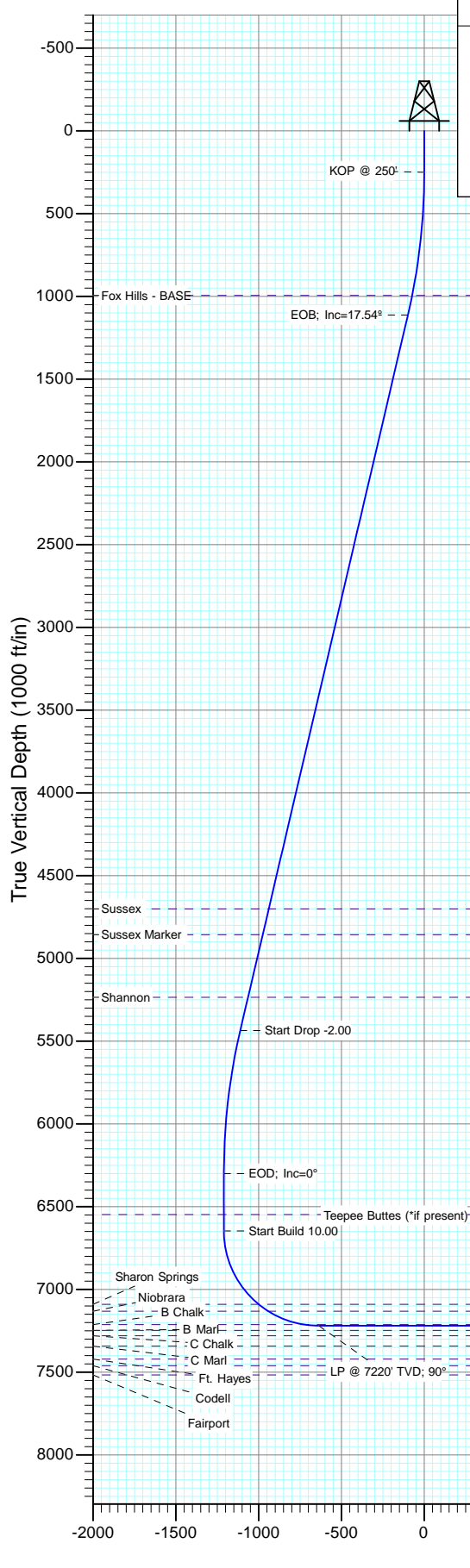
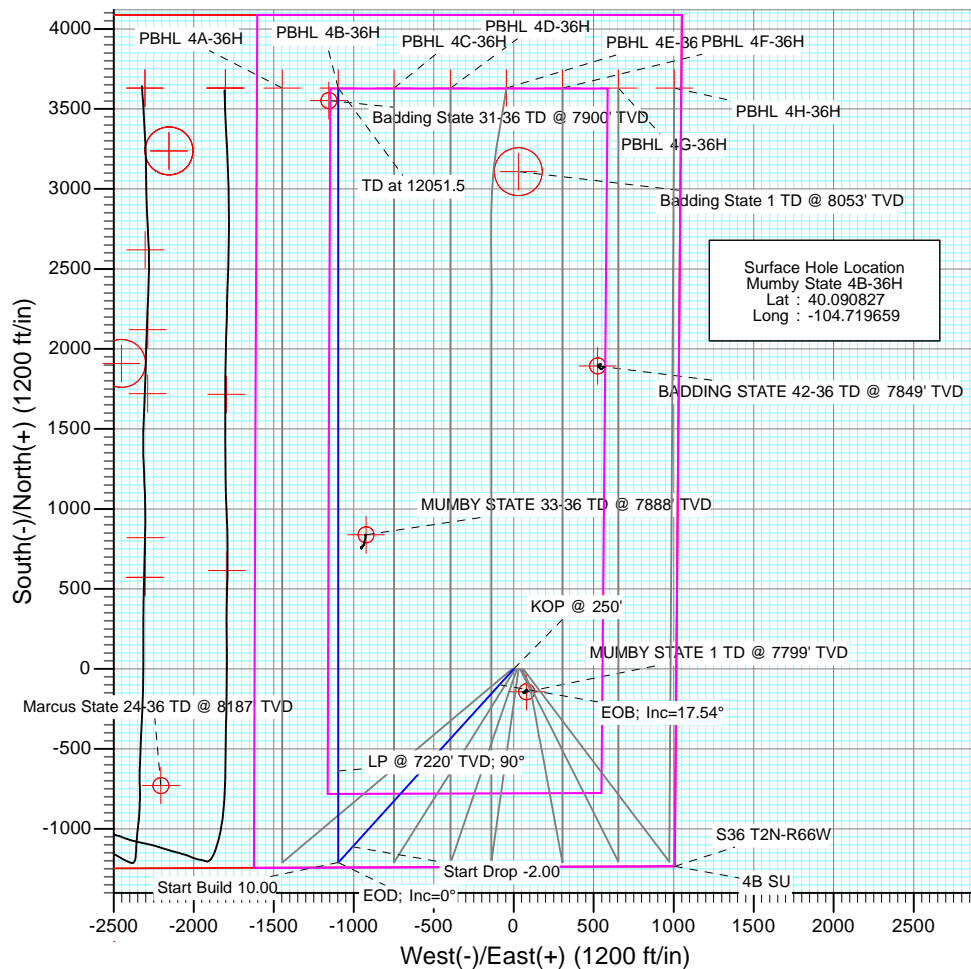




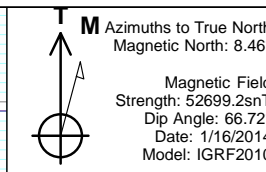
Project: DJ Wattenberg
Site: S36 T2N-R66W (Marcus State, Mumby State)
Well: Mumby State 4B-36H
Wellbore: HZ
Design: Plan #1



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 @ 250'
2	250.0	0.00	0.00	250.0	0.0	0.0	0.00	0.00	0.0		EOB; Inc=17.54°
3	1127.1	17.54	222.19	1113.5	-98.7	-89.5	2.00	222.19	-98.7		Start Drop -2.00
4	5661.0	17.54	222.19	5436.5	-1111.3	-1007.1	0.00	0.00	-1111.3		EOD; Inc=0°
5	6538.1	0.00	0.00	6300.0	-1210.0	-1096.6	2.00	180.00	-1210.0		Start Build 10.00
6	6885.2	0.00	0.00	6647.0	-1210.0	-1096.6	0.00	0.00	-1210.0		LP @ 7220' TVD; 90°
7	7785.2	90.00	360.00	7220.0	-637.0	-1096.6	10.00	360.00	-637.0		TD at 12051.5
8	12051.5	90.00	360.00	7220.0	3629.3	-1096.9	0.00	0.00	3629.3	PBHL 4B-36H	



DESIGN TARGET DETAILS				
Name	+N/-S	+E/-W	Northing	Easting
PBHL 4B-36H	3629.3	-1096.9	1280515.61	3217199.04
			Latitude	Longitude
			40.100790	-104.723580



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
994.0	1002.6	Fox Hills - BASE
4701.0	4889.6	Sussex
4857.0	5053.2	Sussex Marker
5235.0	5449.7	Shannon
6548.0	6786.1	Teepee Buttes (*if present)
7090.0	7391.5	Sharon Springs
7132.0	7463.4	Niobrara
7213.0	7695.5	B Chalk

TD at 12051.5	PBHL 4B-36H
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Plan #1
Mumby State 4B-36H
WELL @ 5048.0ft (Original Well Elev)
Ground Elevation @ 5018.0
North American Datum 1983
Well Mumby State 4B-36H, True North

Cathedral Energy Services

Planning Report

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

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

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

Well	Mumby State 4B-36H					
Well Position	+N/-S	0.0 ft	Northing:	1,276,896.06 ft	Latitude:	40.090827
	+E/-W	0.0 ft	Easting:	3,218,327.79 ft	Longitude:	-104.719659
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,018.0 ft

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

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

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
250.0	0.00	0.00	250.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,127.1	17.54	222.19	1,113.5	-98.7	-89.5	2.00	2.00	0.00	222.19	
5,661.0	17.54	222.19	5,436.5	-1,111.3	-1,007.1	0.00	0.00	0.00	0.00	
6,538.1	0.00	0.00	6,300.0	-1,210.0	-1,096.6	2.00	-2.00	0.00	180.00	
6,885.2	0.00	0.00	6,647.0	-1,210.0	-1,096.6	0.00	0.00	0.00	0.00	
7,785.2	90.00	360.00	7,220.0	-637.0	-1,096.6	10.00	10.00	0.00	360.00	
12,051.5	90.00	360.00	7,220.0	3,629.3	-1,096.9	0.00	0.00	0.00	0.00	PBHL 4B-36H

Cathedral Energy Services

Planning Report

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

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
250.0	0.00	0.00	250.0	0.0	0.0	0.0	0.00	0.00	KOP @ 250'
300.0	1.00	222.19	300.0	-0.3	-0.3	-0.3	2.00	2.00	
400.0	3.00	222.19	399.9	-2.9	-2.6	-2.9	2.00	2.00	
500.0	5.00	222.19	499.7	-8.1	-7.3	-8.1	2.00	2.00	
600.0	7.00	222.19	599.1	-15.8	-14.3	-15.8	2.00	2.00	
700.0	9.00	222.19	698.2	-26.1	-23.7	-26.1	2.00	2.00	
800.0	11.00	222.19	796.6	-39.0	-35.3	-39.0	2.00	2.00	
900.0	13.00	222.19	894.4	-54.4	-49.3	-54.4	2.00	2.00	
1,000.0	15.00	222.19	991.5	-72.3	-65.6	-72.3	2.00	2.00	
1,002.6	15.05	222.19	994.0	-72.8	-66.0	-72.8	2.00	2.00	Fox Hills - BASE
1,100.0	17.00	222.19	1,087.6	-92.8	-84.1	-92.8	2.00	2.00	
1,127.1	17.54	222.19	1,113.5	-98.7	-89.5	-98.7	2.00	2.00	EOB; Inc=17.54°
1,200.0	17.54	222.19	1,183.0	-115.0	-104.2	-115.0	0.00	0.00	
1,300.0	17.54	222.19	1,278.3	-137.3	-124.5	-137.3	0.00	0.00	
1,400.0	17.54	222.19	1,373.7	-159.7	-144.7	-159.7	0.00	0.00	
1,500.0	17.54	222.19	1,469.0	-182.0	-164.9	-182.0	0.00	0.00	
1,600.0	17.54	222.19	1,564.4	-204.3	-185.2	-204.3	0.00	0.00	
1,700.0	17.54	222.19	1,659.7	-226.7	-205.4	-226.7	0.00	0.00	
1,800.0	17.54	222.19	1,755.1	-249.0	-225.7	-249.0	0.00	0.00	
1,900.0	17.54	222.19	1,850.4	-271.3	-245.9	-271.3	0.00	0.00	
2,000.0	17.54	222.19	1,945.8	-293.7	-266.1	-293.7	0.00	0.00	
2,100.0	17.54	222.19	2,041.1	-316.0	-286.4	-316.0	0.00	0.00	
2,200.0	17.54	222.19	2,136.5	-338.3	-306.6	-338.3	0.00	0.00	
2,300.0	17.54	222.19	2,231.8	-360.7	-326.9	-360.7	0.00	0.00	
2,400.0	17.54	222.19	2,327.2	-383.0	-347.1	-383.0	0.00	0.00	
2,500.0	17.54	222.19	2,422.5	-405.3	-367.3	-405.3	0.00	0.00	
2,600.0	17.54	222.19	2,517.9	-427.7	-387.6	-427.7	0.00	0.00	
2,700.0	17.54	222.19	2,613.2	-450.0	-407.8	-450.0	0.00	0.00	
2,800.0	17.54	222.19	2,708.6	-472.3	-428.1	-472.3	0.00	0.00	
2,900.0	17.54	222.19	2,803.9	-494.7	-448.3	-494.7	0.00	0.00	
3,000.0	17.54	222.19	2,899.3	-517.0	-468.5	-517.0	0.00	0.00	
3,100.0	17.54	222.19	2,994.6	-539.3	-488.8	-539.3	0.00	0.00	
3,200.0	17.54	222.19	3,090.0	-561.7	-509.0	-561.7	0.00	0.00	
3,300.0	17.54	222.19	3,185.3	-584.0	-529.3	-584.0	0.00	0.00	
3,400.0	17.54	222.19	3,280.7	-606.3	-549.5	-606.3	0.00	0.00	
3,500.0	17.54	222.19	3,376.0	-628.7	-569.7	-628.7	0.00	0.00	
3,600.0	17.54	222.19	3,471.4	-651.0	-590.0	-651.0	0.00	0.00	
3,700.0	17.54	222.19	3,566.7	-673.3	-610.2	-673.3	0.00	0.00	
3,800.0	17.54	222.19	3,662.1	-695.7	-630.5	-695.7	0.00	0.00	
3,900.0	17.54	222.19	3,757.4	-718.0	-650.7	-718.0	0.00	0.00	
4,000.0	17.54	222.19	3,852.8	-740.3	-670.9	-740.3	0.00	0.00	
4,100.0	17.54	222.19	3,948.1	-762.7	-691.2	-762.7	0.00	0.00	
4,200.0	17.54	222.19	4,043.5	-785.0	-711.4	-785.0	0.00	0.00	
4,300.0	17.54	222.19	4,138.8	-807.3	-731.7	-807.3	0.00	0.00	
4,400.0	17.54	222.19	4,234.2	-829.7	-751.9	-829.7	0.00	0.00	
4,500.0	17.54	222.19	4,329.5	-852.0	-772.1	-852.0	0.00	0.00	
4,600.0	17.54	222.19	4,424.9	-874.3	-792.4	-874.3	0.00	0.00	
4,700.0	17.54	222.19	4,520.2	-896.7	-812.6	-896.7	0.00	0.00	
4,800.0	17.54	222.19	4,615.6	-919.0	-832.9	-919.0	0.00	0.00	

Cathedral Energy Services

Planning Report

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

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,889.6	17.54	222.19	4,701.0	-939.0	-851.0	-939.0	0.00	0.00	Sussex
4,900.0	17.54	222.19	4,710.9	-941.3	-853.1	-941.3	0.00	0.00	
5,000.0	17.54	222.19	4,806.3	-963.7	-873.3	-963.7	0.00	0.00	
5,053.2	17.54	222.19	4,857.0	-975.5	-884.1	-975.5	0.00	0.00	Sussex Marker
5,100.0	17.54	222.19	4,901.6	-986.0	-893.6	-986.0	0.00	0.00	
5,200.0	17.54	222.19	4,997.0	-1,008.3	-913.8	-1,008.3	0.00	0.00	
5,300.0	17.54	222.19	5,092.3	-1,030.7	-934.1	-1,030.7	0.00	0.00	
5,400.0	17.54	222.19	5,187.7	-1,053.0	-954.3	-1,053.0	0.00	0.00	
5,449.7	17.54	222.19	5,235.0	-1,064.1	-964.4	-1,064.1	0.00	0.00	Shannon
5,500.0	17.54	222.19	5,283.0	-1,075.3	-974.5	-1,075.3	0.00	0.00	
5,600.0	17.54	222.19	5,378.4	-1,097.7	-994.8	-1,097.7	0.00	0.00	
5,661.0	17.54	222.19	5,436.5	-1,111.3	-1,007.1	-1,111.3	0.00	0.00	Start Drop -2.00
5,700.0	16.76	222.19	5,473.8	-1,119.8	-1,014.9	-1,119.8	2.00	-2.00	
5,800.0	14.76	222.19	5,570.0	-1,139.9	-1,033.1	-1,139.9	2.00	-2.00	
5,900.0	12.76	222.19	5,667.1	-1,157.6	-1,049.1	-1,157.6	2.00	-2.00	
6,000.0	10.76	222.19	5,765.0	-1,172.7	-1,062.8	-1,172.7	2.00	-2.00	
6,100.0	8.76	222.19	5,863.6	-1,185.2	-1,074.1	-1,185.2	2.00	-2.00	
6,200.0	6.76	222.19	5,962.7	-1,195.2	-1,083.2	-1,195.2	2.00	-2.00	
6,300.0	4.76	222.19	6,062.2	-1,202.7	-1,090.0	-1,202.7	2.00	-2.00	
6,400.0	2.76	222.19	6,161.9	-1,207.5	-1,094.4	-1,207.5	2.00	-2.00	
6,500.0	0.76	222.19	6,261.9	-1,209.8	-1,096.4	-1,209.8	2.00	-2.00	
6,538.1	0.00	0.00	6,300.0	-1,210.0	-1,096.6	-1,210.0	2.00	-2.00	EOD; Inc=0°
6,600.0	0.00	0.00	6,361.9	-1,210.0	-1,096.6	-1,210.0	0.00	0.00	
6,700.0	0.00	0.00	6,461.9	-1,210.0	-1,096.6	-1,210.0	0.00	0.00	
6,786.1	0.00	0.00	6,548.0	-1,210.0	-1,096.6	-1,210.0	0.00	0.00	Teepee Buttes (*if present)
6,800.0	0.00	0.00	6,561.9	-1,210.0	-1,096.6	-1,210.0	0.00	0.00	
6,885.2	0.00	0.00	6,647.0	-1,210.0	-1,096.6	-1,210.0	0.00	0.00	Start Build 10.00
6,900.0	1.48	360.00	6,661.9	-1,209.8	-1,096.6	-1,209.8	10.00	10.00	
7,000.0	11.48	360.00	6,761.1	-1,198.5	-1,096.6	-1,198.5	10.00	10.00	
7,100.0	21.48	360.00	6,856.9	-1,170.2	-1,096.6	-1,170.2	10.00	10.00	
7,200.0	31.48	360.00	6,946.3	-1,125.7	-1,096.6	-1,125.7	10.00	10.00	
7,300.0	41.48	360.00	7,026.6	-1,066.3	-1,096.6	-1,066.3	10.00	10.00	
7,391.5	50.63	360.00	7,090.0	-1,000.5	-1,096.6	-1,000.5	10.00	10.00	Sharon Springs
7,400.0	51.48	360.00	7,095.3	-993.8	-1,096.6	-993.8	10.00	10.00	
7,463.4	57.82	360.00	7,132.0	-942.2	-1,096.6	-942.2	10.00	10.00	Niobrara
7,500.0	61.48	360.00	7,150.5	-910.6	-1,096.6	-910.6	10.00	10.00	
7,600.0	71.48	360.00	7,190.3	-819.0	-1,096.6	-819.0	10.00	10.00	
7,695.5	81.03	360.00	7,213.0	-726.3	-1,096.6	-726.3	10.00	10.00	B Chalk
7,700.0	81.48	360.00	7,213.7	-721.9	-1,096.6	-721.9	10.00	10.00	
7,785.2	90.00	360.00	7,220.0	-637.0	-1,096.6	-637.0	10.00	10.00	LP @ 7220' TVD; 90°
7,800.0	90.00	360.00	7,220.0	-622.2	-1,096.6	-622.2	0.00	0.00	
7,900.0	90.00	360.00	7,220.0	-522.2	-1,096.6	-522.2	0.00	0.00	
8,000.0	90.00	360.00	7,220.0	-422.2	-1,096.6	-422.2	0.00	0.00	
8,100.0	90.00	360.00	7,220.0	-322.2	-1,096.6	-322.2	0.00	0.00	
8,200.0	90.00	360.00	7,220.0	-222.2	-1,096.7	-222.2	0.00	0.00	
8,300.0	90.00	360.00	7,220.0	-122.2	-1,096.7	-122.2	0.00	0.00	
8,400.0	90.00	360.00	7,220.0	-22.2	-1,096.7	-22.2	0.00	0.00	
8,500.0	90.00	360.00	7,220.0	77.8	-1,096.7	77.8	0.00	0.00	
8,600.0	90.00	360.00	7,220.0	177.8	-1,096.7	177.8	0.00	0.00	
8,700.0	90.00	360.00	7,220.0	277.8	-1,096.7	277.8	0.00	0.00	
8,800.0	90.00	360.00	7,220.0	377.8	-1,096.7	377.8	0.00	0.00	
8,900.0	90.00	360.00	7,220.0	477.8	-1,096.7	477.8	0.00	0.00	

Cathedral Energy Services

Planning Report

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

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
9,000.0	90.00	360.00	7,220.0	577.8	-1,096.7	577.8	0.00	0.00	
9,100.0	90.00	360.00	7,220.0	677.8	-1,096.7	677.8	0.00	0.00	
9,200.0	90.00	360.00	7,220.0	777.8	-1,096.7	777.8	0.00	0.00	
9,300.0	90.00	360.00	7,220.0	877.8	-1,096.7	877.8	0.00	0.00	
9,400.0	90.00	360.00	7,220.0	977.8	-1,096.7	977.8	0.00	0.00	
9,500.0	90.00	360.00	7,220.0	1,077.8	-1,096.7	1,077.8	0.00	0.00	
9,600.0	90.00	360.00	7,220.0	1,177.8	-1,096.7	1,177.8	0.00	0.00	
9,700.0	90.00	360.00	7,220.0	1,277.8	-1,096.7	1,277.8	0.00	0.00	
9,800.0	90.00	360.00	7,220.0	1,377.8	-1,096.7	1,377.8	0.00	0.00	
9,900.0	90.00	360.00	7,220.0	1,477.8	-1,096.7	1,477.8	0.00	0.00	
10,000.0	90.00	360.00	7,220.0	1,577.8	-1,096.8	1,577.8	0.00	0.00	
10,100.0	90.00	360.00	7,220.0	1,677.8	-1,096.8	1,677.8	0.00	0.00	
10,200.0	90.00	360.00	7,220.0	1,777.8	-1,096.8	1,777.8	0.00	0.00	
10,300.0	90.00	360.00	7,220.0	1,877.8	-1,096.8	1,877.8	0.00	0.00	
10,400.0	90.00	360.00	7,220.0	1,977.8	-1,096.8	1,977.8	0.00	0.00	
10,500.0	90.00	360.00	7,220.0	2,077.8	-1,096.8	2,077.8	0.00	0.00	
10,600.0	90.00	360.00	7,220.0	2,177.8	-1,096.8	2,177.8	0.00	0.00	
10,700.0	90.00	360.00	7,220.0	2,277.8	-1,096.8	2,277.8	0.00	0.00	
10,800.0	90.00	360.00	7,220.0	2,377.8	-1,096.8	2,377.8	0.00	0.00	
10,900.0	90.00	360.00	7,220.0	2,477.8	-1,096.8	2,477.8	0.00	0.00	
11,000.0	90.00	360.00	7,220.0	2,577.8	-1,096.8	2,577.8	0.00	0.00	
11,100.0	90.00	360.00	7,220.0	2,677.8	-1,096.8	2,677.8	0.00	0.00	
11,200.0	90.00	360.00	7,220.0	2,777.8	-1,096.8	2,777.8	0.00	0.00	
11,300.0	90.00	360.00	7,220.0	2,877.8	-1,096.8	2,877.8	0.00	0.00	
11,400.0	90.00	360.00	7,220.0	2,977.8	-1,096.8	2,977.8	0.00	0.00	
11,500.0	90.00	360.00	7,220.0	3,077.8	-1,096.8	3,077.8	0.00	0.00	
11,600.0	90.00	360.00	7,220.0	3,177.8	-1,096.8	3,177.8	0.00	0.00	
11,700.0	90.00	360.00	7,220.0	3,277.8	-1,096.8	3,277.8	0.00	0.00	
11,800.0	90.00	360.00	7,220.0	3,377.8	-1,096.8	3,377.8	0.00	0.00	
11,900.0	90.00	360.00	7,220.0	3,477.8	-1,096.9	3,477.8	0.00	0.00	
12,000.0	90.00	360.00	7,220.0	3,577.8	-1,096.9	3,577.8	0.00	0.00	
12,051.5	90.00	360.00	7,220.0	3,629.3	-1,096.9	3,629.3	0.00	0.00	TD at 12051.5

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL 4B-36H - plan hits target center - Point	0.00	0.00	7,220.0	3,629.3	-1,096.9	1,280,515.61	3,217,199.04	40.100790	-104.723580

Cathedral Energy Services

Planning Report

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

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,002.6	994.0	Fox Hills - BASE			
4,889.6	4,701.0	Sussex			
5,053.2	4,857.0	Sussex Marker			
5,449.7	5,235.0	Shannon			
6,786.1	6,548.0	Teepee Buttes (*if present)			
7,391.5	7,090.0	Sharon Springs			
7,463.4	7,132.0	Niobrara			
7,695.5	7,213.0	B Chalk			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
250.0	250.0	0.0	0.0	KOP @ 250'
1,127.1	1,113.5	-98.7	-89.5	EOB; Inc=17.54°
5,661.0	5,436.5	-1,111.3	-1,007.1	Start Drop -2.00
6,538.1	6,300.0	-1,210.0	-1,096.6	EOD; Inc=0°
6,885.2	6,647.0	-1,210.0	-1,096.6	Start Build 10.00
7,785.2	7,220.0	-637.0	-1,096.6	LP @ 7220' TVD; 90°
12,051.5	7,220.0	3,629.3	-1,096.9	TD at 12051.5

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S36 T2N-R66W (Marcus State, Mumby State)

Mumby State 4B-36H

HZ

Plan #1

Anticollision Report

16 January, 2014

Cathedral Energy Services

Anticollision Report

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

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

Survey Tool Program		Date	1/16/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	12,051.5	Plan #1 (HZ)	Geolink MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S36 T2N-R66W (Marcus State, Mumby State)						
BADDING STATE 1 (EXISTING) - PDC WELL - NO SUR						Out of range
BADDING STATE 31-36 (EXISTING) - ENCANA WELL -	11,974.3	7,225.0	58.2	-20.3	0.741	Level 1, CC, ES, 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	869.0	869.0	150.2	147.5	54.741	CC, ES
MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYRO	1,200.0	1,185.3	175.6	171.3	40.509	SF
MUMBY STATE 33-36 (EXISTING) - ENCANA WELL - G	9,260.1	7,225.7	168.5	139.7	5.868	CC, ES, SF
Mumby State 4A-36H - HZ - Plan #1	166.3	167.3	10.1	9.6	21.088	CC
Mumby State 4A-36H - HZ - Plan #1	200.0	201.0	10.1	9.5	16.923	ES
Mumby State 4A-36H - HZ - Plan #1	12,051.5	12,372.3	429.3	317.7	3.848	SF
Mumby State 4C-36H - HZ - Plan #1	200.0	201.0	9.8	9.2	16.453	CC
Mumby State 4C-36H - HZ - Plan #1	227.8	228.8	9.8	9.1	14.209	ES
Mumby State 4C-36H - HZ - Plan #1	12,051.5	12,249.2	429.3	317.2	3.831	SF
Mumby State 4D-36H - HZ - Plan #1	200.0	200.0	19.9	19.3	33.481	CC
Mumby State 4D-36H - HZ - Plan #1	300.0	300.0	20.2	19.2	21.386	ES
Mumby State 4D-36H - HZ - Plan #1	4,500.0	4,478.6	489.0	452.8	13.508	SF
Mumby State 4E-36H - HZ - Plan #1	200.0	200.0	29.9	29.3	50.452	CC
Mumby State 4E-36H - HZ - Plan #1	300.0	300.0	30.2	29.3	32.072	ES
Mumby State 4E-36H - HZ - Plan #1	600.0	599.7	46.3	44.2	22.964	SF
Mumby State 4F-36H - HZ - Plan #1	200.0	200.0	40.0	39.4	67.424	CC
Mumby State 4F-36H - HZ - Plan #1	300.0	300.0	40.3	39.4	42.757	ES
Mumby State 4F-36H - HZ - Plan #1	700.0	698.3	67.9	65.4	27.436	SF
Mumby State 4G-36H - HZ - Plan #1	200.0	200.0	49.8	49.2	83.925	CC
Mumby State 4G-36H - HZ - Plan #1	300.0	300.0	50.1	49.2	53.146	ES
Mumby State 4G-36H - HZ - Plan #1	700.0	694.3	85.8	83.2	33.511	SF
Mumby State 4H-36H - HZ - Plan #1	200.0	200.0	59.9	59.3	100.904	CC, ES
Mumby State 4H-36H - HZ - Plan #1	700.0	688.0	110.1	107.4	42.043	SF

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

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - BADDING STATE 31-36 (EXISTING) - ENCANA WELL													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
11,500.0	7,220.0	7,225.0	7,225.0	60.9	12.6	-90.00	3,552.1	-1,155.1	477.9	407.4	70.44	6.784		
11,600.0	7,220.0	7,225.0	7,225.0	62.5	12.6	-90.00	3,552.1	-1,155.1	378.8	306.7	72.13	5.251		
11,700.0	7,220.0	7,225.0	7,225.0	64.1	12.6	-90.00	3,552.1	-1,155.1	280.4	206.6	73.83	3.798		
11,800.0	7,220.0	7,225.0	7,225.0	65.7	12.6	-90.00	3,552.1	-1,155.1	183.8	108.2	75.53	2.433		
11,900.0	7,220.0	7,225.0	7,225.0	67.4	12.6	-90.00	3,552.1	-1,155.1	94.4	17.1	77.24	1.222	Level 2	
11,974.3	7,220.0	7,225.0	7,225.0	68.6	12.6	-90.00	3,552.1	-1,155.1	58.2	-20.3	78.51	0.741	Level 1, CC, ES, SF	
12,000.0	7,220.0	7,225.0	7,225.0	69.0	12.6	-90.00	3,552.1	-1,155.1	63.6	-15.3	78.95	0.806	Level 1	
12,051.5	7,220.0	7,225.0	7,225.0	69.9	12.6	-90.00	3,552.1	-1,155.1	96.7	16.9	79.83	1.211	Level 2	

Cathedral Energy Services

Anticollision Report

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

Offset Design		S36 T2N-R66W (Marcus State, Mumby State) - MUMBY STATE 1 (EXISTING) - ENCANA WELL - GYR										Offset Site Error:		0.0 ft
Survey Program:		100-Gyro										Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)				
0.0	0.0	4.9	4.9	0.0	0.0	158.80	-145.7	56.5	156.3					
100.0	100.0	103.0	103.0	0.1	0.1	158.65	-146.2	57.1	157.0	156.8	0.20	781.906		
200.0	200.0	205.4	205.4	0.3	0.2	158.31	-146.3	58.2	157.4	157.0	0.46	338.736		
218.4	218.4	223.3	223.3	0.3	0.2	-63.96	-146.2	58.4	157.4	156.9	0.51	306.664		
300.0	300.0	303.0	302.9	0.5	0.3	-64.43	-146.3	59.5	157.8	157.1	0.73	217.375		
400.0	399.9	402.2	402.1	0.7	0.3	-65.95	-147.3	61.0	157.9	156.9	0.99	158.780		
500.0	499.7	501.9	501.9	0.9	0.4	-68.56	-148.7	62.4	156.9	155.7	1.28	122.320		
600.0	599.1	601.8	601.8	1.1	0.5	-72.29	-150.0	63.4	155.1	153.5	1.61	96.548		
700.0	698.2	700.9	700.9	1.4	0.6	-77.38	-151.1	64.4	152.9	151.0	1.98	77.288		
800.0	796.6	801.6	801.5	1.7	0.7	-84.25	-151.2	65.6	150.9	148.5	2.41	62.586		
869.0	864.2	869.0	869.0	2.0	0.8	-89.61	-151.0	65.9	150.2	147.5	2.74	54.741	CC, ES	
900.0	894.4	899.3	899.2	2.1	0.8	-92.15	-151.0	65.9	150.4	147.5	2.89	51.983		
1,000.0	991.5	996.9	996.8	2.6	0.9	-101.09	-150.6	66.1	153.2	149.7	3.40	44.990		
1,100.0	1,087.6	1,091.6	1,091.5	3.1	0.9	-110.52	-149.7	66.7	161.2	157.3	3.90	41.284		
1,200.0	1,183.0	1,185.3	1,185.2	3.6	1.0	-119.45	-149.4	68.0	175.6	171.3	4.33	40.509	SF	
1,300.0	1,278.3	1,280.5	1,280.4	4.2	1.1	-126.86	-150.2	69.4	194.3	189.6	4.70	41.352		
1,400.0	1,373.7	1,377.4	1,377.2	4.7	1.2	-132.97	-151.3	70.5	215.4	210.4	5.01	42.959		
1,500.0	1,469.0	1,473.5	1,473.4	5.3	1.3	-138.06	-151.9	70.9	237.8	232.5	5.29	44.958		
1,600.0	1,564.4	1,569.3	1,569.1	5.8	1.4	-142.49	-151.6	71.1	261.6	256.1	5.53	47.314		
1,700.0	1,659.7	1,665.1	1,665.0	6.4	1.4	-146.29	-150.9	70.9	286.5	280.8	5.75	49.844		
1,800.0	1,755.1	1,759.9	1,759.8	6.9	1.5	-149.52	-149.8	70.5	312.3	306.4	5.96	52.445		
1,900.0	1,850.4	1,853.5	1,853.4	7.5	1.6	-152.13	-149.2	70.6	339.2	333.1	6.17	55.011		
2,000.0	1,945.8	1,950.9	1,950.8	8.1	1.7	-154.27	-149.5	71.3	367.0	360.6	6.39	57.446		
2,100.0	2,041.1	2,049.1	2,048.9	8.6	1.8	-156.14	-150.1	71.0	394.0	387.4	6.61	59.626		
2,200.0	2,136.5	2,143.5	2,143.3	9.2	1.9	-157.83	-149.9	70.3	421.4	414.5	6.82	61.793		
2,300.0	2,231.8	2,239.1	2,238.9	9.7	1.9	-159.41	-149.2	69.5	449.2	442.2	7.03	63.948		
2,400.0	2,327.2	2,335.9	2,335.7	10.3	2.0	-160.77	-149.0	68.6	477.1	469.9	7.24	65.920		

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - MUMBY STATE 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						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		
8,800.0	7,220.0	7,224.1	7,222.7	25.6	6.3	89.21	838.0	-928.3	490.0	466.4	23.58	20.779		
8,900.0	7,220.0	7,224.5	7,223.0	26.2	6.3	89.33	838.0	-928.3	397.6	373.1	24.51	16.220		
9,000.0	7,220.0	7,224.8	7,223.4	26.9	6.3	89.44	838.0	-928.3	309.9	284.4	25.56	12.126		
9,100.0	7,220.0	7,225.1	7,223.7	27.7	6.3	89.56	838.0	-928.3	232.4	205.7	26.70	8.704		
9,200.0	7,220.0	7,225.5	7,224.0	28.6	6.3	89.67	838.0	-928.3	178.9	150.9	27.93	6.405		
9,260.1	7,220.0	7,225.7	7,224.2	29.2	6.3	89.74	838.0	-928.3	168.5	139.7	28.71	5.868	CC, ES, SF	
9,300.0	7,220.0	7,225.8	7,224.4	29.6	6.3	89.78	838.0	-928.3	173.1	143.9	29.23	5.923		
9,400.0	7,220.0	7,226.1	7,224.7	30.7	6.3	89.89	838.0	-928.3	218.9	188.4	30.58	7.160		
9,500.0	7,220.0	7,226.5	7,225.0	31.8	6.3	90.00	838.0	-928.3	293.1	261.1	31.98	9.165		
9,600.0	7,220.0	7,226.8	7,225.3	33.0	6.3	90.11	838.0	-928.2	379.3	345.9	33.42	11.349		
9,700.0	7,220.0	7,227.1	7,225.7	34.2	6.3	90.22	838.0	-928.2	471.0	436.1	34.90	13.496		

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4A-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-10.1	10.1					
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-10.1	10.1	9.8	0.25	40.928		
166.3	166.3	167.3	167.3	0.2	0.2	-90.00	0.0	-10.1	10.1	9.6	0.48	21.088 CC		
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-10.1	10.1	9.5	0.60	16.923 ES		
300.0	300.0	300.7	300.7	0.5	0.5	43.60	-1.1	-11.4	11.2	10.2	0.95	11.815		
400.0	399.9	400.3	400.2	0.7	0.7	40.60	-4.5	-15.4	12.9	11.6	1.30	9.909		
500.0	499.7	500.0	499.5	0.9	0.9	39.81	-10.1	-22.1	14.9	13.3	1.68	8.901		
600.0	599.1	599.4	598.1	1.1	1.2	40.49	-17.9	-31.3	17.2	15.2	2.09	8.263		
700.0	698.2	698.8	696.3	1.4	1.5	42.10	-27.9	-43.2	19.8	17.3	2.55	7.781		
800.0	796.6	798.2	793.9	1.7	1.9	44.25	-40.1	-57.7	22.7	19.6	3.08	7.359		
900.0	894.4	897.5	890.6	2.1	2.3	46.69	-54.4	-74.7	25.8	22.1	3.71	6.961		
1,000.0	991.5	996.7	986.5	2.6	2.8	49.24	-70.9	-94.3	29.4	24.9	4.46	6.579		
1,100.0	1,087.6	1,095.8	1,081.3	3.1	3.3	51.78	-89.5	-116.3	33.2	27.9	5.34	6.219		
1,200.0	1,183.0	1,194.8	1,175.0	3.6	3.9	53.16	-110.2	-140.9	38.0	31.8	6.28	6.059		
1,300.0	1,278.3	1,294.7	1,268.8	4.2	4.5	52.79	-132.0	-166.8	44.0	36.8	7.15	6.150		
1,400.0	1,373.7	1,394.5	1,362.7	4.7	5.1	52.50	-153.9	-192.8	49.9	41.8	8.02	6.215		
1,500.0	1,469.0	1,494.3	1,456.6	5.3	5.8	52.28	-175.8	-218.7	55.8	46.9	8.91	6.264		
1,600.0	1,564.4	1,594.1	1,550.5	5.8	6.4	52.10	-197.6	-244.7	61.7	51.9	9.79	6.302		
1,700.0	1,659.7	1,694.0	1,644.4	6.4	7.0	51.95	-219.5	-270.6	67.6	56.9	10.68	6.332		
1,800.0	1,755.1	1,793.8	1,738.2	6.9	7.6	51.82	-241.3	-296.6	73.5	62.0	11.57	6.356		
1,900.0	1,850.4	1,893.6	1,832.1	7.5	8.3	51.71	-263.2	-322.5	79.4	67.0	12.46	6.376		
2,000.0	1,945.8	1,993.4	1,926.0	8.1	8.9	51.62	-285.1	-348.5	85.4	72.0	13.35	6.392		
2,100.0	2,041.1	2,093.3	2,019.9	8.6	9.5	51.54	-306.9	-374.4	91.3	77.0	14.25	6.407		
2,200.0	2,136.5	2,193.1	2,113.8	9.2	10.2	51.47	-328.8	-400.4	97.2	82.0	15.14	6.419		
2,300.0	2,231.8	2,292.9	2,207.6	9.7	10.8	51.41	-350.6	-426.3	103.1	87.1	16.04	6.429		
2,400.0	2,327.2	2,392.7	2,301.5	10.3	11.4	51.35	-372.5	-452.3	109.0	92.1	16.93	6.438		
2,500.0	2,422.5	2,492.6	2,395.4	10.9	12.1	51.30	-394.4	-478.3	114.9	97.1	17.83	6.446		
2,600.0	2,517.9	2,592.4	2,489.3	11.4	12.7	51.26	-416.2	-504.2	120.9	102.1	18.73	6.453		
2,700.0	2,613.2	2,692.2	2,583.2	12.0	13.3	51.22	-438.1	-530.2	126.8	107.1	19.63	6.459		
2,800.0	2,708.6	2,792.0	2,677.1	12.5	14.0	51.18	-459.9	-556.1	132.7	112.2	20.52	6.465		
2,900.0	2,803.9	2,891.9	2,770.9	13.1	14.6	51.14	-481.8	-582.1	138.6	117.2	21.42	6.470		
3,000.0	2,899.3	2,991.7	2,864.8	13.7	15.2	51.11	-503.7	-608.0	144.5	122.2	22.32	6.475		
3,100.0	2,994.6	3,091.5	2,958.7	14.2	15.9	51.08	-525.5	-634.0	150.4	127.2	23.22	6.479		
3,200.0	3,090.0	3,191.3	3,052.6	14.8	16.5	51.06	-547.4	-659.9	156.4	132.2	24.12	6.483		
3,300.0	3,185.3	3,291.2	3,146.5	15.4	17.1	51.03	-569.2	-685.9	162.3	137.3	25.02	6.486		
3,400.0	3,280.7	3,391.0	3,240.3	15.9	17.8	51.01	-591.1	-711.8	168.2	142.3	25.92	6.489		
3,500.0	3,376.0	3,490.8	3,334.2	16.5	18.4	50.99	-613.0	-737.8	174.1	147.3	26.82	6.492		
3,600.0	3,471.4	3,590.6	3,428.1	17.0	19.1	50.97	-634.8	-763.7	180.0	152.3	27.72	6.495		
3,700.0	3,566.7	3,690.5	3,522.0	17.6	19.7	50.95	-656.7	-789.7	185.9	157.3	28.62	6.498		
3,800.0	3,662.1	3,790.3	3,615.9	18.2	20.3	50.93	-678.5	-815.6	191.9	162.3	29.52	6.500		
3,900.0	3,757.4	3,890.1	3,709.7	18.7	21.0	50.92	-700.4	-841.6	197.8	167.4	30.42	6.502		
4,000.0	3,852.8	3,989.9	3,803.6	19.3	21.6	50.90	-722.3	-867.5	203.7	172.4	31.32	6.504		
4,100.0	3,948.1	4,089.8	3,897.5	19.9	22.2	50.89	-744.1	-893.5	209.6	177.4	32.22	6.506		
4,200.0	4,043.5	4,189.6	3,991.4	20.4	22.9	50.87	-766.0	-919.5	215.5	182.4	33.12	6.508		
4,300.0	4,138.8	4,289.4	4,085.3	21.0	23.5	50.86	-787.9	-945.4	221.5	187.4	34.02	6.510		
4,400.0	4,234.2	4,389.2	4,179.1	21.6	24.1	50.85	-809.7	-971.4	227.4	192.4	34.92	6.511		
4,500.0	4,329.5	4,489.1	4,273.0	22.1	24.8	50.83	-831.6	-997.3	233.3	197.5	35.82	6.513		
4,600.0	4,424.9	4,588.9	4,366.9	22.7	25.4	50.82	-853.4	-1,023.3	239.2	202.5	36.72	6.514		
4,700.0	4,520.2	4,688.7	4,460.8	23.2	26.0	50.81	-875.3	-1,049.2	245.1	207.5	37.62	6.515		
4,800.0	4,615.6	4,788.5	4,554.7	23.8	26.7	50.80	-897.2	-1,075.2	251.0	212.5	38.52	6.517		
4,900.0	4,710.9	4,888.4	4,648.5	24.4	27.3	50.79	-919.0	-1,101.1	257.0	217.5	39.42	6.518		
5,000.0	4,806.3	4,988.2	4,742.4	24.9	28.0	50.78	-940.9	-1,127.1	262.9	222.5	40.32	6.519		

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

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Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4A-36H - HZ - Plan #1												Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
5,100.0	4,901.6	5,088.0	4,836.3	25.5	28.6	50.77	-962.7	-1,153.0	268.8	227.6	41.22	6.520	
5,200.0	4,997.0	5,187.8	4,930.2	26.1	29.2	50.77	-984.6	-1,179.0	274.7	232.6	42.13	6.521	
5,300.0	5,092.3	5,287.7	5,024.1	26.6	29.9	50.76	-1,006.5	-1,204.9	280.6	237.6	43.03	6.522	
5,400.0	5,187.7	5,387.5	5,117.9	27.2	30.5	50.75	-1,028.3	-1,230.9	286.5	242.6	43.93	6.523	
5,500.0	5,283.0	5,487.3	5,211.8	27.8	31.1	50.74	-1,050.2	-1,256.8	292.5	247.6	44.83	6.524	
5,600.0	5,378.4	5,587.1	5,305.7	28.3	31.8	50.73	-1,072.0	-1,282.8	298.4	252.6	45.73	6.525	
5,700.0	5,473.8	5,686.9	5,399.6	28.9	32.4	50.73	-1,093.9	-1,308.7	304.5	257.8	46.61	6.532	
5,800.0	5,570.0	5,792.8	5,499.4	29.4	33.0	50.49	-1,116.4	-1,335.5	311.6	264.4	47.28	6.591	
5,900.0	5,667.1	5,901.3	5,603.1	29.8	33.6	50.21	-1,137.1	-1,360.1	318.4	270.6	47.84	6.656	
6,000.0	5,765.0	6,010.0	5,708.1	30.2	34.1	49.92	-1,155.4	-1,381.7	324.6	276.3	48.29	6.723	
6,100.0	5,863.6	6,119.1	5,814.4	30.5	34.5	49.61	-1,171.0	-1,400.3	330.3	281.7	48.63	6.792	
6,200.0	5,962.7	6,228.4	5,921.8	30.7	34.9	49.28	-1,184.1	-1,415.8	335.4	286.6	48.87	6.863	
6,300.0	6,062.2	6,338.0	6,030.2	30.9	35.2	48.94	-1,194.6	-1,428.2	340.0	291.0	49.02	6.936	
6,400.0	6,161.9	6,447.8	6,139.3	31.1	35.4	48.57	-1,202.3	-1,437.5	344.0	294.9	49.06	7.012	
6,500.0	6,261.9	6,557.7	6,248.9	31.1	35.6	48.19	-1,207.4	-1,443.5	347.4	298.4	49.00	7.089	
6,600.0	6,361.9	6,667.9	6,359.1	31.2	35.7	-89.97	-1,209.8	-1,446.3	349.8	300.8	48.94	7.147	
6,700.0	6,461.9	6,771.7	6,462.9	31.3	35.7	-90.00	-1,210.0	-1,446.6	350.0	300.9	49.08	7.130	
6,800.0	6,561.9	6,871.7	6,562.9	31.3	35.8	-90.00	-1,210.0	-1,446.6	350.0	300.7	49.25	7.106	
6,864.3	6,626.2	6,936.1	6,627.2	31.4	35.8	-90.08	-1,210.0	-1,446.6	350.0	300.7	49.29	7.100	
6,900.0	6,661.9	6,971.7	6,662.9	31.4	35.9	-90.03	-1,210.0	-1,446.6	350.0	300.6	49.39	7.086	
6,915.8	6,677.7	6,987.5	6,678.7	31.4	35.9	-90.13	-1,210.0	-1,446.6	350.0	300.7	49.31	7.097	
7,000.0	6,761.1	7,071.0	6,762.1	31.3	35.9	-91.84	-1,210.0	-1,446.6	350.2	302.1	48.08	7.283	
7,100.0	6,856.9	7,166.7	6,857.9	31.0	36.0	-96.04	-1,210.0	-1,446.6	352.2	307.3	44.97	7.833	
7,200.0	6,946.3	7,264.6	6,955.6	30.5	36.0	-101.90	-1,207.0	-1,446.6	359.4	318.6	40.78	8.813	
7,300.0	7,026.6	7,375.1	7,063.7	29.9	35.8	-107.90	-1,185.2	-1,446.6	371.4	334.7	36.73	10.112	
7,400.0	7,095.3	7,497.8	7,176.5	29.2	35.3	-113.47	-1,137.3	-1,446.6	386.6	353.2	33.40	11.573	
7,500.0	7,150.5	7,635.2	7,287.3	28.4	34.6	-118.37	-1,056.6	-1,446.6	402.8	371.8	30.98	13.001	
7,600.0	7,190.3	7,788.6	7,384.4	27.6	33.6	-122.27	-938.3	-1,446.6	417.1	387.5	29.59	14.096	
7,700.0	7,213.7	7,956.3	7,450.6	26.9	32.5	-124.74	-784.9	-1,446.6	426.7	397.4	29.32	14.552	
7,800.0	7,220.0	8,120.7	7,470.0	26.2	31.6	-125.43	-622.2	-1,446.6	429.5	399.7	29.75	14.437	
7,900.0	7,220.0	8,220.7	7,470.0	25.6	31.1	-125.43	-522.2	-1,446.6	429.5	400.9	28.56	15.036	
8,000.0	7,220.0	8,320.7	7,470.0	25.1	30.7	-125.43	-422.2	-1,446.6	429.5	401.9	27.62	15.548	
8,100.0	7,220.0	8,420.7	7,470.0	24.8	30.3	-125.44	-322.2	-1,446.6	429.5	402.5	26.95	15.933	
8,200.0	7,220.0	8,520.7	7,470.0	24.5	30.1	-125.44	-222.2	-1,446.6	429.5	402.9	26.58	16.156	
8,300.0	7,220.0	8,620.7	7,470.0	24.4	30.0	-125.44	-122.2	-1,446.6	429.5	402.9	26.51	16.197	
8,400.0	7,220.0	8,720.7	7,470.0	24.4	30.0	-125.44	-22.2	-1,446.6	429.5	402.7	26.76	16.050	
8,500.0	7,220.0	8,820.7	7,470.0	24.5	30.0	-125.44	77.8	-1,446.6	429.4	402.1	27.30	15.731	
8,600.0	7,220.0	8,920.7	7,470.0	24.7	30.2	-125.44	177.8	-1,446.6	429.4	401.3	28.12	15.269	
8,700.0	7,220.0	9,020.7	7,470.0	25.1	30.5	-125.44	277.8	-1,446.6	429.4	400.2	29.21	14.702	
8,800.0	7,220.0	9,120.7	7,470.0	25.6	30.9	-125.44	377.8	-1,446.6	429.4	398.9	30.53	14.068	
8,900.0	7,220.0	9,220.7	7,470.0	26.2	31.3	-125.44	477.8	-1,446.6	429.4	397.4	32.05	13.401	
9,000.0	7,220.0	9,320.7	7,470.0	26.9	31.9	-125.44	577.8	-1,446.6	429.4	395.7	33.74	12.727	
9,100.0	7,220.0	9,420.7	7,470.0	27.7	32.6	-125.44	677.8	-1,446.6	429.4	393.8	35.59	12.067	
9,200.0	7,220.0	9,520.7	7,470.0	28.6	33.3	-125.44	777.8	-1,446.6	429.4	391.9	37.56	11.433	
9,300.0	7,220.0	9,620.7	7,470.0	29.6	34.1	-125.44	877.8	-1,446.6	429.4	389.8	39.64	10.832	
9,400.0	7,220.0	9,720.7	7,470.0	30.7	35.0	-125.44	977.8	-1,446.6	429.4	387.6	41.82	10.268	
9,500.0	7,220.0	9,820.7	7,470.0	31.8	36.0	-125.44	1,077.8	-1,446.6	429.4	385.3	44.07	9.743	
9,600.0	7,220.0	9,920.7	7,470.0	33.0	37.0	-125.44	1,177.8	-1,446.6	429.4	383.0	46.40	9.255	
9,700.0	7,220.0	10,020.7	7,470.0	34.2	38.1	-125.44	1,277.8	-1,446.6	429.4	380.6	48.78	8.803	
9,800.0	7,220.0	10,120.7	7,470.0	35.5	39.2	-125.44	1,377.8	-1,446.6	429.4	378.2	51.21	8.385	
9,900.0	7,220.0	10,220.7	7,470.0	36.8	40.4	-125.44	1,477.8	-1,446.6	429.4	375.7	53.68	7.999	
10,000.0	7,220.0	10,320.7	7,470.0	38.1	41.7	-125.44	1,577.8	-1,446.6	429.4	373.2	56.19	7.641	

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

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Reference Well:	Mumby State 4B-36H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

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Survey Program: 0-Geolink MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
10,100.0	7,220.0	10,420.7	7,470.0	39.5	42.9	-125.44	1,677.8	-1,446.6	429.4	370.6	58.74	7.310	
10,200.0	7,220.0	10,520.7	7,470.0	40.9	44.2	-125.45	1,777.8	-1,446.6	429.4	368.1	61.31	7.003	
10,300.0	7,220.0	10,620.7	7,470.0	42.4	45.5	-125.45	1,877.8	-1,446.5	429.4	365.5	63.91	6.719	
10,400.0	7,220.0	10,720.7	7,470.0	43.8	46.9	-125.45	1,977.8	-1,446.5	429.4	362.8	66.52	6.454	
10,500.0	7,220.0	10,820.7	7,470.0	45.3	48.3	-125.45	2,077.8	-1,446.5	429.3	360.2	69.16	6.208	
10,600.0	7,220.0	10,920.7	7,470.0	46.8	49.7	-125.45	2,177.8	-1,446.5	429.3	357.5	71.82	5.978	
10,700.0	7,220.0	11,020.7	7,470.0	48.3	51.1	-125.45	2,277.8	-1,446.5	429.3	354.8	74.49	5.764	
10,800.0	7,220.0	11,120.7	7,470.0	49.8	52.6	-125.45	2,377.8	-1,446.5	429.3	352.2	77.18	5.563	
10,900.0	7,220.0	11,220.7	7,470.0	51.4	54.0	-125.45	2,477.8	-1,446.5	429.3	349.5	79.87	5.375	
11,000.0	7,220.0	11,320.7	7,470.0	52.9	55.5	-125.45	2,577.8	-1,446.5	429.3	346.7	82.58	5.199	
11,100.0	7,220.0	11,420.7	7,470.0	54.5	57.0	-125.45	2,677.8	-1,446.5	429.3	344.0	85.30	5.033	
11,200.0	7,220.0	11,520.7	7,470.0	56.1	58.5	-125.45	2,777.8	-1,446.5	429.3	341.3	88.03	4.877	
11,300.0	7,220.0	11,620.7	7,470.0	57.7	60.1	-125.45	2,877.8	-1,446.5	429.3	338.5	90.77	4.730	
11,400.0	7,220.0	11,720.7	7,470.0	59.3	61.6	-125.45	2,977.8	-1,446.5	429.3	335.8	93.52	4.591	
11,500.0	7,220.0	11,820.7	7,470.0	60.9	63.2	-125.45	3,077.8	-1,446.5	429.3	333.0	96.27	4.459	
11,600.0	7,220.0	11,920.7	7,470.0	62.5	64.7	-125.45	3,177.8	-1,446.5	429.3	330.3	99.03	4.335	
11,700.0	7,220.0	12,020.7	7,470.0	64.1	66.3	-125.45	3,277.8	-1,446.5	429.3	327.5	101.79	4.217	
11,800.0	7,220.0	12,120.7	7,470.0	65.7	67.9	-125.45	3,377.8	-1,446.5	429.3	324.7	104.56	4.106	
11,900.0	7,220.0	12,220.7	7,470.0	67.4	69.5	-125.45	3,477.8	-1,446.5	429.3	321.9	107.34	3.999	
12,000.0	7,220.0	12,320.7	7,470.0	69.0	71.1	-125.45	3,577.8	-1,446.5	429.3	319.2	110.12	3.898	
12,051.5	7,220.0	12,372.3	7,470.0	69.9	71.9	-125.45	3,629.3	-1,446.5	429.3	317.7	111.55	3.848 SF	

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4C-36H - HZ - Plan #1													Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	1.0	1.0	0.0	0.0	90.00	0.0	9.8	9.8					
100.0	100.0	101.0	101.0	0.1	0.1	90.00	0.0	9.8	9.8	9.5	0.25	39.791		
200.0	200.0	201.0	201.0	0.3	0.3	90.00	0.0	9.8	9.8	9.2	0.60	16.453 CC		
227.8	227.8	228.8	228.8	0.3	0.3	-132.48	0.0	9.8	9.8	9.1	0.69	14.209 ES		
300.0	300.0	301.0	301.0	0.5	0.5	-134.02	0.0	9.8	10.1	9.1	0.94	10.685		
400.0	399.9	401.2	401.2	0.7	0.7	-139.11	-1.5	8.8	11.6	10.3	1.30	8.906		
500.0	499.7	501.5	501.3	0.9	0.8	-141.06	-6.0	6.0	13.5	11.9	1.67	8.104		
600.0	599.1	601.8	601.2	1.1	1.1	-140.85	-13.5	1.4	15.9	13.8	2.07	7.682		
700.0	698.2	702.1	700.8	1.4	1.3	-139.30	-23.9	-5.2	18.7	16.2	2.53	7.410		
800.0	796.6	802.5	799.9	1.7	1.6	-137.03	-37.3	-13.5	22.0	18.9	3.06	7.183		
900.0	894.4	902.9	898.5	2.1	2.0	-134.43	-53.6	-23.8	25.7	22.0	3.70	6.961		
1,000.0	991.5	1,003.4	996.3	2.6	2.4	-131.74	-72.8	-35.8	30.0	25.5	4.45	6.735		
1,100.0	1,087.6	1,103.7	1,093.2	3.1	2.9	-129.26	-94.8	-49.6	34.8	29.5	5.33	6.539		
1,200.0	1,183.0	1,203.5	1,189.3	3.6	3.4	-129.03	-117.6	-63.9	40.8	34.6	6.18	6.605		
1,300.0	1,278.3	1,303.3	1,285.5	4.2	3.8	-129.00	-140.3	-78.1	46.9	39.8	7.04	6.658		
1,400.0	1,373.7	1,403.1	1,381.6	4.7	4.3	-128.97	-163.1	-92.4	52.9	45.0	7.91	6.692		
1,500.0	1,469.0	1,502.9	1,477.8	5.3	4.8	-128.95	-185.8	-106.6	59.0	50.2	8.78	6.714		
1,600.0	1,564.4	1,602.8	1,573.9	5.8	5.3	-128.94	-208.5	-120.8	65.0	55.4	9.67	6.729		
1,700.0	1,659.7	1,702.6	1,670.1	6.4	5.8	-128.92	-231.3	-135.1	71.1	60.5	10.55	6.739		
1,800.0	1,755.1	1,802.4	1,766.2	6.9	6.3	-128.91	-254.0	-149.3	77.2	65.7	11.44	6.746		
1,900.0	1,850.4	1,902.2	1,862.3	7.5	6.8	-128.90	-276.8	-163.6	83.2	70.9	12.33	6.751		
2,000.0	1,945.8	2,002.0	1,958.5	8.1	7.3	-128.89	-299.5	-177.8	89.3	76.1	13.22	6.754		
2,100.0	2,041.1	2,101.8	2,054.6	8.6	7.8	-128.89	-322.2	-192.1	95.3	81.2	14.11	6.757		
2,200.0	2,136.5	2,201.7	2,150.8	9.2	8.3	-128.88	-345.0	-206.3	101.4	86.4	15.00	6.758		
2,300.0	2,231.8	2,301.5	2,246.9	9.7	8.8	-128.87	-367.7	-220.6	107.5	91.6	15.90	6.759		
2,400.0	2,327.2	2,401.3	2,343.0	10.3	9.3	-128.87	-390.5	-234.8	113.5	96.7	16.79	6.760		
2,500.0	2,422.5	2,501.1	2,439.2	10.9	9.8	-128.86	-413.2	-249.1	119.6	101.9	17.69	6.760		
2,600.0	2,517.9	2,600.9	2,535.3	11.4	10.3	-128.86	-435.9	-263.3	125.6	107.0	18.59	6.760		
2,700.0	2,613.2	2,700.7	2,631.5	12.0	10.8	-128.86	-458.7	-277.6	131.7	112.2	19.48	6.760		
2,800.0	2,708.6	2,800.6	2,727.6	12.5	11.3	-128.85	-481.4	-291.8	137.8	117.4	20.38	6.759		
2,900.0	2,803.9	2,900.4	2,823.7	13.1	11.8	-128.85	-504.2	-306.0	143.8	122.5	21.28	6.759		
3,000.0	2,899.3	3,000.2	2,919.9	13.7	12.3	-128.85	-526.9	-320.3	149.9	127.7	22.18	6.758		
3,100.0	2,994.6	3,100.0	3,016.0	14.2	12.8	-128.84	-549.7	-334.5	155.9	132.9	23.07	6.758		
3,200.0	3,090.0	3,199.8	3,112.2	14.8	13.3	-128.84	-572.4	-348.8	162.0	138.0	23.97	6.757		
3,300.0	3,185.3	3,299.6	3,208.3	15.4	13.8	-128.84	-595.1	-363.0	168.1	143.2	24.87	6.757		
3,400.0	3,280.7	3,399.4	3,304.5	15.9	14.3	-128.84	-617.9	-377.3	174.1	148.3	25.77	6.756		
3,500.0	3,376.0	3,499.3	3,400.6	16.5	14.8	-128.83	-640.6	-391.5	180.2	153.5	26.67	6.756		
3,600.0	3,471.4	3,599.1	3,496.7	17.0	15.3	-128.83	-663.4	-405.8	186.2	158.7	27.57	6.755		
3,700.0	3,566.7	3,698.9	3,592.9	17.6	15.8	-128.83	-686.1	-420.0	192.3	163.8	28.47	6.755		
3,800.0	3,662.1	3,798.7	3,689.0	18.2	16.3	-128.83	-708.8	-434.3	198.3	169.0	29.37	6.754		
3,900.0	3,757.4	3,898.5	3,785.2	18.7	16.9	-128.83	-731.6	-448.5	204.4	174.1	30.27	6.753		
4,000.0	3,852.8	3,998.3	3,881.3	19.3	17.4	-128.83	-754.3	-462.8	210.5	179.3	31.17	6.753		
4,100.0	3,948.1	4,098.2	3,977.4	19.9	17.9	-128.82	-777.1	-477.0	216.5	184.5	32.07	6.752		
4,200.0	4,043.5	4,198.0	4,073.6	20.4	18.4	-128.82	-799.8	-491.2	222.6	189.6	32.97	6.752		
4,300.0	4,138.8	4,297.8	4,169.7	21.0	18.9	-128.82	-822.6	-505.5	228.6	194.8	33.87	6.751		
4,400.0	4,234.2	4,397.6	4,265.9	21.6	19.4	-128.82	-845.3	-519.7	234.7	199.9	34.77	6.751		
4,500.0	4,329.5	4,497.4	4,362.0	22.1	19.9	-128.82	-868.0	-534.0	240.8	205.1	35.67	6.750		
4,600.0	4,424.9	4,597.2	4,458.1	22.7	20.4	-128.82	-890.8	-548.2	246.8	210.3	36.57	6.750		
4,700.0	4,520.2	4,697.1	4,554.3	23.2	20.9	-128.82	-913.5	-562.5	252.9	215.4	37.47	6.749		
4,800.0	4,615.6	4,796.9	4,650.4	23.8	21.4	-128.82	-936.3	-576.7	258.9	220.6	38.37	6.749		
4,900.0	4,710.9	4,896.7	4,746.6	24.4	21.9	-128.82	-959.0	-591.0	265.0	225.7	39.27	6.748		
5,000.0	4,806.3	4,996.5	4,842.7	24.9	22.4	-128.81	-981.7	-605.2	271.1	230.9	40.17	6.748		

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

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4C-36H - HZ - Plan #1												Offset Site Error:	0.0 ft
Survey Program: O-Geolink MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,100.0	4,901.6	5,096.3	4,938.9	25.5	22.9	-128.81	-1,004.5	-619.5	277.1	236.1	41.07	6.747	
5,200.0	4,997.0	5,196.1	5,035.0	26.1	23.4	-128.81	-1,027.2	-633.7	283.2	241.2	41.97	6.747	
5,300.0	5,092.3	5,296.0	5,131.1	26.6	23.9	-128.81	-1,050.0	-648.0	289.2	246.4	42.87	6.747	
5,400.0	5,187.7	5,395.8	5,227.3	27.2	24.4	-128.81	-1,072.7	-662.2	295.3	251.5	43.77	6.746	
5,500.0	5,283.0	5,495.6	5,323.4	27.8	24.9	-128.81	-1,095.5	-676.4	301.4	256.7	44.67	6.746	
5,600.0	5,378.4	5,595.4	5,419.6	28.3	25.4	-128.81	-1,118.2	-690.7	307.4	261.8	45.58	6.745	
5,700.0	5,473.8	5,690.7	5,511.7	28.9	25.8	-129.01	-1,138.9	-703.7	314.0	267.6	46.33	6.776	
5,800.0	5,570.0	5,785.3	5,603.9	29.4	26.2	-129.38	-1,156.9	-714.9	320.3	273.4	46.92	6.827	
5,900.0	5,667.1	5,879.9	5,696.7	29.8	26.6	-129.76	-1,172.2	-724.5	326.1	278.7	47.41	6.878	
6,000.0	5,765.0	5,974.3	5,789.9	30.2	26.8	-130.14	-1,185.0	-732.5	331.3	283.5	47.80	6.931	
6,100.0	5,863.6	6,068.6	5,883.4	30.5	27.1	-130.54	-1,195.1	-738.9	335.9	287.8	48.09	6.986	
6,200.0	5,962.7	6,162.8	5,977.2	30.7	27.2	-130.94	-1,202.6	-743.6	340.0	291.7	48.28	7.042	
6,300.0	6,062.2	6,257.0	6,071.2	30.9	27.4	-131.36	-1,207.5	-746.7	343.4	295.0	48.37	7.100	
6,400.0	6,161.9	6,351.0	6,165.1	31.1	27.5	-131.79	-1,209.8	-748.1	346.3	297.9	48.37	7.159	
6,500.0	6,261.9	6,448.7	6,262.9	31.1	27.5	-132.15	-1,210.0	-748.2	348.2	299.9	48.34	7.203	
6,600.0	6,361.9	6,548.7	6,362.9	31.2	27.6	90.00	-1,210.0	-748.2	348.4	299.9	48.48	7.186	
6,700.0	6,461.9	6,648.7	6,462.9	31.3	27.7	90.00	-1,210.0	-748.2	348.4	299.7	48.65	7.162	
6,800.0	6,561.9	6,748.7	6,562.9	31.3	27.7	90.00	-1,210.0	-748.2	348.4	299.6	48.81	7.137	
6,863.7	6,625.6	6,812.4	6,626.6	31.4	27.8	90.09	-1,210.0	-748.2	348.4	299.4	48.96	7.116	
6,900.0	6,661.9	6,848.7	6,662.9	31.4	27.8	90.03	-1,210.0	-748.2	348.4	299.4	48.99	7.111	
6,915.4	6,677.2	6,864.1	6,678.2	31.4	27.8	90.13	-1,210.0	-748.2	348.4	299.4	49.03	7.105	
7,000.0	6,761.1	6,947.9	6,762.1	31.3	27.9	91.85	-1,210.0	-748.2	348.6	298.8	49.81	6.998	
7,100.0	6,856.9	7,043.7	6,857.9	31.0	28.0	96.07	-1,210.0	-748.2	350.7	299.4	51.25	6.842	
7,200.0	6,946.3	7,141.6	6,955.6	30.5	28.0	101.95	-1,207.0	-748.2	357.9	305.6	52.31	6.841	
7,300.0	7,026.6	7,252.0	7,063.7	29.9	27.7	107.98	-1,185.2	-748.2	369.9	318.2	51.76	7.147	
7,400.0	7,095.3	7,374.7	7,176.4	29.2	27.1	113.57	-1,137.3	-748.2	385.2	335.8	49.36	7.804	
7,500.0	7,150.5	7,512.1	7,287.2	28.4	26.2	118.48	-1,056.6	-748.2	401.4	356.1	45.36	8.850	
7,600.0	7,190.3	7,665.5	7,384.3	27.6	24.9	122.38	-938.4	-748.1	415.9	375.6	40.31	10.317	
7,700.0	7,213.7	7,833.2	7,450.6	26.9	23.4	124.85	-785.0	-748.1	425.5	390.4	35.13	12.112	
7,800.0	7,220.0	7,997.6	7,470.0	26.2	22.1	125.54	-622.3	-748.1	428.4	397.1	31.30	13.686	
7,900.0	7,220.0	8,097.6	7,470.0	25.6	21.4	125.54	-522.3	-748.1	428.4	398.2	30.18	14.192	
8,000.0	7,220.0	8,197.6	7,470.0	25.1	20.9	125.54	-422.3	-748.0	428.4	399.1	29.30	14.619	
8,100.0	7,220.0	8,297.6	7,470.0	24.8	20.4	125.54	-322.3	-748.0	428.4	399.7	28.69	14.934	
8,200.0	7,220.0	8,397.6	7,470.0	24.5	20.2	125.53	-222.3	-748.0	428.4	400.1	28.35	15.115	
8,300.0	7,220.0	8,497.6	7,470.0	24.4	20.0	125.53	-122.3	-748.0	428.5	400.2	28.29	15.145	
8,400.0	7,220.0	8,597.6	7,470.0	24.4	20.1	125.53	-22.3	-748.0	428.5	400.0	28.53	15.021	
8,500.0	7,220.0	8,697.6	7,470.0	24.5	20.2	125.53	77.7	-747.9	428.5	399.5	29.04	14.755	
8,600.0	7,220.0	8,797.6	7,470.0	24.7	20.6	125.53	177.7	-747.9	428.5	398.7	29.83	14.368	
8,700.0	7,220.0	8,897.6	7,470.0	25.1	21.1	125.52	277.7	-747.9	428.5	397.7	30.86	13.888	
8,800.0	7,220.0	8,997.6	7,470.0	25.6	21.7	125.52	377.7	-747.9	428.6	396.5	32.11	13.347	
8,900.0	7,220.0	9,097.6	7,470.0	26.2	22.4	125.52	477.7	-747.9	428.6	395.0	33.56	12.770	
9,000.0	7,220.0	9,197.6	7,470.0	26.9	23.3	125.52	577.7	-747.8	428.6	393.4	35.19	12.180	
9,100.0	7,220.0	9,297.6	7,470.0	27.7	24.2	125.51	677.7	-747.8	428.6	391.7	36.97	11.596	
9,200.0	7,220.0	9,397.6	7,470.0	28.6	25.3	125.51	777.7	-747.8	428.7	389.8	38.87	11.027	
9,300.0	7,220.0	9,497.6	7,470.0	29.6	26.4	125.51	877.7	-747.8	428.7	387.8	40.89	10.483	
9,400.0	7,220.0	9,597.6	7,470.0	30.7	27.6	125.51	977.7	-747.7	428.7	385.7	43.01	9.968	
9,500.0	7,220.0	9,697.6	7,470.0	31.8	28.8	125.51	1,077.7	-747.7	428.7	383.5	45.20	9.484	
9,600.0	7,220.0	9,797.6	7,470.0	33.0	30.1	125.50	1,177.7	-747.7	428.7	381.3	47.47	9.031	
9,700.0	7,220.0	9,897.6	7,470.0	34.2	31.5	125.50	1,277.7	-747.7	428.8	379.0	49.81	8.609	
9,800.0	7,220.0	9,997.6	7,470.0	35.5	32.9	125.50	1,377.7	-747.7	428.8	376.6	52.19	8.216	
9,900.0	7,220.0	10,097.6	7,470.0	36.8	34.3	125.50	1,477.7	-747.6	428.8	374.2	54.62	7.851	
10,000.0	7,220.0	10,197.6	7,470.0	38.1	35.7	125.50	1,577.7	-747.6	428.8	371.7	57.09	7.511	

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

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4C-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning	
10,100.0	7,220.0	10,297.6	7,470.0	39.5	37.2	125.49	1,677.7	-747.6	428.9	369.3	59.60	7.196		
10,200.0	7,220.0	10,397.6	7,470.0	40.9	38.7	125.49	1,777.7	-747.6	428.9	366.7	62.14	6.902		
10,300.0	7,220.0	10,497.6	7,470.0	42.4	40.2	125.49	1,877.7	-747.6	428.9	364.2	64.70	6.629		
10,400.0	7,220.0	10,597.6	7,470.0	43.8	41.7	125.49	1,977.7	-747.5	428.9	361.6	67.29	6.374		
10,500.0	7,220.0	10,697.6	7,470.0	45.3	43.3	125.49	2,077.7	-747.5	428.9	359.0	69.90	6.136		
10,600.0	7,220.0	10,797.6	7,470.0	46.8	44.8	125.48	2,177.7	-747.5	429.0	356.4	72.54	5.914		
10,700.0	7,220.0	10,897.6	7,470.0	48.3	46.4	125.48	2,277.7	-747.5	429.0	353.8	75.18	5.706		
10,800.0	7,220.0	10,997.6	7,470.0	49.8	48.0	125.48	2,377.7	-747.4	429.0	351.2	77.85	5.511		
10,900.0	7,220.0	11,097.6	7,470.0	51.4	49.6	125.48	2,477.7	-747.4	429.0	348.5	80.53	5.328		
11,000.0	7,220.0	11,197.6	7,470.0	52.9	51.2	125.48	2,577.7	-747.4	429.0	345.8	83.22	5.156		
11,100.0	7,220.0	11,297.6	7,470.0	54.5	52.8	125.47	2,677.7	-747.4	429.1	343.1	85.92	4.994		
11,200.0	7,220.0	11,397.6	7,470.0	56.1	54.5	125.47	2,777.7	-747.4	429.1	340.5	88.63	4.841		
11,300.0	7,220.0	11,497.6	7,470.0	57.7	56.1	125.47	2,877.7	-747.3	429.1	337.8	91.36	4.697		
11,400.0	7,220.0	11,597.6	7,470.0	59.3	57.7	125.47	2,977.7	-747.3	429.1	335.0	94.09	4.561		
11,500.0	7,220.0	11,697.6	7,470.0	60.9	59.4	125.47	3,077.7	-747.3	429.2	332.3	96.83	4.432		
11,600.0	7,220.0	11,797.6	7,470.0	62.5	61.0	125.46	3,177.7	-747.3	429.2	329.6	99.57	4.310		
11,700.0	7,220.0	11,897.6	7,470.0	64.1	62.7	125.46	3,277.7	-747.3	429.2	326.9	102.33	4.194		
11,800.0	7,220.0	11,997.6	7,470.0	65.7	64.4	125.46	3,377.7	-747.2	429.2	324.1	105.09	4.084		
11,900.0	7,220.0	12,097.6	7,470.0	67.4	66.0	125.46	3,477.7	-747.2	429.2	321.4	107.85	3.980		
12,000.0	7,220.0	12,197.6	7,470.0	69.0	67.7	125.46	3,577.7	-747.2	429.3	318.6	110.62	3.880		
12,051.5	7,220.0	12,249.2	7,470.0	69.9	68.6	125.45	3,629.3	-747.2	429.3	317.2	112.05	3.831 SF		

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4D-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	91.05	-0.4	19.9	19.9					
100.0	100.0	100.0	100.0	0.1	0.1	91.05	-0.4	19.9	19.9	19.6	0.24	81.310		
200.0	200.0	200.0	200.0	0.3	0.3	91.05	-0.4	19.9	19.9	19.3	0.59	33.481	CC	
228.4	228.4	228.4	228.4	0.3	0.3	-131.29	-0.4	19.9	19.9	19.2	0.69	28.756		
300.0	300.0	300.0	300.0	0.5	0.5	-132.06	-0.4	19.9	20.2	19.2	0.94	21.386	ES	
400.0	399.9	399.9	399.9	0.7	0.6	-138.60	-0.4	19.9	22.6	21.3	1.29	17.490		
500.0	499.7	500.2	500.2	0.9	0.8	-144.95	-2.0	19.3	27.3	25.6	1.65	16.508		
600.0	599.1	600.6	600.4	1.1	1.0	-147.57	-7.0	17.6	33.2	31.1	2.03	16.338		
700.0	698.2	701.1	700.5	1.4	1.2	-147.87	-15.3	14.7	40.0	37.6	2.44	16.417		
800.0	796.6	801.7	800.3	1.7	1.5	-146.80	-27.0	10.8	47.8	44.9	2.90	16.508		
900.0	894.4	902.3	899.7	2.1	1.8	-144.99	-41.9	5.6	56.6	53.2	3.43	16.497		
1,000.0	991.5	1,002.9	998.4	2.6	2.1	-142.80	-60.2	-0.6	66.5	62.4	4.06	16.352		
1,100.0	1,087.6	1,103.4	1,096.4	3.1	2.5	-140.47	-81.7	-8.0	77.4	72.6	4.81	16.091		
1,200.0	1,183.0	1,203.1	1,192.8	3.6	3.0	-138.30	-105.5	-16.1	89.2	83.5	5.64	15.813		
1,300.0	1,278.3	1,302.4	1,288.8	4.2	3.4	-136.62	-129.4	-24.3	101.0	94.5	6.50	15.546		
1,400.0	1,373.7	1,401.6	1,384.8	4.7	3.9	-135.30	-153.3	-32.5	113.0	105.6	7.38	15.310		
1,500.0	1,469.0	1,500.9	1,480.8	5.3	4.3	-134.23	-177.2	-40.6	124.9	116.7	8.27	15.106		
1,600.0	1,564.4	1,600.1	1,576.8	5.8	4.8	-133.35	-201.1	-48.8	137.0	127.8	9.17	14.929		
1,700.0	1,659.7	1,699.4	1,672.8	6.4	5.3	-132.61	-225.0	-57.0	149.0	138.9	10.08	14.777		
1,800.0	1,755.1	1,798.7	1,768.8	6.9	5.7	-131.98	-248.9	-65.2	161.1	150.1	11.00	14.644		
1,900.0	1,850.4	1,897.9	1,864.7	7.5	6.2	-131.43	-272.8	-73.4	173.1	161.2	11.92	14.529		
2,000.0	1,945.8	1,997.2	1,960.7	8.1	6.7	-130.96	-296.7	-81.5	185.2	172.4	12.84	14.427		
2,100.0	2,041.1	2,096.4	2,056.7	8.6	7.1	-130.55	-320.6	-89.7	197.3	183.6	13.76	14.337		
2,200.0	2,136.5	2,195.7	2,152.7	9.2	7.6	-130.18	-344.5	-97.9	209.4	194.8	14.69	14.257		
2,300.0	2,231.8	2,294.9	2,248.7	9.7	8.1	-129.86	-368.4	-106.1	221.6	205.9	15.62	14.186		
2,400.0	2,327.2	2,394.2	2,344.7	10.3	8.5	-129.57	-392.4	-114.3	233.7	217.1	16.55	14.122		
2,500.0	2,422.5	2,493.4	2,440.7	10.9	9.0	-129.30	-416.3	-122.4	245.8	228.3	17.48	14.064		
2,600.0	2,517.9	2,592.7	2,536.7	11.4	9.5	-129.07	-440.2	-130.6	258.0	239.5	18.41	14.011		
2,700.0	2,613.2	2,692.0	2,632.6	12.0	9.9	-128.85	-464.1	-138.8	270.1	250.8	19.34	13.963		
2,800.0	2,708.6	2,791.2	2,728.6	12.5	10.4	-128.65	-488.0	-147.0	282.2	262.0	20.28	13.920		
2,900.0	2,803.9	2,890.5	2,824.6	13.1	10.9	-128.47	-511.9	-155.1	294.4	273.2	21.21	13.879		
3,000.0	2,899.3	2,989.7	2,920.6	13.7	11.4	-128.30	-535.8	-163.3	306.5	284.4	22.14	13.842		
3,100.0	2,994.6	3,089.0	3,016.6	14.2	11.8	-128.15	-559.7	-171.5	318.7	295.6	23.08	13.808		
3,200.0	3,090.0	3,188.2	3,112.6	14.8	12.3	-128.00	-583.6	-179.7	330.8	306.8	24.02	13.776		
3,300.0	3,185.3	3,287.5	3,208.6	15.4	12.8	-127.87	-607.5	-187.9	343.0	318.0	24.95	13.747		
3,400.0	3,280.7	3,386.7	3,304.5	15.9	13.3	-127.75	-631.4	-196.0	355.2	329.3	25.89	13.719		
3,500.0	3,376.0	3,486.0	3,400.5	16.5	13.7	-127.63	-655.3	-204.2	367.3	340.5	26.82	13.694		
3,600.0	3,471.4	3,585.3	3,496.5	17.0	14.2	-127.52	-679.2	-212.4	379.5	351.7	27.76	13.670		
3,700.0	3,566.7	3,684.5	3,592.5	17.6	14.7	-127.42	-703.1	-220.6	391.6	362.9	28.70	13.647		
3,800.0	3,662.1	3,783.8	3,688.5	18.2	15.2	-127.33	-727.0	-228.8	403.8	374.2	29.63	13.626		
3,900.0	3,757.4	3,883.0	3,784.5	18.7	15.6	-127.24	-750.9	-236.9	416.0	385.4	30.57	13.606		
4,000.0	3,852.8	3,982.3	3,880.5	19.3	16.1	-127.15	-774.8	-245.1	428.1	396.6	31.51	13.588		
4,100.0	3,948.1	4,081.5	3,976.4	19.9	16.6	-127.07	-798.7	-253.3	440.3	407.8	32.45	13.570		
4,200.0	4,043.5	4,180.8	4,072.4	20.4	17.0	-127.00	-822.6	-261.5	452.4	419.1	33.38	13.553		
4,300.0	4,138.8	4,280.0	4,168.4	21.0	17.5	-126.92	-846.5	-269.7	464.6	430.3	34.32	13.537		
4,400.0	4,234.2	4,379.3	4,264.4	21.6	18.0	-126.85	-870.4	-277.8	476.8	441.5	35.26	13.522		
4,500.0	4,329.5	4,478.6	4,360.4	22.1	18.5	-126.79	-894.4	-286.0	489.0	452.8	36.20	13.508	SF	

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

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4E-36H - HZ - Plan #1												Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.70	-0.4	29.9	29.9				
100.0	100.0	100.0	100.0	0.1	0.1	90.70	-0.4	29.9	29.9	29.7	0.24	122.526	
200.0	200.0	200.0	200.0	0.3	0.3	90.70	-0.4	29.9	29.9	29.3	0.59	50.452 CC	
228.2	228.2	228.2	228.2	0.3	0.3	-131.59	-0.4	29.9	30.0	29.3	0.69	43.342	
300.0	300.0	300.0	300.0	0.5	0.5	-132.10	-0.4	29.9	30.2	29.3	0.94	32.072 ES	
400.0	399.9	399.9	399.9	0.7	0.6	-136.61	-0.4	29.9	32.7	31.4	1.30	25.229	
500.0	499.7	499.7	499.7	0.9	0.8	-143.78	-0.4	29.9	38.0	36.4	1.65	23.030	
600.0	599.1	599.7	599.7	1.1	1.0	-149.31	-2.1	29.8	46.3	44.2	2.01	22.964 SF	
700.0	698.2	699.9	699.7	1.4	1.2	-151.49	-7.3	29.5	56.4	54.0	2.39	23.581	
800.0	796.6	800.0	799.5	1.7	1.4	-151.62	-16.0	29.0	68.3	65.5	2.81	24.344	
900.0	894.4	900.1	898.8	2.1	1.6	-150.57	-28.2	28.2	81.9	78.7	3.28	24.998	
1,000.0	991.5	1,000.0	997.5	2.6	1.9	-148.88	-43.8	27.2	97.3	93.4	3.83	25.421	
1,100.0	1,087.6	1,099.8	1,095.4	3.1	2.3	-146.88	-62.8	26.0	114.4	109.9	4.47	25.583	
1,200.0	1,183.0	1,198.5	1,191.7	3.6	2.6	-144.98	-84.3	24.7	132.8	127.6	5.19	25.586	
1,300.0	1,278.3	1,296.7	1,287.5	4.2	3.0	-143.52	-105.9	23.4	151.4	145.4	5.94	25.474	
1,400.0	1,373.7	1,394.9	1,383.3	4.7	3.4	-142.39	-127.5	22.0	170.0	163.3	6.71	25.326	
1,500.0	1,469.0	1,493.1	1,479.0	5.3	3.8	-141.48	-149.2	20.7	188.7	181.2	7.50	25.169	
1,600.0	1,564.4	1,591.3	1,574.8	5.8	4.2	-140.74	-170.8	19.3	207.5	199.2	8.29	25.018	
1,700.0	1,659.7	1,689.4	1,670.6	6.4	4.6	-140.11	-192.4	18.0	226.2	217.2	9.10	24.876	
1,800.0	1,755.1	1,787.6	1,766.4	6.9	5.0	-139.59	-214.0	16.6	245.0	235.1	9.90	24.746	
1,900.0	1,850.4	1,885.8	1,862.2	7.5	5.4	-139.14	-235.6	15.3	263.8	253.1	10.71	24.627	
2,000.0	1,945.8	1,984.0	1,957.9	8.1	5.8	-138.74	-257.3	13.9	282.7	271.1	11.53	24.519	
2,100.0	2,041.1	2,082.2	2,053.7	8.6	6.2	-138.40	-278.9	12.6	301.5	289.2	12.35	24.421	
2,200.0	2,136.5	2,180.4	2,149.5	9.2	6.6	-138.10	-300.5	11.2	320.3	307.2	13.17	24.332	
2,300.0	2,231.8	2,278.6	2,245.3	9.7	7.0	-137.83	-322.1	9.9	339.2	325.2	13.99	24.250	
2,400.0	2,327.2	2,376.8	2,341.0	10.3	7.4	-137.59	-343.7	8.5	358.0	343.2	14.81	24.176	
2,500.0	2,422.5	2,475.0	2,436.8	10.9	7.8	-137.37	-365.4	7.2	376.9	361.3	15.63	24.108	
2,600.0	2,517.9	2,573.2	2,532.6	11.4	8.2	-137.18	-387.0	5.8	395.8	379.3	16.46	24.045	
2,700.0	2,613.2	2,671.4	2,628.4	12.0	8.7	-137.00	-408.6	4.5	414.6	397.3	17.29	23.988	
2,800.0	2,708.6	2,769.6	2,724.1	12.5	9.1	-136.84	-430.2	3.1	433.5	415.4	18.11	23.934	
2,900.0	2,803.9	2,867.8	2,819.9	13.1	9.5	-136.69	-451.8	1.8	452.4	433.4	18.94	23.885	
3,000.0	2,899.3	2,966.0	2,915.7	13.7	9.9	-136.55	-473.5	0.4	471.3	451.5	19.77	23.839	
3,100.0	2,994.6	3,064.2	3,011.5	14.2	10.3	-136.43	-495.1	-0.9	490.1	469.5	20.60	23.797	

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4F-36H - HZ - Plan #1												Offset Site Error: 0.0 ft	
Survey Program: 0-Geolink MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			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	90.52	-0.4	40.0	40.0				
100.0	100.0	100.0	100.0	0.1	0.1	90.52	-0.4	40.0	40.0	39.8	0.24	163.744	
200.0	200.0	200.0	200.0	0.3	0.3	90.52	-0.4	40.0	40.0	39.4	0.59	67.424	CC
228.1	228.1	228.1	228.1	0.3	0.3	-131.74	-0.4	40.0	40.1	39.4	0.69	57.929	
300.0	300.0	300.0	300.0	0.5	0.5	-132.12	-0.4	40.0	40.3	39.4	0.94	42.757	ES
400.0	399.9	399.9	399.9	0.7	0.6	-135.56	-0.4	40.0	42.7	41.4	1.30	32.984	
500.0	499.7	499.6	499.5	0.9	0.8	-139.27	-2.1	40.4	48.1	46.4	1.66	29.009	
600.0	599.1	599.0	598.9	1.1	1.0	-140.82	-7.1	41.5	56.5	54.5	2.04	27.649	
700.0	698.2	698.3	697.7	1.4	1.2	-140.81	-15.5	43.3	67.9	65.4	2.47	27.436	SF
800.0	796.6	797.1	795.8	1.7	1.5	-139.86	-27.2	45.9	82.1	79.1	2.97	27.683	
900.0	894.4	895.3	892.8	2.1	1.8	-138.44	-42.1	49.2	99.3	95.7	3.54	28.059	
1,000.0	991.5	992.9	988.6	2.6	2.1	-136.85	-60.1	53.1	119.3	115.1	4.20	28.422	
1,100.0	1,087.6	1,089.6	1,082.9	3.1	2.5	-135.24	-81.0	57.7	142.3	137.4	4.96	28.727	
1,200.0	1,183.0	1,186.2	1,176.6	3.6	2.9	-134.05	-104.1	62.8	167.5	161.7	5.76	29.072	
1,300.0	1,278.3	1,282.9	1,270.3	4.2	3.3	-133.25	-127.4	67.9	192.8	186.2	6.59	29.258	
1,400.0	1,373.7	1,379.6	1,364.1	4.7	3.7	-132.64	-150.6	73.0	218.1	210.7	7.43	29.359	
1,500.0	1,469.0	1,476.3	1,457.8	5.3	4.2	-132.15	-173.8	78.1	243.4	235.2	8.28	29.411	
1,600.0	1,564.4	1,573.0	1,551.6	5.8	4.6	-131.75	-197.0	83.2	268.8	259.7	9.13	29.436	
1,700.0	1,659.7	1,669.7	1,645.3	6.4	5.0	-131.43	-220.3	88.3	294.2	284.2	9.99	29.444	
1,800.0	1,755.1	1,766.5	1,739.1	6.9	5.5	-131.15	-243.5	93.4	319.5	308.7	10.85	29.442	
1,900.0	1,850.4	1,863.2	1,832.8	7.5	5.9	-130.92	-266.7	98.5	344.9	333.2	11.72	29.434	
2,000.0	1,945.8	1,959.9	1,926.6	8.1	6.4	-130.71	-289.9	103.6	370.3	357.7	12.58	29.422	
2,100.0	2,041.1	2,056.6	2,020.3	8.6	6.8	-130.54	-313.1	108.7	395.7	382.2	13.45	29.409	
2,200.0	2,136.5	2,153.3	2,114.1	9.2	7.2	-130.38	-336.4	113.8	421.0	406.7	14.32	29.394	
2,300.0	2,231.8	2,250.1	2,207.8	9.7	7.7	-130.24	-359.6	118.9	446.4	431.2	15.20	29.380	
2,400.0	2,327.2	2,346.8	2,301.6	10.3	8.1	-130.12	-382.8	124.0	471.8	455.8	16.07	29.365	
2,500.0	2,422.5	2,443.5	2,395.3	10.9	8.6	-130.01	-406.0	129.1	497.2	480.3	16.94	29.350	

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4G-36H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance				Total		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.42	-0.4	49.8	49.8					
100.0	100.0	100.0	100.0	0.1	0.1	90.42	-0.4	49.8	49.8	49.6	0.24	203.819		
200.0	200.0	200.0	200.0	0.3	0.3	90.42	-0.4	49.8	49.8	49.2	0.59	83.925 CC		
228.0	228.0	228.0	228.0	0.3	0.3	-131.82	-0.4	49.8	49.8	49.2	0.69	72.112		
300.0	300.0	300.0	300.0	0.5	0.5	-132.13	-0.4	49.8	50.1	49.2	0.94	53.146 ES		
400.0	399.9	399.2	399.1	0.7	0.6	-133.20	-1.9	50.6	53.2	51.9	1.30	41.049		
500.0	499.7	498.1	497.9	0.9	0.8	-133.49	-6.5	52.9	60.2	58.6	1.67	36.007		
600.0	599.1	596.5	596.0	1.1	1.1	-133.16	-14.1	56.7	71.1	69.0	2.09	34.036		
700.0	698.2	694.3	693.0	1.4	1.3	-132.47	-24.6	61.9	85.8	83.2	2.56	33.511 SF		
800.0	796.6	791.1	788.7	1.7	1.6	-131.63	-37.9	68.6	104.3	101.2	3.10	33.663		
900.0	894.4	886.9	882.8	2.1	1.9	-130.76	-53.9	76.7	126.5	122.8	3.71	34.112		
1,000.0	991.5	981.4	975.0	2.6	2.3	-129.89	-72.5	86.0	152.4	148.0	4.39	34.703		
1,100.0	1,087.6	1,077.0	1,067.8	3.1	2.7	-129.47	-92.8	96.1	181.3	176.1	5.13	35.323		
1,200.0	1,183.0	1,172.2	1,160.3	3.6	3.1	-129.92	-113.0	106.3	211.7	205.8	5.90	35.910		
1,300.0	1,278.3	1,267.4	1,252.8	4.2	3.5	-130.38	-133.2	116.4	242.3	235.6	6.67	36.306		
1,400.0	1,373.7	1,362.6	1,345.3	4.7	4.0	-130.74	-153.4	126.6	272.8	265.4	7.46	36.586		
1,500.0	1,469.0	1,457.8	1,437.8	5.3	4.4	-131.02	-173.7	136.7	303.4	295.1	8.25	36.791		
1,600.0	1,564.4	1,553.0	1,530.2	5.8	4.8	-131.26	-193.9	146.8	333.9	324.9	9.04	36.946		
1,700.0	1,659.7	1,648.2	1,622.7	6.4	5.2	-131.45	-214.1	157.0	364.5	354.7	9.83	37.066		
1,800.0	1,755.1	1,743.4	1,715.2	6.9	5.7	-131.62	-234.4	167.1	395.1	384.4	10.63	37.161		
1,900.0	1,850.4	1,838.6	1,807.7	7.5	6.1	-131.76	-254.6	177.3	425.7	414.2	11.43	37.237		
2,000.0	1,945.8	1,933.8	1,900.2	8.1	6.5	-131.88	-274.8	187.4	456.2	444.0	12.23	37.300		
2,100.0	2,041.1	2,029.1	1,992.6	8.6	6.9	-131.99	-295.0	197.6	486.8	473.8	13.03	37.351		

Cathedral Energy Services

Anticollision Report

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

Offset Design S36 T2N-R66W (Marcus State, Mumby State) - Mumby State 4H-36H - HZ - Plan #1												Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.70	-0.7	59.9	59.9				
100.0	100.0	100.0	100.0	0.1	0.1	90.70	-0.7	59.9	59.9	59.6	0.24	245.052	
200.0	200.0	200.0	200.0	0.3	0.3	90.70	-0.7	59.9	59.9	59.3	0.59	100.904	CC, ES
300.0	300.0	298.7	298.7	0.5	0.5	-130.53	-2.1	60.9	61.3	60.3	0.94	64.986	
400.0	399.9	397.1	396.9	0.7	0.7	-129.33	-6.1	64.0	66.8	65.5	1.31	51.192	
500.0	499.7	495.0	494.4	0.9	0.9	-128.37	-12.7	69.2	76.9	75.2	1.70	45.287	
600.0	599.1	592.0	590.8	1.1	1.1	-127.69	-21.8	76.4	91.3	89.2	2.13	42.839	
700.0	698.2	688.0	685.6	1.4	1.4	-127.22	-33.4	85.4	110.1	107.4	2.62	42.043	SF
800.0	796.6	782.6	778.6	1.7	1.8	-126.89	-47.2	96.2	133.1	129.9	3.16	42.058	
900.0	894.4	875.6	869.4	2.1	2.2	-126.63	-63.2	108.7	160.3	156.5	3.77	42.463	
1,000.0	991.5	966.9	957.7	2.6	2.6	-126.39	-81.1	122.7	191.5	187.0	4.45	43.045	
1,100.0	1,087.6	1,057.8	1,045.1	3.1	3.1	-126.18	-101.0	138.3	226.5	221.4	5.18	43.734	
1,200.0	1,183.0	1,150.7	1,134.2	3.6	3.5	-126.69	-121.7	154.5	263.4	257.5	5.96	44.231	
1,300.0	1,278.3	1,243.6	1,223.3	4.2	4.0	-127.22	-142.5	170.8	300.4	293.6	6.75	44.532	
1,400.0	1,373.7	1,336.5	1,312.3	4.7	4.5	-127.63	-163.3	187.0	337.4	329.8	7.54	44.730	
1,500.0	1,469.0	1,429.4	1,401.4	5.3	5.0	-127.96	-184.0	203.3	374.4	366.0	8.34	44.864	
1,600.0	1,564.4	1,522.3	1,490.5	5.8	5.5	-128.24	-204.8	219.5	411.4	402.2	9.15	44.959	
1,700.0	1,659.7	1,615.2	1,579.5	6.4	6.0	-128.47	-225.5	235.7	448.4	438.4	9.96	45.026	
1,800.0	1,755.1	1,708.0	1,668.6	6.9	6.5	-128.66	-246.3	252.0	485.4	474.7	10.77	45.075	

Cathedral Energy Services

Anticollision Report

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

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

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

