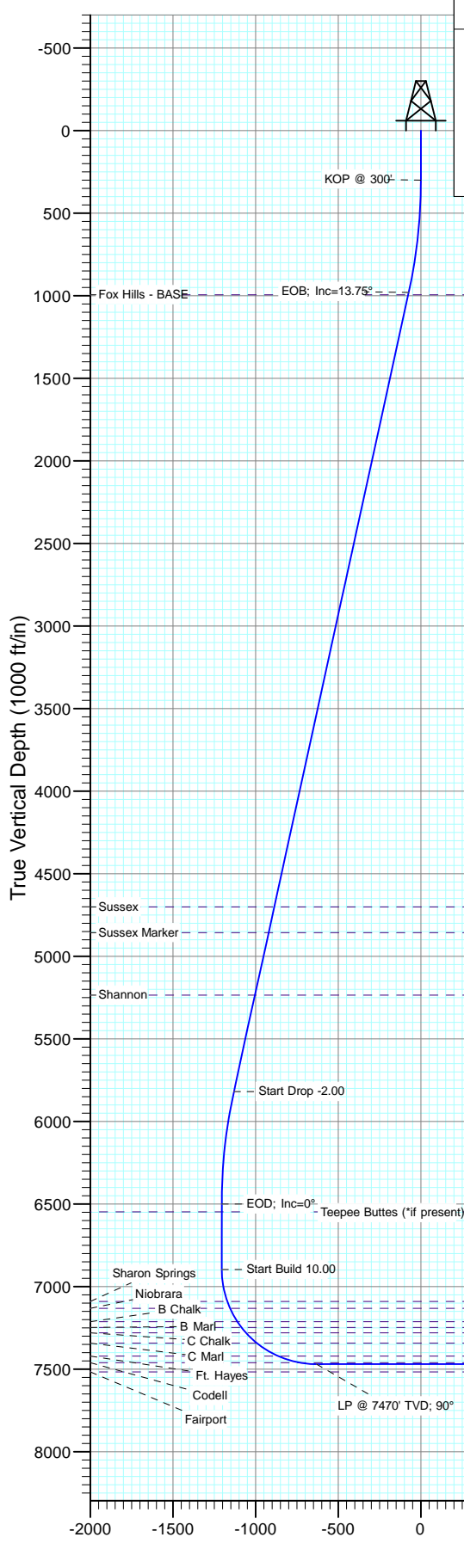
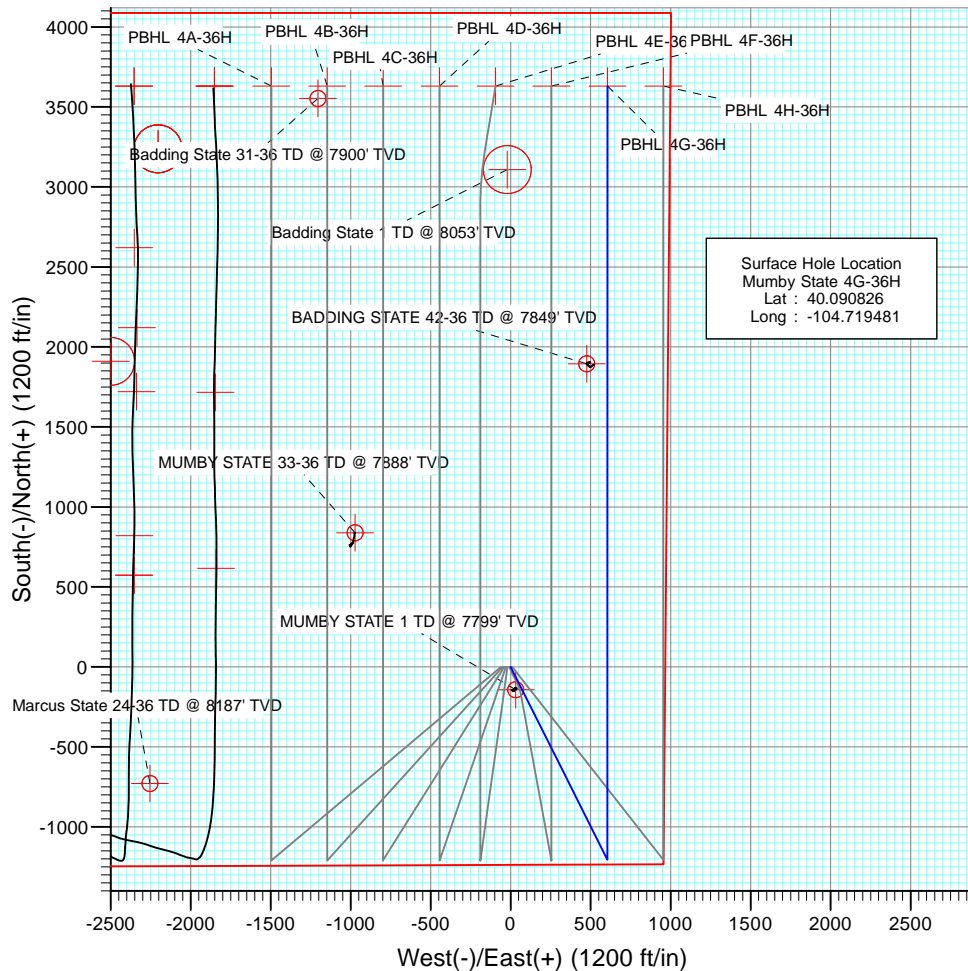




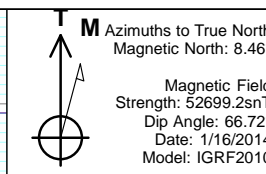
Project: DJ Wattenberg  
Site: S36 T2N-R66W (Marcus State, Mumby State)  
Well: Mumby State 4G-36H  
Wellbore: HZ  
Design: Plan #1



SECTION DETAILS											Annotation
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		KOP @ 300'
2	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0		
3	987.4	13.75	153.37	980.9	-73.4	36.8	2.00	153.37	-73.4		EOB; Inc=13.75°
4	5968.4	13.75	153.37	5819.1	-1131.6	567.4	0.00	0.00	-1131.6		Start Drop -2.00
5	6655.9	0.00	0.00	6500.0	-1205.0	604.2	2.00	180.00	-1205.0		EOD; Inc=0°
6	7052.9	0.00	0.00	6897.0	-1205.0	604.2	0.00	0.00	-1205.0		Start Build 10.00
7	7952.9	90.00	0.00	7470.0	-632.0	604.2	10.00	0.00	-632.0		LP @ 7470' TVD; 90°
8	12214.7	90.00	0.00	7470.0	3629.7	604.5	0.00	0.00	3629.7	PBHL 4G-36H	TD at 12214.7



DESIGN TARGET DETAILS					
Name	+N/-S	+E/-W	Northing	Easting	Latitude
PBHL 4G-36H	3629.7	604.5	1280531.00	3218950.14	40.100790
					Longitude
					-104.717320



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
994.0	1001.0	Fox Hills - BASE
4701.0	4817.3	Sussex
4857.0	4977.9	Sussex Marker
5235.0	5367.1	Shannon
6548.0	6703.9	Teepee Buttes (*if present)
7090.0	7249.7	Sharon Springs
7132.0	7295.0	Niobrara
7213.0	7387.6	B Chalk
7248.0	7430.7	B Marl
7280.0	7472.3	C Chalk
7343.0	7564.0	C Marl
7421.0	7714.2	Ft. Hayes
7461.0	7851.2	Codell

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

# Cathedral Energy Services

## Planning Report

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

<b>Project</b>	DJ Wattenberg		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	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 4G-36H					
Well Position	+N/-S	0.0 ft	Northing:	1,276,896.14 ft	Latitude:	40.090826
	+E/-W	0.0 ft	Easting:	3,218,377.60 ft	Longitude:	-104.719481
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,018.0 ft

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

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	0.00

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
987.4	13.75	153.37	980.9	-73.4	36.8	2.00	2.00	0.00	153.37	
5,968.4	13.75	153.37	5,819.1	-1,131.6	567.4	0.00	0.00	0.00	0.00	
6,655.9	0.00	0.00	6,500.0	-1,205.0	604.2	2.00	-2.00	0.00	180.00	
7,052.9	0.00	0.00	6,897.0	-1,205.0	604.2	0.00	0.00	0.00	0.00	
7,952.9	90.00	0.00	7,470.0	-632.0	604.2	10.00	10.00	0.00	0.00	
12,214.7	90.00	0.00	7,470.0	3,629.7	604.5	0.00	0.00	0.00	0.00	PBHL 4G-36H

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	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	KOP @ 300'
400.0	2.00	153.37	400.0	-1.6	0.8	-1.6	2.00	2.00	
500.0	4.00	153.37	499.8	-6.2	3.1	-6.2	2.00	2.00	
600.0	6.00	153.37	599.5	-14.0	7.0	-14.0	2.00	2.00	
700.0	8.00	153.37	698.7	-24.9	12.5	-24.9	2.00	2.00	
800.0	10.00	153.37	797.5	-38.9	19.5	-38.9	2.00	2.00	
900.0	12.00	153.37	895.6	-56.0	28.1	-56.0	2.00	2.00	
987.4	13.75	153.37	980.9	-73.4	36.8	-73.4	2.00	2.00	EOB; Inc=13.75°
1,000.0	13.75	153.37	993.1	-76.0	38.1	-76.0	0.00	0.00	
1,001.0	13.75	153.37	994.0	-76.3	38.2	-76.3	0.00	0.00	Fox Hills - BASE
1,100.0	13.75	153.37	1,090.2	-97.3	48.8	-97.3	0.00	0.00	
1,200.0	13.75	153.37	1,187.3	-118.5	59.4	-118.5	0.00	0.00	
1,300.0	13.75	153.37	1,284.5	-139.8	70.1	-139.8	0.00	0.00	
1,400.0	13.75	153.37	1,381.6	-161.0	80.7	-161.0	0.00	0.00	
1,500.0	13.75	153.37	1,478.7	-182.3	91.4	-182.3	0.00	0.00	
1,600.0	13.75	153.37	1,575.9	-203.5	102.0	-203.5	0.00	0.00	
1,700.0	13.75	153.37	1,673.0	-224.8	112.7	-224.8	0.00	0.00	
1,800.0	13.75	153.37	1,770.1	-246.0	123.4	-246.0	0.00	0.00	
1,900.0	13.75	153.37	1,867.3	-267.3	134.0	-267.3	0.00	0.00	
2,000.0	13.75	153.37	1,964.4	-288.5	144.7	-288.5	0.00	0.00	
2,100.0	13.75	153.37	2,061.5	-309.7	155.3	-309.7	0.00	0.00	
2,200.0	13.75	153.37	2,158.7	-331.0	166.0	-331.0	0.00	0.00	
2,300.0	13.75	153.37	2,255.8	-352.2	176.6	-352.2	0.00	0.00	
2,400.0	13.75	153.37	2,352.9	-373.5	187.3	-373.5	0.00	0.00	
2,500.0	13.75	153.37	2,450.1	-394.7	197.9	-394.7	0.00	0.00	
2,600.0	13.75	153.37	2,547.2	-416.0	208.6	-416.0	0.00	0.00	
2,700.0	13.75	153.37	2,644.4	-437.2	219.2	-437.2	0.00	0.00	
2,800.0	13.75	153.37	2,741.5	-458.5	229.9	-458.5	0.00	0.00	
2,900.0	13.75	153.37	2,838.6	-479.7	240.5	-479.7	0.00	0.00	
3,000.0	13.75	153.37	2,935.8	-501.0	251.2	-501.0	0.00	0.00	
3,100.0	13.75	153.37	3,032.9	-522.2	261.8	-522.2	0.00	0.00	
3,200.0	13.75	153.37	3,130.0	-543.4	272.5	-543.4	0.00	0.00	
3,300.0	13.75	153.37	3,227.2	-564.7	283.1	-564.7	0.00	0.00	
3,400.0	13.75	153.37	3,324.3	-585.9	293.8	-585.9	0.00	0.00	
3,500.0	13.75	153.37	3,421.4	-607.2	304.5	-607.2	0.00	0.00	
3,600.0	13.75	153.37	3,518.6	-628.4	315.1	-628.4	0.00	0.00	
3,700.0	13.75	153.37	3,615.7	-649.7	325.8	-649.7	0.00	0.00	
3,800.0	13.75	153.37	3,712.8	-670.9	336.4	-670.9	0.00	0.00	
3,900.0	13.75	153.37	3,810.0	-692.2	347.1	-692.2	0.00	0.00	
4,000.0	13.75	153.37	3,907.1	-713.4	357.7	-713.4	0.00	0.00	
4,100.0	13.75	153.37	4,004.2	-734.7	368.4	-734.7	0.00	0.00	
4,200.0	13.75	153.37	4,101.4	-755.9	379.0	-755.9	0.00	0.00	
4,300.0	13.75	153.37	4,198.5	-777.2	389.7	-777.2	0.00	0.00	
4,400.0	13.75	153.37	4,295.6	-798.4	400.3	-798.4	0.00	0.00	
4,500.0	13.75	153.37	4,392.8	-819.6	411.0	-819.6	0.00	0.00	
4,600.0	13.75	153.37	4,489.9	-840.9	421.6	-840.9	0.00	0.00	
4,700.0	13.75	153.37	4,587.0	-862.1	432.3	-862.1	0.00	0.00	
4,800.0	13.75	153.37	4,684.2	-883.4	442.9	-883.4	0.00	0.00	
4,817.3	13.75	153.37	4,701.0	-887.1	444.8	-887.1	0.00	0.00	Sussex

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	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	13.75	153.37	4,781.3	-904.6	453.6	-904.6	0.00	0.00	
4,977.9	13.75	153.37	4,857.0	-921.2	461.9	-921.2	0.00	0.00	Sussex Marker
5,000.0	13.75	153.37	4,878.4	-925.9	464.2	-925.9	0.00	0.00	
5,100.0	13.75	153.37	4,975.6	-947.1	474.9	-947.1	0.00	0.00	
5,200.0	13.75	153.37	5,072.7	-968.4	485.5	-968.4	0.00	0.00	
5,300.0	13.75	153.37	5,169.9	-989.6	496.2	-989.6	0.00	0.00	
5,367.1	13.75	153.37	5,235.0	-1,003.9	503.3	-1,003.9	0.00	0.00	Shannon
5,400.0	13.75	153.37	5,267.0	-1,010.9	506.9	-1,010.9	0.00	0.00	
5,500.0	13.75	153.37	5,364.1	-1,032.1	517.5	-1,032.1	0.00	0.00	
5,600.0	13.75	153.37	5,461.3	-1,053.3	528.2	-1,053.3	0.00	0.00	
5,700.0	13.75	153.37	5,558.4	-1,074.6	538.8	-1,074.6	0.00	0.00	
5,800.0	13.75	153.37	5,655.5	-1,095.8	549.5	-1,095.8	0.00	0.00	
5,900.0	13.75	153.37	5,752.7	-1,117.1	560.1	-1,117.1	0.00	0.00	
5,968.4	13.75	153.37	5,819.1	-1,131.6	567.4	-1,131.6	0.00	0.00	Start Drop -2.00
6,000.0	13.12	153.37	5,849.8	-1,138.2	570.7	-1,138.2	2.00	-2.00	
6,100.0	11.12	153.37	5,947.6	-1,156.9	580.1	-1,156.9	2.00	-2.00	
6,200.0	9.12	153.37	6,046.0	-1,172.6	588.0	-1,172.6	2.00	-2.00	
6,300.0	7.12	153.37	6,145.0	-1,185.3	594.3	-1,185.3	2.00	-2.00	
6,400.0	5.12	153.37	6,244.5	-1,194.8	599.1	-1,194.8	2.00	-2.00	
6,500.0	3.12	153.37	6,344.2	-1,201.2	602.3	-1,201.2	2.00	-2.00	
6,600.0	1.12	153.37	6,444.1	-1,204.5	604.0	-1,204.5	2.00	-2.00	
6,655.9	0.00	0.00	6,500.0	-1,205.0	604.2	-1,205.0	2.00	-2.00	EOD; Inc=0°
6,700.0	0.00	0.00	6,544.1	-1,205.0	604.2	-1,205.0	0.00	0.00	
6,703.9	0.00	0.00	6,548.0	-1,205.0	604.2	-1,205.0	0.00	0.00	Teepee Buttes (*if present)
6,800.0	0.00	0.00	6,644.1	-1,205.0	604.2	-1,205.0	0.00	0.00	
6,900.0	0.00	0.00	6,744.1	-1,205.0	604.2	-1,205.0	0.00	0.00	
7,000.0	0.00	0.00	6,844.1	-1,205.0	604.2	-1,205.0	0.00	0.00	
7,052.9	0.00	0.00	6,897.0	-1,205.0	604.2	-1,205.0	0.00	0.00	Start Build 10.00
7,100.0	4.71	0.00	6,944.1	-1,203.1	604.2	-1,203.1	10.00	10.00	
7,200.0	14.71	0.00	7,042.5	-1,186.2	604.2	-1,186.2	10.00	10.00	
7,249.7	19.68	0.00	7,090.0	-1,171.5	604.2	-1,171.5	10.00	10.00	Sharon Springs
7,295.0	24.21	0.00	7,132.0	-1,154.6	604.2	-1,154.6	10.00	10.00	Niobrara
7,300.0	24.71	0.00	7,136.5	-1,152.5	604.2	-1,152.5	10.00	10.00	
7,387.6	33.47	0.00	7,213.0	-1,110.0	604.2	-1,110.0	10.00	10.00	B Chalk
7,400.0	34.71	0.00	7,223.3	-1,103.1	604.2	-1,103.1	10.00	10.00	
7,430.7	37.77	0.00	7,248.0	-1,084.9	604.2	-1,084.9	10.00	10.00	B Marl
7,472.3	41.94	0.00	7,280.0	-1,058.2	604.2	-1,058.2	10.00	10.00	C Chalk
7,500.0	44.71	0.00	7,300.1	-1,039.2	604.2	-1,039.2	10.00	10.00	
7,564.0	51.11	0.00	7,343.0	-991.8	604.2	-991.8	10.00	10.00	C Marl
7,600.0	54.71	0.00	7,364.7	-963.1	604.2	-963.1	10.00	10.00	
7,700.0	64.71	0.00	7,415.1	-876.8	604.2	-876.8	10.00	10.00	
7,714.2	66.13	0.00	7,421.0	-863.9	604.2	-863.9	10.00	10.00	Ft. Hayes
7,800.0	74.71	0.00	7,449.7	-783.2	604.2	-783.2	10.00	10.00	
7,851.2	79.83	0.00	7,461.0	-733.2	604.2	-733.2	10.00	10.00	Codell
7,900.0	84.71	0.00	7,467.6	-684.9	604.2	-684.9	10.00	10.00	
7,952.9	90.00	0.00	7,470.0	-632.0	604.2	-632.0	10.00	10.00	LP @ 7470' TVD; 90°
8,000.0	90.00	0.00	7,470.0	-585.0	604.2	-585.0	0.00	0.00	
8,100.0	90.00	0.00	7,470.0	-485.0	604.2	-485.0	0.00	0.00	
8,200.0	90.00	0.00	7,470.0	-385.0	604.3	-385.0	0.00	0.00	
8,300.0	90.00	0.00	7,470.0	-285.0	604.3	-285.0	0.00	0.00	
8,400.0	90.00	0.00	7,470.0	-185.0	604.3	-185.0	0.00	0.00	
8,500.0	90.00	0.00	7,470.0	-85.0	604.3	-85.0	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	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
8,600.0	90.00	0.00	7,470.0	15.0	604.3	15.0	0.00	0.00	
8,700.0	90.00	0.00	7,470.0	115.0	604.3	115.0	0.00	0.00	
8,800.0	90.00	0.00	7,470.0	215.0	604.3	215.0	0.00	0.00	
8,900.0	90.00	0.00	7,470.0	315.0	604.3	315.0	0.00	0.00	
9,000.0	90.00	0.00	7,470.0	415.0	604.3	415.0	0.00	0.00	
9,100.0	90.00	0.00	7,470.0	515.0	604.3	515.0	0.00	0.00	
9,200.0	90.00	0.00	7,470.0	615.0	604.3	615.0	0.00	0.00	
9,300.0	90.00	0.00	7,470.0	715.0	604.3	715.0	0.00	0.00	
9,400.0	90.00	0.00	7,470.0	815.0	604.3	815.0	0.00	0.00	
9,500.0	90.00	0.00	7,470.0	915.0	604.3	915.0	0.00	0.00	
9,600.0	90.00	0.00	7,470.0	1,015.0	604.3	1,015.0	0.00	0.00	
9,700.0	90.00	0.00	7,470.0	1,115.0	604.4	1,115.0	0.00	0.00	
9,800.0	90.00	0.00	7,470.0	1,215.0	604.4	1,215.0	0.00	0.00	
9,900.0	90.00	0.00	7,470.0	1,315.0	604.4	1,315.0	0.00	0.00	
10,000.0	90.00	0.00	7,470.0	1,415.0	604.4	1,415.0	0.00	0.00	
10,100.0	90.00	0.00	7,470.0	1,515.0	604.4	1,515.0	0.00	0.00	
10,200.0	90.00	0.00	7,470.0	1,615.0	604.4	1,615.0	0.00	0.00	
10,300.0	90.00	0.00	7,470.0	1,715.0	604.4	1,715.0	0.00	0.00	
10,400.0	90.00	0.00	7,470.0	1,815.0	604.4	1,815.0	0.00	0.00	
10,500.0	90.00	0.00	7,470.0	1,915.0	604.4	1,915.0	0.00	0.00	
10,600.0	90.00	0.00	7,470.0	2,015.0	604.4	2,015.0	0.00	0.00	
10,700.0	90.00	0.00	7,470.0	2,115.0	604.4	2,115.0	0.00	0.00	
10,800.0	90.00	0.00	7,470.0	2,215.0	604.4	2,215.0	0.00	0.00	
10,900.0	90.00	0.00	7,470.0	2,315.0	604.4	2,315.0	0.00	0.00	
11,000.0	90.00	0.00	7,470.0	2,415.0	604.4	2,415.0	0.00	0.00	
11,100.0	90.00	0.00	7,470.0	2,515.0	604.4	2,515.0	0.00	0.00	
11,200.0	90.00	0.00	7,470.0	2,615.0	604.5	2,615.0	0.00	0.00	
11,300.0	90.00	0.00	7,470.0	2,715.0	604.5	2,715.0	0.00	0.00	
11,400.0	90.00	0.00	7,470.0	2,815.0	604.5	2,815.0	0.00	0.00	
11,500.0	90.00	0.00	7,470.0	2,915.0	604.5	2,915.0	0.00	0.00	
11,600.0	90.00	0.00	7,470.0	3,015.0	604.5	3,015.0	0.00	0.00	
11,700.0	90.00	0.00	7,470.0	3,115.0	604.5	3,115.0	0.00	0.00	
11,800.0	90.00	0.00	7,470.0	3,215.0	604.5	3,215.0	0.00	0.00	
11,900.0	90.00	0.00	7,470.0	3,315.0	604.5	3,315.0	0.00	0.00	
12,000.0	90.00	0.00	7,470.0	3,415.0	604.5	3,415.0	0.00	0.00	
12,100.0	90.00	0.00	7,470.0	3,515.0	604.5	3,515.0	0.00	0.00	
12,200.0	90.00	0.00	7,470.0	3,615.0	604.5	3,615.0	0.00	0.00	
12,214.7	90.00	0.00	7,470.0	3,629.7	604.5	3,629.7	0.00	0.00	TD at 12214.7

### 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 4G-36H	0.00	0.00	7,470.0	3,629.7	604.5	1,280,531.00	3,218,950.14	40.100790	-104.717320
- plan hits target center									
- Point									

# Cathedral Energy Services

## Planning Report

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

### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,001.0	994.0	Fox Hills - BASE			
4,817.3	4,701.0	Sussex			
4,977.9	4,857.0	Sussex Marker			
5,367.1	5,235.0	Shannon			
6,703.9	6,548.0	Teepee Buttes (*if present)			
7,249.7	7,090.0	Sharon Springs			
7,295.0	7,132.0	Niobrara			
7,387.6	7,213.0	B Chalk			
7,430.7	7,248.0	B Marl			
7,472.3	7,280.0	C Chalk			
7,564.0	7,343.0	C Marl			
7,714.2	7,421.0	Ft. Hayes			
7,851.2	7,461.0	Codell			

### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
300.0	300.0	0.0	0.0	KOP @ 300'
987.4	980.9	-73.4	36.8	EOB; Inc=13.75°
5,968.4	5,819.1	-1,131.6	567.4	Start Drop -2.00
6,655.9	6,500.0	-1,205.0	604.2	EOD; Inc=0°
7,052.9	6,897.0	-1,205.0	604.2	Start Build 10.00
7,952.9	7,470.0	-632.0	604.2	LP @ 7470' TVD; 90°
12,214.7	7,470.0	3,629.7	604.5	TD at 12214.7

# **EnCana Oil & Gas (USA) Inc**

**DJ Wattenberg**

**S36 T2N-R66W (Marcus State, Mumby State)**

**Mumby State 4G-36H**

**HZ**

**Plan #1**

## **Anticollision Report**

**16 January, 2014**

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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	12,214.6	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						Out of range
BADDING STATE 31-36 (EXISTING) - ENCANA WELL -						Out of range
BADDING STATE 42-36 (EXISTING) - ENCANA WELL -	10,480.8	7,475.4	129.6	84.9	2.898	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	1,249.0	1,240.6	50.0	45.5	11.031	CC, ES
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	1,300.0	1,290.2	51.4	46.6	10.874	SF
MUMBY STATE 33-36 (EXISTING) - ENCANA WELL - G						Out of range
Mumby State 4A-36H - HZ - Plan #1	166.3	167.3	59.9	59.4	125.358	CC
Mumby State 4A-36H - HZ - Plan #1	200.0	201.0	59.9	59.3	100.604	ES
Mumby State 4A-36H - HZ - Plan #1	800.0	783.0	126.1	123.0	40.845	SF
Mumby State 4B-36H - HZ - Plan #1	233.6	233.6	49.8	49.1	70.087	CC, ES
Mumby State 4B-36H - HZ - Plan #1	700.0	691.6	85.6	83.0	33.460	SF
Mumby State 4C-36H - HZ - Plan #1	266.3	267.3	40.0	39.2	48.398	CC
Mumby State 4C-36H - HZ - Plan #1	300.0	301.0	40.0	39.1	42.374	ES
Mumby State 4C-36H - HZ - Plan #1	700.0	696.3	67.2	64.7	26.310	SF
Mumby State 4D-36H - HZ - Plan #1	300.0	300.0	29.9	29.0	31.764	CC, ES
Mumby State 4D-36H - HZ - Plan #1	600.0	599.2	39.9	37.9	19.531	SF
Mumby State 4E-36H - HZ - Plan #1	300.0	300.0	19.9	18.9	21.077	CC, ES
Mumby State 4E-36H - HZ - Plan #1	500.0	499.8	23.8	22.2	14.433	SF
Mumby State 4F-36H - HZ - Plan #1	300.0	300.0	9.8	8.8	10.390	CC, ES
Mumby State 4F-36H - HZ - Plan #1	12,214.6	11,970.5	429.9	318.5	3.862	SF
Mumby State 4H-36H - HZ - Plan #1	200.0	200.0	10.1	9.5	16.984	CC, ES
Mumby State 4H-36H - HZ - Plan #1	12,214.6	12,019.2	429.9	318.1	3.845	SF

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



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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		
10,000.0	7,470.0	7,475.9	7,474.8	32.4	6.5	-89.92	1,895.8	474.8	497.9	460.8	37.14	13.409		
10,100.0	7,470.0	7,475.8	7,474.7	33.8	6.5	-89.88	1,895.8	474.8	402.2	363.6	38.68	10.400		
10,200.0	7,470.0	7,475.7	7,474.6	35.3	6.5	-89.84	1,895.8	474.8	309.2	269.0	40.24	7.685		
10,300.0	7,470.0	7,475.6	7,474.5	36.8	6.5	-89.80	1,895.8	474.8	222.4	180.6	41.82	5.319		
10,400.0	7,470.0	7,475.5	7,474.4	38.4	6.5	-89.76	1,895.8	474.8	152.7	109.3	43.42	3.517		
10,480.8	7,470.0	7,475.4	7,474.4	39.6	6.5	-89.72	1,895.8	474.8	129.6	84.9	44.72	2.898	CC, ES, SF	
10,500.0	7,470.0	7,475.4	7,474.4	39.9	6.5	-89.72	1,895.8	474.8	131.0	86.0	45.03	2.909		
10,600.0	7,470.0	7,475.3	7,474.3	41.5	6.5	-89.68	1,895.8	474.8	176.1	129.4	46.65	3.774		
10,700.0	7,470.0	7,475.2	7,474.2	43.1	6.5	-89.64	1,895.8	474.8	254.6	206.4	48.28	5.274		
10,800.0	7,470.0	7,475.1	7,474.1	44.7	6.5	-89.60	1,895.8	474.8	344.5	294.6	49.92	6.901		
10,900.0	7,470.0	7,475.1	7,474.0	46.3	6.5	-89.56	1,895.8	474.8	438.8	387.2	51.57	8.508		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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		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	4.9	4.9	0.0	0.0	177.35	-145.4	6.7	145.5					
100.0	100.0	103.6	103.6	0.1	0.1	177.11	-145.9	7.4	146.1	145.8	0.20	722.816		
200.0	200.0	205.8	205.8	0.3	0.2	176.71	-145.9	8.4	146.2	145.7	0.47	313.766		
239.6	239.6	244.6	244.6	0.4	0.2	176.54	-145.8	8.8	146.0	145.5	0.57	256.561		
300.0	300.0	303.8	303.8	0.5	0.3	176.21	-146.0	9.7	146.3	145.6	0.73	201.233		
400.0	400.0	403.0	402.9	0.6	0.3	22.53	-147.0	11.2	145.8	144.8	0.99	147.439		
500.0	499.8	502.9	502.8	0.8	0.4	22.83	-148.3	12.6	142.4	141.1	1.25	113.586		
600.0	599.5	602.6	602.5	1.1	0.5	23.94	-149.7	13.6	135.8	134.3	1.52	89.202		
700.0	698.7	702.8	702.7	1.3	0.6	25.84	-150.8	14.6	125.9	124.1	1.80	69.791		
800.0	797.5	803.3	803.2	1.6	0.7	28.94	-150.8	15.8	112.0	109.9	2.11	53.142		
900.0	895.6	900.5	900.4	2.0	0.8	34.38	-150.6	16.1	95.4	93.0	2.46	38.821		
1,000.0	993.1	999.0	998.9	2.4	0.9	43.98	-150.2	16.3	77.4	74.4	2.93	26.442		
1,100.0	1,090.2	1,096.1	1,096.0	2.8	1.0	58.97	-149.3	17.0	61.0	57.4	3.55	17.177		
1,200.0	1,187.3	1,192.9	1,192.8	3.2	1.0	80.44	-149.1	18.3	51.3	47.0	4.26	12.048		
1,249.0	1,234.9	1,240.6	1,240.4	3.5	1.1	92.53	-149.4	19.0	50.0	45.5	4.54	11.031 CC, ES		
1,300.0	1,284.5	1,290.2	1,290.1	3.7	1.1	104.99	-149.9	19.7	51.4	46.6	4.72	10.874 SF		
1,400.0	1,381.6	1,387.2	1,387.1	4.1	1.2	125.40	-151.0	20.8	60.8	56.0	4.84	12.565		
1,500.0	1,478.7	1,484.0	1,483.9	4.6	1.3	139.43	-151.6	21.2	76.6	71.8	4.84	15.832		
1,600.0	1,575.9	1,580.6	1,580.5	5.0	1.4	148.81	-151.2	21.3	96.3	91.4	4.87	19.754		
1,700.0	1,673.0	1,676.9	1,676.8	5.5	1.5	155.00	-150.4	21.0	118.1	113.1	4.97	23.758		
1,800.0	1,770.1	1,774.2	1,774.1	5.9	1.5	159.33	-149.3	20.7	141.1	136.0	5.11	27.584		
1,900.0	1,867.3	1,873.5	1,873.3	6.4	1.6	162.51	-148.8	20.9	163.8	158.5	5.29	30.949		
2,000.0	1,964.4	1,970.5	1,970.3	6.8	1.7	164.75	-149.3	21.5	185.9	180.4	5.50	33.818		
2,100.0	2,061.5	2,066.0	2,065.8	7.2	1.8	166.23	-149.8	21.0	208.8	203.1	5.72	36.490		
2,200.0	2,158.7	2,161.4	2,161.3	7.7	1.9	167.51	-149.5	20.3	232.7	226.8	5.95	39.091		
2,300.0	2,255.8	2,258.7	2,258.5	8.1	2.0	168.62	-148.7	19.5	257.1	250.9	6.19	41.539		
2,400.0	2,352.9	2,356.3	2,356.1	8.6	2.0	169.46	-148.6	18.7	281.1	274.7	6.43	43.700		
2,500.0	2,450.1	2,452.8	2,452.6	9.0	2.1	170.18	-148.3	17.8	305.2	298.5	6.68	45.701		
2,600.0	2,547.2	2,551.3	2,551.1	9.5	2.2	170.92	-147.6	17.5	329.4	322.5	6.92	47.579		
2,700.0	2,644.4	2,649.5	2,649.3	9.9	2.3	171.43	-148.0	17.0	352.9	345.7	7.18	49.177		
2,800.0	2,741.5	2,745.0	2,744.8	10.4	2.4	171.86	-148.2	16.4	376.6	369.2	7.43	50.707		
2,900.0	2,838.6	2,840.5	2,840.3	10.8	2.5	172.35	-147.6	16.1	400.8	393.1	7.68	52.215		
3,000.0	2,935.8	2,936.5	2,936.3	11.3	2.6	172.75	-146.9	15.5	425.3	417.4	7.93	53.649		
3,100.0	3,032.9	3,033.5	3,033.3	11.7	2.6	173.13	-146.1	14.9	449.9	441.8	8.18	54.997		
3,200.0	3,130.0	3,130.4	3,130.2	12.2	2.7	173.41	-145.6	14.0	474.5	466.1	8.44	56.244		
3,300.0	3,227.2	3,227.7	3,227.5	12.6	2.8	173.67	-145.0	13.0	499.2	490.5	8.69	57.417		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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	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	1.0	1.0	0.0	0.0	-89.65	0.4	-59.9	59.9					
100.0	100.0	101.0	101.0	0.1	0.1	-89.65	0.4	-59.9	59.9	59.6	0.25	243.300		
166.3	166.3	167.3	167.3	0.2	0.2	-89.65	0.4	-59.9	59.9	59.4	0.48	125.358 CC		
200.0	200.0	201.0	201.0	0.3	0.3	-89.65	0.4	-59.9	59.9	59.3	0.60	100.604 ES		
300.0	300.0	300.0	300.0	0.5	0.5	-90.71	-0.8	-61.2	61.2	60.3	0.95	64.732		
400.0	400.0	397.5	397.4	0.6	0.7	114.38	-4.0	-65.1	66.0	64.7	1.30	50.814		
500.0	499.8	495.2	494.7	0.8	0.9	113.83	-9.4	-71.5	74.9	73.3	1.68	44.692		
600.0	599.5	592.2	591.0	1.1	1.1	114.03	-16.9	-80.4	88.0	85.9	2.09	42.040		
700.0	698.7	688.2	685.8	1.3	1.4	114.65	-26.4	-91.6	105.0	102.5	2.56	41.039		
800.0	797.5	783.0	779.0	1.6	1.8	115.41	-37.7	-105.1	126.1	123.0	3.09	40.845 SF		
900.0	895.6	876.3	870.1	2.0	2.2	116.16	-50.8	-120.6	151.2	147.5	3.68	41.041		
1,000.0	993.1	968.0	958.9	2.4	2.6	116.88	-65.6	-138.1	180.1	175.7	4.34	41.447		
1,100.0	1,090.2	1,058.3	1,045.5	2.8	3.1	117.49	-81.9	-157.5	211.8	206.8	5.05	41.964		
1,200.0	1,187.3	1,147.2	1,130.0	3.2	3.6	117.47	-99.6	-178.6	245.8	240.0	5.78	42.546		
1,300.0	1,284.5	1,237.5	1,215.1	3.7	4.2	117.09	-119.2	-201.8	281.6	275.0	6.53	43.141		
1,400.0	1,381.6	1,330.8	1,302.8	4.1	4.7	116.72	-139.6	-226.0	317.7	310.4	7.29	43.549		
1,500.0	1,478.7	1,424.0	1,390.5	4.6	5.3	116.44	-160.0	-250.2	353.8	345.7	8.07	43.852		
1,600.0	1,575.9	1,517.2	1,478.2	5.0	5.9	116.20	-180.4	-274.5	389.9	381.1	8.85	44.083		
1,700.0	1,673.0	1,610.5	1,565.8	5.5	6.5	116.01	-200.8	-298.7	426.1	416.4	9.63	44.265		
1,800.0	1,770.1	1,703.7	1,653.5	5.9	7.1	115.84	-221.2	-323.0	462.2	451.8	10.41	44.410		
1,900.0	1,867.3	1,796.9	1,741.2	6.4	7.7	115.70	-241.7	-347.2	498.4	487.2	11.19	44.528		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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				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	-89.58	0.4	-49.8	49.8					
100.0	100.0	100.0	100.0	0.1	0.1	-89.58	0.4	-49.8	49.8	49.6	0.24	203.819		
200.0	200.0	200.0	200.0	0.3	0.3	-89.58	0.4	-49.8	49.8	49.2	0.59	83.925		
233.6	233.6	233.6	233.6	0.4	0.4	-89.58	0.4	-49.8	49.8	49.1	0.71	70.087 CC, ES		
300.0	300.0	299.4	299.4	0.5	0.5	-89.94	0.0	-50.1	50.1	49.1	0.94	53.192		
400.0	400.0	398.2	398.1	0.6	0.7	115.57	-2.5	-52.4	53.2	51.9	1.30	41.075		
500.0	499.8	496.6	496.3	0.8	0.9	115.16	-7.5	-56.9	60.2	58.5	1.67	36.006		
600.0	599.5	594.5	593.6	1.1	1.1	115.30	-15.0	-63.7	71.0	68.9	2.09	34.009		
700.0	698.7	691.6	689.8	1.3	1.4	115.74	-24.8	-72.6	85.6	83.0	2.56	33.460 SF		
800.0	797.5	787.7	784.6	1.6	1.7	116.25	-36.9	-83.6	103.9	100.8	3.09	33.591		
900.0	895.6	882.8	877.6	2.0	2.1	116.74	-51.2	-96.5	126.0	122.3	3.70	34.024		
1,000.0	993.1	976.4	968.7	2.4	2.5	117.19	-67.5	-111.3	151.7	147.3	4.38	34.595		
1,100.0	1,090.2	1,068.9	1,057.8	2.8	2.9	117.41	-85.8	-127.9	180.0	174.9	5.11	35.200		
1,200.0	1,187.3	1,161.8	1,146.6	3.2	3.4	116.95	-106.1	-146.3	210.1	204.2	5.87	35.813		
1,300.0	1,284.5	1,257.0	1,237.4	3.7	3.9	116.48	-127.4	-165.6	240.6	234.0	6.64	36.227		
1,400.0	1,381.6	1,352.2	1,328.1	4.1	4.5	116.12	-148.6	-184.8	271.2	263.8	7.43	36.522		
1,500.0	1,478.7	1,447.4	1,418.9	4.6	5.0	115.83	-169.9	-204.1	301.7	293.5	8.21	36.739		
1,600.0	1,575.9	1,542.7	1,509.7	5.0	5.5	115.59	-191.2	-223.4	332.3	323.3	9.01	36.903		
1,700.0	1,673.0	1,637.9	1,600.5	5.5	6.0	115.40	-212.4	-242.6	362.9	353.1	9.80	37.030		
1,800.0	1,770.1	1,733.1	1,691.2	5.9	6.6	115.23	-233.7	-261.9	393.5	382.9	10.60	37.130		
1,900.0	1,867.3	1,828.3	1,782.0	6.4	7.1	115.09	-254.9	-281.2	424.0	412.6	11.40	37.211		
2,000.0	1,964.4	1,923.5	1,872.8	6.8	7.6	114.97	-276.2	-300.5	454.6	442.4	12.20	37.278		
2,100.0	2,061.5	2,018.7	1,963.6	7.2	8.2	114.86	-297.5	-319.7	485.2	472.2	13.00	37.333		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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	-89.48	0.4	-40.0	40.0					
100.0	100.0	101.0	101.0	0.1	0.1	-89.48	0.4	-40.0	40.0	39.8	0.25	162.583		
200.0	200.0	201.0	201.0	0.3	0.3	-89.48	0.4	-40.0	40.0	39.4	0.60	67.226		
266.3	266.3	267.3	267.3	0.4	0.4	-89.48	0.4	-40.0	40.0	39.2	0.83	48.398 CC		
300.0	300.0	301.0	301.0	0.5	0.5	-89.48	0.4	-40.0	40.0	39.1	0.94	42.374 ES		
400.0	400.0	400.0	400.0	0.6	0.6	117.18	-1.1	-40.9	41.7	40.4	1.30	32.206		
500.0	499.8	499.3	499.1	0.8	0.8	117.34	-5.5	-43.7	46.9	45.2	1.67	28.066		
600.0	599.5	598.0	597.5	1.1	1.1	117.53	-12.8	-48.2	55.4	53.3	2.08	26.573		
700.0	698.7	696.3	695.0	1.3	1.3	117.69	-22.8	-54.5	67.2	64.7	2.56	26.310 SF		
800.0	797.5	793.8	791.4	1.6	1.6	117.79	-35.6	-62.5	82.4	79.3	3.10	26.604		
900.0	895.6	890.5	886.4	2.0	2.0	117.82	-51.0	-72.2	100.9	97.2	3.72	27.120		
1,000.0	993.1	986.3	979.8	2.4	2.3	117.82	-69.0	-83.4	122.6	118.2	4.42	27.716		
1,100.0	1,090.2	1,081.2	1,071.6	2.8	2.8	117.41	-89.3	-96.2	146.5	141.4	5.18	28.307		
1,200.0	1,187.3	1,178.1	1,164.9	3.2	3.2	116.64	-111.4	-110.0	171.2	165.3	5.96	28.739		
1,300.0	1,284.5	1,275.0	1,258.2	3.7	3.7	116.06	-133.5	-123.9	196.0	189.2	6.75	29.032		
1,400.0	1,381.6	1,371.9	1,351.5	4.1	4.2	115.62	-155.6	-137.7	220.7	213.2	7.55	29.237		
1,500.0	1,478.7	1,468.8	1,444.8	4.6	4.7	115.26	-177.6	-151.5	245.5	237.1	8.35	29.387		
1,600.0	1,575.9	1,565.6	1,538.1	5.0	5.1	114.97	-199.7	-165.3	270.2	261.0	9.16	29.498		
1,700.0	1,673.0	1,662.5	1,631.5	5.5	5.6	114.73	-221.8	-179.2	295.0	285.0	9.97	29.584		
1,800.0	1,770.1	1,759.4	1,724.8	5.9	6.1	114.53	-243.9	-193.0	319.7	309.0	10.78	29.652		
1,900.0	1,867.3	1,856.3	1,818.1	6.4	6.6	114.35	-265.9	-206.8	344.5	332.9	11.60	29.705		
2,000.0	1,964.4	1,953.1	1,911.4	6.8	7.1	114.20	-288.0	-220.7	369.3	356.9	12.41	29.749		
2,100.0	2,061.5	2,050.0	2,004.7	7.2	7.6	114.07	-310.1	-234.5	394.1	380.8	13.23	29.785		
2,200.0	2,158.7	2,146.9	2,098.0	7.7	8.0	113.95	-332.1	-248.3	418.8	404.8	14.05	29.815		
2,300.0	2,255.8	2,243.8	2,191.3	8.1	8.5	113.84	-354.2	-262.1	443.6	428.7	14.87	29.840		
2,400.0	2,352.9	2,340.7	2,284.6	8.6	9.0	113.75	-376.3	-276.0	468.4	452.7	15.69	29.862		
2,500.0	2,450.1	2,437.5	2,378.0	9.0	9.5	113.67	-398.4	-289.8	493.2	476.7	16.51	29.880		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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						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	400.0	400.0	0.6	0.6	119.52	0.0	-29.9	30.8	29.5	1.29	23.778	
500.0	499.8	499.6	499.6	0.8	0.8	124.33	-1.6	-30.5	33.9	32.3	1.66	20.505	
600.0	599.5	599.2	599.1	1.1	1.0	127.23	-6.6	-32.2	39.9	37.9	2.04	19.531	SF
700.0	698.7	698.6	698.1	1.3	1.2	128.42	-14.7	-35.0	48.6	46.1	2.48	19.583	
800.0	797.5	797.8	796.5	1.6	1.5	128.46	-26.1	-38.9	59.8	56.8	2.98	20.050	
900.0	895.6	896.6	894.1	2.0	1.8	127.86	-40.6	-43.8	73.5	70.0	3.56	20.628	
1,000.0	993.1	994.9	990.6	2.4	2.1	126.97	-58.2	-49.9	89.8	85.6	4.24	21.193	
1,100.0	1,090.2	1,092.8	1,086.1	2.8	2.5	125.29	-78.9	-56.9	107.4	102.4	4.99	21.507	
1,200.0	1,187.3	1,190.7	1,180.8	3.2	2.9	122.78	-102.1	-64.9	125.6	119.8	5.80	21.641	
1,300.0	1,284.5	1,288.9	1,275.8	3.7	3.4	120.76	-125.8	-73.0	144.0	137.4	6.63	21.723	
1,400.0	1,381.6	1,387.0	1,370.7	4.1	3.8	119.20	-149.4	-81.1	162.6	155.1	7.46	21.784	
1,500.0	1,478.7	1,485.2	1,465.6	4.6	4.3	117.96	-173.1	-89.2	181.3	173.0	8.30	21.830	
1,600.0	1,575.9	1,583.4	1,560.6	5.0	4.7	116.96	-196.7	-97.2	200.0	190.8	9.15	21.867	
1,700.0	1,673.0	1,681.6	1,655.5	5.5	5.2	116.12	-220.4	-105.3	218.8	208.8	9.99	21.898	
1,800.0	1,770.1	1,779.7	1,750.5	5.9	5.6	115.42	-244.0	-113.4	237.6	226.8	10.84	21.925	
1,900.0	1,867.3	1,877.9	1,845.4	6.4	6.1	114.82	-267.6	-121.5	256.5	244.8	11.68	21.947	
2,000.0	1,964.4	1,976.1	1,940.3	6.8	6.6	114.30	-291.3	-129.6	275.3	262.8	12.53	21.967	
2,100.0	2,061.5	2,074.3	2,035.3	7.2	7.0	113.85	-314.9	-137.7	294.2	280.8	13.38	21.984	
2,200.0	2,158.7	2,172.4	2,130.2	7.7	7.5	113.45	-338.6	-145.8	313.1	298.9	14.23	22.000	
2,300.0	2,255.8	2,270.6	2,225.2	8.1	7.9	113.10	-362.2	-153.9	332.1	317.0	15.08	22.014	
2,400.0	2,352.9	2,368.8	2,320.1	8.6	8.4	112.79	-385.9	-162.0	351.0	335.1	15.93	22.026	
2,500.0	2,450.1	2,467.0	2,415.0	9.0	8.9	112.51	-409.5	-170.1	369.9	353.1	16.79	22.038	
2,600.0	2,547.2	2,565.1	2,510.0	9.5	9.3	112.25	-433.2	-178.1	388.9	371.2	17.64	22.048	
2,700.0	2,644.4	2,663.3	2,604.9	9.9	9.8	112.02	-456.8	-186.2	407.8	389.4	18.49	22.058	
2,800.0	2,741.5	2,761.5	2,699.9	10.4	10.3	111.81	-480.4	-194.3	426.8	407.5	19.34	22.067	
2,900.0	2,838.6	2,859.7	2,794.8	10.8	10.7	111.62	-504.1	-202.4	445.8	425.6	20.19	22.075	
3,000.0	2,935.8	2,957.8	2,889.7	11.3	11.2	111.44	-527.7	-210.5	464.7	443.7	21.05	22.082	
3,100.0	3,032.9	3,056.0	2,984.7	11.7	11.7	111.28	-551.4	-218.6	483.7	461.8	21.90	22.089	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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				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	-19.9	19.9					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-19.9	19.9	19.6	0.24	81.296		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-19.9	19.9	19.3	0.59	33.475		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-19.9	19.9	18.9	0.94	21.077 CC, ES		
400.0	400.0	400.0	400.0	0.6	0.6	120.94	0.0	-19.9	20.7	19.4	1.29	16.007		
500.0	499.8	499.8	499.8	0.8	0.8	131.74	0.0	-19.9	23.8	22.2	1.65	14.433 SF		
600.0	599.5	599.8	599.7	1.1	1.0	140.91	-1.7	-20.1	29.8	27.8	2.01	14.798		
700.0	698.7	699.8	699.6	1.3	1.2	144.89	-6.9	-20.8	37.9	35.5	2.39	15.827		
800.0	797.5	799.8	799.3	1.6	1.4	145.80	-15.5	-22.0	47.7	44.9	2.81	16.970		
900.0	895.6	899.9	898.6	2.0	1.6	145.09	-27.6	-23.7	59.1	55.8	3.29	17.993		
1,000.0	993.1	999.8	997.2	2.4	1.9	143.56	-43.1	-25.9	72.2	68.3	3.84	18.790		
1,100.0	1,090.2	1,099.7	1,095.3	2.8	2.3	140.91	-61.9	-28.6	85.2	80.7	4.50	18.950		
1,200.0	1,187.3	1,199.1	1,192.4	3.2	2.6	137.32	-83.5	-31.6	97.7	92.4	5.24	18.634		
1,300.0	1,284.5	1,298.2	1,288.9	3.7	3.0	134.39	-105.4	-34.7	110.4	104.3	6.02	18.335		
1,400.0	1,381.6	1,397.2	1,385.5	4.1	3.4	132.07	-127.2	-37.7	123.3	116.5	6.81	18.091		
1,500.0	1,478.7	1,496.3	1,482.1	4.6	3.8	130.19	-149.0	-40.8	136.4	128.7	7.62	17.891		
1,600.0	1,575.9	1,595.3	1,578.6	5.0	4.2	128.65	-170.8	-43.9	149.6	141.1	8.44	17.729		
1,700.0	1,673.0	1,694.4	1,675.2	5.5	4.6	127.35	-192.6	-46.9	162.8	153.6	9.26	17.595		
1,800.0	1,770.1	1,793.5	1,771.8	5.9	5.0	126.25	-214.5	-50.0	176.2	166.1	10.08	17.484		
1,900.0	1,867.3	1,892.5	1,868.3	6.4	5.4	125.30	-236.3	-53.1	189.6	178.7	10.90	17.390		
2,000.0	1,964.4	1,991.6	1,964.9	6.8	5.8	124.48	-258.1	-56.1	203.1	191.3	11.73	17.311		
2,100.0	2,061.5	2,090.6	2,061.5	7.2	6.3	123.77	-279.9	-59.2	216.6	204.0	12.56	17.243		
2,200.0	2,158.7	2,189.7	2,158.0	7.7	6.7	123.13	-301.8	-62.3	230.1	216.7	13.39	17.185		
2,300.0	2,255.8	2,288.7	2,254.6	8.1	7.1	122.57	-323.6	-65.3	243.6	229.4	14.22	17.134		
2,400.0	2,352.9	2,387.8	2,351.2	8.6	7.5	122.06	-345.4	-68.4	257.2	242.2	15.05	17.090		
2,500.0	2,450.1	2,486.8	2,447.7	9.0	7.9	121.61	-367.2	-71.5	270.8	254.9	15.88	17.050		
2,600.0	2,547.2	2,585.9	2,544.3	9.5	8.3	121.20	-389.0	-74.5	284.4	267.7	16.71	17.016		
2,700.0	2,644.4	2,684.9	2,640.9	9.9	8.8	120.83	-410.9	-77.6	298.0	280.5	17.55	16.984		
2,800.0	2,741.5	2,784.0	2,737.5	10.4	9.2	120.49	-432.7	-80.7	311.6	293.3	18.38	16.957		
2,900.0	2,838.6	2,883.0	2,834.0	10.8	9.6	120.18	-454.5	-83.7	325.3	306.1	19.21	16.931		
3,000.0	2,935.8	2,982.1	2,930.6	11.3	10.0	119.89	-476.3	-86.8	338.9	318.9	20.04	16.909		
3,100.0	3,032.9	3,081.1	3,027.2	11.7	10.4	119.62	-498.1	-89.9	352.6	331.7	20.88	16.888		
3,200.0	3,130.0	3,180.2	3,123.7	12.2	10.9	119.38	-520.0	-92.9	366.2	344.5	21.71	16.869		
3,300.0	3,227.2	3,279.2	3,220.3	12.6	11.3	119.15	-541.8	-96.0	379.9	357.3	22.54	16.852		
3,400.0	3,324.3	3,378.3	3,316.9	13.1	11.7	118.94	-563.6	-99.1	393.6	370.2	23.38	16.836		
3,500.0	3,421.4	3,477.3	3,413.4	13.6	12.1	118.74	-585.4	-102.1	407.2	383.0	24.21	16.821		
3,600.0	3,518.6	3,576.4	3,510.0	14.0	12.5	118.56	-607.3	-105.2	420.9	395.9	25.04	16.808		
3,700.0	3,615.7	3,675.4	3,606.6	14.5	12.9	118.39	-629.1	-108.2	434.6	408.7	25.88	16.795		
3,800.0	3,712.8	3,774.5	3,703.1	14.9	13.4	118.22	-650.9	-111.3	448.3	421.6	26.71	16.784		
3,900.0	3,810.0	3,873.5	3,799.7	15.4	13.8	118.07	-672.7	-114.4	462.0	434.4	27.54	16.773		
4,000.0	3,907.1	3,972.6	3,896.3	15.8	14.2	117.93	-694.5	-117.4	475.7	447.3	28.38	16.763		
4,100.0	4,004.2	4,071.6	3,992.8	16.3	14.6	117.79	-716.4	-120.5	489.4	460.1	29.21	16.753		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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			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	-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	400.0	400.0	0.6	0.6	125.01	0.0	-9.8	10.7	9.4	1.29	8.265		
500.0	499.8	500.0	500.0	0.8	0.8	140.10	-0.8	-9.4	13.7	12.0	1.65	8.297		
600.0	599.5	600.1	600.0	1.1	1.0	152.03	-3.1	-8.3	18.8	16.8	2.00	9.387		
700.0	698.7	700.1	700.0	1.3	1.2	160.05	-7.1	-6.3	26.0	23.6	2.35	11.061		
800.0	797.5	800.2	799.8	1.6	1.4	165.25	-12.6	-3.7	35.2	32.5	2.69	13.054		
900.0	895.6	900.2	899.6	2.0	1.6	168.70	-19.6	-0.2	46.2	43.2	3.04	15.230		
1,000.0	993.1	1,000.3	999.2	2.4	1.8	171.06	-28.2	4.0	59.1	55.7	3.37	17.504		
1,100.0	1,090.2	1,100.6	1,098.8	2.8	2.1	172.54	-38.4	9.0	71.6	67.8	3.73	19.210		
1,200.0	1,187.3	1,201.3	1,198.7	3.2	2.3	173.44	-50.3	14.7	82.4	78.3	4.08	20.196		
1,300.0	1,284.5	1,302.4	1,298.7	3.7	2.6	174.00	-63.7	21.3	91.5	87.0	4.43	20.626		
1,400.0	1,381.6	1,403.8	1,398.7	4.1	2.9	174.34	-78.8	28.7	98.8	94.0	4.79	20.621		
1,500.0	1,478.7	1,505.5	1,498.6	4.6	3.3	174.54	-95.6	36.8	104.4	99.2	5.15	20.268		
1,600.0	1,575.9	1,607.3	1,598.4	5.0	3.7	174.61	-113.9	45.8	108.2	102.7	5.51	19.632		
1,700.0	1,673.0	1,709.2	1,697.8	5.5	4.1	173.72	-134.8	54.1	110.2	104.3	5.90	18.692		
1,800.0	1,770.1	1,811.0	1,796.5	5.9	4.5	171.23	-158.8	60.7	110.6	104.2	6.35	17.411		
1,900.0	1,867.3	1,911.6	1,893.4	6.4	5.0	167.33	-185.1	65.9	109.9	102.9	6.94	15.839		
2,000.0	1,964.4	2,011.3	1,989.4	6.8	5.4	163.22	-211.6	70.7	109.5	101.9	7.65	14.322		
2,010.3	1,974.4	2,021.6	1,999.3	6.8	5.5	162.80	-214.4	71.2	109.5	101.8	7.73	14.172		
2,100.0	2,061.5	2,111.0	2,085.4	7.2	5.9	159.11	-238.1	75.6	109.8	101.3	8.48	12.938		
2,200.0	2,158.7	2,210.7	2,181.4	7.7	6.4	155.04	-264.6	80.5	110.5	101.1	9.43	11.719		
2,300.0	2,255.8	2,310.3	2,277.3	8.1	6.9	151.05	-291.1	85.4	111.9	101.4	10.48	10.675		
2,400.0	2,352.9	2,410.0	2,373.3	8.6	7.3	147.17	-317.6	90.3	113.8	102.1	11.61	9.800		
2,500.0	2,450.1	2,509.7	2,469.3	9.0	7.8	143.43	-344.1	95.2	116.1	103.3	12.79	9.078		
2,600.0	2,547.2	2,609.4	2,565.3	9.5	8.3	139.86	-370.6	100.1	119.0	105.0	14.02	8.490		
2,700.0	2,644.4	2,709.1	2,661.2	9.9	8.8	136.46	-397.1	104.9	122.3	107.0	15.26	8.014		
2,800.0	2,741.5	2,808.8	2,757.2	10.4	9.3	133.25	-423.6	109.8	126.0	109.5	16.51	7.630		
2,900.0	2,838.6	2,908.5	2,853.2	10.8	9.8	130.24	-450.1	114.7	130.1	112.3	17.76	7.323		
3,000.0	2,935.8	3,008.2	2,949.2	11.3	10.3	127.41	-476.6	119.6	134.5	115.5	19.00	7.078		
3,100.0	3,032.9	3,107.9	3,045.2	11.7	10.8	124.77	-503.1	124.5	139.2	119.0	20.23	6.883		
3,200.0	3,130.0	3,207.5	3,141.1	12.2	11.3	122.30	-529.6	129.4	144.2	122.8	21.43	6.729		
3,300.0	3,227.2	3,307.2	3,237.1	12.6	11.8	120.01	-556.1	134.3	149.5	126.8	22.62	6.608		
3,400.0	3,324.3	3,406.9	3,333.1	13.1	12.3	117.87	-582.6	139.1	154.9	131.2	23.78	6.514		
3,500.0	3,421.4	3,506.6	3,429.1	13.6	12.7	115.88	-609.1	144.0	160.6	135.7	24.93	6.443		
3,600.0	3,518.6	3,606.3	3,525.0	14.0	13.2	114.03	-635.6	148.9	166.5	140.4	26.05	6.390		
3,700.0	3,615.7	3,706.0	3,621.0	14.5	13.7	112.30	-662.1	153.8	172.5	145.3	27.16	6.352		
3,800.0	3,712.8	3,805.7	3,717.0	14.9	14.2	110.70	-688.6	158.7	178.7	150.4	28.24	6.326		
3,900.0	3,810.0	3,905.4	3,813.0	15.4	14.7	109.20	-715.1	163.6	184.9	155.6	29.31	6.310		
4,000.0	3,907.1	4,005.1	3,909.0	15.8	15.2	107.80	-741.6	168.5	191.4	161.0	30.37	6.302		
4,100.0	4,004.2	4,104.7	4,004.9	16.3	15.7	106.49	-768.1	173.3	197.9	166.5	31.40	6.301		
4,200.0	4,101.4	4,204.4	4,100.9	16.7	16.2	105.26	-794.6	178.2	204.5	172.1	32.43	6.305		
4,300.0	4,198.5	4,304.1	4,196.9	17.2	16.7	104.12	-821.1	183.1	211.2	177.7	33.44	6.315		
4,400.0	4,295.6	4,403.8	4,292.9	17.6	17.2	103.04	-847.6	188.0	218.0	183.5	34.45	6.328		
4,500.0	4,392.8	4,503.5	4,388.8	18.1	17.7	102.03	-874.1	192.9	224.8	189.4	35.44	6.344		
4,600.0	4,489.9	4,603.2	4,484.8	18.5	18.2	101.08	-900.6	197.8	231.7	195.3	36.42	6.363		
4,700.0	4,587.0	4,702.9	4,580.8	19.0	18.7	100.18	-927.1	202.6	238.7	201.3	37.40	6.384		
4,800.0	4,684.2	4,802.6	4,676.8	19.4	19.2	99.34	-953.6	207.5	245.8	207.4	38.36	6.406		
4,900.0	4,781.3	4,902.3	4,772.8	19.9	19.7	98.54	-980.1	212.4	252.8	213.5	39.32	6.430		
5,000.0	4,878.4	5,001.9	4,868.7	20.3	20.2	97.78	-1,006.6	217.3	260.0	219.7	40.28	6.455		

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



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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			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	4,975.6	5,101.6	4,964.7	20.8	20.7	97.07	-1,033.1	222.2	267.1	225.9	41.23	6.480	
5,200.0	5,072.7	5,201.3	5,060.7	21.2	21.2	96.39	-1,059.6	227.1	274.4	232.2	42.17	6.506	
5,300.0	5,169.9	5,301.0	5,156.7	21.7	21.7	95.75	-1,086.1	232.0	281.6	238.5	43.11	6.533	
5,400.0	5,267.0	5,401.2	5,253.2	22.1	22.2	95.17	-1,112.6	236.8	288.9	244.8	44.04	6.560	
5,500.0	5,364.1	5,502.9	5,351.8	22.6	22.7	95.11	-1,136.9	241.3	295.7	250.7	44.92	6.582	
5,600.0	5,461.3	5,604.6	5,451.2	23.0	23.0	95.73	-1,157.8	245.2	301.8	256.1	45.76	6.596	
5,700.0	5,558.4	5,705.9	5,551.0	23.5	23.4	96.99	-1,175.2	248.4	307.4	260.9	46.54	6.607	
5,800.0	5,655.5	5,806.8	5,650.9	23.9	23.6	98.84	-1,189.0	250.9	312.8	265.5	47.23	6.622	
5,900.0	5,752.7	5,906.9	5,750.5	24.4	23.8	101.23	-1,199.3	252.8	318.1	270.3	47.79	6.655	
6,000.0	5,849.8	6,006.0	5,849.3	24.8	24.0	104.14	-1,206.1	254.1	323.8	275.6	48.19	6.720	
6,100.0	5,947.6	6,104.5	5,947.7	25.2	24.1	107.14	-1,209.5	254.7	329.6	281.3	48.35	6.817	
6,200.0	6,046.0	6,202.8	6,046.0	25.5	24.2	110.00	-1,210.0	254.8	335.3	286.9	48.35	6.934	
6,300.0	6,145.0	6,301.8	6,145.0	25.8	24.3	112.31	-1,210.0	254.8	340.4	292.1	48.30	7.048	
6,400.0	6,244.5	6,401.2	6,244.5	26.0	24.3	114.02	-1,210.0	254.8	344.6	296.4	48.26	7.141	
6,500.0	6,344.2	6,501.0	6,344.2	26.2	24.4	115.15	-1,210.0	254.8	347.6	299.3	48.26	7.203	
6,600.0	6,444.1	6,600.9	6,444.1	26.3	24.5	115.73	-1,210.0	254.8	349.2	300.9	48.32	7.227	
6,700.0	6,544.1	6,700.9	6,544.1	26.4	24.6	-90.82	-1,210.0	254.8	349.4	301.0	48.46	7.210	
6,800.0	6,644.1	6,800.9	6,644.1	26.4	24.7	-90.82	-1,210.0	254.8	349.4	300.8	48.63	7.185	
6,878.6	6,722.8	6,879.7	6,722.8	26.5	24.6	-90.00	-1,205.0	254.8	349.4	300.9	48.45	7.212	
6,900.0	6,744.1	6,900.8	6,743.6	26.5	24.6	-89.48	-1,201.8	254.8	349.4	301.1	48.31	7.233	
7,000.0	6,844.1	6,995.2	6,834.9	26.6	24.2	-85.64	-1,178.3	254.8	350.5	303.5	47.08	7.446	
7,100.0	6,944.1	7,080.7	6,913.3	26.6	23.8	-80.10	-1,144.4	254.8	355.6	310.6	44.97	7.907	
7,200.0	7,042.5	7,161.4	6,981.9	26.4	23.2	-74.51	-1,102.0	254.8	364.5	322.1	42.34	8.609	
7,300.0	7,136.5	7,239.0	7,041.6	26.0	22.5	-69.51	-1,052.5	254.8	375.6	336.0	39.61	9.483	
7,400.0	7,223.3	7,314.2	7,092.5	25.4	21.8	-65.22	-997.3	254.8	387.7	350.7	37.02	10.474	
7,500.0	7,300.1	7,387.5	7,134.9	24.6	21.1	-61.65	-937.5	254.8	399.7	364.9	34.72	11.512	
7,600.0	7,364.7	7,459.5	7,168.7	23.7	20.3	-58.82	-874.0	254.8	410.4	377.6	32.79	12.516	
7,700.0	7,415.1	7,530.4	7,194.0	22.8	19.5	-56.71	-807.8	254.8	419.2	387.9	31.30	13.396	
7,800.0	7,449.7	7,600.0	7,210.6	21.8	18.8	-55.30	-740.3	254.8	425.6	395.3	30.27	14.061	
7,900.0	7,467.6	7,670.4	7,219.0	20.9	18.1	-54.55	-670.4	254.8	429.0	399.4	29.68	14.453	
8,000.0	7,470.0	7,755.9	7,220.0	20.1	17.3	-54.42	-585.0	254.8	429.7	400.7	28.94	14.845	
8,100.0	7,470.0	7,855.9	7,220.0	19.5	16.6	-54.42	-485.0	254.8	429.7	401.8	27.84	15.436	
8,200.0	7,470.0	7,955.9	7,220.0	18.9	15.9	-54.42	-385.0	254.8	429.7	402.7	26.99	15.922	
8,300.0	7,470.0	8,055.9	7,220.0	18.6	15.5	-54.42	-285.0	254.8	429.7	403.2	26.42	16.263	
8,400.0	7,470.0	8,155.9	7,220.0	18.3	15.2	-54.42	-185.0	254.8	429.7	403.5	26.16	16.427	
8,500.0	7,470.0	8,255.9	7,220.0	18.3	15.1	-54.42	-85.0	254.8	429.7	403.5	26.20	16.397	
8,600.0	7,470.0	8,355.9	7,220.0	18.4	15.3	-54.42	15.0	254.8	429.7	403.1	26.56	16.177	
8,700.0	7,470.0	8,455.9	7,220.0	18.6	15.6	-54.42	115.0	254.8	429.7	402.5	27.22	15.788	
8,800.0	7,470.0	8,555.9	7,220.0	19.1	16.2	-54.42	215.0	254.8	429.7	401.5	28.15	15.265	
8,900.0	7,470.0	8,655.9	7,220.0	19.7	16.9	-54.42	315.0	254.8	429.7	400.4	29.33	14.650	
9,000.0	7,470.0	8,755.9	7,220.0	20.4	17.7	-54.42	415.0	254.8	429.7	399.0	30.73	13.981	
9,100.0	7,470.0	8,855.9	7,220.0	21.3	18.7	-54.42	515.0	254.8	429.7	397.4	32.33	13.291	
9,200.0	7,470.0	8,955.9	7,220.0	22.2	19.7	-54.42	615.0	254.8	429.7	395.6	34.09	12.603	
9,300.0	7,470.0	9,055.9	7,220.0	23.3	20.9	-54.42	715.0	254.8	429.7	393.7	36.00	11.937	
9,400.0	7,470.0	9,155.9	7,220.0	24.4	22.2	-54.42	815.0	254.8	429.7	391.7	38.02	11.301	
9,500.0	7,470.0	9,255.9	7,220.0	25.6	23.5	-54.42	915.0	254.8	429.7	389.6	40.15	10.702	
9,600.0	7,470.0	9,355.9	7,220.0	26.9	24.8	-54.43	1,015.0	254.8	429.7	387.4	42.37	10.143	
9,700.0	7,470.0	9,455.9	7,220.0	28.2	26.2	-54.43	1,115.0	254.8	429.7	385.1	44.65	9.624	
9,800.0	7,470.0	9,555.9	7,220.0	29.5	27.7	-54.43	1,215.0	254.8	429.7	382.7	47.01	9.142	
9,900.0	7,470.0	9,655.9	7,220.0	30.9	29.2	-54.43	1,315.0	254.8	429.7	380.3	49.41	8.697	
10,000.0	7,470.0	9,755.9	7,220.0	32.4	30.7	-54.43	1,415.0	254.8	429.7	377.9	51.86	8.286	
10,100.0	7,470.0	9,855.9	7,220.0	33.8	32.2	-54.43	1,515.0	254.8	429.8	375.4	54.35	7.907	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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			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		
10,200.0	7,470.0	9,955.9	7,220.0	35.3	33.8	-54.43	1,615.0	254.8	429.8	372.9	56.88	7.555		
10,300.0	7,470.0	10,055.9	7,220.0	36.8	35.4	-54.43	1,715.0	254.8	429.8	370.3	59.44	7.230		
10,400.0	7,470.0	10,155.9	7,220.0	38.4	37.0	-54.43	1,815.0	254.8	429.8	367.7	62.02	6.929		
10,500.0	7,470.0	10,255.9	7,220.0	39.9	38.6	-54.43	1,915.0	254.8	429.8	365.1	64.63	6.650		
10,600.0	7,470.0	10,355.9	7,220.0	41.5	40.2	-54.43	2,015.0	254.8	429.8	362.5	67.26	6.390		
10,700.0	7,470.0	10,455.9	7,220.0	43.1	41.8	-54.43	2,115.0	254.8	429.8	359.9	69.90	6.148		
10,800.0	7,470.0	10,555.9	7,220.0	44.7	43.4	-54.43	2,215.0	254.8	429.8	357.2	72.57	5.922		
10,900.0	7,470.0	10,655.9	7,220.0	46.3	45.1	-54.43	2,315.0	254.8	429.8	354.5	75.25	5.712		
11,000.0	7,470.0	10,755.9	7,220.0	47.9	46.7	-54.43	2,415.0	254.8	429.8	351.9	77.94	5.515		
11,100.0	7,470.0	10,855.9	7,220.0	49.5	48.4	-54.43	2,515.0	254.8	429.8	349.2	80.64	5.330		
11,200.0	7,470.0	10,955.9	7,220.0	51.2	50.1	-54.43	2,615.0	254.8	429.8	346.4	83.35	5.156		
11,300.0	7,470.0	11,055.9	7,220.0	52.8	51.8	-54.43	2,715.0	254.8	429.8	343.7	86.08	4.993		
11,400.0	7,470.0	11,155.9	7,220.0	54.4	53.4	-54.43	2,815.0	254.8	429.8	341.0	88.81	4.840		
11,500.0	7,470.0	11,255.9	7,220.0	56.1	55.1	-54.43	2,915.0	254.8	429.8	338.3	91.55	4.695		
11,600.0	7,470.0	11,355.9	7,220.0	57.8	56.8	-54.43	3,015.0	254.8	429.8	335.5	94.30	4.558		
11,700.0	7,470.0	11,455.9	7,220.0	59.4	58.5	-54.43	3,115.0	254.8	429.8	332.8	97.05	4.429		
11,800.0	7,470.0	11,555.9	7,220.0	61.1	60.2	-54.44	3,215.0	254.8	429.8	330.0	99.81	4.306		
11,900.0	7,470.0	11,655.9	7,220.0	62.8	61.9	-54.44	3,315.0	254.8	429.8	327.3	102.58	4.190		
12,000.0	7,470.0	11,755.9	7,220.0	64.5	63.6	-54.44	3,415.0	254.8	429.8	324.5	105.35	4.080		
12,100.0	7,470.0	11,855.9	7,220.0	66.1	65.3	-54.44	3,515.0	254.8	429.8	321.7	108.13	3.975		
12,200.0	7,470.0	11,955.9	7,220.0	67.8	67.0	-54.44	3,615.0	254.8	429.9	318.9	110.91	3.876		
12,214.6	7,470.0	11,970.5	7,220.0	68.1	67.3	-54.44	3,629.7	254.8	429.9	318.5	111.31	3.862 SF		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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	92.07	-0.4	10.1	10.1					
100.0	100.0	100.0	100.0	0.1	0.1	92.07	-0.4	10.1	10.1	9.8	0.24	41.248		
200.0	200.0	200.0	200.0	0.3	0.3	92.07	-0.4	10.1	10.1	9.5	0.59	16.984	CC, ES	
300.0	300.0	299.7	299.7	0.5	0.5	98.83	-1.7	11.1	11.3	10.3	0.94	11.969		
400.0	400.0	399.3	399.2	0.6	0.7	-45.85	-5.8	14.3	14.2	12.9	1.30	10.953		
500.0	499.8	498.8	498.2	0.8	0.9	-42.08	-12.6	19.7	17.8	16.1	1.67	10.671		
600.0	599.5	598.1	596.8	1.1	1.2	-41.09	-22.1	27.1	21.8	19.7	2.06	10.584		
700.0	698.7	697.3	694.8	1.3	1.5	-41.64	-34.3	36.6	26.1	23.7	2.49	10.516		
800.0	797.5	796.3	792.0	1.6	1.8	-43.06	-49.1	48.2	30.9	27.9	2.97	10.395		
900.0	895.6	895.2	888.4	2.0	2.3	-44.95	-66.5	61.8	36.1	32.5	3.54	10.192		
1,000.0	993.1	994.0	983.8	2.4	2.7	-47.06	-86.5	77.4	41.7	37.5	4.20	9.924		
1,100.0	1,090.2	1,093.4	1,079.2	2.8	3.2	-48.02	-108.6	94.7	48.6	43.7	4.89	9.939		
1,200.0	1,187.3	1,193.1	1,174.8	3.2	3.8	-48.65	-130.9	112.2	55.6	50.0	5.59	9.948		
1,300.0	1,284.5	1,292.9	1,270.5	3.7	4.3	-49.14	-153.1	129.6	62.6	56.3	6.30	9.936		
1,400.0	1,381.6	1,392.6	1,366.2	4.1	4.8	-49.53	-175.4	147.0	69.6	62.6	7.02	9.916		
1,500.0	1,478.7	1,492.4	1,461.8	4.6	5.3	-49.85	-197.7	164.5	76.6	68.9	7.74	9.891		
1,600.0	1,575.9	1,592.1	1,557.5	5.0	5.8	-50.11	-220.0	181.9	83.6	75.1	8.48	9.866		
1,700.0	1,673.0	1,691.9	1,653.1	5.5	6.4	-50.34	-242.3	199.4	90.6	81.4	9.21	9.841		
1,800.0	1,770.1	1,791.6	1,748.8	5.9	6.9	-50.53	-264.6	216.8	97.7	87.7	9.95	9.817		
1,900.0	1,867.3	1,891.4	1,844.4	6.4	7.4	-50.70	-286.9	234.2	104.7	94.0	10.69	9.795		
2,000.0	1,964.4	1,991.1	1,940.1	6.8	7.9	-50.84	-309.2	251.7	111.7	100.3	11.43	9.774		
2,100.0	2,061.5	2,090.9	2,035.7	7.2	8.5	-50.97	-331.5	269.1	118.7	106.5	12.17	9.754		
2,200.0	2,158.7	2,190.6	2,131.4	7.7	9.0	-51.08	-353.8	286.6	125.7	112.8	12.92	9.736		
2,300.0	2,255.8	2,290.4	2,227.0	8.1	9.5	-51.18	-376.1	304.0	132.8	119.1	13.66	9.719		
2,400.0	2,352.9	2,390.1	2,322.7	8.6	10.1	-51.28	-398.4	321.5	139.8	125.4	14.41	9.703		
2,500.0	2,450.1	2,489.9	2,418.3	9.0	10.6	-51.36	-420.7	338.9	146.8	131.7	15.15	9.688		
2,600.0	2,547.2	2,589.7	2,514.0	9.5	11.1	-51.43	-443.0	356.3	153.8	137.9	15.90	9.674		
2,700.0	2,644.4	2,689.4	2,609.6	9.9	11.6	-51.50	-465.3	373.8	160.9	144.2	16.65	9.661		
2,800.0	2,741.5	2,789.2	2,705.3	10.4	12.2	-51.56	-487.6	391.2	167.9	150.5	17.40	9.649		
2,900.0	2,838.6	2,888.9	2,800.9	10.8	12.7	-51.62	-509.9	408.7	174.9	156.8	18.15	9.638		
3,000.0	2,935.8	2,988.7	2,896.6	11.3	13.2	-51.68	-532.1	426.1	181.9	163.0	18.90	9.628		
3,100.0	3,032.9	3,088.4	2,992.2	11.7	13.8	-51.72	-554.4	443.5	189.0	169.3	19.65	9.618		
3,200.0	3,130.0	3,188.2	3,087.9	12.2	14.3	-51.77	-576.7	461.0	196.0	175.6	20.40	9.609		
3,300.0	3,227.2	3,287.9	3,183.5	12.6	14.8	-51.81	-599.0	478.4	203.0	181.9	21.15	9.600		
3,400.0	3,324.3	3,387.7	3,279.2	13.1	15.4	-51.85	-621.3	495.9	210.0	188.1	21.90	9.592		
3,500.0	3,421.4	3,487.4	3,374.9	13.6	15.9	-51.89	-643.6	513.3	217.1	194.4	22.65	9.584		
3,600.0	3,518.6	3,587.2	3,470.5	14.0	16.4	-51.93	-665.9	530.7	224.1	200.7	23.40	9.577		
3,700.0	3,615.7	3,686.9	3,566.2	14.5	16.9	-51.96	-688.2	548.2	231.1	207.0	24.15	9.570		
3,800.0	3,712.8	3,786.7	3,661.8	14.9	17.5	-51.99	-710.5	565.6	238.1	213.2	24.90	9.563		
3,900.0	3,810.0	3,886.4	3,757.5	15.4	18.0	-52.02	-732.8	583.1	245.2	219.5	25.65	9.557		
4,000.0	3,907.1	3,986.2	3,853.1	15.8	18.5	-52.05	-755.1	600.5	252.2	225.8	26.41	9.551		
4,100.0	4,004.2	4,085.9	3,948.8	16.3	19.1	-52.07	-777.4	618.0	259.2	232.1	27.16	9.545		
4,200.0	4,101.4	4,185.7	4,044.4	16.7	19.6	-52.10	-799.7	635.4	266.2	238.3	27.91	9.540		
4,300.0	4,198.5	4,285.5	4,140.1	17.2	20.1	-52.12	-822.0	652.8	273.3	244.6	28.66	9.535		
4,400.0	4,295.6	4,385.2	4,235.7	17.6	20.7	-52.14	-844.3	670.3	280.3	250.9	29.41	9.530		
4,500.0	4,392.8	4,485.0	4,331.4	18.1	21.2	-52.16	-866.6	687.7	287.3	257.2	30.16	9.525		
4,600.0	4,489.9	4,584.7	4,427.0	18.5	21.7	-52.18	-888.9	705.2	294.4	263.4	30.92	9.521		
4,700.0	4,587.0	4,684.5	4,522.7	19.0	22.3	-52.20	-911.1	722.6	301.4	269.7	31.67	9.516		
4,800.0	4,684.2	4,784.2	4,618.3	19.4	22.8	-52.22	-933.4	740.0	308.4	276.0	32.42	9.512		
4,900.0	4,781.3	4,884.0	4,714.0	19.9	23.3	-52.24	-955.7	757.5	315.4	282.3	33.17	9.508		
5,000.0	4,878.4	4,983.7	4,809.6	20.3	23.8	-52.25	-978.0	774.9	322.5	288.5	33.93	9.504		
5,100.0	4,975.6	5,083.5	4,905.3	20.8	24.4	-52.27	-1,000.3	792.4	329.5	294.8	34.68	9.501		

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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	
5,200.0	5,072.7	5,183.2	5,000.9	21.2	24.9	-52.29	-1,022.6	809.8	336.5	301.1	35.43	9.497	
5,300.0	5,169.9	5,283.0	5,096.6	21.7	25.4	-52.30	-1,044.9	827.2	343.5	307.4	36.18	9.494	
5,400.0	5,267.0	5,382.7	5,192.3	22.1	26.0	-52.31	-1,067.2	844.7	350.6	313.6	36.94	9.491	
5,500.0	5,364.1	5,482.5	5,287.9	22.6	26.5	-52.33	-1,089.5	862.1	357.6	319.9	37.69	9.488	
5,600.0	5,461.3	5,582.2	5,383.6	23.0	27.0	-52.34	-1,111.8	879.6	364.6	326.2	38.44	9.485	
5,700.0	5,558.4	5,692.3	5,489.6	23.5	27.5	-52.56	-1,134.9	897.6	370.3	331.0	39.30	9.424	
5,800.0	5,655.5	5,802.9	5,597.3	23.9	28.0	-53.20	-1,154.9	913.3	373.1	332.8	40.32	9.254	
5,900.0	5,752.7	5,913.3	5,705.6	24.4	28.4	-54.28	-1,171.5	926.3	373.2	331.7	41.52	8.989	
6,000.0	5,849.8	6,023.2	5,814.2	24.8	28.7	-55.76	-1,184.8	936.7	370.7	327.8	42.86	8.649	
6,100.0	5,947.6	6,132.6	5,922.9	25.2	28.9	-57.30	-1,194.8	944.5	367.2	323.1	44.11	8.325	
6,200.0	6,046.0	6,241.6	6,031.6	25.5	29.1	-58.83	-1,201.5	949.7	363.2	317.9	45.25	8.025	
6,300.0	6,145.0	6,350.2	6,140.1	25.8	29.2	-60.34	-1,204.9	952.4	358.7	312.4	46.29	7.748	
6,400.0	6,244.5	6,454.6	6,244.5	26.0	29.3	-61.75	-1,205.4	952.8	353.8	306.7	47.19	7.498	
6,500.0	6,344.2	6,554.4	6,344.2	26.2	29.4	-62.73	-1,205.4	952.8	350.5	302.7	47.83	7.327	
6,600.0	6,444.1	6,654.3	6,444.1	26.3	29.4	-63.23	-1,205.4	952.8	348.8	300.6	48.23	7.233	
6,680.4	6,524.5	6,734.7	6,524.5	26.4	29.5	-63.37	-1,205.4	952.8	348.4	300.0	48.41	7.196	
6,700.0	6,544.1	6,754.3	6,544.1	26.4	29.5	90.06	-1,205.4	952.8	348.6	300.2	48.42	7.199	
6,800.0	6,644.1	6,854.3	6,644.1	26.4	29.6	90.06	-1,205.4	952.8	348.6	300.0	48.59	7.174	
6,831.2	6,675.4	6,885.5	6,675.3	26.5	29.6	89.94	-1,204.7	952.8	348.6	299.9	48.66	7.163	
6,900.0	6,744.1	6,953.4	6,742.8	26.5	29.5	88.74	-1,197.3	952.8	348.7	299.5	49.12	7.098	
7,000.0	6,844.1	7,047.1	6,833.5	26.6	29.2	84.95	-1,174.2	952.8	350.1	299.8	50.33	6.957	
7,100.0	6,944.1	7,132.1	6,911.5	26.6	28.8	79.46	-1,140.7	952.8	355.6	304.0	51.67	6.883	
7,200.0	7,042.5	7,212.4	6,980.0	26.4	28.4	73.91	-1,098.7	952.8	364.8	312.7	52.12	7.000	
7,300.0	7,136.5	7,289.8	7,039.7	26.0	27.8	68.98	-1,049.7	952.8	376.2	324.8	51.40	7.319	
7,400.0	7,223.3	7,364.7	7,090.8	25.4	27.3	64.75	-994.9	952.8	388.3	338.8	49.57	7.834	
7,500.0	7,300.1	7,437.9	7,133.3	24.6	26.7	61.27	-935.4	952.9	400.2	353.4	46.81	8.549	
7,600.0	7,364.7	7,509.8	7,167.4	23.7	26.1	58.51	-872.2	952.9	410.8	367.4	43.39	9.468	
7,700.0	7,415.1	7,580.6	7,193.0	22.8	25.5	56.48	-806.2	952.9	419.4	379.8	39.61	10.587	
7,800.0	7,449.7	7,650.0	7,210.0	21.8	24.9	55.14	-739.0	952.9	425.4	389.6	35.86	11.864	
7,900.0	7,467.6	7,720.5	7,218.8	20.9	24.4	54.46	-669.1	952.9	428.6	396.1	32.49	13.192	
8,000.0	7,470.0	7,804.5	7,220.0	20.1	23.8	54.36	-585.1	953.0	429.1	398.6	30.42	14.103	
8,100.0	7,470.0	7,904.5	7,220.0	19.5	23.2	54.36	-485.1	953.0	429.1	399.7	29.38	14.605	
8,200.0	7,470.0	8,004.5	7,220.0	18.9	22.8	54.37	-385.1	953.0	429.1	400.5	28.58	15.012	
8,300.0	7,470.0	8,104.5	7,220.0	18.6	22.4	54.37	-285.1	953.0	429.1	401.1	28.06	15.294	
8,400.0	7,470.0	8,204.5	7,220.0	18.3	22.2	54.37	-185.1	953.1	429.1	401.3	27.82	15.426	
8,500.0	7,470.0	8,304.5	7,220.0	18.3	22.1	54.37	-85.1	953.1	429.2	401.3	27.87	15.397	
8,600.0	7,470.0	8,404.5	7,220.0	18.4	22.2	54.37	14.9	953.1	429.2	401.0	28.22	15.210	
8,700.0	7,470.0	8,504.5	7,220.0	18.6	22.4	54.37	114.9	953.2	429.2	400.4	28.84	14.881	
8,800.0	7,470.0	8,604.5	7,220.0	19.1	22.7	54.38	214.9	953.2	429.2	399.5	29.73	14.437	
8,900.0	7,470.0	8,704.5	7,220.0	19.7	23.2	54.38	314.9	953.2	429.2	398.4	30.86	13.909	
9,000.0	7,470.0	8,804.5	7,220.0	20.4	23.8	54.38	414.9	953.2	429.3	397.1	32.21	13.329	
9,100.0	7,470.0	8,904.5	7,220.0	21.3	24.5	54.38	514.9	953.3	429.3	395.5	33.74	12.723	
9,200.0	7,470.0	9,004.5	7,220.0	22.2	25.3	54.38	614.9	953.3	429.3	393.9	35.44	12.114	
9,300.0	7,470.0	9,104.5	7,220.0	23.3	26.3	54.39	714.9	953.3	429.3	392.0	37.28	11.516	
9,400.0	7,470.0	9,204.5	7,220.0	24.4	27.3	54.39	814.9	953.4	429.3	390.1	39.24	10.940	
9,500.0	7,470.0	9,304.5	7,220.0	25.6	28.3	54.39	914.9	953.4	429.3	388.0	41.31	10.392	
9,600.0	7,470.0	9,404.5	7,220.0	26.9	29.5	54.39	1,014.9	953.4	429.4	385.9	43.47	9.877	
9,700.0	7,470.0	9,504.5	7,220.0	28.2	30.7	54.39	1,114.9	953.5	429.4	383.7	45.71	9.394	
9,800.0	7,470.0	9,604.5	7,220.0	29.5	32.0	54.39	1,214.9	953.5	429.4	381.4	48.01	8.944	
9,900.0	7,470.0	9,704.5	7,220.0	30.9	33.3	54.40	1,314.9	953.5	429.4	379.0	50.37	8.525	
10,000.0	7,470.0	9,804.5	7,220.0	32.4	34.6	54.40	1,414.9	953.5	429.4	376.7	52.78	8.136	
10,100.0	7,470.0	9,904.5	7,220.0	33.8	36.0	54.40	1,514.9	953.6	429.5	374.2	55.24	7.775	

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

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4G-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5048.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4G-36H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	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							
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	7,470.0	10,004.5	7,220.0	35.3	37.4	54.40	1,614.9	953.6	429.5	371.7	57.73	7.440		
10,300.0	7,470.0	10,104.5	7,220.0	36.8	38.8	54.40	1,714.9	953.6	429.5	369.2	60.25	7.128		
10,400.0	7,470.0	10,204.5	7,220.0	38.4	40.3	54.41	1,814.9	953.7	429.5	366.7	62.81	6.839		
10,500.0	7,470.0	10,304.5	7,220.0	39.9	41.8	54.41	1,914.9	953.7	429.5	364.1	65.39	6.569		
10,600.0	7,470.0	10,404.5	7,220.0	41.5	43.3	54.41	2,014.9	953.7	429.6	361.6	67.99	6.318		
10,700.0	7,470.0	10,504.5	7,220.0	43.1	44.8	54.41	2,114.9	953.7	429.6	359.0	70.61	6.084		
10,800.0	7,470.0	10,604.5	7,220.0	44.7	46.3	54.41	2,214.9	953.8	429.6	356.3	73.25	5.865		
10,900.0	7,470.0	10,704.5	7,220.0	46.3	47.9	54.41	2,314.9	953.8	429.6	353.7	75.91	5.660		
11,000.0	7,470.0	10,804.5	7,220.0	47.9	49.4	54.42	2,414.9	953.8	429.6	351.0	78.58	5.467		
11,100.0	7,470.0	10,904.5	7,220.0	49.5	51.0	54.42	2,514.9	953.9	429.6	348.4	81.26	5.287		
11,200.0	7,470.0	11,004.5	7,220.0	51.2	52.6	54.42	2,614.9	953.9	429.7	345.7	83.96	5.117		
11,300.0	7,470.0	11,104.5	7,220.0	52.8	54.2	54.42	2,714.9	953.9	429.7	343.0	86.67	4.958		
11,400.0	7,470.0	11,204.5	7,220.0	54.4	55.8	54.42	2,814.9	954.0	429.7	340.3	89.38	4.807		
11,500.0	7,470.0	11,304.5	7,220.0	56.1	57.4	54.42	2,914.9	954.0	429.7	337.6	92.11	4.665		
11,600.0	7,470.0	11,404.5	7,220.0	57.8	59.1	54.43	3,014.9	954.0	429.7	334.9	94.85	4.531		
11,700.0	7,470.0	11,504.5	7,220.0	59.4	60.7	54.43	3,114.9	954.0	429.8	332.2	97.59	4.404		
11,800.0	7,470.0	11,604.5	7,220.0	61.1	62.3	54.43	3,214.9	954.1	429.8	329.4	100.34	4.283		
11,900.0	7,470.0	11,704.5	7,220.0	62.8	64.0	54.43	3,314.9	954.1	429.8	326.7	103.09	4.169		
12,000.0	7,470.0	11,804.5	7,220.0	64.5	65.6	54.43	3,414.9	954.1	429.8	324.0	105.85	4.060		
12,100.0	7,470.0	11,904.5	7,220.0	66.1	67.3	54.44	3,514.9	954.2	429.8	321.2	108.62	3.957		
12,200.0	7,470.0	12,004.5	7,220.0	67.8	68.9	54.44	3,614.9	954.2	429.8	318.5	111.39	3.859		
12,214.6	7,470.0	12,019.2	7,220.0	68.1	69.2	54.44	3,629.6	954.2	429.9	318.1	111.80	3.845 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 4G-36H  
**Well Error:** 0.0ft  
**Reference Wellbore:** HZ  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well Mumby State 4G-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 4G-36H  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 0.50°

