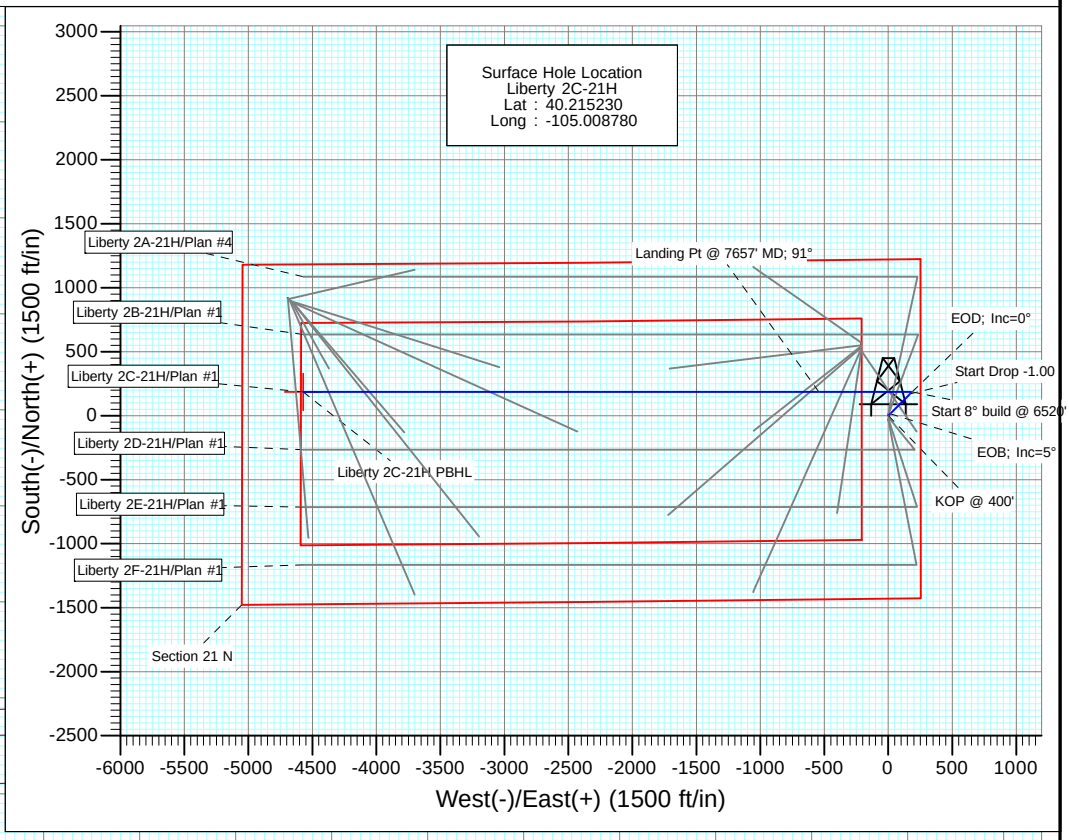
encana natural gas

Project: DJ Wattenberg
Site: NENE S20-T3N-R68W (Liberty 2A-21H)
Well: Liberty 2C-21H
Wellbore: Hz
Design: Plan #1

CATHEDRAL

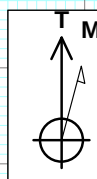
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	900.0	5.00	45.00	899.4	15.4	15.4	1.00	45.00	-15.4	
4	3420.0	5.00	45.00	3409.8	170.7	170.7	0.00	0.00	-170.7	
5	3920.0	0.00	0.00	3909.1	186.1	186.1	1.00	180.00	-186.1	
6	4020.0	0.00	0.00	4009.1	186.1	186.1	0.00	0.00	-186.1	
7	6520.3	0.00	0.00	6509.4	186.1	186.1	0.00	0.00	-186.1	
8	7657.8	91.00	270.00	7225.5	186.1	-542.6	8.00	270.00	542.6	
9	11687.5	91.00	270.00	7155.2	186.2	-4571.6	0.00	0.00	4571.6	Liberty 2C-21H PBHL



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Liberty 2C-21H PBHL	186.2	-4571.6	1321793.99	3132615.72	40.215740	-105.025150



Azimuths to True North
Magnetic North: 8.76°

Magnetic Field
Strength: 52899.7snT
Dip Angle: 66.83°
Date: 9/18/2012
Model: IGRF200510

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
236.0	236.0	Base of Fox Hills
4077.2	4088.1	Sussex
4212.2	4223.1	Sussex Marker
4463.2	4474.1	Shannon
4952.2	4963.1	Teepee Buttes
6878.5	6908.0	Sharon Springs
6961.4	7009.5	Niobrara
7204.7	7471.9	Ft. Hayes
7222.0	7573.1	Codell

Plan #1
Liberty 2C-21H
12xxx; LR
WELL @ 5036.0ft (Original Well Elev)
Ground Elevation @ 5023.0
North American Datum 1983
Well Liberty 2C-21H, True North

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**North Reference:**	True
Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H)

Site Position:		**Northing:**	1,322,254.59 ft	**Latitude:**	40.216940
From:	Lat/Long	**Easting:**	3,136,925.14 ft	**Longitude:**	-105.009710
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.32 °

Well Liberty 2C-21H

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,321,633.10 ft	**Latitude:**	40.215230
	+E/-W	0.0 ft	**Easting:**	3,137,188.30 ft	**Longitude:**	-105.008780
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	5,023.0 ft

Wellbore Hz

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	9/18/2012	8.76	66.83	52,900

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	270.00

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
900.0	5.00	45.00	899.4	15.4	15.4	1.00	1.00	0.00	45.00	
3,420.0	5.00	45.00	3,409.8	170.7	170.7	0.00	0.00	0.00	0.00	
3,920.0	0.00	0.00	3,909.1	186.1	186.1	1.00	-1.00	0.00	180.00	
4,020.0	0.00	0.00	4,009.1	186.1	186.1	0.00	0.00	0.00	0.00	
6,520.3	0.00	0.00	6,509.4	186.1	186.1	0.00	0.00	0.00	0.00	
7,657.8	91.00	270.00	7,225.5	186.1	-542.6	8.00	8.00	0.00	270.00	
11,687.5	91.00	270.00	7,155.2	186.2	-4,571.6	0.00	0.00	0.00	0.00	Liberty 2C-21H PBHL

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**North Reference:**	True
Well:	Liberty 2C-21H	**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	
236.0	0.00	0.00	236.0	0.0	0.0	0.0	0.00	0.00	Base of Fox Hills
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	KOP @ 400'
500.0	1.00	45.00	500.0	0.6	0.6	-0.6	1.00	1.00	
600.0	2.00	45.00	600.0	2.5	2.5	-2.5	1.00	1.00	
700.0	3.00	45.00	699.9	5.6	5.6	-5.6	1.00	1.00	
800.0	4.00	45.00	799.7	9.9	9.9	-9.9	1.00	1.00	
900.0	5.00	45.00	899.4	15.4	15.4	-15.4	1.00	1.00	EOB; Inc=5°
1,000.0	5.00	45.00	999.0	21.6	21.6	-21.6	0.00	0.00	
1,100.0	5.00	45.00	1,098.6	27.7	27.7	-27.7	0.00	0.00	
1,200.0	5.00	45.00	1,198.2	33.9	33.9	-33.9	0.00	0.00	
1,300.0	5.00	45.00	1,297.8	40.1	40.1	-40.1	0.00	0.00	
1,400.0	5.00	45.00	1,397.5	46.2	46.2	-46.2	0.00	0.00	
1,500.0	5.00	45.00	1,497.1	52.4	52.4	-52.4	0.00	0.00	
1,600.0	5.00	45.00	1,596.7	58.6	58.6	-58.6	0.00	0.00	
1,700.0	5.00	45.00	1,696.3	64.7	64.7	-64.7	0.00	0.00	
1,800.0	5.00	45.00	1,795.9	70.9	70.9	-70.9	0.00	0.00	
1,900.0	5.00	45.00	1,895.6	77.0	77.0	-77.0	0.00	0.00	
2,000.0	5.00	45.00	1,995.2	83.2	83.2	-83.2	0.00	0.00	
2,100.0	5.00	45.00	2,094.8	89.4	89.4	-89.4	0.00	0.00	
2,200.0	5.00	45.00	2,194.4	95.5	95.5	-95.5	0.00	0.00	
2,300.0	5.00	45.00	2,294.0	101.7	101.7	-101.7	0.00	0.00	
2,400.0	5.00	45.00	2,393.7	107.9	107.9	-107.9	0.00	0.00	
2,500.0	5.00	45.00	2,493.3	114.0	114.0	-114.0	0.00	0.00	
2,600.0	5.00	45.00	2,592.9	120.2	120.2	-120.2	0.00	0.00	
2,700.0	5.00	45.00	2,692.5	126.3	126.3	-126.3	0.00	0.00	
2,800.0	5.00	45.00	2,792.1	132.5	132.5	-132.5	0.00	0.00	
2,900.0	5.00	45.00	2,891.8	138.7	138.7	-138.7	0.00	0.00	
3,000.0	5.00	45.00	2,991.4	144.8	144.8	-144.8	0.00	0.00	
3,100.0	5.00	45.00	3,091.0	151.0	151.0	-151.0	0.00	0.00	
3,200.0	5.00	45.00	3,190.6	157.2	157.2	-157.2	0.00	0.00	
3,300.0	5.00	45.00	3,290.2	163.3	163.3	-163.3	0.00	0.00	
3,400.0	5.00	45.00	3,389.9	169.5	169.5	-169.5	0.00	0.00	
3,420.0	5.00	45.00	3,409.8	170.7	170.7	-170.7	0.00	0.00	Start Drop -1.00
3,500.0	4.20	45.00	3,489.5	175.3	175.3	-175.3	1.00	-1.00	
3,600.0	3.20	45.00	3,589.3	179.8	179.8	-179.8	1.00	-1.00	
3,700.0	2.20	45.00	3,689.2	183.2	183.2	-183.2	1.00	-1.00	
3,800.0	1.20	45.00	3,789.2	185.2	185.2	-185.2	1.00	-1.00	
3,900.0	0.20	45.00	3,889.1	186.1	186.1	-186.1	1.00	-1.00	
3,920.0	0.00	0.00	3,909.1	186.1	186.1	-186.1	1.00	-1.00	EOD; Inc=0°
4,000.0	0.00	0.00	3,989.1	186.1	186.1	-186.1	0.00	0.00	
4,020.0	0.00	0.00	4,009.1	186.1	186.1	-186.1	0.00	0.00	
4,088.1	0.00	0.00	4,077.2	186.1	186.1	-186.1	0.00	0.00	Sussex
4,100.0	0.00	0.00	4,089.1	186.1	186.1	-186.1	0.00	0.00	
4,200.0	0.00	0.00	4,189.1	186.1	186.1	-186.1	0.00	0.00	
4,223.1	0.00	0.00	4,212.2	186.1	186.1	-186.1	0.00	0.00	Sussex Marker
4,300.0	0.00	0.00	4,289.1	186.1	186.1	-186.1	0.00	0.00	
4,400.0	0.00	0.00	4,389.1	186.1	186.1	-186.1	0.00	0.00	
4,474.1	0.00	0.00	4,463.2	186.1	186.1	-186.1	0.00	0.00	Shannon

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Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**North Reference:**	True
Well:	Liberty 2C-21H	**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
4,500.0	0.00	0.00	4,489.1	186.1	186.1	-186.1	0.00	0.00	
4,600.0	0.00	0.00	4,589.1	186.1	186.1	-186.1	0.00	0.00	
4,700.0	0.00	0.00	4,689.1	186.1	186.1	-186.1	0.00	0.00	
4,800.0	0.00	0.00	4,789.1	186.1	186.1	-186.1	0.00	0.00	
4,900.0	0.00	0.00	4,889.1	186.1	186.1	-186.1	0.00	0.00	
4,963.1	0.00	0.00	4,952.2	186.1	186.1	-186.1	0.00	0.00	Teepee Buttes
5,000.0	0.00	0.00	4,989.1	186.1	186.1	-186.1	0.00	0.00	
5,100.0	0.00	0.00	5,089.1	186.1	186.1	-186.1	0.00	0.00	
5,200.0	0.00	0.00	5,189.1	186.1	186.1	-186.1	0.00	0.00	
5,300.0	0.00	0.00	5,289.1	186.1	186.1	-186.1	0.00	0.00	
5,400.0	0.00	0.00	5,389.1	186.1	186.1	-186.1	0.00	0.00	
5,500.0	0.00	0.00	5,489.1	186.1	186.1	-186.1	0.00	0.00	
5,600.0	0.00	0.00	5,589.1	186.1	186.1	-186.1	0.00	0.00	
5,700.0	0.00	0.00	5,689.1	186.1	186.1	-186.1	0.00	0.00	
5,800.0	0.00	0.00	5,789.1	186.1	186.1	-186.1	0.00	0.00	
5,900.0	0.00	0.00	5,889.1	186.1	186.1	-186.1	0.00	0.00	
6,000.0	0.00	0.00	5,989.1	186.1	186.1	-186.1	0.00	0.00	
6,100.0	0.00	0.00	6,089.1	186.1	186.1	-186.1	0.00	0.00	
6,200.0	0.00	0.00	6,189.1	186.1	186.1	-186.1	0.00	0.00	
6,300.0	0.00	0.00	6,289.1	186.1	186.1	-186.1	0.00	0.00	
6,400.0	0.00	0.00	6,389.1	186.1	186.1	-186.1	0.00	0.00	
6,500.0	0.00	0.00	6,489.1	186.1	186.1	-186.1	0.00	0.00	
6,520.3	0.00	0.00	6,509.4	186.1	186.1	-186.1	0.00	0.00	Start 8° build @ 6520' MD
6,600.0	6.38	270.00	6,589.0	186.1	181.7	-181.7	8.00	8.00	
6,700.0	14.38	270.00	6,687.3	186.1	163.7	-163.7	8.00	8.00	
6,800.0	22.38	270.00	6,782.1	186.1	132.2	-132.2	8.00	8.00	
6,900.0	30.38	270.00	6,871.6	186.1	87.8	-87.8	8.00	8.00	
6,908.0	31.01	270.00	6,878.5	186.1	83.7	-83.7	8.00	8.00	Sharon Springs
7,000.0	38.38	270.00	6,954.1	186.1	31.4	-31.4	8.00	8.00	
7,009.5	39.13	270.00	6,961.4	186.1	25.5	-25.5	8.00	8.00	Niobrara
7,100.0	46.38	270.00	7,027.9	186.1	-35.9	35.9	8.00	8.00	
7,200.0	54.38	270.00	7,091.6	186.1	-112.9	112.9	8.00	8.00	
7,300.0	62.38	270.00	7,144.0	186.1	-198.0	198.0	8.00	8.00	
7,400.0	70.38	270.00	7,184.0	186.1	-289.5	289.5	8.00	8.00	
7,471.9	76.13	270.00	7,204.7	186.1	-358.3	358.3	8.00	8.00	Ft. Hayes
7,500.0	78.38	270.00	7,210.9	186.1	-385.8	385.8	8.00	8.00	
7,573.1	84.23	270.00	7,222.0	186.1	-458.0	458.0	8.00	8.00	Codell
7,600.0	86.38	270.00	7,224.2	186.1	-484.8	484.8	8.00	8.00	
7,657.8	91.00	270.00	7,225.5	186.1	-542.6	542.6	8.00	8.00	Landing Pt @ 7657' MD; 91°
7,700.0	91.00	270.00	7,224.8	186.2	-584.8	584.8	0.00	0.00	
7,800.0	91.00	270.00	7,223.0	186.2	-684.7	684.7	0.00	0.00	
7,900.0	91.00	270.00	7,221.3	186.2	-784.7	784.7	0.00	0.00	
8,000.0	91.00	270.00	7,219.6	186.2	-884.7	884.7	0.00	0.00	
8,100.0	91.00	270.00	7,217.8	186.2	-984.7	984.7	0.00	0.00	
8,200.0	91.00	270.00	7,216.1	186.2	-1,084.7	1,084.7	0.00	0.00	
8,300.0	91.00	270.00	7,214.3	186.2	-1,184.7	1,184.7	0.00	0.00	
8,400.0	91.00	270.00	7,212.6	186.2	-1,284.6	1,284.6	0.00	0.00	
8,500.0	91.00	270.00	7,210.8	186.2	-1,384.6	1,384.6	0.00	0.00	
8,600.0	91.00	270.00	7,209.1	186.2	-1,484.6	1,484.6	0.00	0.00	
8,700.0	91.00	270.00	7,207.3	186.2	-1,584.6	1,584.6	0.00	0.00	
8,800.0	91.00	270.00	7,205.6	186.2	-1,684.6	1,684.6	0.00	0.00	
8,900.0	91.00	270.00	7,203.8	186.2	-1,784.6	1,784.6	0.00	0.00	

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Well:	Liberty 2C-21H	**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	91.00	270.00	7,202.1	186.2	-1,884.6	1,884.6	0.00	0.00	
9,100.0	91.00	270.00	7,200.4	186.2	-1,984.5	1,984.5	0.00	0.00	
9,200.0	91.00	270.00	7,198.6	186.2	-2,084.5	2,084.5	0.00	0.00	
9,300.0	91.00	270.00	7,196.9	186.2	-2,184.5	2,184.5	0.00	0.00	
9,400.0	91.00	270.00	7,195.1	186.2	-2,284.5	2,284.5	0.00	0.00	
9,500.0	91.00	270.00	7,193.4	186.2	-2,384.5	2,384.5	0.00	0.00	
9,600.0	91.00	270.00	7,191.6	186.2	-2,484.5	2,484.5	0.00	0.00	
9,700.0	91.00	270.00	7,189.9	186.2	-2,584.5	2,584.5	0.00	0.00	
9,800.0	91.00	270.00	7,188.1	186.2	-2,684.4	2,684.4	0.00	0.00	
9,900.0	91.00	270.00	7,186.4	186.2	-2,784.4	2,784.4	0.00	0.00	
10,000.0	91.00	270.00	7,184.7	186.2	-2,884.4	2,884.4	0.00	0.00	
10,100.0	91.00	270.00	7,182.9	186.2	-2,984.4	2,984.4	0.00	0.00	
10,200.0	91.00	270.00	7,181.2	186.2	-3,084.4	3,084.4	0.00	0.00	
10,300.0	91.00	270.00	7,179.4	186.2	-3,184.4	3,184.4	0.00	0.00	
10,400.0	91.00	270.00	7,177.7	186.2	-3,284.3	3,284.3	0.00	0.00	
10,500.0	91.00	270.00	7,175.9	186.2	-3,384.3	3,384.3	0.00	0.00	
10,600.0	91.00	270.00	7,174.2	186.2	-3,484.3	3,484.3	0.00	0.00	
10,700.0	91.00	270.00	7,172.4	186.2	-3,584.3	3,584.3	0.00	0.00	
10,800.0	91.00	270.00	7,170.7	186.2	-3,684.3	3,684.3	0.00	0.00	
10,900.0	91.00	270.00	7,168.9	186.2	-3,784.3	3,784.3	0.00	0.00	
11,000.0	91.00	270.00	7,167.2	186.2	-3,884.3	3,884.3	0.00	0.00	
11,100.0	91.00	270.00	7,165.5	186.2	-3,984.2	3,984.2	0.00	0.00	
11,200.0	91.00	270.00	7,163.7	186.2	-4,084.2	4,084.2	0.00	0.00	
11,300.0	91.00	270.00	7,162.0	186.2	-4,184.2	4,184.2	0.00	0.00	
11,400.0	91.00	270.00	7,160.2	186.2	-4,284.2	4,284.2	0.00	0.00	
11,500.0	91.00	270.00	7,158.5	186.2	-4,384.2	4,384.2	0.00	0.00	
11,600.0	91.00	270.00	7,156.7	186.2	-4,484.2	4,484.2	0.00	0.00	
11,687.5	91.00	270.00	7,155.2	186.2	-4,571.6	4,571.6	0.00	0.00	TD at 11687.5 - Liberty 2C-21H PBHL

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
Liberty 2C-21H PBHL - plan hits target center - Point	0.00	0.00	7,155.2	186.2	-4,571.6	1,321,793.99	3,132,615.72	40.215740	-105.025150

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**North Reference:**	True
Well:	Liberty 2C-21H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
236.0	236.0	Base of Fox Hills		-1.00	270.00
4,088.1	4,074.0	Sussex		-1.00	270.00
4,223.1	4,209.0	Sussex Marker		-1.00	270.00
4,474.1	4,460.0	Shannon		-1.00	270.00
4,963.1	4,949.0	Teepee Buttes		-1.00	270.00
6,908.0	6,877.0	Sharon Springs		-1.00	270.00
7,009.5	6,961.0	Niobrara		-1.00	270.00
7,471.9	7,211.0	Ft. Hayes		-1.00	270.00
7,573.1	7,230.0	Codell		-1.00	270.00

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
400.0	400.0	0.0	0.0	KOP @ 400'
900.0	899.4	15.4	15.4	EOB; Inc=5°
3,420.0	3,409.8	170.7	170.7	Start Drop -1.00
3,920.0	3,909.1	186.1	186.1	EOD; Inc=0°
6,520.3	6,509.4	186.1	186.1	Start 8° build @ 6520' MD
7,657.8	7,225.5	186.1	-542.6	Landing Pt @ 7657' MD; 91°
11,687.5	7,155.2	186.2	-4,571.6	TD at 11687.5

EnCana Oil & Gas (USA) Inc

DJ Wattenberg
NENE S20-T3N-R68W (Liberty 2A-21H)
Liberty 2C-21H
Hz
Plan #1

Anticollision Report

19 September, 2012

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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** 9/19/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,686.7	Plan #1 (Hz)	MWD	Geolink MWD

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
NENE S20-T3N-R68W (Liberty 2A-21H)						
Haley 1-20 (Proposed) - DD - Plan #1						Out of range
Haley 31-20 (Proposed) - DD - Plan #1						Out of range
Haley 32-20 (Proposed) - DD - Plan #1						Out of range
Haley 41-20 (Proposed) - DD - Plan #1						Out of range
Haley 42-20 (Proposed) - DD - Plan #1						Out of range
Haley 6-0-20 (Proposed) - DD - Plan #1						Out of range
Haley 6-4-20 (Proposed) - DD - Plan #1						Out of range
Haley 8-2-20 (Proposed) - DD - Plan #1						Out of range
Liberty 11-21 (Proposed) - DD - Plan #1						Out of range
Liberty 12-21 (Proposed) - DD - Plan #1						Out of range
Liberty 2-0-21 (Proposed) - DD - Plan #1						Out of range
Liberty 21-21 (Proposed) - DD - Plan #1						Out of range
Liberty 2-21 (Proposed) - DD - Plan #1						Out of range
Liberty 22-21 (Proposed) - DD - Plan #1	1,706.0	1,764.9	341.6	331.3	33.178	CC, ES
Liberty 22-21 (Proposed) - DD - Plan #1	2,100.0	2,129.1	373.2	360.5	29.245	SF
Liberty 2-4-21 (Proposed) - DD - Plan #1	1,467.4	1,522.7	431.9	422.8	47.570	CC, ES
Liberty 2-4-21 (Proposed) - DD - Plan #1	1,800.0	1,792.7	469.3	457.5	39.805	SF
Liberty 2A-21H - HZ - Plan #4	200.0	200.0	18.2	17.6	27.904	CC, ES
Liberty 2A-21H - HZ - Plan #4	800.0	796.9	39.1	36.3	14.088	SF
Liberty 2B-21H - Hz - Plan #1	300.0	300.0	7.3	6.3	7.272	CC, ES
Liberty 2B-21H - Hz - Plan #1	11,687.5	11,559.2	497.0	287.6	2.373	SF
Liberty 2D-21H - Hz - Plan #1	400.0	400.0	10.9	9.6	8.093	CC, ES
Liberty 2D-21H - Hz - Plan #1	11,687.5	11,622.7	459.8	232.6	2.024	SF
Liberty 2E-21H - HZ - Plan #1	400.0	400.0	21.9	20.5	16.180	CC, ES
Liberty 2E-21H - HZ - Plan #1	600.0	599.1	27.7	25.6	13.499	SF
Liberty 2F-21H - HZ - Plan #1	233.3	233.3	32.8	32.0	42.627	CC
Liberty 2F-21H - HZ - Plan #1	300.0	299.7	33.0	32.0	32.954	ES
Liberty 2F-21H - HZ - Plan #1	600.0	597.5	45.7	43.6	22.313	SF
Liberty 4-2-21 (Proposed) - DD - Plan #1	3,037.3	3,075.4	100.9	86.0	6.767	CC, ES
Liberty 4-2-21 (Proposed) - DD - Plan #1	3,100.0	3,136.7	101.8	86.4	6.610	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 22-21 (Proposed) - DD - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
700.0	699.9	787.1	783.0	1.2	1.8	-72.87	443.4	-221.0	500.0	497.2	2.74	182.160	
800.0	799.7	898.7	891.8	1.4	2.3	-75.62	418.8	-224.7	480.4	477.1	3.28	146.426	
900.0	899.4	1,007.2	996.5	1.6	2.8	-79.14	391.0	-228.8	458.4	454.5	3.90	117.433	
1,000.0	999.0	1,112.3	1,097.0	1.8	3.4	-83.15	360.2	-233.3	435.0	430.4	4.61	94.332	
1,100.0	1,098.6	1,204.8	1,184.8	2.0	3.9	-87.20	331.6	-237.6	412.5	407.2	5.33	77.423	
1,200.0	1,198.2	1,297.2	1,272.6	2.3	4.4	-91.65	303.0	-241.8	392.4	386.3	6.10	64.353	
1,300.0	1,297.8	1,389.6	1,360.4	2.5	4.9	-96.49	274.4	-246.0	375.1	368.2	6.91	54.272	
1,400.0	1,397.5	1,482.1	1,448.2	2.7	5.4	-101.70	245.8	-250.3	361.0	353.3	7.75	46.554	
1,500.0	1,497.1	1,574.5	1,536.0	2.9	6.0	-107.23	217.2	-254.5	350.5	341.9	8.61	40.721	
1,600.0	1,596.7	1,666.9	1,623.8	3.2	6.5	-112.99	188.6	-258.7	344.0	334.5	9.45	36.409	
1,700.0	1,696.3	1,759.4	1,711.6	3.4	7.0	-118.88	160.0	-263.0	341.6	331.4	10.25	33.329	
1,706.0	1,702.3	1,764.9	1,716.8	3.4	7.0	-119.24	158.3	-263.2	341.6	331.3	10.30	33.178	CC, ES
1,800.0	1,795.9	1,851.8	1,799.4	3.6	7.5	-124.78	131.5	-267.2	343.5	332.5	10.99	31.247	
1,900.0	1,895.6	1,944.2	1,887.2	3.8	8.1	-130.56	102.9	-271.4	349.5	337.9	11.66	29.973	
2,000.0	1,995.2	2,036.7	1,975.0	4.1	8.6	-136.12	74.3	-275.7	359.6	347.3	12.25	29.350	
2,100.0	2,094.8	2,129.1	2,062.8	4.3	9.1	-141.37	45.7	-279.9	373.2	360.5	12.76	29.245	SF
2,200.0	2,194.4	2,221.5	2,150.6	4.5	9.6	-146.26	17.1	-284.1	390.2	377.0	13.20	29.551	
2,300.0	2,294.0	2,314.0	2,238.4	4.8	10.2	-150.76	-11.5	-288.4	410.0	396.4	13.59	30.175	
2,400.0	2,393.7	2,406.4	2,326.2	5.0	10.7	-154.86	-40.1	-292.6	432.2	418.3	13.92	31.044	
2,500.0	2,493.3	2,498.8	2,413.9	5.2	11.2	-158.58	-68.7	-296.8	456.6	442.4	14.23	32.097	
2,600.0	2,592.9	2,591.3	2,501.7	5.4	11.8	-161.95	-97.3	-301.1	482.8	468.3	14.50	33.284	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2-4-21 (Proposed) - DD - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
900.0	899.4	982.8	973.1	1.6	2.7	-79.33	423.8	-255.4	495.5	491.5	4.07	121.657	
1,000.0	999.0	1,085.0	1,071.0	1.8	3.2	-83.36	397.0	-267.3	479.1	474.3	4.82	99.323	
1,100.0	1,098.6	1,184.3	1,165.1	2.0	3.8	-87.89	367.9	-280.2	463.7	458.0	5.65	82.016	
1,200.0	1,198.2	1,280.6	1,255.1	2.3	4.5	-92.89	336.9	-294.0	450.1	443.5	6.55	68.729	
1,300.0	1,297.8	1,373.8	1,341.2	2.5	5.1	-98.31	304.2	-308.5	439.5	432.0	7.49	58.689	
1,400.0	1,397.5	1,463.8	1,423.2	2.7	5.8	-104.03	270.3	-323.6	433.2	424.8	8.45	51.295	
1,467.4	1,464.6	1,522.7	1,476.2	2.9	6.3	-108.00	246.8	-334.1	431.9	422.8	9.08	47.570	CC, ES
1,500.0	1,497.1	1,550.7	1,501.2	2.9	6.5	-109.94	235.3	-339.2	432.2	422.8	9.38	46.066	
1,600.0	1,596.7	1,634.5	1,575.3	3.2	7.2	-115.87	199.5	-355.1	437.5	427.3	10.27	42.613	
1,700.0	1,696.3	1,715.1	1,645.5	3.4	7.9	-121.68	163.2	-371.2	449.8	438.7	11.07	40.619	
1,800.0	1,795.9	1,792.7	1,711.9	3.6	8.7	-127.23	126.6	-387.5	469.3	457.5	11.79	39.805	SF
1,900.0	1,895.6	1,867.3	1,774.8	3.8	9.4	-132.43	89.9	-403.8	495.9	483.5	12.42	39.938	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2A-21H - HZ - Plan #4

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	18.2	0.0	18.2				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	18.2	0.0	18.2	17.9	0.30	59.977	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	18.2	0.0	18.2	17.6	0.65	27.904	CC, ES
300.0	300.0	299.7	299.7	0.5	0.5	0.54	19.1	0.2	19.1	18.1	1.00	19.030	
400.0	400.0	399.3	399.3	0.7	0.7	1.91	21.6	0.7	21.6	20.3	1.35	15.977	
500.0	500.0	498.8	498.7	0.9	0.9	-42.69	25.8	1.6	25.3	23.6	1.70	14.877	
600.0	600.0	598.3	598.0	1.0	1.1	-44.12	31.7	2.9	29.4	27.3	2.05	14.321	
700.0	699.9	697.6	697.0	1.2	1.3	-46.66	39.3	4.5	33.9	31.5	2.41	14.100	
800.0	799.7	796.9	795.8	1.4	1.5	-49.80	48.6	6.5	39.1	36.3	2.77	14.088	SF
900.0	899.4	896.0	894.3	1.6	1.8	-53.21	59.5	8.8	44.9	41.7	3.16	14.207	
1,000.0	999.0	994.9	992.4	1.8	2.0	-55.92	72.1	11.4	51.9	48.4	3.56	14.581	
1,100.0	1,098.6	1,093.7	1,090.0	2.0	2.3	-57.29	86.2	14.5	60.6	56.6	3.97	15.266	
1,200.0	1,198.2	1,192.1	1,187.2	2.3	2.6	-57.72	102.0	17.8	70.9	66.5	4.38	16.168	
1,300.0	1,297.8	1,290.2	1,283.6	2.5	3.0	-57.54	119.4	21.5	82.7	77.9	4.80	17.235	
1,400.0	1,397.5	1,387.9	1,379.4	2.7	3.3	-56.99	138.2	25.5	96.0	90.8	5.21	18.434	
1,500.0	1,497.1	1,485.2	1,474.4	2.9	3.7	-56.22	158.6	29.8	110.9	105.3	5.62	19.741	
1,600.0	1,596.7	1,582.0	1,568.6	3.2	4.1	-55.34	180.4	34.5	127.4	121.4	6.03	21.140	
1,700.0	1,696.3	1,678.2	1,661.8	3.4	4.6	-54.42	203.7	39.4	145.4	139.0	6.43	22.618	
1,800.0	1,795.9	1,775.8	1,756.1	3.6	5.0	-53.55	228.4	44.7	164.5	157.7	6.83	24.087	
1,900.0	1,895.6	1,873.9	1,850.9	3.8	5.5	-52.85	253.2	49.9	183.7	176.5	7.23	25.397	
2,000.0	1,995.2	1,972.0	1,945.7	4.1	5.9	-52.28	278.0	55.2	203.0	195.3	7.64	26.569	
2,100.0	2,094.8	2,070.1	2,040.4	4.3	6.4	-51.81	302.9	60.5	222.2	214.2	8.04	27.625	
2,200.0	2,194.4	2,168.3	2,135.2	4.5	6.9	-51.42	327.7	65.8	241.5	233.0	8.45	28.579	
2,300.0	2,294.0	2,266.4	2,230.0	4.8	7.3	-51.08	352.6	71.1	260.7	251.9	8.85	29.445	
2,400.0	2,393.7	2,364.5	2,324.8	5.0	7.8	-50.79	377.4	76.3	280.0	270.7	9.26	30.236	
2,500.0	2,493.3	2,462.6	2,419.5	5.2	8.3	-50.54	402.2	81.6	299.3	289.6	9.67	30.960	
2,600.0	2,592.9	2,560.7	2,514.3	5.4	8.7	-50.32	427.1	86.9	318.5	308.5	10.07	31.626	
2,700.0	2,692.5	2,658.8	2,609.1	5.7	9.2	-50.12	451.9	92.2	337.8	327.3	10.48	32.240	
2,800.0	2,792.1	2,757.0	2,703.9	5.9	9.7	-49.94	476.8	97.5	357.1	346.2	10.88	32.808	
2,900.0	2,891.8	2,855.1	2,798.6	6.1	10.2	-49.79	501.6	102.7	376.4	365.1	11.29	33.335	
3,000.0	2,991.4	2,953.2	2,893.4	6.4	10.6	-49.64	526.4	108.0	395.7	384.0	11.70	33.825	
3,100.0	3,091.0	3,051.3	2,988.2	6.6	11.1	-49.51	551.3	113.3	415.0	402.9	12.10	34.282	
3,200.0	3,190.6	3,149.4	3,083.0	6.8	11.6	-49.40	576.1	118.6	434.3	421.8	12.51	34.710	
3,300.0	3,290.2	3,247.5	3,177.7	7.1	12.0	-49.29	601.0	123.9	453.6	440.7	12.92	35.110	
3,400.0	3,389.9	3,345.7	3,272.5	7.3	12.5	-49.19	625.8	129.1	472.9	459.6	13.33	35.486	
3,500.0	3,489.5	3,443.7	3,367.2	7.5	13.0	-49.17	650.6	134.4	492.5	478.8	13.73	35.878	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2B-21H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	7.3	0.0	7.3				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	7.3	0.0	7.3	7.0	0.30	23.991	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	7.3	0.0	7.3	6.6	0.65	11.161	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	7.3	0.0	7.3	6.3	1.00	7.272	CC, ES
400.0	400.0	399.9	399.9	0.7	0.7	2.14	8.1	0.3	8.1	6.8	1.35	6.001	
500.0	500.0	499.7	499.7	0.9	0.9	-41.55	10.5	1.2	10.0	8.3	1.70	5.855	
600.0	600.0	599.5	599.4	1.0	1.0	-43.72	14.6	2.7	12.2	10.1	2.05	5.932	
700.0	699.9	699.2	698.9	1.2	1.2	-47.63	20.3	4.8	14.8	12.4	2.41	6.147	
800.0	799.7	798.9	798.3	1.4	1.4	-52.21	27.6	7.6	18.0	15.2	2.78	6.458	
900.0	899.4	898.5	897.5	1.6	1.7	-56.82	36.6	10.9	21.7	18.5	3.18	6.834	
1,000.0	999.0	998.1	996.3	1.8	1.9	-59.53	47.1	14.8	26.5	22.9	3.59	7.395	
1,100.0	1,098.6	1,097.5	1,094.9	2.0	2.2	-59.60	59.2	19.3	32.8	28.8	4.00	8.196	
1,200.0	1,198.2	1,196.6	1,193.0	2.3	2.5	-58.23	72.9	24.4	40.5	36.1	4.41	9.176	
1,300.0	1,297.8	1,295.5	1,290.5	2.5	2.8	-56.23	88.1	30.1	49.6	44.8	4.82	10.305	
1,400.0	1,397.5	1,395.0	1,388.5	2.7	3.1	-54.38	104.3	36.1	59.7	54.4	5.22	11.432	
1,500.0	1,497.1	1,494.5	1,486.5	2.9	3.4	-53.07	120.5	42.1	69.7	64.1	5.62	12.402	
1,600.0	1,596.7	1,594.0	1,584.4	3.2	3.8	-52.09	136.7	48.1	79.8	73.8	6.02	13.246	
1,700.0	1,696.3	1,693.4	1,682.4	3.4	4.1	-51.32	152.9	54.2	89.9	83.5	6.43	13.984	
1,800.0	1,795.9	1,792.9	1,780.4	3.6	4.4	-50.72	169.1	60.2	100.0	93.2	6.83	14.636	
1,900.0	1,895.6	1,892.4	1,878.3	3.8	4.8	-50.22	185.3	66.2	110.1	102.9	7.24	15.214	
2,000.0	1,995.2	1,991.9	1,976.3	4.1	5.1	-49.81	201.5	72.2	120.3	112.6	7.65	15.731	
2,100.0	2,094.8	2,091.4	2,074.3	4.3	5.5	-49.46	217.7	78.2	130.4	122.4	8.05	16.196	
2,200.0	2,194.4	2,190.9	2,172.2	4.5	5.8	-49.16	233.9	84.3	140.5	132.1	8.46	16.616	
2,300.0	2,294.0	2,290.3	2,270.2	4.8	6.1	-48.90	250.1	90.3	150.7	141.8	8.87	16.998	
2,400.0	2,393.7	2,389.8	2,368.2	5.0	6.5	-48.68	266.2	96.3	160.8	151.6	9.27	17.346	
2,500.0	2,493.3	2,489.3	2,466.2	5.2	6.8	-48.48	282.4	102.3	171.0	161.3	9.68	17.664	
2,600.0	2,592.9	2,588.8	2,564.1	5.4	7.2	-48.30	298.6	108.4	181.1	171.0	10.09	17.956	
2,700.0	2,692.5	2,688.3	2,662.1	5.7	7.5	-48.14	314.8	114.4	191.3	180.8	10.50	18.226	
2,800.0	2,792.1	2,787.7	2,760.1	5.9	7.9	-48.00	331.0	120.4	201.4	190.5	10.90	18.475	
2,900.0	2,891.8	2,887.2	2,858.0	6.1	8.2	-47.87	347.2	126.4	211.6	200.3	11.31	18.707	
3,000.0	2,991.4	2,986.7	2,956.0	6.4	8.5	-47.76	363.4	132.4	221.7	210.0	11.72	18.922	
3,100.0	3,091.0	3,086.2	3,054.0	6.6	8.9	-47.65	379.6	138.5	231.9	219.8	12.13	19.122	
3,200.0	3,190.6	3,185.7	3,152.0	6.8	9.2	-47.55	395.8	144.5	242.1	229.5	12.54	19.310	
3,300.0	3,290.2	3,285.2	3,249.9	7.1	9.6	-47.46	412.0	150.5	252.2	239.3	12.94	19.485	
3,400.0	3,389.9	3,384.6	3,347.9	7.3	9.9	-47.38	428.2	156.5	262.4	249.0	13.35	19.650	
3,500.0	3,489.5	3,484.1	3,445.8	7.5	10.3	-47.28	444.3	162.5	272.9	259.2	13.75	19.850	
3,600.0	3,589.3	3,583.4	3,543.6	7.7	10.6	-46.96	460.5	168.6	284.6	270.5	14.11	20.169	
3,700.0	3,689.2	3,682.5	3,641.2	7.9	11.0	-46.44	476.6	174.6	297.5	283.1	14.44	20.603	
3,800.0	3,789.2	3,781.4	3,738.6	8.1	11.3	-45.74	492.7	180.5	311.6	296.9	14.74	21.143	
3,900.0	3,889.1	3,880.1	3,835.8	8.2	11.7	-44.91	508.8	186.5	327.1	312.0	15.01	21.784	
4,000.0	3,989.1	3,978.5	3,932.8	8.3	12.0	1.07	524.8	192.5	343.4	324.1	19.26	17.831	
4,100.0	4,089.1	4,077.0	4,029.8	8.5	12.3	1.99	540.9	198.4	359.9	340.1	19.81	18.166	
4,200.0	4,189.1	4,177.2	4,128.4	8.6	12.7	2.83	557.1	204.5	376.3	356.0	20.36	18.486	
4,300.0	4,289.1	4,282.7	4,232.6	8.8	13.0	3.58	572.9	210.4	391.6	370.7	20.89	18.747	
4,400.0	4,389.1	4,388.8	4,337.6	8.9	13.3	4.20	587.0	215.6	405.2	383.8	21.39	18.944	
4,500.0	4,489.1	4,495.4	4,443.3	9.1	13.6	4.71	599.3	220.2	417.1	395.2	21.86	19.081	
4,600.0	4,589.1	4,602.4	4,549.8	9.2	13.9	5.12	609.8	224.1	427.2	404.9	22.29	19.161	
4,700.0	4,689.1	4,709.9	4,656.8	9.4	14.1	5.44	618.5	227.3	435.5	412.8	22.70	19.187	
4,800.0	4,789.1	4,817.6	4,764.4	9.5	14.3	5.68	625.3	229.8	442.0	418.9	23.07	19.160	
4,900.0	4,889.1	4,925.6	4,872.2	9.7	14.5	5.85	630.2	231.7	446.7	423.3	23.41	19.080	
5,000.0	4,989.1	5,033.7	4,980.3	9.8	14.6	5.96	633.2	232.8	449.6	425.9	23.72	18.950	
5,100.0	5,089.1	5,142.0	5,088.5	10.0	14.7	5.99	634.3	233.2	450.6	426.6	24.01	18.767	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2B-21H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,189.1	5,242.6	5,189.1	10.2	14.8	5.99	634.3	233.2	450.6	426.4	24.28	18.557	
5,300.0	5,289.1	5,342.6	5,289.1	10.3	14.9	5.99	634.3	233.2	450.6	426.1	24.56	18.351	
5,400.0	5,389.1	5,442.6	5,389.1	10.5	15.1	5.99	634.3	233.2	450.6	425.8	24.83	18.148	
5,500.0	5,489.1	5,542.6	5,489.1	10.6	15.2	5.99	634.3	233.2	450.6	425.5	25.11	17.949	
5,600.0	5,589.1	5,642.6	5,589.1	10.8	15.3	5.99	634.3	233.2	450.6	425.3	25.38	17.753	
5,700.0	5,689.1	5,742.6	5,689.1	10.9	15.4	5.99	634.3	233.2	450.6	425.0	25.66	17.560	
5,800.0	5,789.1	5,842.6	5,789.1	11.1	15.5	5.99	634.3	233.2	450.6	424.7	25.94	17.370	
5,900.0	5,889.1	5,942.6	5,889.1	11.3	15.6	5.99	634.3	233.2	450.6	424.4	26.23	17.183	
6,000.0	5,989.1	6,042.6	5,989.1	11.4	15.7	5.99	634.3	233.2	450.6	424.1	26.51	17.000	
6,100.0	6,089.1	6,142.6	6,089.1	11.6	15.9	5.99	634.3	233.2	450.6	423.8	26.79	16.819	
6,200.0	6,189.1	6,242.6	6,189.1	11.7	16.0	5.99	634.3	233.2	450.6	423.6	27.08	16.642	
6,300.0	6,289.1	6,342.6	6,289.1	11.9	16.1	5.99	634.3	233.2	450.6	423.3	27.37	16.467	
6,400.0	6,389.1	6,448.5	6,394.8	12.1	16.2	5.11	634.3	226.2	450.0	422.4	27.60	16.302	
6,500.0	6,489.1	6,550.7	6,494.6	12.2	16.2	2.40	634.3	204.9	448.6	420.9	27.74	16.174	
6,568.2	6,557.3	6,616.9	6,557.3	12.3	16.2	90.00	634.3	183.5	448.2	424.4	23.77	18.853	
6,600.0	6,589.0	6,646.7	6,584.7	12.4	16.2	88.72	634.3	172.1	448.3	424.4	23.90	18.761	
6,700.0	6,687.3	6,739.0	6,666.5	12.4	16.2	85.11	634.3	129.5	450.0	425.8	24.16	18.625	
6,800.0	6,782.1	6,828.1	6,739.7	12.5	16.2	81.66	634.3	78.6	453.4	429.0	24.33	18.630	
6,900.0	6,871.6	6,914.6	6,804.1	12.5	16.3	78.42	634.3	21.0	458.1	433.6	24.49	18.706	
7,000.0	6,954.1	7,000.0	6,860.4	12.6	16.5	75.42	634.3	-43.1	463.9	439.2	24.70	18.781	
7,100.0	7,027.9	7,081.3	6,906.6	12.9	16.7	72.79	634.3	-109.9	470.1	445.0	25.14	18.705	
7,200.0	7,091.6	7,162.1	6,944.7	13.4	17.1	70.45	634.3	-181.2	476.5	450.6	25.92	18.383	
7,300.0	7,144.0	7,241.7	6,974.2	14.2	17.7	68.46	634.3	-255.0	482.6	455.4	27.21	17.741	
7,400.0	7,184.0	7,320.2	6,995.1	15.4	18.5	66.83	634.3	-330.7	488.1	459.1	29.06	16.797	
7,500.0	7,210.9	7,400.0	7,007.7	16.9	19.5	65.54	634.3	-409.4	492.7	461.2	31.50	15.640	
7,600.0	7,224.2	7,475.1	7,011.5	18.6	20.7	64.65	634.3	-484.4	496.1	461.7	34.40	14.422	
7,700.0	7,224.8	7,571.7	7,009.9	20.5	22.3	64.37	634.3	-581.0	497.1	459.1	37.95	13.097	
7,800.0	7,223.0	7,671.7	7,008.1	22.5	24.2	64.37	634.3	-681.0	497.0	455.5	41.58	11.954	
7,900.0	7,221.3	7,771.7	7,006.4	24.6	26.1	64.37	634.3	-781.0	497.0	451.7	45.36	10.958	
8,000.0	7,219.6	7,871.7	7,004.6	26.8	28.2	64.37	634.3	-881.0	497.0	447.8	49.25	10.092	
8,100.0	7,217.8	7,971.7	7,002.9	29.0	30.3	64.37	634.3	-980.9	497.0	443.8	53.24	9.336	
8,200.0	7,216.1	8,071.7	7,001.1	31.2	32.5	64.37	634.3	-1,080.9	497.0	439.7	57.29	8.676	
8,300.0	7,214.3	8,171.7	6,999.4	33.5	34.7	64.37	634.3	-1,180.9	497.0	435.6	61.40	8.095	
8,400.0	7,212.6	8,271.7	6,997.6	35.8	37.0	64.37	634.3	-1,280.9	497.0	431.5	65.56	7.581	
8,500.0	7,210.8	8,371.7	6,995.9	38.1	39.3	64.37	634.3	-1,380.9	497.0	427.3	69.76	7.125	
8,600.0	7,209.1	8,471.7	6,994.1	40.5	41.6	64.37	634.3	-1,480.9	497.0	423.0	73.98	6.718	
8,700.0	7,207.3	8,571.7	6,992.4	42.8	43.9	64.37	634.3	-1,580.9	497.0	418.8	78.24	6.353	
8,800.0	7,205.6	8,671.7	6,990.7	45.2	46.2	64.37	634.3	-1,680.8	497.0	414.5	82.51	6.024	
8,900.0	7,203.8	8,771.7	6,988.9	47.6	48.6	64.37	634.3	-1,780.8	497.0	410.2	86.81	5.726	
9,000.0	7,202.1	8,871.7	6,987.2	50.0	51.0	64.37	634.3	-1,880.8	497.0	405.9	91.12	5.455	
9,100.0	7,200.4	8,971.7	6,985.4	52.4	53.3	64.37	634.3	-1,980.8	497.0	401.6	95.44	5.207	
9,200.0	7,198.6	9,071.7	6,983.7	54.8	55.7	64.37	634.3	-2,080.8	497.0	397.2	99.78	4.981	
9,300.0	7,196.9	9,171.7	6,981.9	57.2	58.1	64.37	634.3	-2,180.8	497.0	392.9	104.13	4.773	
9,400.0	7,195.1	9,271.7	6,980.2	59.6	60.5	64.37	634.3	-2,280.7	497.0	388.5	108.49	4.581	
9,500.0	7,193.4	9,371.7	6,978.4	62.0	62.9	64.37	634.3	-2,380.7	497.0	384.2	112.85	4.404	
9,600.0	7,191.6	9,471.7	6,976.7	64.4	65.3	64.37	634.3	-2,480.7	497.0	379.8	117.23	4.240	
9,700.0	7,189.9	9,571.7	6,975.0	66.9	67.7	64.37	634.3	-2,580.7	497.0	375.4	121.61	4.087	
9,800.0	7,188.1	9,671.7	6,973.2	69.3	70.1	64.37	634.3	-2,680.7	497.0	371.0	125.99	3.945	
9,900.0	7,186.4	9,771.7	6,971.5	71.7	72.6	64.37	634.3	-2,780.7	497.0	366.6	130.38	3.812	
10,000.0	7,184.7	9,871.7	6,969.7	74.2	75.0	64.37	634.3	-2,880.7	497.0	362.2	134.78	3.688	
10,100.0	7,182.9	9,971.7	6,968.0	76.6	77.4	64.37	634.3	-2,980.6	497.0	357.8	139.18	3.571	
10,200.0	7,181.2	10,071.7	6,966.2	79.1	79.9	64.37	634.3	-3,080.6	497.0	353.4	143.58	3.461	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2B-21H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
10,300.0	7,179.4	10,171.7	6,964.5	81.5	82.3	64.37	634.3	-3,180.6	497.0	349.0	147.99	3.358	
10,400.0	7,177.7	10,271.7	6,962.7	84.0	84.7	64.37	634.3	-3,280.6	497.0	344.6	152.40	3.261	
10,500.0	7,175.9	10,371.7	6,961.0	86.4	87.2	64.37	634.3	-3,380.6	497.0	340.2	156.82	3.169	
10,600.0	7,174.2	10,471.7	6,959.2	88.8	89.6	64.37	634.3	-3,480.6	497.0	335.8	161.23	3.082	
10,700.0	7,172.4	10,571.7	6,957.5	91.3	92.0	64.37	634.3	-3,580.5	497.0	331.3	165.65	3.000	
10,800.0	7,170.7	10,671.7	6,955.8	93.7	94.5	64.37	634.3	-3,680.5	497.0	326.9	170.07	2.922	
10,900.0	7,168.9	10,771.7	6,954.0	96.2	96.9	64.37	634.3	-3,780.5	497.0	322.5	174.50	2.848	
11,000.0	7,167.2	10,871.7	6,952.3	98.7	99.4	64.37	634.3	-3,880.5	497.0	318.1	178.92	2.778	
11,100.0	7,165.5	10,971.7	6,950.5	101.1	101.8	64.37	634.3	-3,980.5	497.0	313.6	183.35	2.711	
11,200.0	7,163.7	11,071.7	6,948.8	103.6	104.3	64.37	634.3	-4,080.5	497.0	309.2	187.78	2.647	
11,300.0	7,162.0	11,171.7	6,947.0	106.0	106.7	64.37	634.3	-4,180.5	497.0	304.8	192.21	2.586	
11,400.0	7,160.2	11,271.7	6,945.3	108.5	109.2	64.37	634.3	-4,280.4	497.0	300.3	196.64	2.527	
11,500.0	7,158.5	11,371.7	6,943.5	110.9	111.6	64.37	634.3	-4,380.4	497.0	295.9	201.08	2.472	
11,600.0	7,156.7	11,471.7	6,941.8	113.4	114.1	64.37	634.3	-4,480.4	497.0	291.5	205.51	2.418	
11,687.5	7,155.2	11,559.2	6,940.3	115.5	116.2	64.37	634.3	-4,567.9	497.0	287.6	209.39	2.373	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2D-21H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-10.9	0.0	10.9				
100.0	100.0	100.0	100.0	0.2	0.2	180.00	-10.9	0.0	10.9	10.6	0.30	36.000	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-10.9	0.0	10.9	10.3	0.65	16.749	
300.0	300.0	300.0	300.0	0.5	0.5	180.00	-10.9	0.0	10.9	9.9	1.00	10.913	
400.0	400.0	400.0	400.0	0.7	0.7	180.00	-10.9	0.0	10.9	9.6	1.35	8.093	CC, ES
500.0	500.0	499.8	499.8	0.9	0.9	135.31	-11.6	0.5	12.2	10.5	1.70	7.192	
600.0	600.0	599.6	599.5	1.0	1.0	135.95	-13.6	2.2	16.1	14.1	2.05	7.853	
700.0	699.9	699.1	699.0	1.2	1.2	136.51	-17.0	4.9	22.6	20.2	2.41	9.377	
800.0	799.7	798.3	798.0	1.4	1.4	136.89	-21.7	8.7	31.6	28.9	2.77	11.409	
900.0	899.4	897.2	896.6	1.6	1.6	137.13	-27.7	13.6	43.2	40.1	3.15	13.742	
1,000.0	999.0	996.3	995.3	1.8	1.8	137.30	-34.4	19.0	56.2	52.6	3.53	15.917	
1,100.0	1,098.6	1,095.5	1,094.1	2.0	2.0	137.41	-41.1	24.4	69.1	65.2	3.91	17.650	
1,200.0	1,198.2	1,194.6	1,192.9	2.3	2.3	137.49	-47.8	29.9	82.0	77.7	4.30	19.059	
1,300.0	1,297.8	1,293.8	1,291.7	2.5	2.5	137.54	-54.6	35.3	94.9	90.2	4.69	20.226	
1,400.0	1,397.5	1,393.0	1,390.5	2.7	2.7	137.59	-61.3	40.8	107.9	102.8	5.09	21.205	
1,500.0	1,497.1	1,492.1	1,489.2	2.9	2.9	137.62	-68.0	46.2	120.8	115.3	5.48	22.040	
1,600.0	1,596.7	1,591.3	1,588.0	3.2	3.1	137.64	-74.7	51.6	133.7	127.8	5.88	22.758	
1,700.0	1,696.3	1,690.4	1,686.8	3.4	3.4	137.67	-81.4	57.1	146.6	140.4	6.27	23.383	
1,800.0	1,795.9	1,789.6	1,785.6	3.6	3.6	137.68	-88.1	62.5	159.6	152.9	6.67	23.931	
1,900.0	1,895.6	1,888.8	1,884.4	3.8	3.8	137.70	-94.8	68.0	172.5	165.4	7.07	24.415	
2,000.0	1,995.2	1,987.9	1,983.2	4.1	4.0	137.71	-101.6	73.4	185.4	178.0	7.46	24.847	
2,100.0	2,094.8	2,087.1	2,081.9	4.3	4.3	137.72	-108.3	78.8	198.4	190.5	7.86	25.233	
2,200.0	2,194.4	2,186.3	2,180.7	4.5	4.5	137.74	-115.0	84.3	211.3	203.0	8.26	25.581	
2,300.0	2,294.0	2,285.4	2,279.5	4.8	4.7	137.74	-121.7	89.7	224.2	215.5	8.66	25.896	
2,400.0	2,393.7	2,384.6	2,378.3	5.0	5.0	137.75	-128.4	95.1	237.1	228.1	9.06	26.183	
2,500.0	2,493.3	2,483.7	2,477.1	5.2	5.2	137.76	-135.1	100.6	250.1	240.6	9.46	26.444	
2,600.0	2,592.9	2,582.9	2,575.9	5.4	5.4	137.77	-141.9	106.0	263.0	253.1	9.86	26.684	
2,700.0	2,692.5	2,682.1	2,674.6	5.7	5.6	137.77	-148.6	111.5	275.9	265.7	10.25	26.905	
2,800.0	2,792.1	2,781.2	2,773.4	5.9	5.9	137.78	-155.3	116.9	288.8	278.2	10.65	27.109	
2,900.0	2,891.8	2,880.4	2,872.2	6.1	6.1	137.78	-162.0	122.3	301.8	290.7	11.05	27.298	
3,000.0	2,991.4	2,979.5	2,971.0	6.4	6.3	137.79	-168.7	127.8	314.7	303.2	11.45	27.473	
3,100.0	3,091.0	3,078.7	3,069.8	6.6	6.5	137.79	-175.4	133.2	327.6	315.8	11.85	27.636	
3,200.0	3,190.6	3,177.9	3,168.6	6.8	6.8	137.79	-182.2	138.7	340.5	328.3	12.25	27.789	
3,300.0	3,290.2	3,277.0	3,267.3	7.1	7.0	137.80	-188.9	144.1	353.5	340.8	12.66	27.931	
3,400.0	3,389.9	3,376.2	3,366.1	7.3	7.2	137.80	-195.6	149.5	366.4	353.3	13.06	28.065	
3,500.0	3,489.5	3,475.4	3,465.0	7.5	7.5	137.81	-202.3	155.0	378.9	365.5	13.46	28.159	
3,600.0	3,589.3	3,574.7	3,563.9	7.7	7.7	137.67	-209.0	160.4	390.2	376.3	13.85	28.177	
3,700.0	3,689.2	3,674.2	3,663.0	7.9	7.9	137.36	-215.8	165.9	400.2	385.9	14.23	28.125	
3,800.0	3,789.2	3,773.8	3,762.2	8.1	8.2	136.89	-222.5	171.3	408.9	394.3	14.60	28.010	
3,900.0	3,889.1	3,873.4	3,861.4	8.2	8.4	136.27	-229.3	176.8	416.4	401.5	14.96	27.842	
4,000.0	3,989.1	3,973.0	3,960.7	8.3	8.6	-179.48	-236.0	182.3	423.1	407.5	15.66	27.024	
4,100.0	4,089.1	4,072.6	4,059.9	8.5	8.8	179.79	-242.8	187.7	429.9	413.9	16.03	26.820	
4,200.0	4,189.1	4,173.5	4,160.4	8.6	9.1	179.07	-249.6	193.2	436.7	420.3	16.40	26.621	
4,300.0	4,289.1	4,279.7	4,266.3	8.8	9.3	178.44	-255.7	198.2	442.6	425.8	16.78	26.379	
4,400.0	4,389.1	4,386.1	4,372.6	8.9	9.5	177.97	-260.3	201.9	447.0	429.9	17.14	26.084	
4,500.0	4,489.1	4,492.7	4,479.1	9.1	9.7	177.67	-263.4	204.4	450.0	432.5	17.48	25.737	
4,600.0	4,589.1	4,599.5	4,585.8	9.2	9.8	177.52	-264.9	205.7	451.5	433.7	17.82	25.340	
4,700.0	4,689.1	4,702.8	4,689.1	9.4	10.0	177.50	-265.1	205.8	451.7	433.5	18.14	24.903	
4,800.0	4,789.1	4,802.8	4,789.1	9.5	10.1	177.50	-265.1	205.8	451.7	433.2	18.45	24.476	
4,900.0	4,889.1	4,902.8	4,889.1	9.7	10.3	177.50	-265.1	205.8	451.7	432.9	18.77	24.063	
5,000.0	4,989.1	5,002.8	4,989.1	9.8	10.4	177.50	-265.1	205.8	451.7	432.6	19.09	23.662	
5,100.0	5,089.1	5,102.8	5,089.1	10.0	10.6	177.50	-265.1	205.8	451.7	432.2	19.41	23.272	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2D-21H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,189.1	5,202.8	5,189.1	10.2	10.7	177.50	-265.1	205.8	451.7	431.9	19.73	22.895	
5,300.0	5,289.1	5,302.8	5,289.1	10.3	10.9	177.50	-265.1	205.8	451.7	431.6	20.05	22.528	
5,400.0	5,389.1	5,402.8	5,389.1	10.5	11.0	177.50	-265.1	205.8	451.7	431.3	20.37	22.172	
5,500.0	5,489.1	5,502.8	5,489.1	10.6	11.2	177.50	-265.1	205.8	451.7	431.0	20.69	21.826	
5,600.0	5,589.1	5,602.8	5,589.1	10.8	11.3	177.50	-265.1	205.8	451.7	430.6	21.02	21.489	
5,700.0	5,689.1	5,702.8	5,689.1	10.9	11.5	177.50	-265.1	205.8	451.7	430.3	21.34	21.162	
5,800.0	5,789.1	5,802.8	5,789.1	11.1	11.6	177.50	-265.1	205.8	451.7	430.0	21.67	20.845	
5,900.0	5,889.1	5,902.8	5,889.1	11.3	11.8	177.50	-265.1	205.8	451.7	429.7	21.99	20.536	
6,000.0	5,989.1	6,002.8	5,989.1	11.4	11.9	177.50	-265.1	205.8	451.7	429.3	22.32	20.235	
6,100.0	6,089.1	6,102.8	6,089.1	11.6	12.1	177.50	-265.1	205.8	451.7	429.0	22.65	19.943	
6,200.0	6,189.1	6,202.8	6,189.1	11.7	12.2	177.50	-265.1	205.8	451.7	428.7	22.98	19.658	
6,300.0	6,289.1	6,302.8	6,289.1	11.9	12.4	177.50	-265.1	205.8	451.7	428.3	23.30	19.381	
6,400.0	6,389.1	6,402.8	6,389.1	12.1	12.5	177.50	-265.1	205.8	451.7	428.0	23.63	19.111	
6,500.0	6,489.1	6,504.4	6,490.7	12.2	12.7	177.90	-265.1	202.7	451.5	427.6	23.96	18.843	
6,600.0	6,589.0	6,605.2	6,590.1	12.4	12.7	-90.59	-265.1	186.2	451.3	427.4	23.84	18.928	
6,637.2	6,625.8	6,642.2	6,625.8	12.4	12.7	-90.01	-265.1	176.7	451.2	427.3	23.89	18.891	
6,700.0	6,687.3	6,704.3	6,684.5	12.4	12.8	-89.05	-265.1	156.7	451.3	427.3	23.95	18.840	
6,800.0	6,782.1	6,801.7	6,772.6	12.5	12.8	-87.54	-265.1	115.2	451.7	427.6	24.03	18.794	
6,900.0	6,871.6	6,897.6	6,853.0	12.5	12.8	-86.09	-265.1	63.0	452.3	428.1	24.18	18.707	
7,000.0	6,954.1	6,992.2	6,924.7	12.6	13.0	-84.72	-265.1	1.5	453.2	428.7	24.53	18.476	
7,100.0	7,027.9	7,085.6	6,987.0	12.9	13.3	-83.46	-265.1	-68.0	454.2	429.0	25.22	18.010	
7,200.0	7,091.6	7,177.9	7,039.2	13.4	13.8	-82.33	-265.1	-144.1	455.4	429.0	26.39	17.253	
7,300.0	7,144.0	7,269.3	7,080.8	14.2	14.7	-81.35	-265.1	-225.4	456.5	428.4	28.13	16.229	
7,400.0	7,184.0	7,359.9	7,111.5	15.4	15.9	-80.52	-265.1	-310.6	457.5	427.1	30.44	15.031	
7,500.0	7,210.9	7,450.0	7,131.2	16.9	17.3	-79.86	-265.1	-398.4	458.5	425.2	33.28	13.777	
7,600.0	7,224.2	7,539.5	7,139.6	18.6	18.9	-79.38	-265.1	-487.5	459.2	422.6	36.54	12.567	
7,700.0	7,224.8	7,635.3	7,138.8	20.5	20.7	-79.21	-265.2	-583.2	459.4	419.2	40.22	11.422	
7,800.0	7,223.0	7,735.3	7,137.1	22.5	22.7	-79.21	-265.2	-683.2	459.4	415.2	44.20	10.395	
7,900.0	7,221.3	7,835.3	7,135.3	24.6	24.8	-79.21	-265.2	-783.2	459.4	411.1	48.34	9.505	
8,000.0	7,219.6	7,935.3	7,133.6	26.8	27.0	-79.21	-265.2	-883.2	459.5	406.9	52.60	8.735	
8,100.0	7,217.8	8,035.3	7,131.8	29.0	29.2	-79.21	-265.2	-983.2	459.5	402.5	56.96	8.067	
8,200.0	7,216.1	8,135.3	7,130.1	31.2	31.4	-79.21	-265.2	-1,083.1	459.5	398.1	61.39	7.484	
8,300.0	7,214.3	8,235.3	7,128.3	33.5	33.7	-79.21	-265.2	-1,183.1	459.5	393.6	65.89	6.974	
8,400.0	7,212.6	8,335.3	7,126.6	35.8	36.0	-79.21	-265.2	-1,283.1	459.5	389.1	70.43	6.524	
8,500.0	7,210.8	8,435.3	7,124.9	38.1	38.3	-79.21	-265.2	-1,383.1	459.5	384.5	75.01	6.126	
8,600.0	7,209.1	8,535.3	7,123.1	40.5	40.7	-79.22	-265.2	-1,483.1	459.5	379.9	79.63	5.771	
8,700.0	7,207.3	8,635.3	7,121.4	42.8	43.0	-79.22	-265.2	-1,583.1	459.5	375.2	84.27	5.453	
8,800.0	7,205.6	8,735.3	7,119.6	45.2	45.4	-79.22	-265.2	-1,683.0	459.5	370.6	88.94	5.167	
8,900.0	7,203.8	8,835.3	7,117.9	47.6	47.8	-79.22	-265.3	-1,783.0	459.5	365.9	93.63	4.908	
9,000.0	7,202.1	8,935.3	7,116.1	50.0	50.2	-79.22	-265.3	-1,883.0	459.6	361.2	98.33	4.674	
9,100.0	7,200.4	9,035.3	7,114.4	52.4	52.6	-79.22	-265.3	-1,983.0	459.6	356.5	103.05	4.460	
9,200.0	7,198.6	9,135.3	7,112.6	54.8	55.0	-79.22	-265.3	-2,083.0	459.6	351.8	107.78	4.264	
9,300.0	7,196.9	9,235.3	7,110.9	57.2	57.4	-79.22	-265.3	-2,183.0	459.6	347.1	112.52	4.084	
9,400.0	7,195.1	9,335.3	7,109.2	59.6	59.8	-79.22	-265.3	-2,283.0	459.6	342.3	117.28	3.919	
9,500.0	7,193.4	9,435.3	7,107.4	62.0	62.2	-79.22	-265.3	-2,382.9	459.6	337.6	122.04	3.766	
9,600.0	7,191.6	9,535.3	7,105.7	64.4	64.7	-79.22	-265.3	-2,482.9	459.6	332.8	126.80	3.625	
9,700.0	7,189.9	9,635.3	7,103.9	66.9	67.1	-79.22	-265.3	-2,582.9	459.6	328.0	131.58	3.493	
9,800.0	7,188.1	9,735.3	7,102.2	69.3	69.5	-79.22	-265.3	-2,682.9	459.6	323.3	136.36	3.371	
9,900.0	7,186.4	9,835.3	7,100.4	71.7	72.0	-79.22	-265.3	-2,782.9	459.6	318.5	141.15	3.257	
10,000.0	7,184.7	9,935.3	7,098.7	74.2	74.4	-79.22	-265.4	-2,882.9	459.7	313.7	145.94	3.150	
10,100.0	7,182.9	10,035.3	7,096.9	76.6	76.8	-79.22	-265.4	-2,982.9	459.7	308.9	150.73	3.050	
10,200.0	7,181.2	10,135.3	7,095.2	79.1	79.3	-79.22	-265.4	-3,082.8	459.7	304.1	155.53	2.955	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2D-21H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
10,300.0	7,179.4	10,235.3	7,093.4	81.5	81.7	-79.22	-265.4	-3,182.8	459.7	299.3	160.34	2.867	
10,400.0	7,177.7	10,335.3	7,091.7	84.0	84.2	-79.22	-265.4	-3,282.8	459.7	294.6	165.14	2.784	
10,500.0	7,175.9	10,435.3	7,090.0	86.4	86.6	-79.22	-265.4	-3,382.8	459.7	289.8	169.95	2.705	
10,600.0	7,174.2	10,535.3	7,088.2	88.8	89.1	-79.22	-265.4	-3,482.8	459.7	284.9	174.77	2.630	
10,700.0	7,172.4	10,635.3	7,086.5	91.3	91.5	-79.22	-265.4	-3,582.8	459.7	280.1	179.58	2.560	
10,800.0	7,170.7	10,735.3	7,084.7	93.7	94.0	-79.22	-265.4	-3,682.7	459.7	275.3	184.40	2.493	
10,900.0	7,168.9	10,835.3	7,083.0	96.2	96.4	-79.22	-265.4	-3,782.7	459.7	270.5	189.22	2.430	
11,000.0	7,167.2	10,935.3	7,081.2	98.7	98.9	-79.22	-265.4	-3,882.7	459.8	265.7	194.04	2.369	
11,100.0	7,165.5	11,035.3	7,079.5	101.1	101.3	-79.22	-265.4	-3,982.7	459.8	260.9	198.87	2.312	
11,200.0	7,163.7	11,135.3	7,077.7	103.6	103.8	-79.22	-265.5	-4,082.7	459.8	256.1	203.69	2.257	
11,300.0	7,162.0	11,235.3	7,076.0	106.0	106.2	-79.22	-265.5	-4,182.7	459.8	251.3	208.52	2.205	
11,400.0	7,160.2	11,335.3	7,074.2	108.5	108.7	-79.22	-265.5	-4,282.7	459.8	246.4	213.35	2.155	
11,500.0	7,158.5	11,435.3	7,072.5	110.9	111.1	-79.22	-265.5	-4,382.6	459.8	241.6	218.18	2.107	
11,600.0	7,156.7	11,535.3	7,070.8	113.4	113.6	-79.22	-265.5	-4,482.6	459.8	236.8	223.01	2.062	
11,687.5	7,155.2	11,622.7	7,069.2	115.5	115.7	-79.22	-265.5	-4,570.1	459.8	232.6	227.24	2.024	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2E-21H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-21.9	0.0	21.9				
100.0	100.0	100.0	100.0	0.2	0.2	180.00	-21.9	0.0	21.9	21.6	0.30	71.972	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-21.9	0.0	21.9	21.2	0.65	33.484	
300.0	300.0	300.0	300.0	0.5	0.5	180.00	-21.9	0.0	21.9	20.9	1.00	21.817	
400.0	400.0	400.0	400.0	0.7	0.7	180.00	-21.9	0.0	21.9	20.5	1.35	16.180	CC, ES
500.0	500.0	499.6	499.6	0.9	0.8	135.84	-22.7	0.3	23.3	21.6	1.70	13.712	
600.0	600.0	599.1	599.1	1.0	1.0	137.84	-25.1	1.1	27.7	25.6	2.05	13.499	SF
700.0	699.9	698.3	698.2	1.2	1.2	140.05	-29.2	2.4	35.0	32.6	2.40	14.564	
800.0	799.7	797.2	796.8	1.4	1.4	141.92	-34.9	4.3	45.3	42.5	2.76	16.408	
900.0	899.4	895.5	894.8	1.6	1.6	143.35	-42.2	6.6	58.5	55.4	3.12	18.745	
1,000.0	999.0	993.3	992.2	1.8	1.8	144.08	-51.0	9.5	73.9	70.4	3.49	21.200	
1,100.0	1,098.6	1,090.6	1,088.9	2.0	2.1	144.07	-61.4	12.8	90.9	87.0	3.86	23.545	
1,200.0	1,198.2	1,187.3	1,184.9	2.3	2.3	143.66	-73.2	16.7	109.3	105.1	4.24	25.801	
1,300.0	1,297.8	1,283.5	1,280.0	2.5	2.6	143.04	-86.5	21.0	129.2	124.6	4.62	27.986	
1,400.0	1,397.5	1,379.1	1,374.4	2.7	2.9	142.31	-101.2	25.8	150.7	145.6	5.00	30.114	
1,500.0	1,497.1	1,476.0	1,469.8	2.9	3.2	141.60	-117.2	31.0	173.1	167.7	5.39	32.107	
1,600.0	1,596.7	1,573.5	1,565.7	3.2	3.5	141.03	-133.3	36.2	195.6	189.8	5.78	33.829	
1,700.0	1,696.3	1,670.9	1,661.7	3.4	3.8	140.59	-149.4	41.4	218.1	212.0	6.17	35.330	
1,800.0	1,795.9	1,768.3	1,757.6	3.6	4.1	140.23	-165.5	46.7	240.7	234.1	6.57	36.649	
1,900.0	1,895.6	1,865.7	1,853.6	3.8	4.5	139.93	-181.6	51.9	263.2	256.2	6.96	37.817	
2,000.0	1,995.2	1,963.1	1,949.5	4.1	4.8	139.68	-197.6	57.1	285.7	278.4	7.35	38.858	
2,100.0	2,094.8	2,060.5	2,045.4	4.3	5.1	139.46	-213.7	62.3	308.3	300.5	7.75	39.791	
2,200.0	2,194.4	2,158.0	2,141.4	4.5	5.5	139.27	-229.8	67.6	330.8	322.7	8.14	40.633	
2,300.0	2,294.0	2,255.4	2,237.3	4.8	5.8	139.11	-245.9	72.8	353.4	344.8	8.54	41.395	
2,400.0	2,393.7	2,352.8	2,333.3	5.0	6.1	138.97	-262.0	78.0	375.9	367.0	8.93	42.089	
2,500.0	2,493.3	2,450.2	2,429.2	5.2	6.5	138.84	-278.1	83.3	398.5	389.2	9.33	42.723	
2,600.0	2,592.9	2,547.6	2,525.1	5.4	6.8	138.73	-294.2	88.5	421.1	411.3	9.72	43.305	
2,700.0	2,692.5	2,645.1	2,621.1	5.7	7.1	138.63	-310.3	93.7	443.6	433.5	10.12	43.840	
2,800.0	2,792.1	2,742.5	2,717.0	5.9	7.5	138.54	-326.4	98.9	466.2	455.7	10.51	44.335	
2,900.0	2,891.8	2,839.9	2,813.0	6.1	7.8	138.45	-342.4	104.2	488.7	477.8	10.91	44.793	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 2F-21H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-32.8	0.0	32.8				
100.0	100.0	100.0	100.0	0.2	0.2	-180.00	-32.8	0.0	32.8	32.5	0.30	107.958	
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-32.8	0.0	32.8	32.1	0.65	50.227	
233.3	233.3	233.3	233.3	0.4	0.4	-180.00	-32.8	0.0	32.8	32.0	0.77	42.627	CC
300.0	300.0	299.7	299.7	0.5	0.5	179.93	-33.0	0.0	33.0	32.0	1.00	32.954	ES
400.0	400.0	399.1	399.1	0.7	0.7	179.39	-34.7	0.4	34.7	33.4	1.35	25.706	
500.0	500.0	498.4	498.3	0.9	0.9	134.36	-38.1	1.0	38.7	37.0	1.70	22.811	
600.0	600.0	597.5	597.2	1.0	1.0	135.48	-43.1	2.0	45.7	43.6	2.05	22.313	SF
700.0	699.9	696.1	695.7	1.2	1.2	137.12	-49.8	3.3	55.6	53.2	2.40	23.170	
800.0	799.7	794.2	793.4	1.4	1.5	138.84	-58.1	4.9	68.5	65.7	2.75	24.856	
900.0	899.4	891.7	890.3	1.6	1.7	140.41	-68.0	6.8	84.4	81.2	3.12	27.075	
1,000.0	999.0	988.5	986.4	1.8	1.9	141.57	-79.4	9.1	102.6	99.1	3.48	29.455	
1,100.0	1,098.6	1,084.7	1,081.8	2.0	2.2	142.13	-92.4	11.6	122.4	118.5	3.85	31.772	
1,200.0	1,198.2	1,180.3	1,176.2	2.3	2.5	142.32	-106.8	14.4	143.7	139.5	4.22	34.033	
1,300.0	1,297.8	1,275.2	1,269.7	2.5	2.8	142.29	-122.6	17.5	166.6	162.0	4.60	36.245	
1,400.0	1,397.5	1,369.4	1,362.3	2.7	3.1	142.10	-139.8	20.8	191.0	186.0	4.97	38.417	
1,500.0	1,497.1	1,462.8	1,453.8	2.9	3.5	141.83	-158.3	24.4	216.9	211.6	5.35	40.556	
1,600.0	1,596.7	1,555.4	1,544.2	3.2	3.9	141.50	-178.1	28.3	244.3	238.6	5.73	42.667	
1,700.0	1,696.3	1,647.2	1,633.4	3.4	4.3	141.14	-199.2	32.3	273.2	267.1	6.11	44.755	
1,800.0	1,795.9	1,738.1	1,721.4	3.6	4.7	140.77	-221.4	36.7	303.6	297.1	6.48	46.828	
1,900.0	1,895.6	1,832.5	1,812.6	3.8	5.1	140.40	-245.4	41.3	334.8	328.0	6.87	48.753	
2,000.0	1,995.2	1,927.4	1,904.3	4.1	5.5	140.09	-269.5	46.0	366.1	358.9	7.25	50.466	
2,100.0	2,094.8	2,022.4	1,996.0	4.3	6.0	139.83	-293.6	50.7	397.4	389.8	7.64	52.004	
2,200.0	2,194.4	2,117.4	2,087.8	4.5	6.4	139.61	-317.8	55.4	428.7	420.7	8.03	53.393	
2,300.0	2,294.0	2,212.3	2,179.5	4.8	6.9	139.41	-341.9	60.1	460.0	451.6	8.42	54.653	
2,400.0	2,393.7	2,307.3	2,271.2	5.0	7.3	139.25	-366.0	64.8	491.3	482.5	8.81	55.801	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 4-2-21 (Proposed) - DD - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
700.0	699.9	789.7	785.7	1.2	1.8	-67.55	461.0	-178.8	498.8	496.2	2.59	192.900	
800.0	799.7	887.7	882.3	1.4	2.1	-67.97	446.8	-169.1	479.3	476.3	2.95	162.312	
900.0	899.4	985.6	978.6	1.6	2.5	-68.62	432.5	-159.3	459.1	455.8	3.33	137.926	
1,000.0	999.0	1,083.4	1,074.9	1.8	2.8	-69.24	418.3	-149.6	438.7	435.0	3.71	118.241	
1,100.0	1,098.6	1,181.2	1,171.1	2.0	3.2	-69.91	404.1	-139.9	418.4	414.3	4.09	102.176	
1,200.0	1,198.2	1,278.9	1,267.4	2.3	3.5	-70.65	389.9	-130.2	398.1	393.6	4.48	88.850	
1,300.0	1,297.8	1,376.7	1,363.6	2.5	3.8	-71.48	375.7	-120.5	377.8	373.0	4.87	77.636	
1,400.0	1,397.5	1,474.5	1,459.9	2.7	4.2	-72.39	361.5	-110.8	357.7	352.4	5.25	68.080	
1,500.0	1,497.1	1,572.3	1,556.1	2.9	4.5	-73.41	347.3	-101.1	337.6	332.0	5.64	59.847	
1,600.0	1,596.7	1,670.0	1,652.4	3.2	4.9	-74.56	333.0	-91.4	317.7	311.6	6.03	52.684	
1,700.0	1,696.3	1,767.8	1,748.6	3.4	5.2	-75.87	318.8	-81.7	297.9	291.5	6.42	46.399	
1,800.0	1,795.9	1,865.6	1,844.9	3.6	5.6	-77.35	304.6	-72.0	278.3	271.4	6.81	40.841	
1,900.0	1,895.6	1,963.4	1,941.1	3.8	5.9	-79.06	290.4	-62.3	258.8	251.6	7.21	35.893	
2,000.0	1,995.2	2,061.2	2,037.4	4.1	6.2	-81.05	276.2	-52.6	239.7	232.1	7.62	31.461	
2,100.0	2,094.8	2,158.9	2,133.6	4.3	6.6	-83.37	262.0	-42.8	220.9	212.8	8.04	27.471	
2,200.0	2,194.4	2,256.7	2,229.9	4.5	6.9	-86.12	247.7	-33.1	202.4	194.0	8.48	23.863	
2,300.0	2,294.0	2,354.5	2,326.1	4.8	7.3	-89.39	233.5	-23.4	184.6	175.6	8.96	20.593	
2,400.0	2,393.7	2,452.3	2,422.4	5.0	7.6	-93.35	219.3	-13.7	167.4	157.9	9.50	17.630	
2,500.0	2,493.3	2,550.1	2,518.6	5.2	8.0	-98.16	205.1	-4.0	151.2	141.1	10.11	14.962	
2,600.0	2,592.9	2,647.8	2,614.9	5.4	8.3	-104.05	190.9	5.7	136.3	125.5	10.82	12.598	
2,700.0	2,692.5	2,745.6	2,711.1	5.7	8.7	-111.25	176.7	15.4	123.2	111.6	11.66	10.567	
2,800.0	2,792.1	2,843.4	2,807.4	5.9	9.0	-119.92	162.4	25.1	112.5	99.9	12.62	8.919	
2,900.0	2,891.8	2,941.2	2,903.6	6.1	9.4	-130.07	148.2	34.8	105.0	91.3	13.63	7.701	
3,000.0	2,991.4	3,039.0	2,999.9	6.4	9.7	-141.31	134.0	44.5	101.3	86.7	14.59	6.938	
3,037.3	3,028.5	3,075.4	3,035.8	6.5	9.8	-145.64	128.7	48.1	100.9	86.0	14.92	6.767	CC, ES
3,100.0	3,091.0	3,136.7	3,096.1	6.6	10.0	-152.90	119.8	54.2	101.8	86.4	15.40	6.610	SF
3,200.0	3,190.6	3,234.5	3,192.4	6.8	10.4	-163.92	105.6	63.9	106.6	90.5	16.00	6.658	
3,300.0	3,290.2	3,332.3	3,288.7	7.1	10.7	-173.71	91.4	73.7	115.0	98.5	16.44	6.995	
3,400.0	3,389.9	3,430.1	3,384.9	7.3	11.1	177.99	77.2	83.4	126.4	109.6	16.77	7.536	
3,500.0	3,489.5	3,527.9	3,481.2	7.5	11.4	171.13	62.9	93.1	139.4	122.4	17.06	8.173	
3,600.0	3,589.3	3,625.9	3,577.7	7.7	11.8	165.34	48.7	102.8	152.5	135.2	17.32	8.804	
3,700.0	3,689.2	3,724.1	3,674.3	7.9	12.1	160.31	34.4	112.6	165.3	147.8	17.56	9.412	
3,800.0	3,789.2	3,822.4	3,771.1	8.1	12.5	155.81	20.1	122.3	177.6	159.9	17.78	9.991	
3,900.0	3,889.1	3,920.8	3,868.0	8.2	12.8	151.67	5.8	132.1	189.4	171.4	17.97	10.542	
4,000.0	3,989.1	4,019.2	3,964.9	8.3	13.2	-167.18	-8.5	141.9	201.1	182.8	18.29	10.997	
4,100.0	4,089.1	4,117.7	4,061.8	8.5	13.5	-170.62	-22.8	151.6	213.5	194.5	19.00	11.239	
4,200.0	4,189.1	4,216.1	4,158.7	8.6	13.9	-173.68	-37.1	161.4	226.7	207.0	19.69	11.512	
4,300.0	4,289.1	4,314.6	4,255.6	8.8	14.2	-176.40	-51.4	171.2	240.4	220.0	20.36	11.808	
4,400.0	4,389.1	4,413.0	4,352.5	8.9	14.6	-178.82	-65.7	180.9	254.6	233.6	21.01	12.119	
4,500.0	4,489.1	4,511.4	4,449.4	9.1	14.9	179.01	-80.1	190.7	269.2	247.6	21.64	12.440	
4,600.0	4,589.1	4,614.6	4,551.1	9.2	15.3	177.04	-94.6	200.7	283.7	261.4	22.26	12.746	
4,700.0	4,689.1	4,723.2	4,658.5	9.4	15.6	175.52	-107.0	209.1	295.6	272.8	22.80	12.964	
4,800.0	4,789.1	4,832.7	4,767.5	9.5	15.8	174.49	-116.0	215.3	304.4	281.1	23.26	13.083	
4,900.0	4,889.1	4,942.9	4,877.5	9.7	16.0	173.88	-121.7	219.1	309.8	286.2	23.64	13.102	
5,000.0	4,989.1	5,053.4	4,988.0	9.8	16.1	173.65	-123.8	220.6	311.9	287.9	23.96	13.019	
5,100.0	5,089.1	5,154.6	5,089.1	10.0	16.2	173.65	-123.8	220.6	311.9	287.7	24.23	12.873	
5,200.0	5,189.1	5,254.6	5,189.1	10.2	16.3	173.65	-123.8	220.6	311.9	287.4	24.50	12.731	
5,300.0	5,289.1	5,354.6	5,289.1	10.3	16.4	173.65	-123.8	220.6	311.9	287.1	24.77	12.590	
5,400.0	5,389.1	5,454.6	5,389.1	10.5	16.5	173.65	-123.8	220.6	311.9	286.8	25.05	12.452	
5,500.0	5,489.1	5,554.6	5,489.1	10.6	16.6	173.65	-123.8	220.6	311.9	286.6	25.33	12.316	
5,600.0	5,589.1	5,654.6	5,589.1	10.8	16.7	173.65	-123.8	220.6	311.9	286.3	25.60	12.182	
5,700.0	5,689.1	5,754.6	5,689.1	10.9	16.8	173.65	-123.8	220.6	311.9	286.0	25.88	12.050	

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

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 NENE S20-T3N-R68W (Liberty 2A-21H) - Liberty 4-2-21 (Proposed) - DD - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,800.0	5,789.1	5,854.6	5,789.1	11.1	16.9	173.65	-123.8	220.6	311.9	285.7	26.16	11.921	
5,900.0	5,889.1	5,954.6	5,889.1	11.3	17.0	173.65	-123.8	220.6	311.9	285.5	26.45	11.794	
6,000.0	5,989.1	6,054.6	5,989.1	11.4	17.1	173.65	-123.8	220.6	311.9	285.2	26.73	11.669	
6,100.0	6,089.1	6,065.4	6,000.0	11.6	17.1	173.65	-123.8	220.6	324.4	297.5	26.91	12.054	
6,200.0	6,189.1	6,065.4	6,000.0	11.7	17.1	173.65	-123.8	220.6	364.8	337.7	27.08	13.471	
6,300.0	6,289.1	6,065.4	6,000.0	11.9	17.1	173.65	-123.8	220.6	425.3	398.1	27.25	15.609	
6,400.0	6,389.1	6,065.4	6,000.0	12.1	17.1	173.65	-123.8	220.6	498.7	471.3	27.42	18.190	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Liberty 2C-21H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Reference Site:	NENE S20-T3N-R68W (Liberty 2A-21H)	**MD Reference:**	WELL @ 5036.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Liberty 2C-21H	**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 @ 5036.0ft (Original Well Elev)	Coordinates are relative to: Liberty 2C-21H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.32°