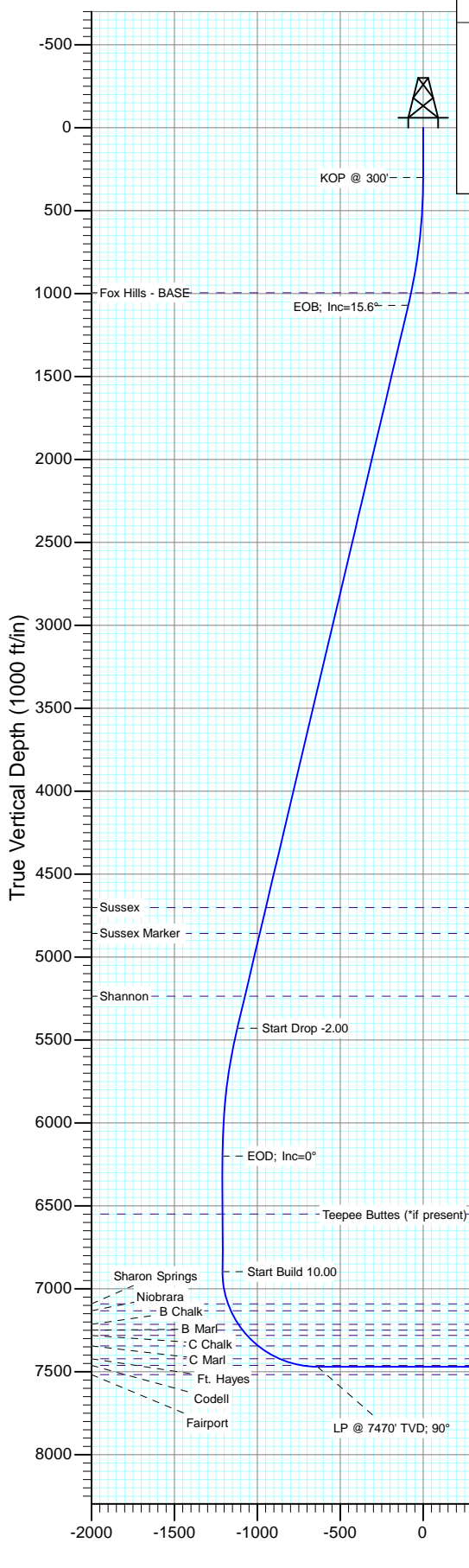
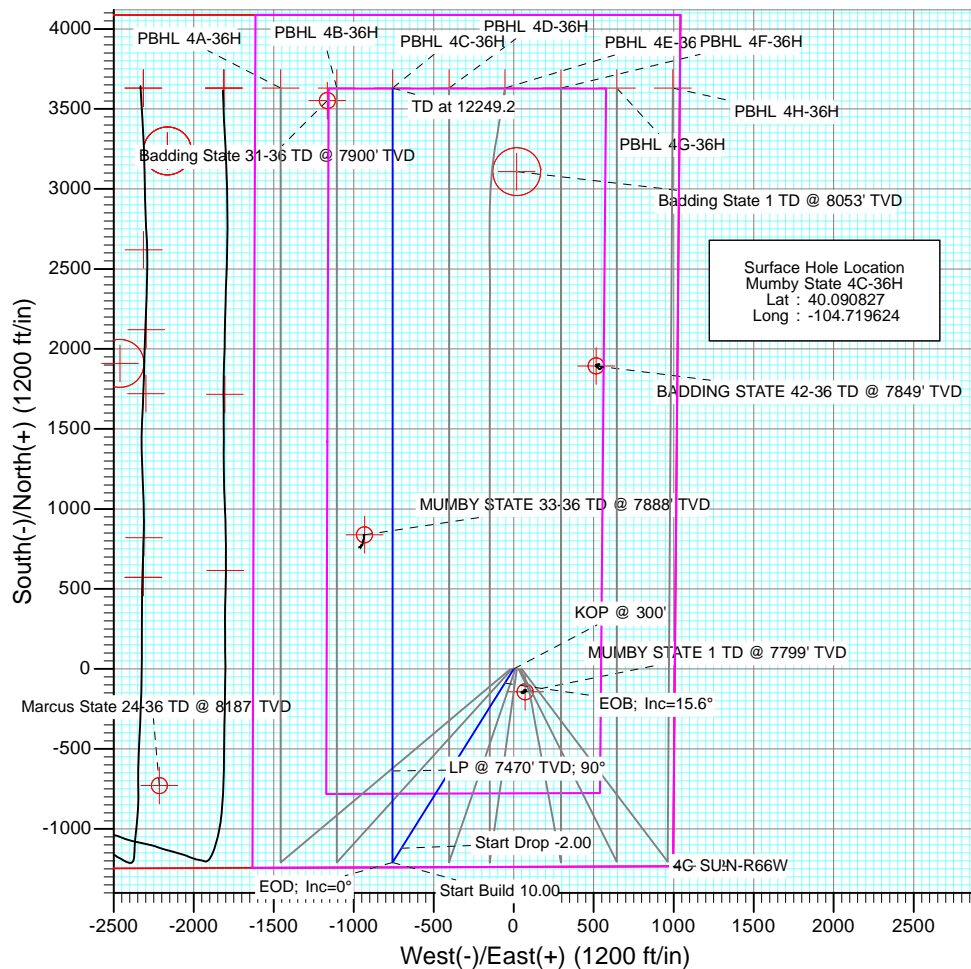




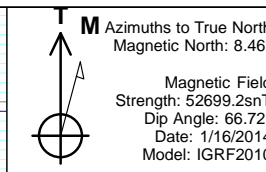
Project: DJ Wattenberg  
Site: S36 T2N-R66W (Marcus State, Mumby State)  
Well: Mumby State 4C-36H  
Wellbore: HZ  
Design: Plan #1



SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		KOP @ 300'
2	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0		EOB; Inc=15.6°
3	1079.8	15.60	212.06	1070.2	-89.4	-56.0	2.00	212.06	-89.4		Start Drop -2.00
4	5606.0	15.60	212.06	5429.8	-1120.6	-702.0	0.00	0.00	-1120.6		EOD; Inc=0°
5	6385.8	0.00	0.00	6200.0	-1210.0	-758.0	2.00	180.00	-1210.0		Start Build 10.00
6	7082.9	0.00	0.00	6897.0	-1210.0	-758.0	0.00	0.00	-1210.0		LP @ 7470' TVD; 90°
7	7982.9	90.00	0.01	7470.0	-637.0	-757.9	10.00	0.01	-637.0	PBHL 4C-36H	TD at 12249.2
8	12249.2	90.00	0.01	7470.0	3629.3	-757.0	0.00	0.00	3629.3		



DESIGN TARGET DETAILS					
Name	+N/-S	+E/-W	Northing	Easting	Latitude
PBHL 4C-36H	3629.3	-757.0	1280518.67	3217548.70	40.100790



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
995.0	1002.0	Fox Hills - BASE
4702.0	4850.4	Sussex
4858.0	5012.4	Sussex Marker
5236.0	5404.8	Shannon
6549.0	6734.8	Teepee Buttes (*if present)
7091.0	7280.7	Sharon Springs
7133.0	7326.1	Niobrara
7214.0	7418.7	B Chalk
7249.0	7461.9	B Marl
7281.0	7503.6	C Chalk
7344.0	7595.6	C Marl
7422.0	7746.7	Ft. Hayes
7462.0	7887.0	Codell

Plan #1  
Mumby State 4C-36H  
WELL @ 5049.0ft (Original Well Elev)  
Ground Elevation @ 5019.0  
North American Datum 1983  
Well Mumby State 4C-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 4C-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4C-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 4C-36H					
Well Position	+N/-S	0.0 ft	Northing:	1,276,896.15 ft	Latitude:	40.090827
	+E/-W	0.0 ft	Easting:	3,218,337.59 ft	Longitude:	-104.719624
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,019.0 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	
1,079.8	15.60	212.06	1,070.2	-89.4	-56.0	2.00	2.00	0.00	212.06	
5,606.0	15.60	212.06	5,429.8	-1,120.6	-702.0	0.00	0.00	0.00	0.00	
6,385.8	0.00	0.00	6,200.0	-1,210.0	-758.0	2.00	-2.00	0.00	180.00	
7,082.9	0.00	0.00	6,897.0	-1,210.0	-758.0	0.00	0.00	0.00	0.00	
7,982.9	90.00	0.01	7,470.0	-637.0	-757.9	10.00	10.00	0.00	0.01	
12,249.2	90.00	0.01	7,470.0	3,629.3	-757.0	0.00	0.00	0.00	0.00	PBHL 4C-36H

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4C-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	212.06	400.0	-1.5	-0.9	-1.5	2.00	2.00	
500.0	4.00	212.06	499.8	-5.9	-3.7	-5.9	2.00	2.00	
600.0	6.00	212.06	599.5	-13.3	-8.3	-13.3	2.00	2.00	
700.0	8.00	212.06	698.7	-23.6	-14.8	-23.6	2.00	2.00	
800.0	10.00	212.06	797.5	-36.9	-23.1	-36.9	2.00	2.00	
900.0	12.00	212.06	895.6	-53.1	-33.2	-53.1	2.00	2.00	
1,000.0	14.00	212.06	993.1	-72.1	-45.2	-72.1	2.00	2.00	
1,002.0	14.04	212.06	995.0	-72.5	-45.4	-72.5	2.00	2.00	Fox Hills - BASE
1,079.8	15.60	212.06	1,070.2	-89.4	-56.0	-89.4	2.00	2.00	EOB; Inc=15.6°
1,100.0	15.60	212.06	1,089.7	-94.0	-58.9	-94.0	0.00	0.00	
1,200.0	15.60	212.06	1,186.0	-116.8	-73.2	-116.8	0.00	0.00	
1,300.0	15.60	212.06	1,282.3	-139.6	-87.4	-139.6	0.00	0.00	
1,400.0	15.60	212.06	1,378.6	-162.3	-101.7	-162.3	0.00	0.00	
1,500.0	15.60	212.06	1,474.9	-185.1	-116.0	-185.1	0.00	0.00	
1,600.0	15.60	212.06	1,571.3	-207.9	-130.2	-207.9	0.00	0.00	
1,700.0	15.60	212.06	1,667.6	-230.7	-144.5	-230.7	0.00	0.00	
1,800.0	15.60	212.06	1,763.9	-253.5	-158.8	-253.5	0.00	0.00	
1,900.0	15.60	212.06	1,860.2	-276.3	-173.1	-276.3	0.00	0.00	
2,000.0	15.60	212.06	1,956.5	-299.0	-187.3	-299.0	0.00	0.00	
2,100.0	15.60	212.06	2,052.8	-321.8	-201.6	-321.8	0.00	0.00	
2,200.0	15.60	212.06	2,149.2	-344.6	-215.9	-344.6	0.00	0.00	
2,300.0	15.60	212.06	2,245.5	-367.4	-230.1	-367.4	0.00	0.00	
2,400.0	15.60	212.06	2,341.8	-390.2	-244.4	-390.2	0.00	0.00	
2,500.0	15.60	212.06	2,438.1	-413.0	-258.7	-413.0	0.00	0.00	
2,600.0	15.60	212.06	2,534.4	-435.7	-273.0	-435.7	0.00	0.00	
2,700.0	15.60	212.06	2,630.8	-458.5	-287.2	-458.5	0.00	0.00	
2,800.0	15.60	212.06	2,727.1	-481.3	-301.5	-481.3	0.00	0.00	
2,900.0	15.60	212.06	2,823.4	-504.1	-315.8	-504.1	0.00	0.00	
3,000.0	15.60	212.06	2,919.7	-526.9	-330.1	-526.9	0.00	0.00	
3,100.0	15.60	212.06	3,016.0	-549.7	-344.3	-549.7	0.00	0.00	
3,200.0	15.60	212.06	3,112.3	-572.4	-358.6	-572.4	0.00	0.00	
3,300.0	15.60	212.06	3,208.7	-595.2	-372.9	-595.2	0.00	0.00	
3,400.0	15.60	212.06	3,305.0	-618.0	-387.1	-618.0	0.00	0.00	
3,500.0	15.60	212.06	3,401.3	-640.8	-401.4	-640.8	0.00	0.00	
3,600.0	15.60	212.06	3,497.6	-663.6	-415.7	-663.6	0.00	0.00	
3,700.0	15.60	212.06	3,593.9	-686.4	-430.0	-686.4	0.00	0.00	
3,800.0	15.60	212.06	3,690.3	-709.1	-444.2	-709.1	0.00	0.00	
3,900.0	15.60	212.06	3,786.6	-731.9	-458.5	-731.9	0.00	0.00	
4,000.0	15.60	212.06	3,882.9	-754.7	-472.8	-754.7	0.00	0.00	
4,100.0	15.60	212.06	3,979.2	-777.5	-487.1	-777.5	0.00	0.00	
4,200.0	15.60	212.06	4,075.5	-800.3	-501.3	-800.3	0.00	0.00	
4,300.0	15.60	212.06	4,171.8	-823.1	-515.6	-823.1	0.00	0.00	
4,400.0	15.60	212.06	4,268.2	-845.8	-529.9	-845.8	0.00	0.00	
4,500.0	15.60	212.06	4,364.5	-868.6	-544.1	-868.6	0.00	0.00	
4,600.0	15.60	212.06	4,460.8	-891.4	-558.4	-891.4	0.00	0.00	
4,700.0	15.60	212.06	4,557.1	-914.2	-572.7	-914.2	0.00	0.00	
4,800.0	15.60	212.06	4,653.4	-937.0	-587.0	-937.0	0.00	0.00	
4,850.4	15.60	212.06	4,702.0	-948.5	-594.2	-948.5	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 4C-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4C-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	15.60	212.06	4,749.8	-959.8	-601.2	-959.8	0.00	0.00	
5,000.0	15.60	212.06	4,846.1	-982.5	-615.5	-982.5	0.00	0.00	
5,012.4	15.60	212.06	4,858.0	-985.4	-617.3	-985.4	0.00	0.00	Sussex Marker
5,100.0	15.60	212.06	4,942.4	-1,005.3	-629.8	-1,005.3	0.00	0.00	
5,200.0	15.60	212.06	5,038.7	-1,028.1	-644.1	-1,028.1	0.00	0.00	
5,300.0	15.60	212.06	5,135.0	-1,050.9	-658.3	-1,050.9	0.00	0.00	
5,400.0	15.60	212.06	5,231.3	-1,073.7	-672.6	-1,073.7	0.00	0.00	
5,404.8	15.60	212.06	5,236.0	-1,074.8	-673.3	-1,074.8	0.00	0.00	Shannon
5,500.0	15.60	212.06	5,327.7	-1,096.5	-686.9	-1,096.5	0.00	0.00	
5,600.0	15.60	212.06	5,424.0	-1,119.2	-701.1	-1,119.2	0.00	0.00	
5,606.0	15.60	212.06	5,429.8	-1,120.6	-702.0	-1,120.6	0.00	0.00	Start Drop -2.00
5,700.0	13.72	212.06	5,520.7	-1,140.8	-714.6	-1,140.8	2.00	-2.00	
5,800.0	11.72	212.06	5,618.2	-1,159.4	-726.3	-1,159.4	2.00	-2.00	
5,900.0	9.72	212.06	5,716.5	-1,175.2	-736.2	-1,175.2	2.00	-2.00	
6,000.0	7.72	212.06	5,815.3	-1,188.0	-744.2	-1,188.0	2.00	-2.00	
6,100.0	5.72	212.06	5,914.6	-1,197.9	-750.4	-1,197.9	2.00	-2.00	
6,200.0	3.72	212.06	6,014.3	-1,204.9	-754.8	-1,204.9	2.00	-2.00	
6,300.0	1.72	212.06	6,114.2	-1,208.9	-757.3	-1,208.9	2.00	-2.00	
6,385.8	0.00	0.00	6,200.0	-1,210.0	-758.0	-1,210.0	2.00	-2.00	EOD; Inc=0°
6,400.0	0.00	0.00	6,214.2	-1,210.0	-758.0	-1,210.0	0.00	0.00	
6,500.0	0.00	0.00	6,314.2	-1,210.0	-758.0	-1,210.0	0.00	0.00	
6,600.0	0.00	0.00	6,414.2	-1,210.0	-758.0	-1,210.0	0.00	0.00	
6,700.0	0.00	0.00	6,514.2	-1,210.0	-758.0	-1,210.0	0.00	0.00	
6,734.8	0.00	0.00	6,549.0	-1,210.0	-758.0	-1,210.0	0.00	0.00	Teepee Buttes (*if present)
6,800.0	0.00	0.00	6,614.2	-1,210.0	-758.0	-1,210.0	0.00	0.00	
6,900.0	0.00	0.00	6,714.2	-1,210.0	-758.0	-1,210.0	0.00	0.00	
7,000.0	0.00	0.00	6,814.2	-1,210.0	-758.0	-1,210.0	0.00	0.00	
7,082.9	0.00	0.00	6,897.0	-1,210.0	-758.0	-1,210.0	0.00	0.00	Start Build 10.00
7,100.0	1.71	0.01	6,914.2	-1,209.7	-758.0	-1,209.7	10.00	10.00	
7,200.0	11.71	0.01	7,013.4	-1,198.1	-758.0	-1,198.1	10.00	10.00	
7,280.7	19.79	0.01	7,091.0	-1,176.2	-758.0	-1,176.2	10.00	10.00	Sharon Springs
7,300.0	21.71	0.01	7,109.0	-1,169.3	-758.0	-1,169.3	10.00	10.00	
7,326.1	24.32	0.01	7,133.0	-1,159.2	-758.0	-1,159.2	10.00	10.00	Niobrara
7,400.0	31.71	0.01	7,198.2	-1,124.5	-758.0	-1,124.5	10.00	10.00	
7,418.7	33.59	0.01	7,214.0	-1,114.3	-758.0	-1,114.3	10.00	10.00	B Chalk
7,461.9	37.90	0.01	7,249.0	-1,089.2	-758.0	-1,089.2	10.00	10.00	B Marl
7,500.0	41.71	0.01	7,278.3	-1,064.7	-758.0	-1,064.7	10.00	10.00	
7,503.6	42.08	0.01	7,281.0	-1,062.3	-758.0	-1,062.3	10.00	10.00	C Chalk
7,595.6	51.27	0.01	7,344.0	-995.5	-758.0	-995.5	10.00	10.00	C Marl
7,600.0	51.71	0.01	7,346.8	-992.0	-758.0	-992.0	10.00	10.00	
7,700.0	61.71	0.01	7,401.6	-908.6	-757.9	-908.6	10.00	10.00	
7,746.7	66.38	0.01	7,422.0	-866.6	-757.9	-866.6	10.00	10.00	Ft. Hayes
7,800.0	71.71	0.01	7,441.1	-816.8	-757.9	-816.8	10.00	10.00	
7,887.0	80.41	0.01	7,462.0	-732.5	-757.9	-732.5	10.00	10.00	Codell
7,900.0	81.71	0.01	7,464.0	-719.6	-757.9	-719.6	10.00	10.00	
7,982.9	90.00	0.01	7,470.0	-637.0	-757.9	-637.0	10.00	10.00	LP @ 7470' TVD; 90°
8,000.0	90.00	0.01	7,470.0	-619.9	-757.9	-619.9	0.00	0.00	
8,100.0	90.00	0.01	7,470.0	-519.9	-757.9	-519.9	0.00	0.00	
8,200.0	90.00	0.01	7,470.0	-419.9	-757.8	-419.9	0.00	0.00	
8,300.0	90.00	0.01	7,470.0	-319.9	-757.8	-319.9	0.00	0.00	
8,400.0	90.00	0.01	7,470.0	-219.9	-757.8	-219.9	0.00	0.00	
8,500.0	90.00	0.01	7,470.0	-119.9	-757.8	-119.9	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 4C-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4C-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	0.01	7,470.0	-19.9	-757.7	-19.9	0.00	0.00	
8,700.0	90.00	0.01	7,470.0	80.1	-757.7	80.1	0.00	0.00	
8,800.0	90.00	0.01	7,470.0	180.1	-757.7	180.1	0.00	0.00	
8,900.0	90.00	0.01	7,470.0	280.1	-757.7	280.1	0.00	0.00	
9,000.0	90.00	0.01	7,470.0	380.1	-757.7	380.1	0.00	0.00	
9,100.0	90.00	0.01	7,470.0	480.1	-757.6	480.1	0.00	0.00	
9,200.0	90.00	0.01	7,470.0	580.1	-757.6	580.1	0.00	0.00	
9,300.0	90.00	0.01	7,470.0	680.1	-757.6	680.1	0.00	0.00	
9,400.0	90.00	0.01	7,470.0	780.1	-757.6	780.1	0.00	0.00	
9,500.0	90.00	0.01	7,470.0	880.1	-757.6	880.1	0.00	0.00	
9,600.0	90.00	0.01	7,470.0	980.1	-757.5	980.1	0.00	0.00	
9,700.0	90.00	0.01	7,470.0	1,080.1	-757.5	1,080.1	0.00	0.00	
9,800.0	90.00	0.01	7,470.0	1,180.1	-757.5	1,180.1	0.00	0.00	
9,900.0	90.00	0.01	7,470.0	1,280.1	-757.5	1,280.1	0.00	0.00	
10,000.0	90.00	0.01	7,470.0	1,380.1	-757.5	1,380.1	0.00	0.00	
10,100.0	90.00	0.01	7,470.0	1,480.1	-757.4	1,480.1	0.00	0.00	
10,200.0	90.00	0.01	7,470.0	1,580.1	-757.4	1,580.1	0.00	0.00	
10,300.0	90.00	0.01	7,470.0	1,680.1	-757.4	1,680.1	0.00	0.00	
10,400.0	90.00	0.01	7,470.0	1,780.1	-757.4	1,780.1	0.00	0.00	
10,500.0	90.00	0.01	7,470.0	1,880.1	-757.3	1,880.1	0.00	0.00	
10,600.0	90.00	0.01	7,470.0	1,980.1	-757.3	1,980.1	0.00	0.00	
10,700.0	90.00	0.01	7,470.0	2,080.1	-757.3	2,080.1	0.00	0.00	
10,800.0	90.00	0.01	7,470.0	2,180.1	-757.3	2,180.1	0.00	0.00	
10,900.0	90.00	0.01	7,470.0	2,280.1	-757.3	2,280.1	0.00	0.00	
11,000.0	90.00	0.01	7,470.0	2,380.1	-757.2	2,380.1	0.00	0.00	
11,100.0	90.00	0.01	7,470.0	2,480.1	-757.2	2,480.1	0.00	0.00	
11,200.0	90.00	0.01	7,470.0	2,580.1	-757.2	2,580.1	0.00	0.00	
11,300.0	90.00	0.01	7,470.0	2,680.1	-757.2	2,680.1	0.00	0.00	
11,400.0	90.00	0.01	7,470.0	2,780.1	-757.2	2,780.1	0.00	0.00	
11,500.0	90.00	0.01	7,470.0	2,880.1	-757.1	2,880.1	0.00	0.00	
11,600.0	90.00	0.01	7,470.0	2,980.1	-757.1	2,980.1	0.00	0.00	
11,700.0	90.00	0.01	7,470.0	3,080.1	-757.1	3,080.1	0.00	0.00	
11,800.0	90.00	0.01	7,470.0	3,180.1	-757.1	3,180.1	0.00	0.00	
11,900.0	90.00	0.01	7,470.0	3,280.1	-757.1	3,280.1	0.00	0.00	
12,000.0	90.00	0.01	7,470.0	3,380.1	-757.0	3,380.1	0.00	0.00	
12,100.0	90.00	0.01	7,470.0	3,480.1	-757.0	3,480.1	0.00	0.00	
12,200.0	90.00	0.01	7,470.0	3,580.1	-757.0	3,580.1	0.00	0.00	
12,249.2	90.00	0.01	7,470.0	3,629.3	-757.0	3,629.3	0.00	0.00	TD at 12249.2

### 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 4C-36H	0.00	0.00	7,470.0	3,629.3	-757.0	1,280,518.67	3,217,548.70	40.100790	-104.722330
- 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 4C-36H
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Project:</b>	DJ Wattenberg	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>North Reference:</b>	True
<b>Well:</b>	Mumby State 4C-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 (°)
1,002.0	995.0	Fox Hills - BASE			
4,850.4	4,702.0	Sussex			
5,012.4	4,858.0	Sussex Marker			
5,404.8	5,236.0	Shannon			
6,734.8	6,549.0	Teepee Buttes (*if present)			
7,280.7	7,091.0	Sharon Springs			
7,326.1	7,133.0	Niobrara			
7,418.7	7,214.0	B Chalk			
7,461.9	7,249.0	B Marl			
7,503.6	7,281.0	C Chalk			
7,595.6	7,344.0	C Marl			
7,746.7	7,422.0	Ft. Hayes			
7,887.0	7,462.0	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'
1,079.8	1,070.2	-89.4	-56.0	EOB; Inc=15.6°
5,606.0	5,429.8	-1,120.6	-702.0	Start Drop -2.00
6,385.8	6,200.0	-1,210.0	-758.0	EOD; Inc=0°
7,082.9	6,897.0	-1,210.0	-758.0	Start Build 10.00
7,982.9	7,470.0	-637.0	-757.9	LP @ 7470' TVD; 90°
12,249.2	7,470.0	3,629.3	-757.0	TD at 12249.2

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

**DJ Wattenberg**

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

**Mumby State 4C-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 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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	12,249.2	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 -	12,171.9	7,474.0	407.8	328.9	5.163	CC, ES
BADDING STATE 31-36 (EXISTING) - ENCANA WELL -	12,200.0	7,474.0	408.8	329.3	5.144	SF
BADDING STATE 42-36 (EXISTING) - ENCANA WELL -						Out of range
BALLANTYNE WW 01-18D (EXISTING) - NOBLE WELL						Out of range
Marcus State 3A-36H - HZ - FINAL						Out of range
Marcus State 3B-36H - HZ - FINAL						Out of range
Marcus State 3C-36H - HZ - FINAL						Out of range
Marcus State 3D-36H - HZ - FINAL						Out of range
Marcus State 3E-36H - HZ - FINAL						Out of range
Marcus State 3F-36H - HZ - FINAL						Out of range
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	1,047.7	1,043.3	127.6	124.1	36.221	CC, ES
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	1,300.0	1,284.2	147.5	142.8	31.560	SF
MUMBY STATE 33-36 (EXISTING) - ENCANA WELL - G	9,458.4	7,476.9	178.4	149.3	6.147	CC, ES, SF
Mumby State 4A-36H - HZ - Plan #1	200.0	200.0	19.9	19.3	33.475	CC, ES
Mumby State 4A-36H - HZ - Plan #1	1,200.0	1,186.6	78.1	72.0	12.685	SF
Mumby State 4B-36H - HZ - Plan #1	235.6	234.6	9.8	9.1	13.676	CC, ES
Mumby State 4B-36H - HZ - Plan #1	12,249.2	12,051.5	429.3	317.2	3.831	SF
Mumby State 4D-36H - HZ - Plan #1	300.0	299.0	10.1	9.1	10.714	CC, ES
Mumby State 4D-36H - HZ - Plan #1	12,249.2	11,971.1	431.6	319.8	3.863	SF
Mumby State 4E-36H - HZ - Plan #1	300.0	299.0	20.1	19.2	21.417	CC, ES
Mumby State 4E-36H - HZ - Plan #1	500.0	498.8	24.5	22.8	14.862	SF
Mumby State 4F-36H - HZ - Plan #1	300.0	299.0	30.2	29.3	32.122	CC, ES
Mumby State 4F-36H - HZ - Plan #1	700.0	698.0	49.0	46.5	19.838	SF
Mumby State 4G-36H - HZ - Plan #1	300.0	299.0	40.0	39.1	42.531	CC, ES
Mumby State 4G-36H - HZ - Plan #1	700.0	694.7	67.1	64.6	26.313	SF
Mumby State 4H-36H - HZ - Plan #1	200.0	199.0	50.1	49.5	84.653	CC, ES
Mumby State 4H-36H - HZ - Plan #1	700.0	689.1	91.7	89.1	35.351	SF



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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

<b>Offset Design</b> S36 T2N-R66W (Marcus State, Mumby State) - BADDING STATE 31-36 (EXISTING) - ENCANA WELL													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD													<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
11,900.0	7,470.0	7,474.0	7,474.0	62.7	13.0	-90.00	3,552.1	-1,164.8	490.2	415.8	74.36	6.592		
12,000.0	7,470.0	7,474.0	7,474.0	64.4	13.0	-90.00	3,552.1	-1,164.8	442.6	366.5	76.06	5.819		
12,100.0	7,470.0	7,474.0	7,474.0	66.1	13.0	-90.00	3,552.1	-1,164.8	414.1	336.4	77.76	5.326		
12,171.9	7,470.0	7,474.0	7,474.0	67.3	13.0	-90.00	3,552.1	-1,164.8	407.8	328.9	78.99	5.163 CC, ES		
12,200.0	7,470.0	7,474.0	7,474.0	67.7	13.0	-90.00	3,552.1	-1,164.8	408.8	329.3	79.47	5.144 SF		
12,249.2	7,470.0	7,474.0	7,474.0	68.6	13.0	-90.00	3,552.1	-1,164.8	415.1	334.8	80.31	5.169		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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		Highside Tooface (")	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.0	0.0	3.9	3.9	0.0	0.0	162.22	-145.7	46.7	153.0					
100.0	100.0	102.1	102.1	0.1	0.1	162.06	-146.2	47.3	153.7	153.5	0.20	768.607		
200.0	200.0	204.5	204.5	0.3	0.2	161.70	-146.3	48.4	154.1	153.6	0.46	331.965		
220.8	220.8	224.8	224.8	0.3	0.2	161.61	-146.2	48.6	154.0	153.5	0.52	297.337		
300.0	300.0	302.1	302.1	0.5	0.3	161.26	-146.3	49.7	154.5	153.8	0.72	213.454		
400.0	400.0	401.4	401.3	0.6	0.3	-51.72	-147.3	51.2	154.9	153.9	0.99	156.764		
500.0	499.8	501.2	501.2	0.8	0.4	-53.61	-148.6	52.6	153.5	152.2	1.26	121.686		
600.0	599.5	601.2	601.1	1.1	0.5	-56.50	-150.0	53.6	150.1	148.6	1.55	96.548		
700.0	698.7	700.7	700.7	1.3	0.6	-60.77	-151.1	54.6	145.2	143.3	1.89	77.008		
800.0	797.5	801.7	801.6	1.6	0.7	-67.00	-151.2	55.8	138.9	136.6	2.27	61.068		
900.0	895.6	899.5	899.4	2.0	0.8	-74.75	-151.0	56.1	132.6	129.9	2.73	48.570		
1,000.0	993.1	997.6	997.5	2.4	0.9	-84.55	-150.6	56.3	128.3	125.0	3.26	39.404		
1,047.7	1,039.3	1,043.3	1,043.2	2.6	0.9	-89.86	-150.2	56.5	127.6	124.1	3.52	36.221 CC, ES		
1,100.0	1,089.7	1,093.0	1,092.9	2.9	0.9	-96.05	-149.7	56.9	128.5	124.7	3.80	33.809		
1,200.0	1,186.0	1,187.9	1,187.8	3.3	1.0	-107.23	-149.5	58.2	135.4	131.1	4.28	31.640		
1,300.0	1,282.3	1,284.2	1,284.1	3.8	1.1	-116.83	-150.2	59.7	147.5	142.8	4.67	31.560 SF		
1,400.0	1,378.6	1,381.8	1,381.7	4.3	1.2	-124.85	-151.3	60.7	162.8	157.8	5.00	32.571		
1,500.0	1,474.9	1,478.6	1,478.5	4.8	1.3	-131.57	-151.9	61.2	180.2	174.9	5.27	34.200		
1,600.0	1,571.3	1,575.1	1,575.0	5.3	1.4	-137.37	-151.6	61.3	199.6	194.1	5.49	36.330		
1,700.0	1,667.6	1,671.7	1,671.6	5.8	1.5	-142.27	-150.8	61.1	220.6	214.9	5.69	38.732		
1,800.0	1,763.9	1,767.5	1,767.3	6.3	1.5	-146.36	-149.7	60.7	242.8	236.9	5.88	41.269		
1,900.0	1,860.2	1,862.7	1,862.5	6.8	1.6	-149.60	-149.2	60.8	266.2	260.1	6.08	43.796		
2,000.0	1,956.5	1,961.5	1,961.3	7.3	1.7	-152.19	-149.6	61.6	290.3	284.0	6.29	46.175		
2,100.0	2,052.8	2,059.0	2,058.9	7.8	1.8	-154.44	-150.2	61.1	313.8	307.3	6.49	48.324		
2,200.0	2,149.2	2,154.3	2,154.1	8.3	1.9	-156.48	-149.9	60.4	338.0	331.3	6.69	50.491		
2,300.0	2,245.5	2,251.0	2,250.8	8.8	2.0	-158.35	-149.1	59.6	362.8	355.9	6.89	52.632		
2,400.0	2,341.8	2,348.5	2,348.3	9.3	2.0	-159.93	-148.9	58.7	387.4	380.3	7.10	54.577		
2,500.0	2,438.1	2,442.9	2,442.7	9.8	2.1	-161.28	-148.7	57.9	412.4	405.1	7.31	56.412		
2,600.0	2,534.4	2,538.6	2,538.4	10.3	2.2	-162.49	-148.0	57.6	438.2	430.7	7.52	58.242		
2,700.0	2,630.8	2,638.6	2,638.5	10.8	2.3	-163.54	-148.3	57.1	463.5	455.7	7.75	59.809		
2,800.0	2,727.1	2,732.9	2,732.7	11.3	2.4	-164.44	-148.6	56.5	488.7	480.8	7.97	61.284		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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 33-36 (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							
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	
9,000.0	7,470.0	7,475.5	7,474.0	21.7	6.6	-90.01	838.5	-935.9	491.8	467.9	23.93	20.551		
9,100.0	7,470.0	7,475.8	7,474.3	22.4	6.6	-90.11	838.5	-935.9	400.3	375.4	24.86	16.102		
9,200.0	7,470.0	7,476.1	7,474.6	23.3	6.6	-90.21	838.5	-935.9	313.9	288.0	25.90	12.120		
9,300.0	7,470.0	7,476.4	7,475.0	24.3	6.6	-90.31	838.5	-935.9	238.5	211.5	27.04	8.820		
9,400.0	7,470.0	7,476.7	7,475.3	25.3	6.6	-90.41	838.5	-935.9	187.7	159.4	28.26	6.640		
9,458.4	7,470.0	7,476.9	7,475.5	26.0	6.6	-90.47	838.5	-935.9	178.4	149.3	29.02	6.147	CC, ES, SF	
9,500.0	7,470.0	7,477.1	7,475.6	26.4	6.6	-90.51	838.5	-935.9	183.2	153.6	29.55	6.197		
9,600.0	7,470.0	7,477.4	7,475.9	27.6	6.6	-90.62	838.5	-935.9	227.8	196.9	30.90	7.370		
9,700.0	7,470.0	7,477.7	7,476.2	28.9	6.6	-90.72	838.5	-935.9	300.3	268.0	32.30	9.298		
9,800.0	7,470.0	7,478.0	7,476.6	30.2	6.6	-90.82	838.5	-935.9	385.4	351.7	33.74	11.423		
9,900.0	7,470.0	7,478.3	7,476.9	31.5	6.6	-90.93	838.5	-935.9	476.3	441.1	35.21	13.526		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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							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	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	CC, ES	
300.0	300.0	299.4	299.4	0.5	0.5	-93.00	-1.1	-21.2	21.2	20.3	0.94	22.539		
400.0	400.0	398.7	398.6	0.6	0.7	50.89	-4.4	-25.1	24.4	23.1	1.30	18.812		
500.0	499.8	497.9	497.3	0.8	0.9	49.50	-10.0	-31.7	28.4	26.7	1.67	17.002		
600.0	599.5	596.9	595.6	1.1	1.2	49.88	-17.7	-40.9	33.0	31.0	2.07	15.943		
700.0	698.7	695.7	693.2	1.3	1.5	51.36	-27.6	-52.6	38.4	35.9	2.53	15.192		
800.0	797.5	794.3	790.1	1.6	1.8	53.47	-39.6	-66.8	44.4	41.4	3.05	14.550		
900.0	895.6	892.7	886.0	2.0	2.3	55.88	-53.7	-83.6	51.3	47.6	3.68	13.937		
1,000.0	993.1	991.0	981.0	2.4	2.7	58.38	-69.9	-102.9	59.0	54.5	4.42	13.340		
1,100.0	1,089.7	1,089.0	1,074.8	2.9	3.3	60.82	-88.1	-124.5	67.6	62.3	5.28	12.796		
1,200.0	1,186.0	1,186.6	1,167.2	3.3	3.9	61.74	-108.4	-148.5	78.1	72.0	6.16	12.685	SF	
1,300.0	1,282.3	1,285.8	1,260.5	3.8	4.5	61.58	-130.1	-174.3	90.1	83.1	7.02	12.834		
1,400.0	1,378.6	1,385.1	1,353.9	4.3	5.1	61.46	-151.8	-200.1	102.0	94.1	7.89	12.936		
1,500.0	1,474.9	1,484.3	1,447.2	4.8	5.7	61.36	-173.6	-225.9	114.0	105.2	8.76	13.009		
1,600.0	1,571.3	1,583.6	1,540.6	5.3	6.3	61.28	-195.3	-251.7	125.9	116.3	9.64	13.062		
1,700.0	1,667.6	1,682.9	1,634.0	5.8	6.9	61.21	-217.1	-277.5	137.9	127.4	10.52	13.103		
1,800.0	1,763.9	1,782.2	1,727.3	6.3	7.6	61.16	-238.8	-303.4	149.8	138.4	11.41	13.134		
1,900.0	1,860.2	1,881.5	1,820.7	6.8	8.2	61.11	-260.5	-329.2	161.8	149.5	12.30	13.159		
2,000.0	1,956.5	1,980.8	1,914.1	7.3	8.8	61.07	-282.3	-355.0	173.8	160.6	13.18	13.178		
2,100.0	2,052.8	2,080.0	2,007.5	7.8	9.5	61.03	-304.0	-380.8	185.7	171.6	14.07	13.194		
2,200.0	2,149.2	2,179.3	2,100.8	8.3	10.1	61.00	-325.8	-406.6	197.7	182.7	14.97	13.207		
2,300.0	2,245.5	2,278.6	2,194.2	8.8	10.7	60.97	-347.5	-432.4	209.6	193.8	15.86	13.218		
2,400.0	2,341.8	2,377.9	2,287.6	9.3	11.3	60.95	-369.2	-458.2	221.6	204.8	16.75	13.227		
2,500.0	2,438.1	2,477.2	2,380.9	9.8	12.0	60.92	-391.0	-484.0	233.5	215.9	17.64	13.235		
2,600.0	2,534.4	2,576.5	2,474.3	10.3	12.6	60.90	-412.7	-509.9	245.5	226.9	18.54	13.242		
2,700.0	2,630.8	2,675.7	2,567.7	10.8	13.2	60.89	-434.5	-535.7	257.4	238.0	19.43	13.248		
2,800.0	2,727.1	2,775.0	2,661.0	11.3	13.9	60.87	-456.2	-561.5	269.4	249.1	20.33	13.253		
2,900.0	2,823.4	2,874.3	2,754.4	11.8	14.5	60.85	-478.0	-587.3	281.3	260.1	21.22	13.257		
3,000.0	2,919.7	2,973.6	2,847.8	12.3	15.1	60.84	-499.7	-613.1	293.3	271.2	22.12	13.261		
3,100.0	3,016.0	3,072.9	2,941.2	12.8	15.8	60.83	-521.4	-638.9	305.3	282.2	23.01	13.264		
3,200.0	3,112.3	3,172.2	3,034.5	13.3	16.4	60.82	-543.2	-664.7	317.2	293.3	23.91	13.267		
3,300.0	3,208.7	3,271.4	3,127.9	13.8	17.0	60.80	-564.9	-690.5	329.2	304.4	24.81	13.270		
3,400.0	3,305.0	3,370.7	3,221.3	14.3	17.7	60.79	-586.7	-716.4	341.1	315.4	25.70	13.272		
3,500.0	3,401.3	3,470.0	3,314.6	14.8	18.3	60.78	-608.4	-742.2	353.1	326.5	26.60	13.274		
3,600.0	3,497.6	3,569.3	3,408.0	15.3	18.9	60.78	-630.2	-768.0	365.0	337.5	27.50	13.276		
3,700.0	3,593.9	3,668.6	3,501.4	15.9	19.6	60.77	-651.9	-793.8	377.0	348.6	28.39	13.278		
3,800.0	3,690.3	3,767.8	3,594.8	16.4	20.2	60.76	-673.6	-819.6	388.9	359.7	29.29	13.279		
3,900.0	3,786.6	3,867.1	3,688.1	16.9	20.8	60.75	-695.4	-845.4	400.9	370.7	30.19	13.281		
4,000.0	3,882.9	3,966.4	3,781.5	17.4	21.4	60.74	-717.1	-871.2	412.9	381.8	31.08	13.282		
4,100.0	3,979.2	4,065.7	3,874.9	17.9	22.1	60.74	-738.9	-897.0	424.8	392.8	31.98	13.283		
4,200.0	4,075.5	4,165.0	3,968.2	18.4	22.7	60.73	-760.6	-922.8	436.8	403.9	32.88	13.284		
4,300.0	4,171.8	4,264.3	4,061.6	18.9	23.3	60.73	-782.3	-948.7	448.7	414.9	33.78	13.285		
4,400.0	4,268.2	4,363.5	4,155.0	19.4	24.0	60.72	-804.1	-974.5	460.7	426.0	34.67	13.286		
4,500.0	4,364.5	4,462.8	4,248.4	19.9	24.6	60.71	-825.8	-1,000.3	472.6	437.1	35.57	13.287		
4,600.0	4,460.8	4,562.1	4,341.7	20.4	25.2	60.71	-847.6	-1,026.1	484.6	448.1	36.47	13.288		
4,700.0	4,557.1	4,661.4	4,435.1	20.9	25.9	60.71	-869.3	-1,051.9	496.5	459.2	37.37	13.289		

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 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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							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	99.0	99.0	0.1	0.1	-90.00	0.0	-9.8	9.8	9.5	0.24	40.277		
200.0	200.0	199.0	199.0	0.3	0.3	-90.00	0.0	-9.8	9.8	9.2	0.59	16.550		
235.6	235.6	234.6	234.6	0.4	0.4	-90.00	0.0	-9.8	9.8	9.1	0.72	13.676	CC, ES	
300.0	300.0	298.9	298.9	0.5	0.5	-91.76	-0.3	-10.1	10.1	9.1	0.94	10.715		
400.0	400.0	398.6	398.5	0.6	0.7	51.04	-2.9	-12.4	11.5	10.2	1.29	8.919		
500.0	499.8	498.2	497.9	0.8	0.9	49.04	-8.0	-17.0	13.5	11.8	1.66	8.108		
600.0	599.5	597.8	597.0	1.1	1.1	49.19	-15.6	-24.0	15.9	13.8	2.07	7.681		
700.0	698.7	697.3	695.5	1.3	1.4	50.66	-25.8	-33.2	18.7	16.1	2.52	7.406		
800.0	797.5	796.7	793.4	1.6	1.7	52.85	-38.5	-44.7	21.9	18.8	3.05	7.179		
900.0	895.6	896.1	890.6	2.0	2.1	55.36	-53.8	-58.5	25.6	21.9	3.68	6.957		
1,000.0	993.1	995.3	986.9	2.4	2.6	57.95	-71.4	-74.5	29.8	25.4	4.43	6.731		
1,100.0	1,089.7	1,094.5	1,082.3	2.9	3.1	60.39	-91.6	-92.8	34.6	29.3	5.29	6.529		
1,200.0	1,186.0	1,194.0	1,177.3	3.3	3.6	60.67	-113.7	-112.8	40.5	34.4	6.15	6.591		
1,300.0	1,282.3	1,293.9	1,272.5	3.8	4.1	60.70	-136.0	-133.0	46.6	39.6	7.01	6.647		
1,400.0	1,378.6	1,393.7	1,367.6	4.3	4.7	60.73	-158.2	-153.2	52.6	44.8	7.88	6.682		
1,500.0	1,474.9	1,493.5	1,462.8	4.8	5.2	60.75	-180.5	-173.4	58.7	49.9	8.75	6.706		
1,600.0	1,571.3	1,593.3	1,558.0	5.3	5.8	60.77	-202.8	-193.6	64.8	55.1	9.63	6.722		
1,700.0	1,667.6	1,693.1	1,653.2	5.8	6.3	60.78	-225.1	-213.8	70.8	60.3	10.52	6.733		
1,800.0	1,763.9	1,792.9	1,748.3	6.3	6.9	60.79	-247.4	-234.0	76.9	65.5	11.40	6.741		
1,900.0	1,860.2	1,892.8	1,843.5	6.8	7.5	60.80	-269.7	-254.2	82.9	70.6	12.29	6.746		
2,000.0	1,956.5	1,992.6	1,938.7	7.3	8.0	60.81	-292.0	-274.4	89.0	75.8	13.18	6.750		
2,100.0	2,052.8	2,092.4	2,033.9	7.8	8.6	60.82	-314.3	-294.6	95.0	81.0	14.08	6.753		
2,200.0	2,149.2	2,192.2	2,129.0	8.3	9.1	60.82	-336.6	-314.8	101.1	86.1	14.97	6.755		
2,300.0	2,245.5	2,292.0	2,224.2	8.8	9.7	60.83	-358.9	-335.0	107.2	91.3	15.86	6.756		
2,400.0	2,341.8	2,391.8	2,319.4	9.3	10.3	60.84	-381.2	-355.2	113.2	96.5	16.76	6.757		
2,500.0	2,438.1	2,491.7	2,414.6	9.8	10.8	60.84	-403.5	-375.4	119.3	101.6	17.65	6.757		
2,600.0	2,534.4	2,591.5	2,509.7	10.3	11.4	60.84	-425.8	-395.6	125.3	106.8	18.55	6.757		
2,700.0	2,630.8	2,691.3	2,604.9	10.8	11.9	60.85	-448.0	-415.9	131.4	112.0	19.45	6.757		
2,800.0	2,727.1	2,791.1	2,700.1	11.3	12.5	60.85	-470.3	-436.1	137.5	117.1	20.34	6.757		
2,900.0	2,823.4	2,890.9	2,795.3	11.8	13.1	60.86	-492.6	-456.3	143.5	122.3	21.24	6.757		
3,000.0	2,919.7	2,990.7	2,890.4	12.3	13.6	60.86	-514.9	-476.5	149.6	127.4	22.14	6.756		
3,100.0	3,016.0	3,090.6	2,985.6	12.8	14.2	60.86	-537.2	-496.7	155.6	132.6	23.04	6.756		
3,200.0	3,112.3	3,190.4	3,080.8	13.3	14.7	60.86	-559.5	-516.9	161.7	137.8	23.94	6.756		
3,300.0	3,208.7	3,290.2	3,176.0	13.8	15.3	60.87	-581.8	-537.1	167.8	142.9	24.84	6.755		
3,400.0	3,305.0	3,390.0	3,271.1	14.3	15.9	60.87	-604.1	-557.3	173.8	148.1	25.73	6.755		
3,500.0	3,401.3	3,489.8	3,366.3	14.8	16.4	60.87	-626.4	-577.5	179.9	153.3	26.63	6.754		
3,600.0	3,497.6	3,589.6	3,461.5	15.3	17.0	60.87	-648.7	-597.7	185.9	158.4	27.53	6.754		
3,700.0	3,593.9	3,689.4	3,556.7	15.9	17.6	60.87	-671.0	-617.9	192.0	163.6	28.43	6.753		
3,800.0	3,690.3	3,789.3	3,651.8	16.4	18.1	60.88	-693.3	-638.1	198.1	168.7	29.33	6.752		
3,900.0	3,786.6	3,889.1	3,747.0	16.9	18.7	60.88	-715.6	-658.3	204.1	173.9	30.23	6.752		
4,000.0	3,882.9	3,988.9	3,842.2	17.4	19.2	60.88	-737.8	-678.5	210.2	179.1	31.13	6.751		
4,100.0	3,979.2	4,088.7	3,937.4	17.9	19.8	60.88	-760.1	-698.7	216.2	184.2	32.03	6.751		
4,200.0	4,075.5	4,188.5	4,032.5	18.4	20.4	60.88	-782.4	-718.9	222.3	189.4	32.93	6.750		
4,300.0	4,171.8	4,288.3	4,127.7	18.9	20.9	60.88	-804.7	-739.1	228.4	194.5	33.83	6.750		
4,400.0	4,268.2	4,388.2	4,222.9	19.4	21.5	60.88	-827.0	-759.3	234.4	199.7	34.73	6.749		
4,500.0	4,364.5	4,488.0	4,318.0	19.9	22.1	60.88	-849.3	-779.5	240.5	204.8	35.63	6.749		
4,600.0	4,460.8	4,587.8	4,413.2	20.4	22.6	60.89	-871.6	-799.7	246.5	210.0	36.53	6.749		
4,700.0	4,557.1	4,687.6	4,508.4	20.9	23.2	60.89	-893.9	-819.9	252.6	215.2	37.43	6.748		
4,800.0	4,653.4	4,787.4	4,603.6	21.4	23.7	60.89	-916.2	-840.1	258.7	220.3	38.33	6.748		
4,900.0	4,749.8	4,887.2	4,698.7	21.9	24.3	60.89	-938.5	-860.3	264.7	225.5	39.23	6.747		
5,000.0	4,846.1	4,987.1	4,793.9	22.4	24.9	60.89	-960.8	-880.5	270.8	230.6	40.13	6.747		

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 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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						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	4,942.4	5,086.9	4,889.1	22.9	25.4	60.89	-983.1	-900.7	276.8	235.8	41.04	6.746	
5,200.0	5,038.7	5,186.7	4,984.3	23.4	26.0	60.89	-1,005.4	-920.9	282.9	241.0	41.94	6.746	
5,300.0	5,135.0	5,286.5	5,079.4	23.9	26.6	60.89	-1,027.6	-941.1	289.0	246.1	42.84	6.746	
5,400.0	5,231.3	5,386.3	5,174.6	24.4	27.1	60.89	-1,049.9	-961.3	295.0	251.3	43.74	6.745	
5,500.0	5,327.7	5,486.1	5,269.8	24.9	27.7	60.89	-1,072.2	-981.5	301.1	256.4	44.64	6.745	
5,600.0	5,424.0	5,586.0	5,365.0	25.4	28.2	60.89	-1,094.5	-1,001.7	307.1	261.6	45.54	6.744	
5,700.0	5,520.7	5,687.5	5,461.9	25.9	28.8	60.77	-1,117.1	-1,022.2	313.9	267.5	46.33	6.775	
5,800.0	5,618.2	5,794.8	5,565.0	26.3	29.3	60.47	-1,138.9	-1,042.0	320.6	273.7	46.95	6.830	
5,900.0	5,716.5	5,902.3	5,669.4	26.6	29.8	60.14	-1,157.9	-1,059.2	326.8	279.3	47.45	6.886	
6,000.0	5,815.3	6,010.1	5,775.0	26.9	30.2	59.79	-1,174.1	-1,073.8	332.2	284.4	47.85	6.943	
6,100.0	5,914.6	6,118.2	5,881.6	27.1	30.5	59.42	-1,187.2	-1,085.8	337.0	288.9	48.13	7.003	
6,200.0	6,014.3	6,226.5	5,988.9	27.3	30.8	59.01	-1,197.4	-1,095.0	341.2	292.9	48.30	7.064	
6,300.0	6,114.2	6,334.9	6,097.0	27.4	31.0	58.58	-1,204.7	-1,101.6	344.6	296.3	48.36	7.127	
6,400.0	6,214.2	6,443.6	6,205.5	27.5	31.1	-89.81	-1,208.8	-1,105.3	347.4	299.1	48.31	7.191	
6,500.0	6,314.2	6,551.3	6,313.2	27.6	31.2	-90.00	-1,210.0	-1,106.4	348.4	300.0	48.39	7.199	
6,600.0	6,414.2	6,651.3	6,413.2	27.6	31.2	-90.00	-1,210.0	-1,106.4	348.4	299.8	48.56	7.175	
6,700.0	6,514.2	6,751.3	6,513.2	27.7	31.3	-90.00	-1,210.0	-1,106.4	348.4	299.7	48.72	7.150	
6,800.0	6,614.2	6,851.3	6,613.2	27.8	31.4	-90.00	-1,210.0	-1,106.4	348.4	299.5	48.89	7.126	
6,844.4	6,658.6	6,895.7	6,657.6	27.8	31.4	-89.98	-1,209.9	-1,106.4	348.4	299.4	48.97	7.114	
6,900.0	6,714.2	6,951.0	6,712.7	27.9	31.4	-89.38	-1,206.2	-1,106.4	348.4	299.1	49.28	7.070	
7,000.0	6,814.2	7,046.8	6,806.6	27.9	31.2	-86.28	-1,187.3	-1,106.4	349.2	298.6	50.59	6.903	
7,100.0	6,914.2	7,134.4	6,888.5	28.0	30.8	-81.23	-1,156.6	-1,106.4	353.3	300.9	52.41	6.740	
7,200.0	7,013.4	7,215.9	6,959.7	27.9	30.4	-75.54	-1,117.2	-1,106.4	361.5	307.9	53.67	6.737	
7,300.0	7,109.0	7,294.1	7,022.1	27.5	29.9	-70.43	-1,070.2	-1,106.4	372.3	318.7	53.63	6.942	
7,400.0	7,198.2	7,369.8	7,075.9	27.0	29.4	-66.00	-1,017.0	-1,106.4	384.3	332.0	52.28	7.351	
7,500.0	7,278.3	7,443.5	7,121.1	26.3	28.8	-62.30	-958.8	-1,106.4	396.3	346.5	49.77	7.962	
7,600.0	7,346.8	7,515.8	7,157.8	25.5	28.3	-59.34	-896.6	-1,106.4	407.2	360.9	46.35	8.787	
7,700.0	7,401.6	7,587.0	7,186.1	24.6	27.7	-57.10	-831.3	-1,106.4	416.4	374.1	42.35	9.834	
7,800.0	7,441.1	7,657.4	7,205.8	23.7	27.2	-55.55	-763.7	-1,106.4	423.3	385.1	38.16	11.091	
7,900.0	7,464.0	7,727.4	7,217.1	22.8	26.7	-54.68	-694.7	-1,106.4	427.3	393.1	34.23	12.483	
8,000.0	7,470.0	7,802.3	7,220.0	22.1	26.2	-54.46	-619.9	-1,106.4	428.4	397.1	31.28	13.696	
8,100.0	7,470.0	7,902.3	7,220.0	21.4	25.6	-54.46	-519.9	-1,106.4	428.4	398.2	30.16	14.202	
8,200.0	7,470.0	8,002.3	7,220.0	20.9	25.1	-54.46	-419.9	-1,106.4	428.4	399.1	29.29	14.626	
8,300.0	7,470.0	8,102.3	7,220.0	20.4	24.8	-54.46	-319.9	-1,106.4	428.4	399.7	28.68	14.939	
8,400.0	7,470.0	8,202.3	7,220.0	20.2	24.5	-54.47	-219.9	-1,106.4	428.4	400.1	28.34	15.117	
8,500.0	7,470.0	8,302.3	7,220.0	20.0	24.4	-54.47	-119.9	-1,106.5	428.5	400.2	28.29	15.143	
8,600.0	7,470.0	8,402.3	7,220.0	20.1	24.4	-54.47	-19.9	-1,106.5	428.5	399.9	28.53	15.016	
8,700.0	7,470.0	8,502.3	7,220.0	20.2	24.5	-54.47	80.1	-1,106.5	428.5	399.4	29.06	14.747	
8,800.0	7,470.0	8,602.3	7,220.0	20.6	24.7	-54.47	180.1	-1,106.5	428.5	398.7	29.85	14.358	
8,900.0	7,470.0	8,702.3	7,220.0	21.1	25.1	-54.48	280.1	-1,106.5	428.5	397.7	30.88	13.877	
9,000.0	7,470.0	8,802.3	7,220.0	21.7	25.6	-54.48	380.1	-1,106.5	428.6	396.4	32.14	13.335	
9,100.0	7,470.0	8,902.3	7,220.0	22.4	26.2	-54.48	480.1	-1,106.5	428.6	395.0	33.60	12.757	
9,200.0	7,470.0	9,002.3	7,220.0	23.3	26.9	-54.48	580.1	-1,106.5	428.6	393.4	35.22	12.168	
9,300.0	7,470.0	9,102.3	7,220.0	24.3	27.8	-54.49	680.1	-1,106.5	428.6	391.6	37.00	11.583	
9,400.0	7,470.0	9,202.3	7,220.0	25.3	28.7	-54.49	780.1	-1,106.5	428.7	389.7	38.91	11.015	
9,500.0	7,470.0	9,302.3	7,220.0	26.4	29.6	-54.49	880.1	-1,106.5	428.7	387.7	40.94	10.472	
9,600.0	7,470.0	9,402.3	7,220.0	27.6	30.7	-54.49	980.1	-1,106.5	428.7	385.6	43.05	9.958	
9,700.0	7,470.0	9,502.3	7,220.0	28.9	31.8	-54.49	1,080.1	-1,106.5	428.7	383.5	45.25	9.474	
9,800.0	7,470.0	9,602.3	7,220.0	30.2	33.0	-54.50	1,180.1	-1,106.5	428.7	381.2	47.52	9.022	
9,900.0	7,470.0	9,702.3	7,220.0	31.5	34.2	-54.50	1,280.1	-1,106.5	428.8	378.9	49.86	8.600	
10,000.0	7,470.0	9,802.3	7,220.0	32.9	35.5	-54.50	1,380.1	-1,106.5	428.8	376.5	52.24	8.208	
10,100.0	7,470.0	9,902.3	7,220.0	34.3	36.8	-54.50	1,480.1	-1,106.5	428.8	374.1	54.67	7.843	

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 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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		
10,200.0	7,470.0	10,002.3	7,220.0	35.7	38.2	-54.50	1,580.1	-1,106.5	428.8	371.7	57.14	7.504		
10,300.0	7,470.0	10,102.3	7,220.0	37.2	39.5	-54.51	1,680.1	-1,106.5	428.9	369.2	59.65	7.189		
10,400.0	7,470.0	10,202.3	7,220.0	38.7	41.0	-54.51	1,780.1	-1,106.6	428.9	366.7	62.19	6.896		
10,500.0	7,470.0	10,302.3	7,220.0	40.2	42.4	-54.51	1,880.1	-1,106.6	428.9	364.1	64.76	6.623		
10,600.0	7,470.0	10,402.3	7,220.0	41.8	43.8	-54.51	1,980.1	-1,106.6	428.9	361.6	67.35	6.369		
10,700.0	7,470.0	10,502.3	7,220.0	43.3	45.3	-54.51	2,080.1	-1,106.6	428.9	359.0	69.96	6.131		
10,800.0	7,470.0	10,602.3	7,220.0	44.9	46.8	-54.52	2,180.1	-1,106.6	429.0	356.4	72.59	5.909		
10,900.0	7,470.0	10,702.3	7,220.0	46.4	48.3	-54.52	2,280.1	-1,106.6	429.0	353.7	75.24	5.701		
11,000.0	7,470.0	10,802.3	7,220.0	48.0	49.9	-54.52	2,380.1	-1,106.6	429.0	351.1	77.90	5.507		
11,100.0	7,470.0	10,902.3	7,220.0	49.6	51.4	-54.52	2,480.1	-1,106.6	429.0	348.4	80.58	5.324		
11,200.0	7,470.0	11,002.3	7,220.0	51.2	53.0	-54.52	2,580.1	-1,106.6	429.0	345.8	83.27	5.152		
11,300.0	7,470.0	11,102.3	7,220.0	52.9	54.5	-54.53	2,680.1	-1,106.6	429.1	343.1	85.98	4.990		
11,400.0	7,470.0	11,202.3	7,220.0	54.5	56.1	-54.53	2,780.1	-1,106.6	429.1	340.4	88.69	4.838		
11,500.0	7,470.0	11,302.3	7,220.0	56.1	57.7	-54.53	2,880.1	-1,106.6	429.1	337.7	91.41	4.694		
11,600.0	7,470.0	11,402.3	7,220.0	57.8	59.3	-54.53	2,980.1	-1,106.6	429.1	335.0	94.15	4.558		
11,700.0	7,470.0	11,502.3	7,220.0	59.4	60.9	-54.53	3,080.1	-1,106.6	429.2	332.3	96.88	4.430		
11,800.0	7,470.0	11,602.3	7,220.0	61.1	62.5	-54.54	3,180.1	-1,106.6	429.2	329.5	99.63	4.308		
11,900.0	7,470.0	11,702.3	7,220.0	62.7	64.2	-54.54	3,280.1	-1,106.6	429.2	326.8	102.39	4.192		
12,000.0	7,470.0	11,802.3	7,220.0	64.4	65.8	-54.54	3,380.1	-1,106.6	429.2	324.1	105.15	4.082		
12,100.0	7,470.0	11,902.3	7,220.0	66.1	67.4	-54.54	3,480.1	-1,106.6	429.2	321.3	107.91	3.978		
12,200.0	7,470.0	12,002.3	7,220.0	67.7	69.1	-54.54	3,580.1	-1,106.6	429.3	318.6	110.68	3.878		
12,249.2	7,470.0	12,051.5	7,220.0	68.6	69.9	-54.55	3,629.3	-1,106.7	429.3	317.2	112.05	3.831 SF		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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	92.07	-0.4	10.1	10.1						
100.0	100.0	99.0	99.0	0.1	0.1	92.07	-0.4	10.1	10.1	9.8	0.24	41.455			
200.0	200.0	199.0	199.0	0.3	0.3	92.07	-0.4	10.1	10.1	9.5	0.59	17.034			
300.0	300.0	299.0	299.0	0.5	0.5	92.07	-0.4	10.1	10.1	9.1	0.94	10.714	CC, ES		
400.0	400.0	399.0	399.0	0.6	0.6	-127.83	-0.4	10.1	11.1	9.8	1.29	8.561			
500.0	499.8	499.1	499.1	0.8	0.8	-138.59	-2.0	9.5	13.8	12.1	1.65	8.370			
600.0	599.5	599.4	599.2	1.1	1.0	-143.60	-6.9	7.8	17.4	15.4	2.02	8.615			
700.0	698.7	699.8	699.2	1.3	1.2	-145.20	-15.2	5.0	21.6	19.2	2.41	8.940			
800.0	797.5	800.2	798.9	1.6	1.5	-144.92	-26.8	1.0	26.3	23.4	2.85	9.220			
900.0	895.6	900.7	898.2	2.0	1.8	-143.60	-41.7	-4.1	31.5	28.2	3.35	9.399			
1,000.0	993.1	1,001.3	996.9	2.4	2.1	-141.73	-59.9	-10.3	37.3	33.4	3.94	9.460			
1,100.0	1,089.7	1,102.0	1,095.0	2.9	2.5	-139.55	-81.3	-17.6	43.6	39.0	4.64	9.404			
1,200.0	1,186.0	1,202.1	1,191.9	3.3	3.0	-136.21	-105.3	-25.8	49.2	43.8	5.45	9.029			
1,300.0	1,282.3	1,301.9	1,288.4	3.8	3.4	-133.37	-129.3	-34.0	54.8	48.5	6.31	8.690			
1,400.0	1,378.6	1,401.7	1,384.9	4.3	3.9	-131.06	-153.3	-42.3	60.6	53.4	7.20	8.416			
1,500.0	1,474.9	1,501.6	1,481.4	4.8	4.3	-129.15	-177.4	-50.5	66.4	58.3	8.10	8.193			
1,600.0	1,571.3	1,601.4	1,578.0	5.3	4.8	-127.56	-201.4	-58.7	72.2	63.2	9.02	8.012			
1,700.0	1,667.6	1,701.2	1,674.5	5.8	5.3	-126.20	-225.4	-66.9	78.2	68.2	9.94	7.862			
1,800.0	1,763.9	1,801.0	1,771.0	6.3	5.7	-125.03	-249.5	-75.2	84.1	73.2	10.87	7.736			
1,900.0	1,860.2	1,900.8	1,867.5	6.8	6.2	-124.02	-273.5	-83.4	90.1	78.3	11.81	7.630			
2,000.0	1,956.5	2,000.6	1,964.1	7.3	6.7	-123.14	-297.6	-91.6	96.1	83.4	12.75	7.540			
2,100.0	2,052.8	2,100.4	2,060.6	7.8	7.1	-122.36	-321.6	-99.8	102.1	88.5	13.69	7.462			
2,200.0	2,149.2	2,200.2	2,157.1	8.3	7.6	-121.67	-345.6	-108.1	108.2	93.6	14.63	7.394			
2,300.0	2,245.5	2,300.0	2,253.6	8.8	8.1	-121.05	-369.7	-116.3	114.3	98.7	15.58	7.335			
2,400.0	2,341.8	2,399.8	2,350.1	9.3	8.6	-120.49	-393.7	-124.5	120.3	103.8	16.52	7.282			
2,500.0	2,438.1	2,499.6	2,446.7	9.8	9.0	-119.99	-417.7	-132.7	126.4	108.9	17.47	7.236			
2,600.0	2,534.4	2,599.5	2,543.2	10.3	9.5	-119.53	-441.8	-141.0	132.5	114.1	18.42	7.194			
2,700.0	2,630.8	2,699.3	2,639.7	10.8	10.0	-119.11	-465.8	-149.2	138.6	119.2	19.37	7.157			
2,800.0	2,727.1	2,799.1	2,736.2	11.3	10.5	-118.73	-489.9	-157.4	144.7	124.4	20.31	7.124			
2,900.0	2,823.4	2,898.9	2,832.7	11.8	10.9	-118.38	-513.9	-165.6	150.8	129.6	21.26	7.093			
3,000.0	2,919.7	2,998.7	2,929.3	12.3	11.4	-118.05	-537.9	-173.9	156.9	134.7	22.21	7.065			
3,100.0	3,016.0	3,098.5	3,025.8	12.8	11.9	-117.75	-562.0	-182.1	163.1	139.9	23.16	7.040			
3,200.0	3,112.3	3,198.3	3,122.3	13.3	12.4	-117.48	-586.0	-190.3	169.2	145.1	24.11	7.017			
3,300.0	3,208.7	3,298.1	3,218.8	13.8	12.8	-117.22	-610.1	-198.5	175.3	150.3	25.06	6.995			
3,400.0	3,305.0	3,397.9	3,315.3	14.3	13.3	-116.98	-634.1	-206.8	181.5	155.4	26.01	6.976			
3,500.0	3,401.3	3,497.7	3,411.9	14.8	13.8	-116.75	-658.1	-215.0	187.6	160.6	26.96	6.957			
3,600.0	3,497.6	3,597.5	3,508.4	15.3	14.3	-116.54	-682.2	-223.2	193.7	165.8	27.92	6.940			
3,700.0	3,593.9	3,697.4	3,604.9	15.9	14.7	-116.34	-706.2	-231.4	199.9	171.0	28.87	6.925			
3,800.0	3,690.3	3,797.2	3,701.4	16.4	15.2	-116.16	-730.2	-239.7	206.0	176.2	29.82	6.910			
3,900.0	3,786.6	3,897.0	3,798.0	16.9	15.7	-115.98	-754.3	-247.9	212.2	181.4	30.77	6.896			
4,000.0	3,882.9	3,996.8	3,894.5	17.4	16.2	-115.82	-778.3	-256.1	218.3	186.6	31.72	6.883			
4,100.0	3,979.2	4,096.6	3,991.0	17.9	16.6	-115.66	-802.4	-264.3	224.5	191.8	32.67	6.871			
4,200.0	4,075.5	4,196.4	4,087.5	18.4	17.1	-115.51	-826.4	-272.6	230.6	197.0	33.62	6.860			
4,300.0	4,171.8	4,296.2	4,184.0	18.9	17.6	-115.37	-850.4	-280.8	236.8	202.2	34.57	6.849			
4,400.0	4,268.2	4,396.0	4,280.6	19.4	18.1	-115.24	-874.5	-289.0	242.9	207.4	35.52	6.839			
4,500.0	4,364.5	4,495.8	4,377.1	19.9	18.6	-115.11	-898.5	-297.2	249.1	212.6	36.48	6.829			
4,600.0	4,460.8	4,595.6	4,473.6	20.4	19.0	-114.99	-922.5	-305.5	255.2	217.8	37.43	6.820			
4,700.0	4,557.1	4,695.4	4,570.1	20.9	19.5	-114.88	-946.6	-313.7	261.4	223.0	38.38	6.811			
4,800.0	4,653.4	4,795.2	4,666.6	21.4	20.0	-114.77	-970.6	-321.9	267.6	228.2	39.33	6.803			
4,900.0	4,749.8	4,895.1	4,763.2	21.9	20.5	-114.66	-994.7	-330.1	273.7	233.4	40.28	6.796			
5,000.0	4,846.1	4,994.9	4,859.7	22.4	20.9	-114.56	-1,018.7	-338.4	279.9	238.7	41.23	6.788			
5,100.0	4,942.4	5,094.7	4,956.2	22.9	21.4	-114.47	-1,042.7	-346.6	286.1	243.9	42.18	6.781			

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 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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		
5,200.0	5,038.7	5,194.5	5,052.7	23.4	21.9	-114.38	-1,066.8	-354.8	292.2	249.1	43.13	6.774		
5,300.0	5,135.0	5,294.3	5,149.3	23.9	22.4	-114.29	-1,090.8	-363.0	298.4	254.3	44.09	6.768		
5,400.0	5,231.3	5,394.1	5,245.8	24.4	22.8	-114.20	-1,114.9	-371.2	304.5	259.5	45.04	6.762		
5,500.0	5,327.7	5,492.3	5,341.0	24.9	23.3	-114.29	-1,137.7	-379.1	310.9	265.0	45.92	6.771		
5,600.0	5,424.0	5,589.8	5,436.2	25.4	23.7	-114.94	-1,157.4	-385.8	317.9	271.3	46.60	6.822		
5,700.0	5,520.7	5,687.0	5,531.8	25.9	24.0	-116.01	-1,173.9	-391.5	325.1	278.0	47.10	6.902		
5,800.0	5,618.2	5,784.0	5,627.8	26.3	24.2	-117.07	-1,187.4	-396.1	331.6	284.1	47.48	6.984		
5,900.0	5,716.5	5,880.8	5,724.0	26.6	24.5	-118.10	-1,197.8	-399.6	337.4	289.7	47.74	7.068		
6,000.0	5,815.3	5,977.5	5,820.3	26.9	24.6	-119.11	-1,205.0	-402.1	342.6	294.7	47.89	7.154		
6,100.0	5,914.6	6,073.9	5,916.6	27.1	24.7	-120.12	-1,209.2	-403.5	347.1	299.2	47.93	7.242		
6,200.0	6,014.3	6,170.6	6,013.3	27.3	24.8	-121.12	-1,210.4	-403.9	350.9	303.0	47.87	7.330		
6,300.0	6,114.2	6,270.5	6,113.2	27.4	24.9	-121.82	-1,210.4	-403.9	353.4	305.5	47.85	7.386		
6,400.0	6,214.2	6,370.5	6,213.2	27.5	25.0	90.06	-1,210.4	-403.9	354.1	306.1	47.94	7.386		
6,500.0	6,314.2	6,470.5	6,313.2	27.6	25.1	90.06	-1,210.4	-403.9	354.1	306.0	48.10	7.361		
6,600.0	6,414.2	6,570.5	6,413.2	27.6	25.1	90.06	-1,210.4	-403.9	354.1	305.8	48.26	7.336		
6,700.0	6,514.2	6,670.5	6,513.2	27.7	25.2	90.06	-1,210.4	-403.9	354.1	305.6	48.43	7.311		
6,800.0	6,614.2	6,770.5	6,613.2	27.8	25.3	90.06	-1,210.4	-403.9	354.1	305.5	48.60	7.286		
6,855.4	6,669.6	6,825.9	6,668.6	27.8	25.3	89.99	-1,210.0	-403.9	354.1	305.4	48.65	7.279		
6,900.0	6,714.2	6,870.2	6,712.8	27.9	25.3	89.45	-1,206.6	-403.9	354.1	305.6	48.47	7.306		
7,000.0	6,814.2	6,966.1	6,806.7	27.9	25.0	86.39	-1,187.7	-403.9	354.8	307.6	47.27	7.506		
7,100.0	6,914.2	7,053.7	6,888.6	28.0	24.6	81.39	-1,156.9	-403.9	358.8	313.7	45.09	7.958		
7,200.0	7,013.4	7,135.2	6,959.8	27.9	24.1	75.79	-1,117.4	-403.9	366.9	324.7	42.18	8.699		
7,300.0	7,109.0	7,213.5	7,022.3	27.5	23.5	70.74	-1,070.4	-403.9	377.5	338.2	39.24	9.620		
7,400.0	7,198.2	7,289.2	7,076.1	27.0	22.8	66.35	-1,017.2	-404.0	389.3	352.7	36.53	10.656		
7,500.0	7,278.3	7,363.0	7,121.3	26.3	22.1	62.68	-958.9	-404.0	401.1	366.9	34.21	11.725		
7,600.0	7,346.8	7,435.3	7,158.0	25.5	21.3	59.74	-896.7	-404.0	411.9	379.6	32.34	12.737		
7,700.0	7,401.6	7,500.0	7,183.9	24.6	20.7	57.61	-837.4	-404.0	421.0	390.0	31.06	13.557		
7,800.0	7,441.1	7,576.9	7,205.9	23.7	19.9	55.97	-763.8	-404.0	427.7	397.6	30.10	14.208		
7,900.0	7,464.0	7,650.0	7,217.4	22.8	19.2	55.08	-691.7	-404.0	431.7	402.0	29.69	14.538		
8,000.0	7,470.0	7,721.9	7,220.0	22.1	18.5	54.87	-619.9	-404.0	432.7	403.2	29.51	14.663		
8,100.0	7,470.0	7,821.9	7,220.0	21.4	17.7	54.87	-519.9	-404.0	432.7	404.4	28.31	15.286		
8,200.0	7,470.0	7,921.9	7,220.0	20.9	17.1	54.86	-419.9	-404.0	432.6	405.3	27.35	15.818		
8,300.0	7,470.0	8,021.9	7,220.0	20.4	16.6	54.86	-319.9	-404.0	432.6	405.9	26.67	16.219		
8,400.0	7,470.0	8,121.9	7,220.0	20.2	16.3	54.86	-219.9	-404.0	432.6	406.3	26.30	16.451		
8,500.0	7,470.0	8,221.9	7,220.0	20.0	16.1	54.86	-119.9	-404.1	432.6	406.3	26.23	16.492		
8,600.0	7,470.0	8,321.9	7,220.0	20.1	16.2	54.85	-19.9	-404.1	432.5	406.1	26.48	16.336		
8,700.0	7,470.0	8,421.9	7,220.0	20.2	16.5	54.85	80.1	-404.1	432.5	405.5	27.03	16.001		
8,800.0	7,470.0	8,521.9	7,220.0	20.6	16.9	54.85	180.1	-404.1	432.5	404.6	27.87	15.518		
8,900.0	7,470.0	8,621.9	7,220.0	21.1	17.5	54.85	280.1	-404.1	432.5	403.5	28.97	14.926		
9,000.0	7,470.0	8,721.9	7,220.0	21.7	18.3	54.84	380.1	-404.1	432.4	402.1	30.31	14.267		
9,100.0	7,470.0	8,821.9	7,220.0	22.4	19.2	54.84	480.1	-404.1	432.4	400.6	31.85	13.576		
9,200.0	7,470.0	8,921.9	7,220.0	23.3	20.2	54.84	580.1	-404.1	432.4	398.8	33.57	12.881		
9,300.0	7,470.0	9,021.9	7,220.0	24.3	21.3	54.84	680.1	-404.2	432.3	396.9	35.44	12.201		
9,400.0	7,470.0	9,121.9	7,220.0	25.3	22.4	54.83	780.1	-404.2	432.3	394.9	37.43	11.550		
9,500.0	7,470.0	9,221.9	7,220.0	26.4	23.7	54.83	880.1	-404.2	432.3	392.8	39.54	10.934		
9,600.0	7,470.0	9,321.9	7,220.0	27.6	25.0	54.83	980.1	-404.2	432.3	390.5	41.73	10.358		
9,700.0	7,470.0	9,421.9	7,220.0	28.9	26.4	54.83	1,080.1	-404.2	432.2	388.2	44.01	9.822		
9,800.0	7,470.0	9,521.9	7,220.0	30.2	27.8	54.82	1,180.1	-404.2	432.2	385.9	46.35	9.326		
9,900.0	7,470.0	9,621.9	7,220.0	31.5	29.2	54.82	1,280.1	-404.2	432.2	383.4	48.75	8.866		
10,000.0	7,470.0	9,721.9	7,220.0	32.9	30.7	54.82	1,380.1	-404.2	432.2	381.0	51.19	8.442		
10,100.0	7,470.0	9,821.9	7,220.0	34.3	32.2	54.82	1,480.1	-404.2	432.1	378.5	53.68	8.050		
10,200.0	7,470.0	9,921.9	7,220.0	35.7	33.7	54.81	1,580.1	-404.3	432.1	375.9	56.21	7.687		

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 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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

<b>Offset Design</b> S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4D-36H - HZ - Plan #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-Geolink MWD												<b>Offset Well Error:</b>	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
10,300.0	7,470.0	10,021.9	7,220.0	37.2	35.3	54.81	1,680.1	-404.3	432.1	373.3	58.77	7.352	
10,400.0	7,470.0	10,121.9	7,220.0	38.7	36.8	54.81	1,780.1	-404.3	432.1	370.7	61.35	7.042	
10,500.0	7,470.0	10,221.9	7,220.0	40.2	38.4	54.81	1,880.1	-404.3	432.0	368.1	63.96	6.754	
10,600.0	7,470.0	10,321.9	7,220.0	41.8	40.0	54.80	1,980.1	-404.3	432.0	365.4	66.60	6.487	
10,700.0	7,470.0	10,421.9	7,220.0	43.3	41.6	54.80	2,080.1	-404.3	432.0	362.7	69.25	6.238	
10,800.0	7,470.0	10,521.9	7,220.0	44.9	43.3	54.80	2,180.1	-404.3	431.9	360.0	71.91	6.006	
10,900.0	7,470.0	10,621.9	7,220.0	46.4	44.9	54.80	2,280.1	-404.3	431.9	357.3	74.60	5.790	
11,000.0	7,470.0	10,721.9	7,220.0	48.0	46.5	54.79	2,380.1	-404.4	431.9	354.6	77.29	5.588	
11,100.0	7,470.0	10,821.9	7,220.0	49.6	48.2	54.79	2,480.1	-404.4	431.9	351.9	80.00	5.398	
11,200.0	7,470.0	10,921.9	7,220.0	51.2	49.8	54.79	2,580.1	-404.4	431.8	349.1	82.72	5.220	
11,300.0	7,470.0	11,021.9	7,220.0	52.9	51.5	54.79	2,680.1	-404.4	431.8	346.4	85.45	5.053	
11,400.0	7,470.0	11,121.9	7,220.0	54.5	53.2	54.78	2,780.1	-404.4	431.8	343.6	88.19	4.896	
11,500.0	7,470.0	11,221.9	7,220.0	56.1	54.8	54.78	2,880.1	-404.4	431.8	340.8	90.94	4.748	
11,600.0	7,470.0	11,321.9	7,220.0	57.8	56.5	54.78	2,980.1	-404.4	431.7	338.0	93.69	4.608	
11,700.0	7,470.0	11,421.9	7,220.0	59.4	58.2	54.78	3,080.1	-404.4	431.7	335.2	96.45	4.476	
11,800.0	7,470.0	11,521.9	7,220.0	61.1	59.9	54.77	3,180.1	-404.5	431.7	332.5	99.22	4.351	
11,900.0	7,470.0	11,621.9	7,220.0	62.7	61.6	54.77	3,280.1	-404.5	431.6	329.7	101.99	4.232	
12,000.0	7,470.0	11,721.9	7,220.0	64.4	63.3	54.77	3,380.1	-404.5	431.6	326.9	104.77	4.120	
12,100.0	7,470.0	11,821.9	7,220.0	66.1	65.0	54.76	3,480.1	-404.5	431.6	324.0	107.55	4.013	
12,200.0	7,470.0	11,921.9	7,220.0	67.7	66.7	54.76	3,580.1	-404.5	431.6	321.2	110.34	3.911	
12,249.2	7,470.0	11,971.1	7,220.0	68.6	67.5	54.76	3,629.3	-404.5	431.6	319.8	111.71	3.863 SF	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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							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	91.04	-0.4	20.1	20.2					
100.0	100.0	99.0	99.0	0.1	0.1	91.04	-0.4	20.1	20.1	19.9	0.24	82.869		
200.0	200.0	199.0	199.0	0.3	0.3	91.04	-0.4	20.1	20.1	19.6	0.59	34.052		
300.0	300.0	299.0	299.0	0.5	0.5	91.04	-0.4	20.1	20.1	19.2	0.94	21.417 CC, ES		
400.0	400.0	399.0	399.0	0.6	0.6	-125.08	-0.4	20.1	21.1	19.8	1.29	16.337		
500.0	499.8	498.8	498.8	0.8	0.8	-135.09	-0.4	20.1	24.5	22.8	1.65	14.862 SF		
600.0	599.5	598.9	598.9	1.1	1.0	-143.56	-2.1	20.0	30.5	28.5	2.01	15.188		
700.0	698.7	699.1	699.0	1.3	1.2	-147.31	-7.3	19.7	38.2	35.8	2.39	16.018		
800.0	797.5	799.5	798.9	1.6	1.4	-148.27	-16.0	19.2	47.2	44.4	2.79	16.905		
900.0	895.6	899.9	898.6	2.0	1.6	-147.66	-28.2	18.4	57.5	54.2	3.25	17.662		
1,000.0	993.1	1,000.3	997.7	2.4	1.9	-146.21	-43.8	17.4	68.9	65.1	3.79	18.202		
1,100.0	1,089.7	1,100.6	1,096.2	2.9	2.3	-144.33	-63.0	16.2	81.6	77.2	4.41	18.495		
1,200.0	1,186.0	1,200.3	1,193.5	3.3	2.6	-141.93	-84.7	14.9	94.1	89.0	5.12	18.358		
1,300.0	1,282.3	1,299.4	1,290.2	3.8	3.0	-139.97	-106.5	13.5	106.6	100.7	5.87	18.156		
1,400.0	1,378.6	1,398.6	1,386.9	4.3	3.4	-138.43	-128.3	12.2	119.2	112.5	6.64	17.954		
1,500.0	1,474.9	1,497.7	1,483.6	4.8	3.8	-137.19	-150.2	10.8	131.8	124.4	7.42	17.768		
1,600.0	1,571.3	1,596.9	1,580.3	5.3	4.2	-136.16	-172.0	9.4	144.6	136.4	8.21	17.600		
1,700.0	1,667.6	1,696.0	1,677.0	5.8	4.6	-135.30	-193.8	8.1	157.3	148.3	9.02	17.451		
1,800.0	1,763.9	1,795.2	1,773.8	6.3	5.0	-134.57	-215.7	6.7	170.1	160.3	9.82	17.318		
1,900.0	1,860.2	1,894.4	1,870.5	6.8	5.4	-133.94	-237.5	5.3	182.9	172.3	10.63	17.201		
2,000.0	1,956.5	1,993.5	1,967.2	7.3	5.8	-133.39	-259.3	4.0	195.7	184.3	11.45	17.096		
2,100.0	2,052.8	2,092.7	2,063.9	7.8	6.2	-132.91	-281.2	2.6	208.6	196.3	12.27	17.003		
2,200.0	2,149.2	2,191.8	2,160.6	8.3	6.7	-132.49	-303.0	1.3	221.4	208.3	13.09	16.919		
2,300.0	2,245.5	2,291.0	2,257.3	8.8	7.1	-132.11	-324.8	-0.1	234.3	220.4	13.91	16.844		
2,400.0	2,341.8	2,390.2	2,354.0	9.3	7.5	-131.77	-346.7	-1.5	247.2	232.4	14.73	16.776		
2,500.0	2,438.1	2,489.3	2,450.8	9.8	7.9	-131.47	-368.5	-2.8	260.1	244.5	15.56	16.714		
2,600.0	2,534.4	2,588.5	2,547.5	10.3	8.3	-131.19	-390.3	-4.2	272.9	256.6	16.39	16.658		
2,700.0	2,630.8	2,687.6	2,644.2	10.8	8.7	-130.94	-412.2	-5.6	285.8	268.6	17.21	16.606		
2,800.0	2,727.1	2,786.8	2,740.9	11.3	9.1	-130.71	-434.0	-6.9	298.7	280.7	18.04	16.559		
2,900.0	2,823.4	2,885.9	2,837.6	11.8	9.6	-130.50	-455.8	-8.3	311.6	292.8	18.87	16.515		
3,000.0	2,919.7	2,985.1	2,934.3	12.3	10.0	-130.31	-477.7	-9.6	324.6	304.9	19.70	16.475		
3,100.0	3,016.0	3,084.3	3,031.0	12.8	10.4	-130.13	-499.5	-11.0	337.5	316.9	20.53	16.438		
3,200.0	3,112.3	3,183.4	3,127.8	13.3	10.8	-129.97	-521.3	-12.4	350.4	329.0	21.36	16.404		
3,300.0	3,208.7	3,282.6	3,224.5	13.8	11.2	-129.81	-543.2	-13.7	363.3	341.1	22.19	16.372		
3,400.0	3,305.0	3,381.7	3,321.2	14.3	11.6	-129.67	-565.0	-15.1	376.2	353.2	23.02	16.342		
3,500.0	3,401.3	3,480.9	3,417.9	14.8	12.1	-129.53	-586.8	-16.4	389.1	365.3	23.85	16.314		
3,600.0	3,497.6	3,580.0	3,514.6	15.3	12.5	-129.41	-608.7	-17.8	402.1	377.4	24.68	16.288		
3,700.0	3,593.9	3,679.2	3,611.3	15.9	12.9	-129.29	-630.5	-19.2	415.0	389.5	25.52	16.263		
3,800.0	3,690.3	3,778.4	3,708.0	16.4	13.3	-129.18	-652.3	-20.5	427.9	401.6	26.35	16.240		
3,900.0	3,786.6	3,877.5	3,804.8	16.9	13.7	-129.08	-674.2	-21.9	440.8	413.7	27.18	16.218		
4,000.0	3,882.9	3,976.7	3,901.5	17.4	14.1	-128.98	-696.0	-23.3	453.8	425.7	28.01	16.198		
4,100.0	3,979.2	4,075.8	3,998.2	17.9	14.6	-128.89	-717.8	-24.6	466.7	437.8	28.85	16.178		
4,200.0	4,075.5	4,175.0	4,094.9	18.4	15.0	-128.80	-739.7	-26.0	479.6	449.9	29.68	16.160		
4,300.0	4,171.8	4,274.1	4,191.6	18.9	15.4	-128.72	-761.5	-27.3	492.6	462.0	30.51	16.142		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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		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	90.69	-0.4	30.2	30.2					
100.0	100.0	99.0	99.0	0.1	0.1	90.69	-0.4	30.2	30.2	30.0	0.24	124.292		
200.0	200.0	199.0	199.0	0.3	0.3	90.69	-0.4	30.2	30.2	29.6	0.59	51.074		
300.0	300.0	299.0	299.0	0.5	0.5	90.69	-0.4	30.2	30.2	29.3	0.94	32.122 CC, ES		
400.0	400.0	399.0	399.0	0.6	0.6	-124.10	-0.4	30.2	31.2	29.9	1.29	24.128		
500.0	499.8	498.7	498.7	0.8	0.8	-128.46	-2.0	30.6	34.5	32.9	1.65	20.886		
600.0	599.5	598.4	598.3	1.1	1.0	-130.73	-7.1	31.7	40.5	38.5	2.04	19.868		
700.0	698.7	698.0	697.4	1.3	1.2	-131.31	-15.5	33.5	49.0	46.5	2.47	19.838 SF		
800.0	797.5	797.3	796.0	1.6	1.5	-130.83	-27.2	36.1	60.0	57.0	2.97	20.208		
900.0	895.6	896.2	893.7	2.0	1.8	-129.80	-42.2	39.4	73.5	69.9	3.55	20.687		
1,000.0	993.1	994.7	990.5	2.4	2.1	-128.53	-60.4	43.4	89.4	85.1	4.23	21.145		
1,100.0	1,089.7	1,092.7	1,085.9	2.9	2.5	-127.23	-81.8	48.1	107.7	102.7	5.00	21.551		
1,200.0	1,186.0	1,190.7	1,181.0	3.3	2.9	-125.85	-105.2	53.3	127.0	121.2	5.82	21.833		
1,300.0	1,282.3	1,288.8	1,276.0	3.8	3.3	-124.81	-128.8	58.4	146.3	139.7	6.65	21.992		
1,400.0	1,378.6	1,386.8	1,371.1	4.3	3.8	-124.01	-152.3	63.6	165.7	158.2	7.50	22.086		
1,500.0	1,474.9	1,484.9	1,466.2	4.8	4.2	-123.38	-175.9	68.8	185.1	176.8	8.36	22.143		
1,600.0	1,571.3	1,583.0	1,561.2	5.3	4.6	-122.87	-199.4	73.9	204.6	195.3	9.22	22.177		
1,700.0	1,667.6	1,681.1	1,656.3	5.8	5.1	-122.45	-223.0	79.1	224.0	213.9	10.09	22.198		
1,800.0	1,763.9	1,779.2	1,751.4	6.3	5.5	-122.09	-246.5	84.3	243.4	232.5	10.96	22.209		
1,900.0	1,860.2	1,877.2	1,846.5	6.8	6.0	-121.79	-270.1	89.5	262.9	251.1	11.83	22.215		
2,000.0	1,956.5	1,975.3	1,941.5	7.3	6.4	-121.53	-293.6	94.6	282.4	269.7	12.71	22.217		
2,100.0	2,052.8	2,073.4	2,036.6	7.8	6.9	-121.30	-317.2	99.8	301.8	288.3	13.59	22.217		
2,200.0	2,149.2	2,171.5	2,131.7	8.3	7.3	-121.10	-340.7	105.0	321.3	306.8	14.46	22.215		
2,300.0	2,245.5	2,269.6	2,226.7	8.8	7.8	-120.92	-364.3	110.2	340.8	325.4	15.34	22.211		
2,400.0	2,341.8	2,367.6	2,321.8	9.3	8.2	-120.77	-387.8	115.3	360.3	344.0	16.22	22.208		
2,500.0	2,438.1	2,465.7	2,416.9	9.8	8.7	-120.63	-411.4	120.5	379.7	362.6	17.10	22.203		
2,600.0	2,534.4	2,563.8	2,511.9	10.3	9.1	-120.50	-434.9	125.7	399.2	381.2	17.98	22.199		
2,700.0	2,630.8	2,661.9	2,607.0	10.8	9.6	-120.38	-458.5	130.9	418.7	399.8	18.87	22.194		
2,800.0	2,727.1	2,760.0	2,702.1	11.3	10.0	-120.28	-482.0	136.0	438.2	418.4	19.75	22.189		
2,900.0	2,823.4	2,858.0	2,797.2	11.8	10.5	-120.18	-505.6	141.2	457.7	437.0	20.63	22.185		
3,000.0	2,919.7	2,956.1	2,892.2	12.3	10.9	-120.09	-529.1	146.4	477.2	455.7	21.51	22.180		
3,100.0	3,016.0	3,054.2	2,987.3	12.8	11.4	-120.01	-552.7	151.5	496.7	474.3	22.40	22.175		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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 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		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			
0.0	0.0	0.0	0.0	0.0	0.0	90.52	-0.4	40.0	40.0					
100.0	100.0	99.0	99.0	0.1	0.1	90.52	-0.4	40.0	40.0	39.8	0.24	164.567		
200.0	200.0	199.0	199.0	0.3	0.3	90.52	-0.4	40.0	40.0	39.4	0.59	67.623		
300.0	300.0	299.0	299.0	0.5	0.5	90.52	-0.4	40.0	40.0	39.1	0.94	42.531 CC, ES		
400.0	400.0	398.3	398.3	0.6	0.6	-121.48	-1.9	40.8	41.7	40.4	1.29	32.254		
500.0	499.8	497.5	497.4	0.8	0.8	-121.24	-6.4	43.1	46.8	45.1	1.67	28.088		
600.0	599.5	596.3	595.8	1.1	1.1	-120.90	-14.1	46.9	55.3	53.2	2.08	26.581		
700.0	698.7	694.7	693.4	1.3	1.3	-120.52	-24.6	52.2	67.1	64.6	2.55	26.313 SF		
800.0	797.5	792.3	789.9	1.6	1.6	-120.15	-38.1	58.9	82.3	79.2	3.09	26.606		
900.0	895.6	889.2	885.0	2.0	1.9	-119.78	-54.3	67.1	100.8	97.1	3.72	27.123		
1,000.0	993.1	985.0	978.5	2.4	2.3	-119.42	-73.2	76.5	122.5	118.1	4.42	27.728		
1,100.0	1,089.7	1,082.0	1,072.7	2.9	2.7	-119.69	-93.8	86.9	146.6	141.4	5.18	28.320		
1,200.0	1,186.0	1,178.9	1,166.8	3.3	3.2	-120.45	-114.4	97.2	171.3	165.4	5.96	28.755		
1,300.0	1,282.3	1,275.8	1,260.9	3.8	3.6	-121.03	-135.0	107.5	196.1	189.3	6.75	29.047		
1,400.0	1,378.6	1,372.6	1,355.0	4.3	4.0	-121.47	-155.6	117.8	220.8	213.2	7.55	29.251		
1,500.0	1,474.9	1,469.5	1,449.1	4.8	4.4	-121.83	-176.2	128.2	245.5	237.2	8.35	29.399		
1,600.0	1,571.3	1,566.4	1,543.2	5.3	4.9	-122.12	-196.7	138.5	270.3	261.1	9.16	29.509		
1,700.0	1,667.6	1,663.3	1,637.3	5.8	5.3	-122.36	-217.3	148.8	295.1	285.1	9.97	29.594		
1,800.0	1,763.9	1,760.1	1,731.4	6.3	5.7	-122.57	-237.9	159.1	319.8	309.1	10.78	29.660		
1,900.0	1,860.2	1,857.0	1,825.5	6.8	6.2	-122.74	-258.5	169.4	344.6	333.0	11.60	29.713		
2,000.0	1,956.5	1,953.9	1,919.6	7.3	6.6	-122.89	-279.1	179.8	369.4	357.0	12.41	29.756		
2,100.0	2,052.8	2,050.8	2,013.7	7.8	7.0	-123.03	-299.7	190.1	394.2	380.9	13.23	29.792		
2,200.0	2,149.2	2,147.7	2,107.8	8.3	7.5	-123.14	-320.2	200.4	418.9	404.9	14.05	29.821		
2,300.0	2,245.5	2,244.5	2,201.9	8.8	7.9	-123.25	-340.8	210.7	443.7	428.8	14.87	29.846		
2,400.0	2,341.8	2,341.4	2,296.0	9.3	8.3	-123.34	-361.4	221.0	468.5	452.8	15.69	29.867		
2,500.0	2,438.1	2,438.3	2,390.1	9.8	8.8	-123.42	-382.0	231.4	493.3	476.8	16.51	29.885		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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				
0.0	0.0	0.0	0.0	0.0	0.0	90.83	-0.7	50.1	50.1								
100.0	100.0	99.0	99.0	0.1	0.1	90.83	-0.7	50.1	50.1	49.8	0.24	206.010					
200.0	200.0	199.0	199.0	0.3	0.3	90.83	-0.7	50.1	50.1	49.5	0.59	84.653	CC, ES				
300.0	300.0	297.9	297.9	0.5	0.5	92.29	-2.0	51.1	51.2	50.2	0.94	54.284					
400.0	400.0	396.6	396.4	0.6	0.7	-117.24	-6.0	54.2	55.4	54.1	1.30	42.589					
500.0	499.8	494.8	494.3	0.8	0.9	-115.65	-12.7	59.4	63.6	62.0	1.69	37.746					
600.0	599.5	592.4	591.2	1.1	1.1	-114.90	-21.9	66.6	75.8	73.7	2.11	35.868					
700.0	698.7	689.1	686.7	1.3	1.4	-114.73	-33.5	75.7	91.7	89.1	2.60	35.351	SF				
800.0	797.5	784.8	780.7	1.6	1.8	-114.87	-47.6	86.7	111.5	108.3	3.14	35.459					
900.0	895.6	879.2	872.8	2.0	2.2	-115.13	-63.8	99.5	134.9	131.1	3.76	35.838					
1,000.0	993.1	972.1	962.8	2.4	2.6	-115.41	-82.2	113.8	162.0	157.5	4.46	36.319					
1,100.0	1,089.7	1,065.3	1,052.2	2.9	3.1	-115.83	-102.6	129.8	192.4	187.1	5.22	36.876					
1,200.0	1,186.0	1,160.2	1,143.3	3.3	3.6	-116.65	-123.9	146.4	223.6	217.6	6.01	37.199					
1,300.0	1,282.3	1,255.2	1,234.3	3.8	4.1	-117.27	-145.1	163.0	254.9	248.0	6.82	37.392					
1,400.0	1,378.6	1,350.1	1,325.4	4.3	4.6	-117.76	-166.3	179.6	286.1	278.5	7.63	37.510					
1,500.0	1,474.9	1,445.1	1,416.5	4.8	5.1	-118.14	-187.5	196.2	317.4	309.0	8.45	37.584					
1,600.0	1,571.3	1,540.0	1,507.5	5.3	5.6	-118.46	-208.8	212.8	348.8	339.5	9.27	37.631					
1,700.0	1,667.6	1,635.0	1,598.6	5.8	6.1	-118.73	-230.0	229.4	380.1	370.0	10.09	37.660					
1,800.0	1,763.9	1,729.9	1,689.6	6.3	6.6	-118.96	-251.2	246.0	411.4	400.5	10.92	37.677					
1,900.0	1,860.2	1,824.9	1,780.7	6.8	7.1	-119.15	-272.4	262.6	442.7	431.0	11.75	37.687					
2,000.0	1,956.5	1,919.9	1,871.7	7.3	7.6	-119.32	-293.6	279.2	474.1	461.5	12.58	37.692					

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Mumby State 4C-36H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Reference Site:</b>	S36 T2N-R66W (Marcus State, Mumby State)	<b>MD Reference:</b>	WELL @ 5049.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Mumby State 4C-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 Depths are relative to WELL @ 5049.0ft (Original Well Elev)  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000 °

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

