653.6	4.0	5.2	77.99	-219.9	-95.4	184.3	176.3	8.01	23.023		
1,800.0	1,785.8	1,778.5	1,749.2	4.5	5.6	74.31	-243.7	-103.5	197.7	188.9	8.85	22.340		
1,900.0	1,882.3	1,877.5	1,845.0	4.9	6.1	73.65	-267.6	-111.7	208.8	199.0	9.75	21.403		
2,000.0	1,978.5	1,976.6	1,940.9	5.4	6.6	75.76	-291.4	-119.9	219.6	208.9	10.68	20.562		
2,100.0	2,074.8	2,075.7	2,036.7	5.8	7.0	77.67	-315.3	-128.0	230.6	219.0	11.62	19.856		
2,200.0	2,171.1	2,174.9	2,132.6	6.3	7.5	79.40	-339.2	-136.2	241.9	229.4	12.56	19.258		
2,300.0	2,267.4	2,274.0	2,228.4	6.8	8.0	80.97	-363.0	-144.4	253.4	239.9	13.52	18.750		
2,400.0	2,363.6	2,373.1	2,324.2	7.3	8.4	82.41	-386.9	-152.5	265.1	250.6	14.48	18.315		
2,500.0	2,459.9	2,472.2	2,420.1	7.8	8.9	83.73	-410.8	-160.7	276.9	261.5	15.44	17.940		
2,600.0	2,556.2	2,571.3	2,515.9	8.3	9.4	84.94	-434.6	-168.9	288.9	272.5	16.40	17.614		
2,700.0	2,652.5	2,670.4	2,611.8	8.8	9.8	86.05	-458.5	-177.0	301.0	283.6	17.37	17.330		
2,800.0	2,748.8	2,769.5	2,707.6	9.2	10.3	87.08	-482.4	-185.2	313.2	294.8	18.33	17.081		
2,900.0	2,845.0	2,868.6	2,803.4	9.7	10.8	88.03	-506.2	-193.4	325.4	306.1	19.30	16.861		
3,000.0	2,941.3	2,967.7	2,899.3	10.2	11.3	88.91	-530.1	-201.5	337.8	317.5	20.27	16.667		
3,100.0	3,037.6	3,066.8	2,995.1	10.7	11.7	89.73	-554.0	-209.7	350.2	329.0	21.23	16.493		
3,200.0	3,133.9	3,165.9	3,091.0	11.2	12.2	90.49	-577.8	-217.9	362.7	340.5	22.20	16.338		
3,300.0	3,230.1	3,265.0	3,186.8	11.7	12.7	91.20	-601.7	-226.0	375.3	352.1	23.17	16.199		
3,400.0	3,326.4	3,364.1	3,282.6	12.2	13.1	91.87	-625.6	-234.2	387.9	363.7	24.13	16.074		
3,500.0	3,422.7	3,463.2	3,378.5	12.7	13.6	92.49	-649.4	-242.4	400.5	375.4	25.09	15.961		
3,600.0	3,519.0	3,562.3	3,474.3	13.2	14.1	93.08	-673.3	-250.5	413.2	387.2	26.06	15.858		
3,700.0	3,615.3	3,661.4	3,570.2	13.7	14.6	93.63	-697.2	-258.7	426.0	398.9	27.02	15.764		
3,800.0	3,711.5	3,760.5	3,666.0	14.2	15.0	94.15	-721.1	-266.9	438.7	410.8	27.98	15.679		
3,900.0	3,807.8	3,859.6	3,761.8	14.7	15.5	94.64	-744.9	-275.0	451.5	422.6	28.94	15.601		
4,000.0	3,904.1	3,958.7	3,857.7	15.2	16.0	95.10	-768.8	-283.2	464.4	434.5	29.91	15.529		
4,100.0	4,000.4	4,057.8	3,953.5	15.7	16.5	95.54	-792.7	-291.4	477.3	446.4	30.87	15.463		
4,200.0	4,096.6	4,156.9	4,049.4	16.2	16.9	95.95	-816.5	-299.5	490.2	458.3	31.82	15.402		

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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	120.29	0.0	-10.1	10.5	8.8	1.64	6.389		
600.0	600.0	600.0	600.0	1.0	1.0	122.77	-1.7	-10.3	11.9	9.9	1.99	5.981		
700.0	699.9	699.9	699.7	1.2	1.2	116.55	-6.9	-11.0	14.5	12.1	2.36	6.129		
800.0	799.7	799.6	799.1	1.4	1.4	106.69	-15.5	-12.3	18.6	15.9	2.76	6.738		
900.0	899.4	899.1	897.8	1.6	1.6	97.10	-27.5	-13.9	24.8	21.6	3.19	7.772		
1,000.0	998.9	998.1	995.6	1.8	1.9	89.39	-42.8	-16.1	33.4	29.7	3.66	9.126		
1,100.0	1,098.3	1,096.7	1,092.4	2.1	2.2	83.61	-61.3	-18.7	44.3	40.1	4.15	10.676		
1,200.0	1,197.4	1,195.3	1,188.6	2.3	2.6	79.65	-82.7	-21.7	57.1	52.5	4.66	12.265		
1,300.0	1,296.3	1,294.4	1,285.2	2.6	3.0	78.28	-104.5	-24.8	70.1	64.9	5.22	13.441		
1,400.0	1,394.9	1,393.6	1,382.0	2.9	3.4	78.49	-126.4	-27.8	82.7	76.9	5.82	14.204		
1,500.0	1,493.3	1,492.8	1,478.7	3.3	3.8	79.65	-148.2	-30.9	95.0	88.5	6.49	14.645		
1,600.0	1,591.2	1,592.1	1,575.4	3.6	4.2	81.45	-170.1	-34.0	107.0	99.8	7.21	14.851		
1,700.0	1,688.8	1,691.4	1,672.3	4.0	4.6	76.93	-192.0	-37.0	117.6	109.6	8.00	14.706		
1,800.0	1,785.8	1,790.9	1,769.3	4.5	5.0	74.18	-213.9	-40.1	125.4	116.6	8.85	14.170		
1,900.0	1,882.3	1,890.5	1,866.3	4.9	5.4	74.66	-235.8	-43.2	130.9	121.1	9.76	13.407		
2,000.0	1,978.5	1,990.0	1,963.4	5.4	5.8	77.88	-257.8	-46.3	136.3	125.6	10.70	12.743		
2,100.0	2,074.8	2,089.6	2,060.5	5.8	6.3	80.85	-279.7	-49.4	142.2	130.5	11.64	12.212		
2,200.0	2,171.1	2,189.2	2,157.6	6.3	6.7	83.58	-301.6	-52.5	148.3	135.7	12.58	11.787		
2,300.0	2,267.4	2,288.7	2,254.6	6.8	7.1	86.08	-323.6	-55.5	154.8	141.3	13.53	11.446		
2,400.0	2,363.6	2,388.3	2,351.7	7.3	7.5	88.38	-345.5	-58.6	161.6	147.1	14.46	11.171		
2,500.0	2,459.9	2,487.9	2,448.8	7.8	7.9	90.50	-367.5	-61.7	168.6	153.2	15.39	10.950		
2,600.0	2,556.2	2,587.4	2,545.9	8.3	8.3	92.44	-389.4	-64.8	175.8	159.4	16.32	10.772		
2,700.0	2,652.5	2,687.0	2,642.9	8.8	8.8	94.23	-411.3	-67.9	183.2	165.9	17.23	10.628		
2,800.0	2,748.8	2,786.6	2,740.0	9.2	9.2	95.88	-433.3	-70.9	190.7	172.6	18.14	10.513		
2,900.0	2,845.0	2,886.2	2,837.1	9.7	9.6	97.40	-455.2	-74.0	198.4	179.4	19.04	10.419		
3,000.0	2,941.3	2,985.7	2,934.2	10.2	10.0	98.81	-477.1	-77.1	206.2	186.3	19.94	10.345		
3,100.0	3,037.6	3,085.3	3,031.2	10.7	10.4	100.12	-499.1	-80.2	214.2	193.4	20.82	10.285		
3,200.0	3,133.9	3,184.9	3,128.3	11.2	10.9	101.33	-521.0	-83.3	222.2	200.5	21.71	10.239		
3,300.0	3,230.1	3,284.4	3,225.4	11.7	11.3	102.45	-542.9	-86.4	230.4	207.8	22.58	10.202		
3,400.0	3,326.4	3,384.0	3,322.5	12.2	11.7	103.50	-564.9	-89.4	238.6	215.1	23.45	10.174		
3,500.0	3,422.7	3,483.6	3,419.5	12.7	12.1	104.48	-586.8	-92.5	246.9	222.6	24.32	10.153		
3,600.0	3,519.0	3,583.1	3,516.6	13.2	12.6	105.40	-608.8	-95.6	255.2	230.1	25.18	10.139		
3,700.0	3,615.3	3,682.7	3,613.7	13.7	13.0	106.26	-630.7	-98.7	263.7	237.6	26.03	10.129		
3,800.0	3,711.5	3,782.3	3,710.7	14.2	13.4	107.06	-652.6	-101.8	272.2	245.3	26.88	10.123		
3,900.0	3,807.8	3,881.8	3,807.8	14.7	13.8	107.81	-674.6	-104.8	280.7	252.9	27.73	10.121		
4,000.0	3,904.1	3,981.4	3,904.9	15.2	14.2	108.53	-696.5	-107.9	289.3	260.7	28.58	10.121		
4,100.0	4,000.4	4,081.0	4,002.0	15.7	14.7	109.20	-718.4	-111.0	297.9	268.4	29.42	10.125		
4,200.0	4,096.6	4,180.6	4,099.0	16.2	15.1	109.83	-740.4	-114.1	306.5	276.3	30.26	10.130		
4,300.0	4,192.9	4,280.1	4,196.1	16.7	15.5	110.42	-762.3	-117.2	315.2	284.1	31.10	10.137		
4,400.0	4,289.2	4,379.7	4,293.2	17.2	15.9	110.99	-784.2	-120.3	323.9	292.0	31.93	10.145		
4,500.0	4,385.5	4,479.3	4,390.3	17.7	16.4	111.53	-806.2	-123.3	332.7	299.9	32.76	10.154		
4,600.0	4,481.8	4,578.8	4,487.3	18.2	16.8	112.03	-828.1	-126.4	341.5	307.9	33.59	10.165		
4,700.0	4,578.0	4,678.4	4,584.4	18.7	17.2	112.52	-850.1	-129.5	350.3	315.8	34.42	10.176		
4,800.0	4,674.3	4,778.0	4,681.5	19.2	17.6	112.98	-872.0	-132.6	359.1	323.8	35.25	10.188		
4,900.0	4,770.6	4,877.5	4,778.6	19.7	18.1	113.41	-893.9	-135.7	367.9	331.9	36.07	10.200		
5,000.0	4,866.9	4,977.1	4,875.6	20.2	18.5	113.83	-915.9	-138.7	376.8	339.9	36.90	10.213		
5,100.0	4,963.1	5,076.7	4,972.7	20.7	18.9	114.23	-937.8	-141.8	385.7	348.0	37.72	10.226		

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 4F-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 4F-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	5,059.4	5,176.3	5,069.8	21.2	19.3	114.61	-959.7	-144.9	394.6	356.1	38.54	10.239		
5,300.0	5,155.7	5,275.8	5,166.9	21.7	19.7	114.97	-981.7	-148.0	403.5	364.2	39.36	10.253		
5,400.0	5,252.0	5,375.4	5,263.9	22.2	20.2	115.34	-1,003.6	-151.1	412.4	372.2	40.17	10.266		
5,500.0	5,349.0	5,475.1	5,361.1	22.6	20.6	115.48	-1,025.6	-154.2	420.2	379.2	40.99	10.252		
5,600.0	5,446.7	5,574.8	5,458.4	23.0	21.0	115.17	-1,047.5	-157.2	426.5	384.7	41.83	10.196		
5,700.0	5,545.2	5,674.5	5,555.6	23.4	21.4	114.43	-1,069.5	-160.3	431.4	388.7	42.70	10.102		
5,800.0	5,644.2	5,774.0	5,652.6	23.6	21.9	113.27	-1,091.4	-163.4	435.0	391.4	43.59	9.979		
5,900.0	5,743.6	5,873.2	5,749.3	23.8	22.3	111.69	-1,113.3	-166.5	437.5	393.0	44.47	9.836		
6,000.0	5,843.3	5,972.0	5,845.5	24.0	22.7	109.71	-1,135.0	-169.5	439.1	393.8	45.34	9.686		
6,100.0	5,943.2	6,070.4	5,941.8	24.1	23.1	107.46	-1,155.6	-172.4	440.2	394.1	46.09	9.552		
6,200.0	6,043.2	6,169.5	6,039.2	24.2	23.4	-85.20	-1,173.1	-174.9	441.1	394.3	46.70	9.444		
6,300.0	6,143.2	6,269.5	6,138.3	24.3	23.7	-87.06	-1,187.3	-176.9	442.1	394.9	47.19	9.369		
6,400.0	6,243.2	6,370.5	6,238.7	24.3	23.9	-88.47	-1,198.2	-178.4	443.2	395.6	47.57	9.317		
6,500.0	6,343.2	6,472.2	6,340.0	24.4	24.1	-89.43	-1,205.6	-179.5	444.1	396.2	47.86	9.280		
6,600.0	6,443.2	6,574.2	6,442.0	24.5	24.2	-89.93	-1,209.4	-180.0	444.6	396.5	48.07	9.249		
6,700.0	6,543.2	6,675.5	6,543.2	24.6	24.3	-90.00	-1,210.0	-180.1	444.7	396.4	48.24	9.217		
6,800.0	6,643.2	6,775.5	6,643.2	24.7	24.4	-90.00	-1,210.0	-180.1	444.7	396.3	48.41	9.185		
6,830.1	6,673.3	6,805.5	6,673.3	24.6	24.4	-90.10	-1,210.0	-180.1	444.7	396.3	48.41	9.185		
6,900.0	6,742.8	6,875.0	6,742.8	24.6	24.5	-91.02	-1,210.0	-180.1	444.7	396.3	48.42	9.185		
7,000.0	6,839.4	6,971.7	6,839.4	24.2	24.5	-94.03	-1,210.0	-180.1	445.9	397.8	48.13	9.264		
7,100.0	6,930.2	7,067.4	6,935.1	23.6	24.6	-98.49	-1,208.7	-180.1	450.8	403.4	47.35	9.520		
7,200.0	7,012.4	7,175.8	7,041.9	22.9	24.3	-103.39	-1,191.4	-180.1	459.8	414.0	45.78	10.043		
7,300.0	7,083.5	7,296.0	7,154.2	22.0	23.8	-108.07	-1,149.0	-180.1	471.8	428.3	43.47	10.854		
7,400.0	7,141.3	7,430.6	7,266.3	20.9	22.8	-112.35	-1,075.1	-180.1	485.1	444.6	40.53	11.969		
7,500.0	7,184.1	7,581.3	7,367.5	19.9	21.3	-115.94	-964.0	-180.1	497.6	460.4	37.26	13.356		
11,500.0	7,220.0	11,790.7	7,470.0	59.2	60.3	-120.93	3,223.0	-152.7	490.6	386.6	104.00	4.718		
11,600.0	7,220.0	11,895.1	7,470.0	60.9	62.1	-121.98	3,326.0	-135.7	476.7	370.8	105.90	4.501		
11,700.0	7,220.0	11,993.7	7,470.0	62.6	63.7	-123.06	3,423.3	-119.5	462.8	355.2	107.61	4.301		
11,800.0	7,220.0	12,092.3	7,470.0	64.3	65.4	-124.20	3,520.6	-103.3	449.0	339.9	109.14	4.114		
11,900.0	7,220.0	12,191.0	7,470.0	66.1	67.0	-125.41	3,617.8	-87.0	435.4	324.9	110.48	3.941		
11,970.5	7,220.0	12,203.0	7,470.0	67.3	67.2	-125.56	3,629.7	-85.0	429.9	318.4	111.44	3.857		
11,971.5	7,220.0	12,203.0	7,470.0	67.3	67.2	-125.56	3,629.7	-85.0	429.9	318.4	111.46	3.857 SF		

Cathedral Energy Services

Anticollision Report

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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 4F-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: O-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		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	9.8	9.8						
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	9.8	9.8	9.5	0.24	40.076			
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	9.8	9.8	9.2	0.59	16.502			
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	9.8	9.8	8.8	0.94	10.390 CC, ES			
400.0	400.0	399.8	399.8	0.6	0.6	98.36	-1.6	10.6	10.7	9.4	1.29	8.273			
500.0	500.0	499.4	499.3	0.8	0.8	-40.57	-6.2	12.9	13.7	12.0	1.65	8.289			
600.0	600.0	598.8	598.2	1.0	1.1	-28.66	-13.9	16.8	18.7	16.7	2.00	9.358			
700.0	699.9	697.8	696.5	1.2	1.3	-20.65	-24.6	22.2	25.9	23.5	2.35	10.999			
800.0	799.7	796.3	793.8	1.4	1.6	-15.45	-38.3	29.0	35.0	32.3	2.70	12.940			
900.0	899.4	894.4	890.1	1.6	2.0	-12.01	-54.9	37.3	45.9	42.8	3.05	15.043			
1,000.0	998.9	991.9	985.2	1.8	2.4	-9.64	-74.3	47.1	58.5	55.1	3.39	17.239			
1,100.0	1,098.3	1,091.1	1,081.5	2.1	2.8	-8.13	-95.4	57.6	71.0	67.3	3.74	18.980			
1,200.0	1,197.4	1,190.5	1,178.1	2.3	3.2	-7.22	-116.5	68.2	81.8	77.7	4.09	20.009			
1,300.0	1,296.3	1,290.1	1,274.8	2.6	3.6	-6.65	-137.7	78.8	91.0	86.5	4.44	20.488			
1,400.0	1,394.9	1,389.8	1,371.7	2.9	4.1	-6.29	-158.9	89.4	98.3	93.6	4.79	20.534			
1,500.0	1,493.3	1,489.6	1,468.6	3.3	4.5	-6.09	-180.1	100.1	104.0	98.9	5.14	20.234			
1,600.0	1,591.2	1,589.5	1,565.7	3.6	5.0	-6.00	-201.3	110.7	107.9	102.4	5.49	19.654			
1,700.0	1,688.8	1,689.5	1,662.8	4.0	5.4	-13.51	-222.5	121.4	110.1	104.2	5.86	18.782			
1,800.0	1,785.8	1,789.4	1,759.8	4.5	5.9	-21.30	-243.8	132.0	110.6	104.3	6.30	17.569			
1,900.0	1,882.3	1,889.1	1,866.7	4.9	6.3	-27.88	-264.9	142.6	109.9	103.1	6.86	16.024			
2,000.0	1,978.5	1,988.8	1,953.5	5.4	6.7	-31.98	-286.1	153.3	109.5	102.0	7.56	14.488			
2,021.6	1,999.3	2,010.3	1,974.4	5.5	6.8	-32.86	-290.7	155.6	109.5	101.8	7.73	14.172			
2,100.0	2,074.8	2,088.5	2,050.4	5.8	7.2	-36.09	-307.3	163.9	109.7	101.3	8.38	13.085			
2,200.0	2,171.1	2,188.2	2,147.2	6.3	7.6	-40.16	-328.5	174.5	110.4	101.1	9.32	11.845			
2,300.0	2,267.4	2,287.9	2,244.0	6.8	8.1	-44.17	-349.7	185.1	111.7	101.3	10.36	10.781			
2,400.0	2,363.6	2,387.6	2,340.9	7.3	8.5	-48.06	-370.8	195.7	113.5	102.0	11.48	9.888			
2,500.0	2,459.9	2,487.3	2,437.7	7.8	9.0	-51.82	-392.0	206.4	115.8	103.2	12.66	9.151			
2,600.0	2,556.2	2,586.9	2,534.5	8.3	9.4	-55.41	-413.2	217.0	118.6	104.8	13.88	8.549			
2,700.0	2,652.5	2,686.6	2,631.4	8.8	9.9	-58.83	-434.4	227.6	121.9	106.8	15.12	8.062			
2,800.0	2,748.8	2,786.3	2,728.2	9.2	10.3	-62.06	-455.6	238.2	125.6	109.2	16.37	7.669			
2,900.0	2,845.0	2,886.0	2,825.0	9.7	10.8	-65.10	-476.7	248.8	129.6	112.0	17.62	7.355			
3,000.0	2,941.3	2,985.7	2,921.9	10.2	11.2	-67.94	-497.9	259.5	134.0	115.1	18.86	7.103			
3,100.0	3,037.6	3,085.4	3,018.7	10.7	11.7	-70.61	-519.1	270.1	138.7	118.6	20.09	6.903			
3,200.0	3,133.9	3,185.1	3,115.5	11.2	12.1	-73.09	-540.3	280.7	143.6	122.3	21.29	6.745			
3,300.0	3,230.1	3,284.8	3,212.4	11.7	12.6	-75.40	-561.5	291.3	148.9	126.4	22.48	6.622			
3,400.0	3,326.4	3,384.5	3,309.2	12.2	13.0	-77.56	-582.6	301.9	154.3	130.7	23.65	6.525			
3,500.0	3,422.7	3,484.1	3,406.0	12.7	13.5	-79.56	-603.8	312.6	160.0	135.2	24.79	6.452			
3,600.0	3,519.0	3,583.8	3,502.9	13.2	13.9	-81.43	-625.0	323.2	165.8	139.9	25.92	6.397			
3,700.0	3,615.3	3,683.5	3,599.7	13.7	14.4	-83.17	-646.2	333.8	171.8	144.8	27.03	6.357			
3,800.0	3,711.5	3,783.2	3,696.5	14.2	14.8	-84.79	-667.4	344.4	178.0	149.8	28.11	6.330			
3,900.0	3,807.8	3,882.9	3,793.4	14.7	15.3	-86.30	-688.5	355.0	184.2	155.0	29.18	6.313			
4,000.0	3,904.1	3,982.6	3,890.2	15.2	15.7	-87.71	-709.7	365.7	190.6	160.4	30.24	6.304			
4,100.0	4,000.4	4,082.3	3,987.0	15.7	16.2	-89.03	-730.9	376.3	197.1	165.9	31.28	6.303			
4,200.0	4,096.6	4,182.0	4,083.9	16.2	16.6	-90.26	-752.1	386.9	203.7	171.4	32.30	6.307			
4,300.0	4,192.9	4,281.7	4,180.7	16.7	17.1	-91.42	-773.3	397.5	210.4	177.1	33.32	6.316			
4,400.0	4,289.2	4,381.3	4,277.5	17.2	17.5	-92.50	-794.4	408.1	217.2	182.9	34.32	6.329			
4,500.0	4,385.5	4,481.0	4,374.3	17.7	18.0	-93.52	-815.6	418.7	224.1	188.7	35.32	6.344			
4,600.0	4,481.8	4,580.7	4,471.2	18.2	18.4	-94.48	-836.8	429.4	231.0	194.7	36.30	6.363			
4,700.0	4,578.0	4,680.4	4,568.0	18.7	18.9	-95.38	-858.0	440.0	237.9	200.7	37.27	6.383			
4,800.0	4,674.3	4,780.1	4,664.8	19.2	19.3	-96.23	-879.2	450.6	245.0	206.7	38.24	6.406			
4,900.0	4,770.6	4,879.8	4,761.7	19.7	19.8	-97.04	-900.3	461.2	252.0	212.8	39.20	6.429			
5,000.0	4,866.9	4,979.5	4,858.5	20.2	20.2	-97.80	-921.5	471.8	259.2	219.0	40.16	6.454			

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 4F-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 4F-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		
5,100.0	4,963.1	5,079.2	4,955.3	20.7	20.7	-98.51	-942.7	482.5	266.3	225.2	41.10	6.480		
5,200.0	5,059.4	5,178.8	5,052.2	21.2	21.1	-99.20	-963.9	493.1	273.5	231.5	42.05	6.506		
5,300.0	5,155.7	5,278.5	5,149.0	21.7	21.6	-99.84	-985.0	503.7	280.8	237.8	42.98	6.532		
5,400.0	5,252.0	5,378.2	5,245.8	22.2	22.0	-100.47	-1,006.2	514.3	288.0	244.1	43.92	6.559		
5,500.0	5,349.0	5,478.0	5,342.7	22.6	22.5	-100.67	-1,027.4	525.0	294.8	250.1	44.80	6.582		
5,600.0	5,446.7	5,577.8	5,439.6	23.0	22.9	-100.20	-1,048.6	535.6	301.0	255.4	45.64	6.596		
5,700.0	5,545.2	5,677.4	5,536.4	23.4	23.4	-99.11	-1,069.8	546.2	306.7	260.2	46.42	6.606		
5,800.0	5,644.2	5,776.8	5,633.0	23.6	23.8	-97.42	-1,090.9	556.8	312.0	264.8	47.13	6.620		
5,900.0	5,743.6	5,875.8	5,729.1	23.8	24.3	-95.19	-1,111.9	567.3	317.2	269.5	47.71	6.649		
6,000.0	5,843.3	5,974.5	5,825.0	24.0	24.7	-92.44	-1,132.9	577.8	322.9	274.7	48.14	6.708		
6,100.0	5,943.2	6,075.8	5,923.9	24.1	25.1	-89.45	-1,152.7	587.8	328.8	280.4	48.33	6.802		
6,200.0	6,043.2	6,178.0	6,024.3	24.2	25.5	83.03	-1,169.5	596.2	334.6	286.2	48.35	6.920		
6,300.0	6,143.2	6,281.3	6,126.4	24.3	25.8	85.46	-1,183.1	603.0	339.9	291.6	48.29	7.038		
6,400.0	6,243.2	6,385.5	6,230.0	24.3	26.0	87.27	-1,193.6	608.3	344.3	296.1	48.25	7.137		
6,500.0	6,343.2	6,490.5	6,334.7	24.4	26.2	88.47	-1,200.7	611.9	347.5	299.2	48.25	7.202		
6,600.0	6,443.2	6,595.9	6,440.1	24.5	26.3	89.09	-1,204.4	613.7	349.2	300.9	48.31	7.227		
6,700.0	6,543.2	6,699.1	6,543.2	24.6	26.4	89.18	-1,205.0	614.0	349.4	301.0	48.46	7.210		
6,800.0	6,643.2	6,799.1	6,643.2	24.7	26.4	89.18	-1,205.0	614.0	349.4	300.8	48.63	7.185		
6,877.2	6,720.2	6,876.1	6,720.2	24.6	26.5	90.00	-1,205.0	614.0	349.4	301.0	48.43	7.214		
6,900.0	6,742.8	6,898.7	6,742.8	24.6	26.5	90.49	-1,205.0	614.0	349.4	301.1	48.31	7.232		
7,000.0	6,839.4	6,995.3	6,839.4	24.2	26.6	94.36	-1,205.0	614.0	350.5	303.4	47.09	7.443		
7,100.0	6,930.2	7,090.7	6,934.7	23.6	26.6	100.05	-1,203.8	614.0	356.1	311.1	45.01	7.912		
7,200.0	7,012.4	7,197.8	7,040.4	22.9	26.4	106.18	-1,186.8	614.0	366.9	324.6	42.27	8.679		
7,300.0	7,083.5	7,316.6	7,151.5	22.0	25.9	111.93	-1,145.4	614.0	381.5	342.2	39.24	9.722		
7,400.0	7,141.3	7,449.4	7,262.6	20.9	25.0	117.09	-1,073.2	614.0	397.8	361.6	36.16	10.999		
7,500.0	7,184.1	7,598.2	7,363.7	19.9	23.7	121.35	-964.5	614.0	413.1	379.8	33.33	12.394		
7,600.0	7,210.6	7,762.5	7,438.6	18.8	22.2	124.31	-819.0	614.0	424.6	393.5	31.08	13.660		
7,700.0	7,220.0	7,937.3	7,469.8	17.8	20.6	125.56	-647.7	614.0	429.6	399.9	29.67	14.478		
7,800.0	7,220.0	8,044.1	7,470.0	17.0	19.8	125.58	-540.9	614.0	429.7	401.2	28.43	15.115		
7,900.0	7,220.0	8,144.1	7,470.0	16.2	19.2	125.58	-440.9	614.0	429.7	402.2	27.43	15.665		
8,000.0	7,220.0	8,244.1	7,470.0	15.7	18.7	125.58	-340.9	614.0	429.7	403.0	26.70	16.092		
8,100.0	7,220.0	8,344.1	7,470.0	15.3	18.4	125.58	-240.9	614.1	429.7	403.4	26.27	16.359		
8,200.0	7,220.0	8,444.1	7,470.0	15.2	18.3	125.58	-140.9	614.1	429.7	403.5	26.14	16.438		
8,300.0	7,220.0	8,544.1	7,470.0	15.2	18.3	125.58	-40.9	614.1	429.7	403.4	26.32	16.323		
8,400.0	7,220.0	8,644.1	7,470.0	15.4	18.5	125.58	59.1	614.1	429.7	402.9	26.81	16.025		
8,500.0	7,220.0	8,744.1	7,470.0	15.8	18.8	125.58	159.1	614.1	429.7	402.1	27.59	15.572		
8,600.0	7,220.0	8,844.1	7,470.0	16.4	19.3	125.58	259.1	614.1	429.7	401.1	28.64	15.003		
8,700.0	7,220.0	8,944.1	7,470.0	17.2	20.0	125.58	359.1	614.1	429.7	399.8	29.92	14.360		
8,800.0	7,220.0	9,044.1	7,470.0	18.1	20.8	125.58	459.1	614.1	429.7	398.3	31.42	13.678		
8,900.0	7,220.0	9,144.1	7,470.0	19.1	21.7	125.58	559.1	614.1	429.7	396.6	33.09	12.986		
9,000.0	7,220.0	9,244.1	7,470.0	20.2	22.7	125.58	659.1	614.1	429.7	394.8	34.92	12.306		
9,100.0	7,220.0	9,344.1	7,470.0	21.4	23.8	125.58	759.1	614.1	429.7	392.8	36.88	11.652		
9,200.0	7,220.0	9,444.1	7,470.0	22.7	24.9	125.58	859.1	614.1	429.7	390.8	38.95	11.032		
9,300.0	7,220.0	9,544.1	7,470.0	24.1	26.2	125.57	959.1	614.1	429.7	388.6	41.12	10.451		
9,400.0	7,220.0	9,644.1	7,470.0	25.4	27.4	125.57	1,059.1	614.1	429.7	386.4	43.37	9.909		
9,500.0	7,220.0	9,744.1	7,470.0	26.9	28.8	125.57	1,159.1	614.1	429.7	384.1	45.68	9.407		
9,600.0	7,220.0	9,844.1	7,470.0	28.3	30.2	125.57	1,259.1	614.2	429.7	381.7	48.06	8.942		
9,700.0	7,220.0	9,944.1	7,470.0	29.8	31.6	125.57	1,359.1	614.2	429.7	379.3	50.49	8.512		
9,800.0	7,220.0	10,044.1	7,470.0	31.4	33.0	125.57	1,459.1	614.2	429.7	376.8	52.96	8.115		
9,900.0	7,220.0	10,144.1	7,470.0	32.9	34.5	125.57	1,559.1	614.2	429.8	374.3	55.46	7.748		
10,000.0	7,220.0	10,244.1	7,470.0	34.5	36.0	125.57	1,659.1	614.2	429.8	371.8	58.00	7.409		
10,100.0	7,220.0	10,344.1	7,470.0	36.1	37.5	125.57	1,759.1	614.2	429.8	369.2	60.57	7.095		

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 4F-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 4F-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							
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	10,444.1	7,470.0	37.7	39.1	125.57	1,859.1	614.2	429.8	366.6	63.17	6.803	
10,300.0	7,220.0	10,544.1	7,470.0	39.3	40.6	125.57	1,959.1	614.2	429.8	364.0	65.79	6.533	
10,400.0	7,220.0	10,644.1	7,470.0	40.9	42.2	125.57	2,059.1	614.2	429.8	361.4	68.42	6.281	
10,500.0	7,220.0	10,744.1	7,470.0	42.5	43.8	125.57	2,159.1	614.2	429.8	358.7	71.08	6.047	
10,600.0	7,220.0	10,844.1	7,470.0	44.2	45.4	125.57	2,259.1	614.2	429.8	356.0	73.75	5.828	
10,700.0	7,220.0	10,944.1	7,470.0	45.8	47.0	125.57	2,359.1	614.2	429.8	353.4	76.43	5.623	
10,800.0	7,220.0	11,044.1	7,470.0	47.5	48.6	125.57	2,459.1	614.2	429.8	350.7	79.13	5.432	
10,900.0	7,220.0	11,144.1	7,470.0	49.1	50.2	125.57	2,559.1	614.2	429.8	348.0	81.84	5.252	
11,000.0	7,220.0	11,244.1	7,470.0	50.8	51.9	125.57	2,659.1	614.2	429.8	345.3	84.55	5.083	
11,100.0	7,220.0	11,344.1	7,470.0	52.5	53.5	125.57	2,759.1	614.3	429.8	342.5	87.28	4.924	
11,200.0	7,220.0	11,444.1	7,470.0	54.2	55.2	125.57	2,859.1	614.3	429.8	339.8	90.02	4.775	
11,300.0	7,220.0	11,544.1	7,470.0	55.9	56.8	125.57	2,959.1	614.3	429.8	337.1	92.76	4.634	
11,400.0	7,220.0	11,644.1	7,470.0	57.6	58.5	125.57	3,059.1	614.3	429.8	334.3	95.51	4.500	
11,500.0	7,220.0	11,744.1	7,470.0	59.2	60.2	125.56	3,159.1	614.3	429.8	331.6	98.27	4.374	
11,600.0	7,220.0	11,844.1	7,470.0	60.9	61.8	125.56	3,259.1	614.3	429.8	328.8	101.03	4.254	
11,700.0	7,220.0	11,944.1	7,470.0	62.6	63.5	125.56	3,359.1	614.3	429.8	326.0	103.80	4.141	
11,800.0	7,220.0	12,044.1	7,470.0	64.3	65.2	125.56	3,459.1	614.3	429.8	323.3	106.57	4.033	
11,900.0	7,220.0	12,144.1	7,470.0	66.1	66.9	125.56	3,559.1	614.3	429.8	320.5	109.35	3.931	
11,941.0	7,220.0	12,185.1	7,470.0	66.8	67.6	125.56	3,600.1	614.3	429.9	319.4	110.49	3.890	
11,971.5	7,220.0	12,214.6	7,470.0	67.3	68.1	125.56	3,629.7	614.3	429.9	318.5	111.33	3.861 SF	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-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 4F-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						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	91.05	-0.4	19.9	19.9				
100.0	100.0	100.0	100.0	0.1	0.1	91.05	-0.4	19.9	19.9	19.6	0.24	81.310	CC, ES
200.0	200.0	200.0	200.0	0.3	0.3	91.05	-0.4	19.9	19.9	19.3	0.59	33.481	
300.0	300.0	299.5	299.5	0.5	0.5	94.71	-1.7	20.9	21.0	20.1	0.94	22.296	
400.0	400.0	398.8	398.6	0.6	0.7	103.51	-5.8	24.1	24.8	23.5	1.29	19.243	
500.0	500.0	497.7	497.2	0.8	0.9	-41.89	-12.5	29.4	31.4	29.8	1.66	18.968	
600.0	600.0	596.1	594.9	1.0	1.2	-35.79	-21.9	36.7	40.2	38.2	2.01	19.960	
700.0	699.9	694.1	691.6	1.2	1.5	-31.63	-33.8	46.1	51.0	48.6	2.37	21.506	
800.0	799.7	791.4	787.2	1.4	1.8	-28.78	-48.3	57.3	63.7	61.0	2.73	23.333	
900.0	899.4	888.0	881.4	1.6	2.2	-26.81	-65.1	70.5	78.2	75.1	3.09	25.304	
1,000.0	998.9	983.8	974.1	1.8	2.7	-25.41	-84.3	85.5	94.4	91.0	3.45	27.344	
1,100.0	1,098.3	1,081.0	1,067.3	2.1	3.2	-24.46	-105.8	102.3	111.8	108.0	3.82	29.256	
1,200.0	1,197.4	1,179.6	1,161.9	2.3	3.7	-24.02	-127.8	119.6	127.9	123.7	4.20	30.445	
1,300.0	1,296.3	1,278.6	1,256.8	2.6	4.2	-23.97	-150.0	136.9	142.4	137.8	4.59	31.017	
1,400.0	1,394.9	1,377.7	1,351.9	2.9	4.7	-24.18	-172.1	154.2	155.4	150.4	5.00	31.092	
1,500.0	1,493.3	1,477.1	1,447.1	3.3	5.2	-24.61	-194.3	171.6	166.8	161.3	5.42	30.761	
1,600.0	1,591.2	1,576.6	1,542.5	3.6	5.8	-25.22	-216.6	189.0	176.6	170.7	5.87	30.096	
1,700.0	1,688.8	1,676.1	1,638.0	4.0	6.3	-33.08	-238.8	206.4	185.3	178.9	6.38	29.059	
1,800.0	1,785.8	1,775.5	1,733.3	4.5	6.8	-40.57	-261.0	223.8	193.6	186.6	7.01	27.628	
1,900.0	1,882.3	1,874.7	1,828.4	4.9	7.3	-46.14	-283.2	241.1	201.7	194.0	7.78	25.929	
2,000.0	1,978.5	1,973.8	1,923.5	5.4	7.9	-48.94	-305.3	258.4	210.3	201.7	8.64	24.346	
2,100.0	2,074.8	2,072.9	2,018.5	5.8	8.4	-51.52	-327.5	275.8	219.4	209.8	9.55	22.972	
2,200.0	2,171.1	2,172.0	2,113.5	6.3	8.9	-53.89	-349.6	293.1	228.8	218.3	10.50	21.793	
2,300.0	2,267.4	2,271.2	2,208.6	6.8	9.4	-56.08	-371.8	310.4	238.7	227.2	11.48	20.786	
2,400.0	2,363.6	2,370.3	2,303.6	7.3	10.0	-58.08	-393.9	327.8	248.8	236.3	12.49	19.927	
2,500.0	2,459.9	2,469.4	2,398.7	7.8	10.5	-59.93	-416.1	345.1	259.2	245.7	13.51	19.193	
2,600.0	2,556.2	2,568.5	2,493.7	8.3	11.0	-61.64	-438.2	362.4	269.9	255.4	14.54	18.564	
2,700.0	2,652.5	2,667.6	2,588.8	8.8	11.5	-63.22	-460.4	379.8	280.8	265.2	15.58	18.022	
2,800.0	2,748.8	2,766.7	2,683.8	9.2	12.1	-64.67	-482.6	397.1	291.9	275.3	16.63	17.554	
2,900.0	2,845.0	2,865.9	2,778.8	9.7	12.6	-66.03	-504.7	414.4	303.2	285.5	17.68	17.148	
3,000.0	2,941.3	2,965.0	2,873.9	10.2	13.1	-67.28	-526.9	431.8	314.6	295.8	18.73	16.793	
3,100.0	3,037.6	3,064.1	2,968.9	10.7	13.6	-68.44	-549.0	449.1	326.1	306.3	19.79	16.482	
3,200.0	3,133.9	3,163.2	3,064.0	11.2	14.2	-69.53	-571.2	466.4	337.8	317.0	20.84	16.208	
3,300.0	3,230.1	3,262.3	3,159.0	11.7	14.7	-70.54	-593.3	483.7	349.6	327.7	21.90	15.966	
3,400.0	3,326.4	3,361.5	3,254.1	12.2	15.2	-71.49	-615.5	501.1	361.5	338.5	22.95	15.751	
3,500.0	3,422.7	3,460.6	3,349.1	12.7	15.7	-72.38	-637.6	518.4	373.5	349.5	24.00	15.560	
3,600.0	3,519.0	3,559.7	3,444.1	13.2	16.3	-73.21	-659.8	535.7	385.6	360.5	25.05	15.389	
3,700.0	3,615.3	3,658.8	3,539.2	13.7	16.8	-73.99	-681.9	553.1	397.7	371.6	26.10	15.235	
3,800.0	3,711.5	3,757.9	3,634.2	14.2	17.3	-74.73	-704.1	570.4	409.9	382.8	27.15	15.096	
3,900.0	3,807.8	3,857.0	3,729.3	14.7	17.9	-75.42	-726.2	587.7	422.2	394.0	28.20	14.971	
4,000.0	3,904.1	3,956.2	3,824.3	15.2	18.4	-76.07	-748.4	605.1	434.5	405.3	29.25	14.858	
4,100.0	4,000.4	4,055.3	3,919.4	15.7	18.9	-76.69	-770.5	622.4	446.9	416.6	30.29	14.755	
4,200.0	4,096.6	4,154.4	4,014.4	16.2	19.4	-77.27	-792.7	639.7	459.3	428.0	31.33	14.661	
4,300.0	4,192.9	4,253.5	4,109.5	16.7	20.0	-77.83	-814.8	657.0	471.8	439.4	32.37	14.575	
4,400.0	4,289.2	4,352.6	4,204.5	17.2	20.5	-78.35	-837.0	674.4	484.3	450.9	33.41	14.497	
4,500.0	4,385.5	4,451.8	4,299.5	17.7	21.0	-78.85	-859.1	691.7	496.9	462.4	34.45	14.425 SF	

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: DJ Wattenberg
Reference Site: S36 T2N-R66W (Marcus State, Mumby State)
Site Error: 0.0ft
Reference Well: Mumby State 4F-36H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #1

Local Co-ordinate Reference: Well Mumby State 4F-36H
TVD Reference: WELL @ 5048.0ft (Original Well Elev)
MD Reference: WELL @ 5048.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
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 4F-36H
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 0.50°

