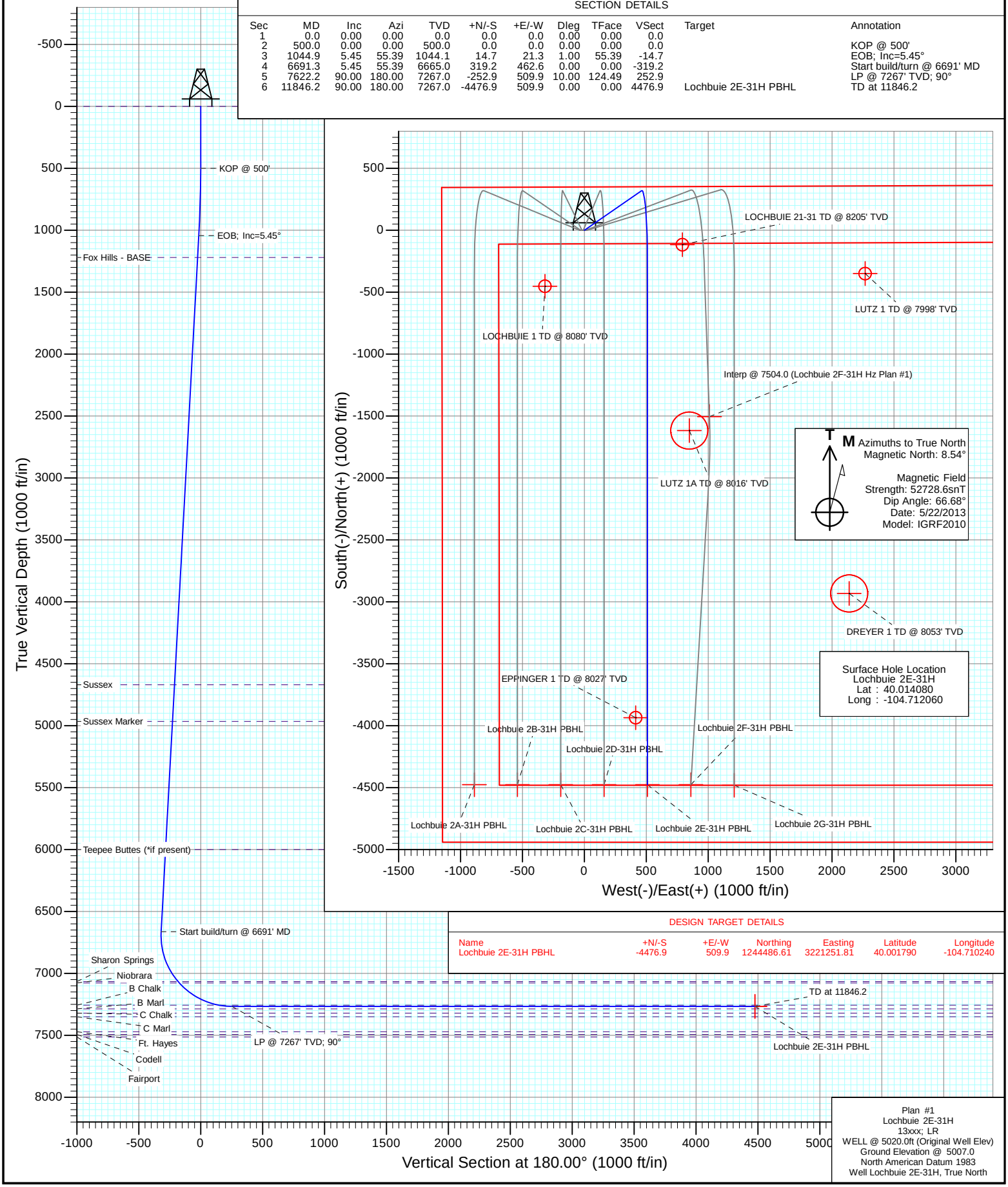
encana

Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2E-31H
Wellbore: Hz
Design: Plan #1

CATHEDRAL

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0		KOP @ 500'
3	1044.9	5.45	55.39	1044.1	14.7	21.3	1.00	55.39	-14.7		EOB; Inc=5.45°
4	6691.3	5.45	55.39	6665.0	319.2	462.6	0.00	0.00	-319.2		Start build/turn @ 6691' MD
5	7622.2	90.00	180.00	7267.0	-252.9	509.9	10.00	124.49	252.9		LP @ 7267' TVD; 90°
6	11846.2	90.00	180.00	7267.0	-4476.9	509.9	0.00	0.00	4476.9	Lochbuie 2E-31H PBHL	TD at 11846.2



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lochbuie 2E-31H PBHL	-4476.9	509.9	1244486.61	3221251.81	40.001790	-104.710240

Plan #1
Lochbuie 2E-31H
13xxx; LR
WELL @ 5020.0ft (Original Well Elev)
Ground Elevation @ 5007.0
North American Datum 1983
Well Lochbuie 2E-31H, True North

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie)

Site Position:		**Northing:**	1,248,958.49 ft	**Latitude:**	40.014080
From:	Lat/Long	**Easting:**	3,220,662.97 ft	**Longitude:**	-104.712200
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.51 °

Well Lochbuie 2E-31H

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,248,958.80 ft	**Latitude:**	40.014080
	+E/-W	0.0 ft	**Easting:**	3,220,702.18 ft	**Longitude:**	-104.712060
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	5,007.0 ft

Wellbore Hz

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/22/2013	8.54	66.68	52,729

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	180.00

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,044.9	5.45	55.39	1,044.1	14.7	21.3	1.00	1.00	0.00	55.39	
6,691.3	5.45	55.39	6,665.0	319.2	462.6	0.00	0.00	0.00	0.00	
7,622.2	90.00	180.00	7,267.0	-252.9	509.9	10.00	9.08	13.39	124.49	
11,846.2	90.00	180.00	7,267.0	-4,476.9	509.9	0.00	0.00	0.00	0.00	Lochbuie 2E-31H PBH

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2E-31H	**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	Shannon
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	KOP @ 500'
600.0	1.00	55.39	600.0	0.5	0.7	-0.5	1.00	1.00	
700.0	2.00	55.39	700.0	2.0	2.9	-2.0	1.00	1.00	
800.0	3.00	55.39	799.9	4.5	6.5	-4.5	1.00	1.00	
900.0	4.00	55.39	899.7	7.9	11.5	-7.9	1.00	1.00	
1,000.0	5.00	55.39	999.4	12.4	17.9	-12.4	1.00	1.00	
1,044.9	5.45	55.39	1,044.1	14.7	21.3	-14.7	1.00	1.00	EOB; Inc=5.45°
1,100.0	5.45	55.39	1,098.9	17.7	25.6	-17.7	0.00	0.00	
1,200.0	5.45	55.39	1,198.5	23.1	33.4	-23.1	0.00	0.00	
1,221.6	5.45	55.39	1,220.0	24.2	35.1	-24.2	0.00	0.00	Fox Hills - BASE
1,300.0	5.45	55.39	1,298.0	28.5	41.2	-28.5	0.00	0.00	
1,400.0	5.45	55.39	1,397.6	33.9	49.1	-33.9	0.00	0.00	
1,500.0	5.45	55.39	1,497.1	39.2	56.9	-39.2	0.00	0.00	
1,600.0	5.45	55.39	1,596.7	44.6	64.7	-44.6	0.00	0.00	
1,700.0	5.45	55.39	1,696.2	50.0	72.5	-50.0	0.00	0.00	
1,800.0	5.45	55.39	1,795.8	55.4	80.3	-55.4	0.00	0.00	
1,900.0	5.45	55.39	1,895.3	60.8	88.1	-60.8	0.00	0.00	
2,000.0	5.45	55.39	1,994.9	66.2	96.0	-66.2	0.00	0.00	
2,100.0	5.45	55.39	2,094.4	71.6	103.8	-71.6	0.00	0.00	
2,200.0	5.45	55.39	2,194.0	77.0	111.6	-77.0	0.00	0.00	
2,300.0	5.45	55.39	2,293.5	82.4	119.4	-82.4	0.00	0.00	
2,400.0	5.45	55.39	2,393.1	87.8	127.2	-87.8	0.00	0.00	
2,500.0	5.45	55.39	2,492.6	93.2	135.0	-93.2	0.00	0.00	
2,600.0	5.45	55.39	2,592.2	98.6	142.8	-98.6	0.00	0.00	
2,700.0	5.45	55.39	2,691.7	104.0	150.7	-104.0	0.00	0.00	
2,800.0	5.45	55.39	2,791.2	109.4	158.5	-109.4	0.00	0.00	
2,900.0	5.45	55.39	2,890.8	114.8	166.3	-114.8	0.00	0.00	
3,000.0	5.45	55.39	2,990.3	120.1	174.1	-120.1	0.00	0.00	
3,100.0	5.45	55.39	3,089.9	125.5	181.9	-125.5	0.00	0.00	
3,200.0	5.45	55.39	3,189.4	130.9	189.7	-130.9	0.00	0.00	
3,300.0	5.45	55.39	3,289.0	136.3	197.6	-136.3	0.00	0.00	
3,400.0	5.45	55.39	3,388.5	141.7	205.4	-141.7	0.00	0.00	
3,500.0	5.45	55.39	3,488.1	147.1	213.2	-147.1	0.00	0.00	
3,600.0	5.45	55.39	3,587.6	152.5	221.0	-152.5	0.00	0.00	
3,700.0	5.45	55.39	3,687.2	157.9	228.8	-157.9	0.00	0.00	
3,800.0	5.45	55.39	3,786.7	163.3	236.6	-163.3	0.00	0.00	
3,900.0	5.45	55.39	3,886.3	168.7	244.4	-168.7	0.00	0.00	
4,000.0	5.45	55.39	3,985.8	174.1	252.3	-174.1	0.00	0.00	
4,100.0	5.45	55.39	4,085.4	179.5	260.1	-179.5	0.00	0.00	
4,200.0	5.45	55.39	4,184.9	184.9	267.9	-184.9	0.00	0.00	
4,300.0	5.45	55.39	4,284.5	190.3	275.7	-190.3	0.00	0.00	
4,400.0	5.45	55.39	4,384.0	195.7	283.5	-195.7	0.00	0.00	
4,500.0	5.45	55.39	4,483.6	201.0	291.3	-201.0	0.00	0.00	
4,600.0	5.45	55.39	4,583.1	206.4	299.2	-206.4	0.00	0.00	
4,687.3	5.45	55.39	4,670.0	211.1	306.0	-211.1	0.00	0.00	Sussex
4,700.0	5.45	55.39	4,682.7	211.8	307.0	-211.8	0.00	0.00	
4,800.0	5.45	55.39	4,782.2	217.2	314.8	-217.2	0.00	0.00	

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Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2E-31H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,900.0	5.45	55.39	4,881.8	222.6	322.6	-222.6	0.00	0.00	
4,984.6	5.45	55.39	4,966.0	227.2	329.2	-227.2	0.00	0.00	Sussex Marker
5,000.0	5.45	55.39	4,981.3	228.0	330.4	-228.0	0.00	0.00	
5,100.0	5.45	55.39	5,080.9	233.4	338.2	-233.4	0.00	0.00	
5,200.0	5.45	55.39	5,180.4	238.8	346.0	-238.8	0.00	0.00	
5,300.0	5.45	55.39	5,280.0	244.2	353.9	-244.2	0.00	0.00	
5,400.0	5.45	55.39	5,379.5	249.6	361.7	-249.6	0.00	0.00	
5,500.0	5.45	55.39	5,479.0	255.0	369.5	-255.0	0.00	0.00	
5,600.0	5.45	55.39	5,578.6	260.4	377.3	-260.4	0.00	0.00	
5,700.0	5.45	55.39	5,678.1	265.8	385.1	-265.8	0.00	0.00	
5,800.0	5.45	55.39	5,777.7	271.2	392.9	-271.2	0.00	0.00	
5,900.0	5.45	55.39	5,877.2	276.6	400.8	-276.6	0.00	0.00	
6,000.0	5.45	55.39	5,976.8	281.9	408.6	-281.9	0.00	0.00	
6,023.3	5.45	55.39	6,000.0	283.2	410.4	-283.2	0.00	0.00	Teepee Buttes (*if present)
6,100.0	5.45	55.39	6,076.3	287.3	416.4	-287.3	0.00	0.00	
6,200.0	5.45	55.39	6,175.9	292.7	424.2	-292.7	0.00	0.00	
6,300.0	5.45	55.39	6,275.4	298.1	432.0	-298.1	0.00	0.00	
6,400.0	5.45	55.39	6,375.0	303.5	439.8	-303.5	0.00	0.00	
6,500.0	5.45	55.39	6,474.5	308.9	447.7	-308.9	0.00	0.00	
6,600.0	5.45	55.39	6,574.1	314.3	455.5	-314.3	0.00	0.00	
6,691.3	5.45	55.39	6,665.0	319.2	462.6	-319.2	0.00	0.00	Start build/turn @ 6691' MD
6,700.0	5.01	63.61	6,673.6	319.6	463.3	-319.6	10.00	-5.07	
6,800.0	8.97	150.18	6,773.1	314.8	471.1	-314.8	10.00	3.96	
6,900.0	18.32	166.28	6,870.2	292.7	478.7	-292.7	10.00	9.34	
7,000.0	28.11	171.55	6,962.0	254.0	485.9	-254.0	10.00	9.79	
7,100.0	38.00	174.23	7,045.7	200.0	492.5	-200.0	10.00	9.89	
7,126.2	40.61	174.75	7,066.0	183.4	494.1	-183.4	10.00	9.92	Sharon Springs
7,142.2	42.19	175.03	7,078.0	172.9	495.0	-172.9	10.00	9.93	Niobrara
7,200.0	47.93	175.94	7,118.8	132.2	498.2	-132.2	10.00	9.94	
7,300.0	57.89	177.18	7,179.0	52.6	503.0	-52.6	10.00	9.95	
7,400.0	67.85	178.17	7,224.6	-36.2	506.5	36.2	10.00	9.96	
7,500.0	77.81	179.03	7,254.0	-131.6	508.9	131.6	10.00	9.97	
7,514.9	79.30	179.15	7,257.0	-146.2	509.1	146.2	10.00	9.97	B Chalk
7,600.0	87.78	179.83	7,266.6	-230.7	509.8	230.7	10.00	9.97	
7,622.2	90.00	180.00	7,267.0	-252.9	509.9	252.9	10.00	9.97	LP @ 7267' TVD; 90°
7,700.0	90.00	180.00	7,267.0	-330.7	509.9	330.7	0.00	0.00	
7,800.0	90.00	180.00	7,267.0	-430.7	509.9	430.7	0.00	0.00	
7,900.0	90.00	180.00	7,267.0	-530.7	509.9	530.7	0.00	0.00	
8,000.0	90.00	180.00	7,267.0	-630.7	509.9	630.7	0.00	0.00	
8,100.0	90.00	180.00	7,267.0	-730.7	509.9	730.7	0.00	0.00	
8,200.0	90.00	180.00	7,267.0	-830.7	509.9	830.7	0.00	0.00	
8,300.0	90.00	180.00	7,267.0	-930.7	509.9	930.7	0.00	0.00	
8,400.0	90.00	180.00	7,267.0	-1,030.7	509.9	1,030.7	0.00	0.00	
8,500.0	90.00	180.00	7,267.0	-1,130.7	509.9	1,130.7	0.00	0.00	
8,600.0	90.00	180.00	7,267.0	-1,230.7	509.9	1,230.7	0.00	0.00	
8,700.0	90.00	180.00	7,267.0	-1,330.7	509.9	1,330.7	0.00	0.00	
8,800.0	90.00	180.00	7,267.0	-1,430.7	509.9	1,430.7	0.00	0.00	
8,900.0	90.00	180.00	7,267.0	-1,530.7	509.9	1,530.7	0.00	0.00	
9,000.0	90.00	180.00	7,267.0	-1,630.7	509.9	1,630.7	0.00	0.00	
9,100.0	90.00	180.00	7,267.0	-1,730.7	509.9	1,730.7	0.00	0.00	
9,200.0	90.00	180.00	7,267.0	-1,830.7	509.9	1,830.7	0.00	0.00	
9,300.0	90.00	180.00	7,267.0	-1,930.7	509.9	1,930.7	0.00	0.00	

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Well:	Lochbuie 2E-31H	**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
9,400.0	90.00	180.00	7,267.0	-2,030.7	509.9	2,030.7	0.00	0.00	
9,500.0	90.00	180.00	7,267.0	-2,130.7	509.9	2,130.7	0.00	0.00	
9,600.0	90.00	180.00	7,267.0	-2,230.7	509.9	2,230.7	0.00	0.00	
9,700.0	90.00	180.00	7,267.0	-2,330.7	509.9	2,330.7	0.00	0.00	
9,800.0	90.00	180.00	7,267.0	-2,430.7	509.9	2,430.7	0.00	0.00	
9,900.0	90.00	180.00	7,267.0	-2,530.7	509.9	2,530.7	0.00	0.00	
10,000.0	90.00	180.00	7,267.0	-2,630.7	509.9	2,630.7	0.00	0.00	
10,100.0	90.00	180.00	7,267.0	-2,730.7	509.9	2,730.7	0.00	0.00	
10,200.0	90.00	180.00	7,267.0	-2,830.7	509.9	2,830.7	0.00	0.00	
10,300.0	90.00	180.00	7,267.0	-2,930.7	509.9	2,930.7	0.00	0.00	
10,400.0	90.00	180.00	7,267.0	-3,030.7	509.9	3,030.7	0.00	0.00	
10,500.0	90.00	180.00	7,267.0	-3,130.7	509.9	3,130.7	0.00	0.00	
10,600.0	90.00	180.00	7,267.0	-3,230.7	509.9	3,230.7	0.00	0.00	
10,700.0	90.00	180.00	7,267.0	-3,330.7	509.9	3,330.7	0.00	0.00	
10,800.0	90.00	180.00	7,267.0	-3,430.7	509.9	3,430.7	0.00	0.00	
10,900.0	90.00	180.00	7,267.0	-3,530.7	509.9	3,530.7	0.00	0.00	
11,000.0	90.00	180.00	7,267.0	-3,630.7	509.9	3,630.7	0.00	0.00	
11,100.0	90.00	180.00	7,267.0	-3,730.7	509.9	3,730.7	0.00	0.00	
11,200.0	90.00	180.00	7,267.0	-3,830.7	509.9	3,830.7	0.00	0.00	
11,300.0	90.00	180.00	7,267.0	-3,930.7	509.9	3,930.7	0.00	0.00	
11,400.0	90.00	180.00	7,267.0	-4,030.7	509.9	4,030.7	0.00	0.00	
11,500.0	90.00	180.00	7,267.0	-4,130.7	509.9	4,130.7	0.00	0.00	
11,600.0	90.00	180.00	7,267.0	-4,230.7	509.9	4,230.7	0.00	0.00	
11,700.0	90.00	180.00	7,267.0	-4,330.7	509.9	4,330.7	0.00	0.00	
11,800.0	90.00	180.00	7,267.0	-4,430.7	509.9	4,430.7	0.00	0.00	
11,846.2	90.00	180.00	7,267.0	-4,476.9	509.9	4,476.9	0.00	0.00	TD at 11846.2 - Lochbuie 2E-31H 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
Lochbuie 2E-31H PBHL - plan hits target center - Point	0.00	0.00	7,267.0	-4,476.9	509.9	1,244,486.61	3,221,251.81	40.001790	-104.710240

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
0.0	0.0	Shannon			
1,221.6	1,220.0	Fox Hills - BASE			
4,687.3	4,670.0	Sussex			
4,984.6	4,966.0	Sussex Marker			
6,023.3	6,000.0	Teepee Buttes (*if present)			
7,126.2	7,066.0	Sharon Springs			
7,142.2	7,078.0	Niobrara			
7,514.9	7,257.0	B Chalk			

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2E-31H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
500.0	500.0	0.0	0.0	KOP @ 500'
1,044.9	1,044.1	14.7	21.3	EOB; Inc=5.45°
6,691.3	6,665.0	319.2	462.6	Start build/turn @ 6691' MD
7,622.2	7,267.0	-252.9	509.9	LP @ 7267' TVD; 90°
11,846.2	7,267.0	-4,476.9	509.9	TD at 11846.2

EnCana Oil & Gas (USA) Inc

DJ Wattenberg
S31-T1N-R65W (Lochbuie)
Lochbuie 2E-31H
Hz
Plan #1

Anticollision Report

22 May, 2013

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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** 5/22/2013

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,846.2	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
S31-T1N-R65W (Lochbuie)						
DREYER 1 (EXISTING) - VESSELS WELL - NO SURVE						Out of range
EPPINGER 1 (EXISTING) - ENCANA WELL - NO SURV	11,304.6	7,258.0	95.5	11.0	1.131	Level 2, CC, ES, SF
LOCHBUIE 1 (EXISTING) - ENCANA WELL - NO SURV						Out of range
LOCHBUIE 21-31 (EXISTING) - ENCANA WELL - NO SU	7,489.9	7,226.8	282.6	256.7	10.899	CC, ES
LOCHBUIE 21-31 (EXISTING) - ENCANA WELL - NO SU	7,500.0	7,229.0	282.8	256.9	10.888	SF
Lochbuie 2A-31H - Hz - Plan #1	166.3	167.3	39.2	38.7	73.028	CC
Lochbuie 2A-31H - Hz - Plan #1	200.0	201.0	39.2	38.6	59.914	ES
Lochbuie 2A-31H - Hz - Plan #1	600.0	597.8	53.0	51.0	25.879	SF
Lochbuie 2B-31H - Hz - Plan #1	300.0	300.0	30.8	29.8	30.755	CC, ES
Lochbuie 2B-31H - Hz - Plan #1	600.0	598.4	38.2	36.1	18.625	SF
Lochbuie 2C-31H - Hz - Plan #1	400.0	400.0	19.6	18.3	14.514	CC, ES
Lochbuie 2C-31H - Hz - Plan #1	600.0	599.6	22.0	20.0	10.731	SF
Lochbuie 2D-31H - Hz - Plan #1	500.0	500.0	8.4	6.7	4.943	CC, ES
Lochbuie 2D-31H - Hz - Plan #1	11,846.2	12,078.6	422.8	286.6	3.104	SF
Lochbuie 2F-31H - Hz - Plan #1	500.0	500.0	11.2	9.5	6.591	CC
Lochbuie 2F-31H - Hz - Plan #1	700.0	699.6	11.6	9.2	4.840	ES
Lochbuie 2F-31H - Hz - Plan #1	11,846.2	12,141.6	422.8	286.7	3.107	SF
Lochbuie 2G-31H - Hz - Plan #1	200.0	200.0	19.6	19.0	30.037	CC, ES
Lochbuie 2G-31H - Hz - Plan #1	700.0	697.4	37.8	35.4	15.755	SF
LUTZ 1 (EXISTING) - ENCANA WELL - NO SURVEYS						Out of range
LUTZ 1A (EXISTING) - VESSELS WELL - NO SURVEYS	8,987.1	7,239.0	337.2	291.9	7.448	CC, ES
LUTZ 1A (EXISTING) - VESSELS WELL - NO SURVEYS	9,000.0	7,239.0	337.4	292.0	7.420	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - EPPINGER 1 (EXISTING) - ENCANA WELL - NO SURVEYS

Offset Site Error: 0.0 ft

Survey Program: 8027-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
10,900.0	7,267.0	7,258.0	7,258.0	65.5	12.7	90.00	-3,935.2	414.3	415.7	338.2	77.53	5.362	
11,000.0	7,267.0	7,258.0	7,258.0	67.2	12.7	90.00	-3,935.2	414.3	319.2	240.0	79.26	4.028	
11,100.0	7,267.0	7,258.0	7,258.0	68.9	12.7	90.00	-3,935.2	414.3	225.8	144.8	80.98	2.788	
11,200.0	7,267.0	7,258.0	7,258.0	70.6	12.7	90.00	-3,935.2	414.3	141.6	58.9	82.70	1.713	
11,300.0	7,267.0	7,258.0	7,258.0	72.3	12.7	90.00	-3,935.2	414.3	95.6	11.2	84.43	1.133	Level 2
11,304.6	7,267.0	7,258.0	7,258.0	72.4	12.7	90.00	-3,935.2	414.3	95.5	11.0	84.51	1.131	Level 2, CC, ES, SF
11,400.0	7,267.0	7,258.0	7,258.0	74.0	12.7	90.00	-3,935.2	414.3	135.0	48.9	86.15	1.567	
11,500.0	7,267.0	7,258.0	7,258.0	75.7	12.7	90.00	-3,935.2	414.3	217.5	129.6	87.88	2.475	
11,600.0	7,267.0	7,258.0	7,258.0	77.5	12.7	90.00	-3,935.2	414.3	310.5	220.9	89.61	3.465	
11,700.0	7,267.0	7,258.0	7,258.0	79.2	12.7	90.00	-3,935.2	414.3	406.8	315.5	91.34	4.454	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - LOCHBUIE 21-31 (EXISTING) - ENCANA WELL - NO SURVEYS

Offset Site Error: 0.0 ft

Survey Program: 8205-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
7,000.0	6,962.0	6,937.0	6,937.0	15.5	12.1	-34.30	-116.5	791.3	480.2	454.4	25.77	18.632	
7,100.0	7,045.7	7,020.7	7,020.7	15.5	12.3	-44.32	-116.5	791.3	435.3	410.3	24.91	17.475	
7,200.0	7,118.8	7,093.8	7,093.8	15.4	12.4	-56.75	-116.5	791.3	384.3	359.9	24.49	15.695	
7,300.0	7,179.0	7,154.0	7,154.0	15.5	12.5	-70.80	-116.5	791.3	334.3	309.5	24.81	13.474	
7,400.0	7,224.6	7,199.6	7,199.6	15.7	12.6	-83.18	-116.5	791.3	295.9	270.4	25.44	11.630	
7,489.9	7,251.8	7,226.8	7,226.8	16.0	12.6	-90.00	-116.5	791.3	282.6	256.7	25.93	10.899	CC, ES
7,500.0	7,254.0	7,229.0	7,229.0	16.1	12.6	-90.44	-116.5	791.3	282.8	256.9	25.98	10.888	SF
7,600.0	7,266.6	7,241.6	7,241.6	16.6	12.6	-90.89	-116.5	791.3	303.7	277.1	26.59	11.422	
7,700.0	7,267.0	7,242.0	7,242.0	17.3	12.6	-90.00	-116.5	791.3	353.6	326.2	27.40	12.907	
7,800.0	7,267.0	7,242.0	7,242.0	18.1	12.6	-90.00	-116.5	791.3	421.7	393.4	28.36	14.872	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2A-31H - 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	1.0	1.0	0.0	0.0	-89.95	0.0	-39.2	39.2				
100.0	100.0	101.0	101.0	0.2	0.2	-89.95	0.0	-39.2	39.2	38.9	0.31	128.387	
166.3	166.3	167.3	167.3	0.3	0.3	-89.95	0.0	-39.2	39.2	38.7	0.54	73.028	CC
200.0	200.0	201.0	201.0	0.3	0.3	-89.95	0.0	-39.2	39.2	38.6	0.65	59.914	ES
300.0	300.0	300.4	300.3	0.5	0.5	-89.47	0.4	-40.0	40.0	39.0	1.00	39.900	
400.0	400.0	399.7	399.6	0.7	0.7	-88.16	1.4	-42.4	42.5	41.1	1.36	31.321	
500.0	500.0	498.8	498.7	0.8	0.9	-86.29	3.0	-46.4	46.6	44.9	1.72	27.142	
600.0	600.0	597.8	597.5	1.0	1.1	-140.13	5.3	-52.0	53.0	51.0	2.05	25.879	SF
700.0	700.0	696.4	695.8	1.2	1.3	-139.50	8.2	-59.1	62.5	60.1	2.40	26.043	
800.0	799.9	794.5	793.4	1.4	1.5	-139.51	11.8	-67.7	74.9	72.1	2.75	27.215	
900.0	899.7	892.0	890.3	1.6	1.7	-139.88	16.0	-77.8	90.2	87.1	3.11	29.027	
1,000.0	999.4	988.8	986.3	1.8	2.0	-140.42	20.7	-89.3	108.5	105.0	3.47	31.257	
1,100.0	1,098.9	1,086.7	1,083.3	2.0	2.3	-141.15	25.8	-101.7	128.6	124.8	3.84	33.467	
1,200.0	1,198.5	1,184.6	1,180.3	2.2	2.6	-141.78	30.9	-114.0	148.9	144.6	4.22	35.285	
1,300.0	1,298.0	1,282.5	1,277.3	2.4	2.8	-142.25	36.0	-126.3	169.1	164.5	4.60	36.790	
1,400.0	1,397.6	1,380.5	1,374.3	2.7	3.1	-142.62	41.1	-138.7	189.4	184.4	4.98	38.055	
1,500.0	1,497.1	1,478.4	1,471.3	2.9	3.4	-142.92	46.2	-151.0	209.7	204.4	5.36	39.131	
1,600.0	1,596.7	1,576.3	1,568.3	3.1	3.7	-143.17	51.3	-163.3	230.0	224.3	5.74	40.057	
1,700.0	1,696.2	1,674.2	1,665.3	3.4	4.0	-143.38	56.4	-175.7	250.3	244.2	6.13	40.862	
1,800.0	1,795.8	1,772.1	1,762.3	3.6	4.3	-143.56	61.5	-188.0	270.6	264.1	6.51	41.568	
1,900.0	1,895.3	1,870.0	1,859.3	3.8	4.5	-143.71	66.6	-200.3	290.9	284.0	6.89	42.192	
2,000.0	1,994.9	1,968.0	1,956.3	4.1	4.8	-143.84	71.7	-212.7	311.2	303.9	7.28	42.747	
2,100.0	2,094.4	2,065.9	2,053.3	4.3	5.1	-143.95	76.8	-225.0	331.5	323.8	7.67	43.244	
2,200.0	2,194.0	2,163.8	2,150.3	4.5	5.4	-144.06	81.9	-237.3	351.8	343.8	8.05	43.692	
2,300.0	2,293.5	2,261.7	2,247.3	4.8	5.7	-144.15	87.0	-249.7	372.1	363.7	8.44	44.097	
2,400.0	2,393.1	2,359.6	2,344.3	5.0	6.0	-144.23	92.1	-262.0	392.4	383.6	8.83	44.466	
2,500.0	2,492.6	2,457.5	2,441.3	5.2	6.3	-144.30	97.2	-274.4	412.7	403.5	9.21	44.802	
2,600.0	2,592.2	2,555.4	2,538.3	5.5	6.6	-144.37	102.3	-286.7	433.0	423.4	9.60	45.110	
2,700.0	2,691.7	2,653.4	2,635.3	5.7	6.8	-144.43	107.4	-299.0	453.3	443.4	9.99	45.394	
2,800.0	2,791.2	2,751.3	2,732.3	6.0	7.1	-144.49	112.5	-311.4	473.7	463.3	10.37	45.656	
2,900.0	2,890.8	2,849.2	2,829.3	6.2	7.4	-144.54	117.6	-323.7	494.0	483.2	10.76	45.898	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2B-31H - 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	-89.95	0.0	-30.8	30.8				
100.0	100.0	100.0	100.0	0.2	0.2	-89.95	0.0	-30.8	30.8	30.5	0.30	101.455	
200.0	200.0	200.0	200.0	0.3	0.3	-89.95	0.0	-30.8	30.8	30.2	0.65	47.201	
300.0	300.0	300.0	300.0	0.5	0.5	-89.95	0.0	-30.8	30.8	29.8	1.00	30.755	CC, ES
400.0	400.0	399.5	399.5	0.7	0.7	-89.07	0.5	-31.5	31.5	30.2	1.35	23.343	
500.0	500.0	499.0	499.0	0.8	0.9	-86.63	2.0	-33.7	33.7	32.0	1.70	19.808	
600.0	600.0	598.4	598.2	1.0	1.0	-139.46	4.4	-37.2	38.2	36.1	2.05	18.625	SF
700.0	700.0	697.5	697.1	1.2	1.2	-137.91	7.8	-42.2	45.5	43.1	2.40	18.946	
800.0	799.9	796.2	795.5	1.4	1.4	-137.22	12.2	-48.5	55.7	52.9	2.76	20.185	
900.0	899.7	895.3	894.3	1.6	1.7	-137.32	17.1	-55.8	68.1	65.0	3.12	21.812	
1,000.0	999.4	994.3	992.9	1.8	1.9	-138.19	22.1	-63.0	81.8	78.3	3.49	23.427	
1,100.0	1,098.9	1,093.2	1,091.4	2.0	2.1	-139.41	27.0	-70.2	96.6	92.7	3.87	24.982	
1,200.0	1,198.5	1,192.1	1,189.9	2.2	2.3	-140.40	32.0	-77.4	111.6	107.3	4.25	26.278	
1,300.0	1,298.0	1,290.9	1,288.4	2.4	2.5	-141.15	36.9	-84.7	126.6	121.9	4.63	27.355	
1,400.0	1,397.6	1,389.8	1,386.8	2.7	2.8	-141.75	41.9	-91.9	141.6	136.6	5.01	28.263	
1,500.0	1,497.1	1,488.6	1,485.3	2.9	3.0	-142.23	46.8	-99.1	156.6	151.2	5.39	29.039	
1,600.0	1,596.7	1,587.5	1,583.8	3.1	3.2	-142.62	51.8	-106.3	171.7	165.9	5.78	29.708	
1,700.0	1,696.2	1,686.3	1,682.2	3.4	3.4	-142.95	56.7	-113.6	186.7	180.6	6.16	30.292	
1,800.0	1,795.8	1,785.2	1,780.7	3.6	3.7	-143.24	61.7	-120.8	201.8	195.2	6.55	30.805	
1,900.0	1,895.3	1,884.1	1,879.2	3.8	3.9	-143.48	66.7	-128.0	216.8	209.9	6.94	31.259	
2,000.0	1,994.9	1,982.9	1,977.6	4.1	4.1	-143.69	71.6	-135.2	231.9	224.6	7.32	31.665	
2,100.0	2,094.4	2,081.8	2,076.1	4.3	4.4	-143.88	76.6	-142.5	247.0	239.2	7.71	32.028	
2,200.0	2,194.0	2,180.6	2,174.6	4.5	4.6	-144.04	81.5	-149.7	262.0	253.9	8.10	32.356	
2,300.0	2,293.5	2,279.5	2,273.0	4.8	4.8	-144.19	86.5	-156.9	277.1	268.6	8.49	32.653	
2,400.0	2,393.1	2,378.3	2,371.5	5.0	5.0	-144.32	91.4	-164.1	292.2	283.3	8.87	32.924	
2,500.0	2,492.6	2,477.2	2,470.0	5.2	5.3	-144.44	96.4	-171.4	307.2	298.0	9.26	33.171	
2,600.0	2,592.2	2,576.1	2,568.4	5.5	5.5	-144.55	101.3	-178.6	322.3	312.7	9.65	33.398	
2,700.0	2,691.7	2,674.9	2,666.9	5.7	5.7	-144.65	106.3	-185.8	337.4	327.3	10.04	33.608	
2,800.0	2,791.2	2,773.8	2,765.4	6.0	6.0	-144.74	111.2	-193.0	352.5	342.0	10.43	33.801	
2,900.0	2,890.8	2,872.6	2,863.8	6.2	6.2	-144.82	116.2	-200.2	367.5	356.7	10.82	33.980	
3,000.0	2,990.3	2,971.5	2,962.3	6.4	6.4	-144.89	121.1	-207.5	382.6	371.4	11.21	34.146	
3,100.0	3,089.9	3,070.3	3,060.8	6.7	6.7	-144.96	126.1	-214.7	397.7	386.1	11.59	34.301	
3,200.0	3,189.4	3,169.2	3,159.2	6.9	6.9	-145.03	131.0	-221.9	412.8	400.8	11.98	34.446	
3,300.0	3,289.0	3,268.0	3,257.7	7.2	7.1	-145.09	136.0	-229.1	427.8	415.5	12.37	34.582	
3,400.0	3,388.5	3,366.9	3,356.2	7.4	7.3	-145.14	140.9	-236.4	442.9	430.2	12.76	34.709	
3,500.0	3,488.1	3,465.8	3,454.6	7.6	7.6	-145.20	145.9	-243.6	458.0	444.9	13.15	34.828	
3,600.0	3,587.6	3,564.6	3,553.1	7.9	7.8	-145.25	150.8	-250.8	473.1	459.5	13.54	34.941	
3,700.0	3,687.2	3,663.5	3,651.6	8.1	8.0	-145.29	155.8	-258.0	488.2	474.2	13.93	35.047	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2C-31H - 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	-89.95	0.0	-19.6	19.6				
100.0	100.0	100.0	100.0	0.2	0.2	-89.95	0.0	-19.6	19.6	19.3	0.30	64.562	
200.0	200.0	200.0	200.0	0.3	0.3	-89.95	0.0	-19.6	19.6	19.0	0.65	30.037	
300.0	300.0	300.0	300.0	0.5	0.5	-89.95	0.0	-19.6	19.6	18.6	1.00	19.571	
400.0	400.0	400.0	400.0	0.7	0.7	-89.95	0.0	-19.6	19.6	18.3	1.35	14.514	CC, ES
500.0	500.0	499.8	499.8	0.8	0.9	-87.71	0.8	-20.0	20.0	18.3	1.70	11.767	
600.0	600.0	599.6	599.6	1.0	1.0	-138.47	3.1	-21.1	22.0	20.0	2.05	10.731	SF
700.0	700.0	699.3	699.1	1.2	1.2	-134.28	7.0	-23.0	26.4	24.0	2.41	10.970	
800.0	799.9	798.9	798.6	1.4	1.4	-131.73	12.2	-25.5	32.9	30.2	2.77	11.894	
900.0	899.7	898.6	898.2	1.6	1.6	-131.78	17.4	-28.1	40.7	37.6	3.14	12.974	
1,000.0	999.4	998.2	997.6	1.8	1.8	-133.29	22.6	-30.6	49.6	46.1	3.51	14.134	
1,100.0	1,098.9	1,097.7	1,096.9	2.0	2.0	-135.38	27.8	-33.1	59.6	55.7	3.89	15.321	
1,200.0	1,198.5	1,197.2	1,196.2	2.2	2.2	-136.98	33.0	-35.7	69.8	65.6	4.28	16.328	
1,300.0	1,298.0	1,296.6	1,295.5	2.4	2.4	-138.18	38.2	-38.2	80.1	75.4	4.66	17.172	
1,400.0	1,397.6	1,396.1	1,394.8	2.7	2.6	-139.10	43.4	-40.7	90.3	85.3	5.05	17.887	
1,500.0	1,497.1	1,495.6	1,494.1	2.9	2.8	-139.84	48.6	-43.3	100.6	95.2	5.44	18.502	
1,600.0	1,596.7	1,595.0	1,593.4	3.1	3.0	-140.44	53.8	-45.8	110.9	105.1	5.83	19.034	
1,700.0	1,696.2	1,694.5	1,692.7	3.4	3.2	-140.94	59.0	-48.3	121.2	115.0	6.22	19.499	
1,800.0	1,795.8	1,793.9	1,792.0	3.6	3.4	-141.36	64.2	-50.9	131.5	124.9	6.61	19.910	
1,900.0	1,895.3	1,893.4	1,891.3	3.8	3.6	-141.71	69.4	-53.4	141.8	134.8	7.00	20.274	
2,000.0	1,994.9	1,992.9	1,990.6	4.1	3.8	-142.02	74.6	-55.9	152.2	144.8	7.39	20.600	
2,100.0	2,094.4	2,092.3	2,089.8	4.3	4.0	-142.29	79.8	-58.5	162.5	154.7	7.78	20.893	
2,200.0	2,194.0	2,191.8	2,189.1	4.5	4.2	-142.53	85.0	-61.0	172.8	164.7	8.17	21.157	
2,300.0	2,293.5	2,291.3	2,288.4	4.8	4.4	-142.74	90.2	-63.5	183.2	174.6	8.56	21.398	
2,400.0	2,393.1	2,390.7	2,387.7	5.0	4.6	-142.93	95.4	-66.1	193.5	184.5	8.95	21.617	
2,500.0	2,492.6	2,490.2	2,487.0	5.2	4.8	-143.10	100.6	-68.6	203.8	194.5	9.34	21.817	
2,600.0	2,592.2	2,589.6	2,586.3	5.5	5.0	-143.26	105.8	-71.1	214.2	204.4	9.73	22.002	
2,700.0	2,691.7	2,689.1	2,685.6	5.7	5.2	-143.39	111.0	-73.6	224.5	214.4	10.13	22.172	
2,800.0	2,791.2	2,788.6	2,784.9	6.0	5.4	-143.52	116.2	-76.2	234.8	224.3	10.52	22.329	
2,900.0	2,890.8	2,888.0	2,884.2	6.2	5.6	-143.64	121.4	-78.7	245.2	234.3	10.91	22.475	
3,000.0	2,990.3	2,987.5	2,983.5	6.4	5.8	-143.74	126.6	-81.2	255.5	244.2	11.30	22.610	
3,100.0	3,089.9	3,087.0	3,082.8	6.7	6.0	-143.84	131.8	-83.8	265.9	254.2	11.69	22.737	
3,200.0	3,189.4	3,186.4	3,182.1	6.9	6.2	-143.93	137.0	-86.3	276.2	264.1	12.09	22.855	
3,300.0	3,289.0	3,285.9	3,281.4	7.2	6.4	-144.02	142.2	-88.8	286.6	274.1	12.48	22.966	
3,400.0	3,388.5	3,385.3	3,380.7	7.4	6.6	-144.10	147.4	-91.4	296.9	284.0	12.87	23.070	
3,500.0	3,488.1	3,484.8	3,480.0	7.6	6.8	-144.17	152.5	-93.9	307.3	294.0	13.26	23.167	
3,600.0	3,587.6	3,584.3	3,579.3	7.9	7.0	-144.24	157.7	-96.4	317.6	303.9	13.65	23.259	
3,700.0	3,687.2	3,683.7	3,678.6	8.1	7.2	-144.30	162.9	-99.0	327.9	313.9	14.05	23.346	
3,800.0	3,786.7	3,783.2	3,777.9	8.4	7.4	-144.36	168.1	-101.5	338.3	323.9	14.44	23.428	
3,900.0	3,886.3	3,882.7	3,877.1	8.6	7.6	-144.42	173.3	-104.0	348.6	333.8	14.83	23.506	
4,000.0	3,985.8	3,982.1	3,976.4	8.8	7.8	-144.47	178.5	-106.6	359.0	343.8	15.22	23.580	
4,100.0	4,085.4	4,081.6	4,075.7	9.1	8.0	-144.52	183.7	-109.1	369.3	353.7	15.62	23.650	
4,200.0	4,184.9	4,181.0	4,175.0	9.3	8.2	-144.57	188.9	-111.6	379.7	363.7	16.01	23.716	
4,300.0	4,284.5	4,280.5	4,274.3	9.6	8.4	-144.62	194.1	-114.2	390.0	373.6	16.40	23.780	
4,400.0	4,384.0	4,380.0	4,373.6	9.8	8.6	-144.66	199.3	-116.7	400.4	383.6	16.79	23.840	
4,500.0	4,483.6	4,479.4	4,472.9	10.0	8.8	-144.70	204.5	-119.2	410.7	393.5	17.19	23.898	
4,600.0	4,583.1	4,578.9	4,572.2	10.3	9.0	-144.74	209.7	-121.8	421.1	403.5	17.58	23.953	
4,700.0	4,682.7	4,678.4	4,671.5	10.5	9.2	-144.78	214.9	-124.3	431.4	413.5	17.97	24.005	
4,800.0	4,782.2	4,777.8	4,770.8	10.8	9.4	-144.81	220.1	-126.8	441.8	423.4	18.36	24.056	
4,900.0	4,881.8	4,877.3	4,870.1	11.0	9.6	-144.84	225.3	-129.4	452.1	433.4	18.76	24.104	
5,000.0	4,981.3	4,976.8	4,969.4	11.2	9.8	-144.88	230.5	-131.9	462.5	443.3	19.15	24.150	
5,100.0	5,080.9	5,076.2	5,068.7	11.5	10.0	-144.91	235.7	-134.4	472.8	453.3	19.54	24.194	

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 Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2C-31H - 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	5,180.4	5,175.7	5,168.0	11.7	10.2	-144.94	240.9	-137.0	483.2	463.2	19.94	24.237	
5,300.0	5,280.0	5,275.1	5,267.3	12.0	10.4	-144.96	246.1	-139.5	493.5	473.2	20.33	24.278	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2D-31H - 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	-89.94	0.0	-8.4	8.4				
100.0	100.0	100.0	100.0	0.2	0.2	-89.94	0.0	-8.4	8.4	8.1	0.30	27.670	
200.0	200.0	200.0	200.0	0.3	0.3	-89.94	0.0	-8.4	8.4	7.8	0.65	12.873	
300.0	300.0	300.0	300.0	0.5	0.5	-89.94	0.0	-8.4	8.4	7.4	1.00	8.388	
400.0	400.0	400.0	400.0	0.7	0.7	-89.94	0.0	-8.4	8.4	7.1	1.35	6.220	
500.0	500.0	500.0	500.0	0.8	0.8	-89.94	0.0	-8.4	8.4	6.7	1.70	4.943	CC, ES
600.0	600.0	600.0	600.0	1.0	1.0	-148.45	0.0	-8.4	9.1	7.1	2.05	4.458	
700.0	700.0	700.0	700.0	1.2	1.2	-155.31	0.0	-8.4	11.4	9.0	2.40	4.774	
800.0	799.9	799.9	799.9	1.4	1.4	-162.04	0.0	-8.4	15.5	12.8	2.75	5.651	
900.0	899.7	899.7	899.7	1.6	1.5	-167.07	0.0	-8.4	21.4	18.3	3.09	6.921	
1,000.0	999.4	999.4	999.4	1.8	1.7	-170.51	0.0	-8.4	29.1	25.7	3.44	8.464	
1,100.0	1,098.9	1,098.9	1,098.9	2.0	1.9	-172.81	0.0	-8.4	38.3	34.5	3.79	10.126	
1,200.0	1,198.5	1,198.5	1,198.5	2.2	2.1	-174.23	0.0	-8.4	47.8	43.6	4.13	11.556	
1,300.0	1,298.0	1,298.0	1,298.0	2.4	2.2	-175.19	0.0	-8.4	57.2	52.7	4.48	12.769	
1,400.0	1,397.6	1,397.6	1,397.6	2.7	2.4	-175.87	0.0	-8.4	66.7	61.9	4.83	13.809	
1,500.0	1,497.1	1,497.1	1,497.1	2.9	2.6	-176.39	0.0	-8.4	76.2	71.0	5.18	14.711	
1,600.0	1,596.7	1,596.7	1,596.7	3.1	2.8	-176.79	0.0	-8.4	85.6	80.1	5.53	15.500	
1,700.0	1,696.2	1,696.2	1,696.2	3.4	2.9	-177.11	0.0	-8.4	95.1	89.3	5.87	16.196	
1,800.0	1,795.8	1,795.8	1,795.8	3.6	3.1	-177.37	0.0	-8.4	104.6	98.4	6.22	16.815	
1,900.0	1,895.3	1,895.3	1,895.3	3.8	3.3	-177.59	0.0	-8.4	114.1	107.5	6.57	17.368	
2,000.0	1,994.9	1,994.9	1,994.9	4.1	3.5	-177.77	0.0	-8.4	123.6	116.7	6.92	17.866	
2,100.0	2,094.4	2,094.4	2,094.4	4.3	3.6	-177.93	0.0	-8.4	133.1	125.8	7.27	18.317	
2,200.0	2,194.0	2,194.0	2,194.0	4.5	3.8	-178.07	0.0	-8.4	142.6	135.0	7.61	18.726	
2,300.0	2,293.5	2,293.5	2,293.5	4.8	4.0	-178.19	0.0	-8.4	152.1	144.1	7.96	19.100	
2,400.0	2,393.1	2,393.1	2,393.1	5.0	4.2	-178.30	0.0	-8.4	161.5	153.2	8.31	19.442	
2,500.0	2,492.6	2,492.6	2,492.6	5.2	4.3	-178.39	0.0	-8.4	171.0	162.4	8.66	19.757	
2,600.0	2,592.2	2,592.2	2,592.2	5.5	4.5	-178.48	0.0	-8.4	180.5	171.5	9.01	20.048	
2,700.0	2,691.7	2,691.7	2,691.7	5.7	4.7	-178.55	0.0	-8.4	190.0	180.7	9.35	20.317	
2,800.0	2,791.2	2,791.2	2,791.2	6.0	4.8	-178.62	0.0	-8.4	199.5	189.8	9.70	20.567	
2,900.0	2,890.8	2,890.8	2,890.8	6.2	5.0	-178.68	0.0	-8.4	209.0	199.0	10.05	20.799	
3,000.0	2,990.3	2,990.3	2,990.3	6.4	5.2	-178.74	0.0	-8.4	218.5	208.1	10.40	21.016	
3,100.0	3,089.9	3,089.9	3,089.9	6.7	5.4	-178.79	0.0	-8.4	228.0	217.3	10.74	21.219	
3,200.0	3,189.4	3,189.4	3,189.4	6.9	5.5	-178.84	0.0	-8.4	237.5	226.4	11.09	21.409	
3,300.0	3,289.0	3,289.0	3,289.0	7.2	5.7	-178.89	0.0	-8.4	247.0	235.5	11.44	21.588	
3,400.0	3,388.5	3,388.5	3,388.5	7.4	5.9	-178.93	0.0	-8.4	256.5	244.7	11.79	21.756	
3,500.0	3,488.1	3,488.1	3,488.1	7.6	6.1	-178.97	0.0	-8.4	266.0	253.8	12.14	21.915	
3,600.0	3,587.6	3,587.6	3,587.6	7.9	6.2	-179.00	0.0	-8.4	275.5	263.0	12.48	22.065	
3,700.0	3,687.2	3,687.2	3,687.2	8.1	6.4	-179.03	0.0	-8.4	285.0	272.1	12.83	22.206	
3,800.0	3,786.7	3,786.7	3,786.7	8.4	6.6	-179.07	0.0	-8.4	294.5	281.3	13.18	22.340	
3,900.0	3,886.3	3,886.3	3,886.3	8.6	6.8	-179.09	0.0	-8.4	304.0	290.4	13.53	22.467	
4,000.0	3,985.8	3,985.8	3,985.8	8.8	6.9	-179.12	0.0	-8.4	313.4	299.6	13.88	22.588	
4,100.0	4,085.4	4,089.6	4,089.6	9.1	7.1	-179.08	0.7	-8.1	322.4	308.2	14.23	22.652	
4,200.0	4,184.9	4,194.3	4,194.2	9.3	7.3	-178.86	3.0	-7.1	329.8	315.2	14.59	22.607	
4,300.0	4,284.5	4,299.1	4,299.0	9.6	7.5	-178.47	7.2	-5.4	335.7	320.8	14.95	22.460	
4,400.0	4,384.0	4,404.1	4,403.8	9.8	7.7	-177.90	13.1	-2.9	340.2	324.9	15.31	22.221	
4,500.0	4,483.6	4,509.1	4,508.4	10.0	7.9	-177.17	20.8	0.4	343.1	327.5	15.67	21.894	
4,600.0	4,583.1	4,614.1	4,612.9	10.3	8.1	-176.27	30.3	4.4	344.7	328.6	16.04	21.487	
4,700.0	4,682.7	4,719.0	4,717.1	10.5	8.3	-175.18	41.5	9.1	344.8	328.4	16.42	21.006	
4,800.0	4,782.2	4,822.1	4,819.3	10.8	8.5	-173.93	54.2	14.5	343.7	326.9	16.80	20.466	
4,900.0	4,881.8	4,921.8	4,918.1	11.0	8.7	-172.66	66.8	19.8	342.4	325.3	17.18	19.939	
5,000.0	4,981.3	5,021.5	5,016.8	11.2	8.9	-171.39	79.5	25.2	341.3	323.8	17.56	19.436	
5,100.0	5,080.9	5,121.3	5,115.6	11.5	9.1	-170.10	92.1	30.5	340.4	322.4	17.96	18.956	

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 Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2D-31H - 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	5,180.4	5,221.0	5,214.3	11.7	9.3	-168.82	104.8	35.8	339.6	321.3	18.36	18.498	
5,300.0	5,280.0	5,320.7	5,313.1	12.0	9.6	-167.52	117.4	41.2	339.0	320.3	18.77	18.060	
5,400.0	5,379.5	5,420.4	5,411.9	12.2	9.8	-166.23	130.1	46.5	338.6	319.4	19.19	17.643	
5,500.0	5,479.0	5,520.1	5,510.6	12.4	10.0	-164.93	142.7	51.9	338.4	318.7	19.62	17.245	
5,590.4	5,569.0	5,610.2	5,599.8	12.7	10.2	-163.75	154.1	56.7	338.3	318.3	20.02	16.901	
5,600.0	5,578.6	5,619.8	5,609.4	12.7	10.3	-163.62	155.4	57.2	338.3	318.2	20.06	16.865	
5,700.0	5,678.1	5,719.5	5,708.1	12.9	10.5	-162.32	168.0	62.5	338.4	317.9	20.51	16.502	
5,800.0	5,777.7	5,819.2	5,806.9	13.2	10.7	-161.02	180.6	67.9	338.7	317.7	20.96	16.156	
5,900.0	5,877.2	5,918.9	5,905.6	13.4	11.0	-159.73	193.3	73.2	339.1	317.7	21.43	15.827	
6,000.0	5,976.8	6,018.6	6,004.4	13.6	11.2	-158.44	205.9	78.6	339.8	317.9	21.90	15.513	
6,100.0	6,076.3	6,118.3	6,103.1	13.9	11.5	-157.15	218.6	83.9	340.6	318.2	22.38	15.214	
6,200.0	6,175.9	6,218.0	6,201.9	14.1	11.7	-155.87	231.2	89.3	341.5	318.7	22.88	14.930	
6,300.0	6,275.4	6,317.7	6,300.6	14.4	12.0	-154.60	243.9	94.6	342.7	319.3	23.38	14.659	
6,400.0	6,375.0	6,417.4	6,399.4	14.6	12.2	-153.33	256.5	99.9	344.0	320.1	23.88	14.403	
6,500.0	6,474.5	6,517.1	6,498.1	14.8	12.5	-152.08	269.2	105.3	345.5	321.1	24.40	14.159	
6,600.0	6,574.1	6,616.8	6,596.9	15.1	12.8	-150.84	281.8	110.6	347.1	322.2	24.92	13.928	
6,700.0	6,673.6	6,716.5	6,695.6	15.3	13.0	-157.79	294.5	116.0	348.9	323.5	25.45	13.710	
6,800.0	6,773.1	6,814.8	6,793.0	15.5	13.3	118.69	306.9	121.2	350.5	324.5	26.00	13.483	
6,900.0	6,870.2	6,909.9	6,887.2	15.5	13.5	107.85	318.3	126.3	353.7	327.2	26.53	13.334	
7,000.0	6,962.0	7,010.2	6,987.3	15.5	13.6	108.35	317.4	131.7	360.7	333.9	26.74	13.489	
7,100.0	7,045.7	7,118.6	7,093.4	15.5	13.7	111.22	296.7	137.5	371.0	344.5	26.51	13.995	
7,200.0	7,118.8	7,236.8	7,202.4	15.4	13.6	114.71	252.0	143.4	383.8	357.9	25.89	14.822	
7,300.0	7,179.0	7,366.1	7,308.3	15.5	13.4	118.13	178.5	149.1	397.2	372.2	25.06	15.851	
7,400.0	7,224.6	7,507.3	7,402.1	15.7	13.4	121.06	73.5	154.2	409.5	385.1	24.39	16.788	
7,500.0	7,254.0	7,659.4	7,471.1	16.1	13.7	123.13	-61.5	157.9	418.6	394.2	24.40	17.157	
7,600.0	7,266.6	7,818.7	7,502.9	16.6	14.6	124.06	-217.0	159.6	422.7	397.2	25.48	16.592	
7,700.0	7,267.0	7,932.4	7,504.0	17.3	15.4	124.09	-330.7	159.7	422.8	395.9	26.94	15.697	
7,800.0	7,267.0	8,032.4	7,504.0	18.1	16.3	124.09	-430.7	159.7	422.8	394.3	28.50	14.836	
7,900.0	7,267.0	8,132.4	7,504.0	19.1	17.4	124.09	-530.7	159.7	422.8	392.6	30.26	13.972	
8,000.0	7,267.0	8,232.4	7,504.0	20.1	18.6	124.09	-630.7	159.7	422.8	390.7	32.19	13.135	
8,100.0	7,267.0	8,332.4	7,504.0	21.3	19.8	124.09	-730.7	159.7	422.8	388.6	34.26	12.341	
8,200.0	7,267.0	8,432.4	7,504.0	22.5	21.1	124.09	-830.7	159.7	422.8	386.4	36.45	11.601	
8,300.0	7,267.0	8,532.4	7,504.0	23.8	22.5	124.09	-930.7	159.7	422.8	384.1	38.73	10.918	
8,400.0	7,267.0	8,632.4	7,504.0	25.1	23.9	124.09	-1,030.7	159.7	422.8	381.8	41.09	10.290	
8,500.0	7,267.0	8,732.4	7,504.0	26.5	25.4	124.09	-1,130.7	159.7	422.8	379.3	43.52	9.716	
8,600.0	7,267.0	8,832.4	7,504.0	28.0	26.9	124.09	-1,230.7	159.7	422.8	376.8	46.00	9.191	
8,700.0	7,267.0	8,932.4	7,504.0	29.5	28.4	124.09	-1,330.7	159.7	422.8	374.3	48.54	8.712	
8,800.0	7,267.0	9,032.4	7,504.0	31.0	30.0	124.09	-1,430.7	159.7	422.8	371.7	51.11	8.273	
8,900.0	7,267.0	9,132.4	7,504.0	32.5	31.6	124.09	-1,530.7	159.7	422.8	369.1	53.72	7.872	
9,000.0	7,267.0	9,232.4	7,504.0	34.0	33.1	124.09	-1,630.7	159.7	422.8	366.5	56.36	7.503	
9,100.0	7,267.0	9,332.4	7,504.0	35.6	34.8	124.09	-1,730.7	159.7	422.8	363.8	59.02	7.164	
9,200.0	7,267.0	9,432.4	7,504.0	37.2	36.4	124.09	-1,830.7	159.7	422.8	361.1	61.71	6.853	
9,300.0	7,267.0	9,532.4	7,504.0	38.8	38.0	124.09	-1,930.7	159.7	422.8	358.4	64.41	6.565	
9,400.0	7,267.0	9,632.4	7,504.0	40.4	39.7	124.09	-2,030.7	159.7	422.8	355.7	67.14	6.298	
9,500.0	7,267.0	9,732.4	7,504.0	42.0	41.3	124.09	-2,130.7	159.7	422.8	353.0	69.87	6.051	
9,600.0	7,267.0	9,832.4	7,504.0	43.7	43.0	124.09	-2,230.7	159.7	422.8	350.2	72.63	5.822	
9,700.0	7,267.0	9,932.4	7,504.0	45.3	44.6	124.09	-2,330.7	159.7	422.8	347.5	75.39	5.609	
9,800.0	7,267.0	10,032.4	7,504.0	47.0	46.3	124.09	-2,430.7	159.7	422.8	344.7	78.17	5.409	
9,900.0	7,267.0	10,132.4	7,504.0	48.6	48.0	124.09	-2,530.7	159.7	422.8	341.9	80.95	5.223	
10,000.0	7,267.0	10,232.4	7,504.0	50.3	49.7	124.09	-2,630.7	159.7	422.8	339.1	83.75	5.049	
10,100.0	7,267.0	10,332.4	7,504.0	52.0	51.4	124.09	-2,730.7	159.7	422.8	336.3	86.55	4.886	
10,200.0	7,267.0	10,432.4	7,504.0	53.6	53.1	124.09	-2,830.7	159.7	422.8	333.5	89.36	4.732	

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 Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2D-31H - 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	7,267.0	10,532.4	7,504.0	55.3	54.8	124.09	-2,930.7	159.7	422.8	330.7	92.17	4.588	
10,400.0	7,267.0	10,632.4	7,504.0	57.0	56.5	124.09	-3,030.7	159.7	422.8	327.9	94.99	4.451	
10,500.0	7,267.0	10,732.4	7,504.0	58.7	58.2	124.09	-3,130.7	159.7	422.8	325.0	97.82	4.323	
10,600.0	7,267.0	10,832.4	7,504.0	60.4	59.9	124.09	-3,230.7	159.7	422.8	322.2	100.65	4.201	
10,700.0	7,267.0	10,932.4	7,504.0	62.1	61.6	124.09	-3,330.7	159.7	422.8	319.4	103.49	4.086	
10,800.0	7,267.0	11,032.4	7,504.0	63.8	63.3	124.09	-3,430.7	159.7	422.8	316.5	106.33	3.977	
10,900.0	7,267.0	11,132.4	7,504.0	65.5	65.0	124.09	-3,530.7	159.7	422.8	313.7	109.17	3.873	
11,000.0	7,267.0	11,232.4	7,504.0	67.2	66.7	124.09	-3,630.7	159.7	422.8	310.8	112.02	3.775	
11,100.0	7,267.0	11,332.4	7,504.0	68.9	68.5	124.09	-3,730.7	159.7	422.8	308.0	114.87	3.681	
11,200.0	7,267.0	11,432.4	7,504.0	70.6	70.2	124.09	-3,830.7	159.7	422.8	305.1	117.73	3.592	
11,300.0	7,267.0	11,532.4	7,504.0	72.3	71.9	124.09	-3,930.7	159.7	422.8	302.3	120.58	3.507	
11,400.0	7,267.0	11,632.4	7,504.0	74.0	73.6	124.09	-4,030.7	159.7	422.8	299.4	123.44	3.425	
11,500.0	7,267.0	11,732.4	7,504.0	75.7	75.4	124.09	-4,130.7	159.7	422.8	296.5	126.30	3.348	
11,600.0	7,267.0	11,832.4	7,504.0	77.5	77.1	124.09	-4,230.7	159.7	422.8	293.7	129.17	3.274	
11,700.0	7,267.0	11,932.4	7,504.0	79.2	78.8	124.09	-4,330.7	159.7	422.8	290.8	132.04	3.202	
11,800.0	7,267.0	12,032.4	7,504.0	80.9	80.5	124.09	-4,430.7	159.7	422.8	287.9	134.90	3.134	
11,846.2	7,267.0	12,078.6	7,504.0	81.7	81.3	124.09	-4,476.9	159.7	422.8	286.6	136.23	3.104	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2F-31H - 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	90.04	0.0	11.2	11.2				
100.0	100.0	100.0	100.0	0.2	0.2	90.04	0.0	11.2	11.2	10.9	0.30	36.893	
200.0	200.0	200.0	200.0	0.3	0.3	90.04	0.0	11.2	11.2	10.6	0.65	17.164	
300.0	300.0	300.0	300.0	0.5	0.5	90.04	0.0	11.2	11.2	10.2	1.00	11.184	
400.0	400.0	400.0	400.0	0.7	0.7	90.04	0.0	11.2	11.2	9.9	1.35	8.294	
500.0	500.0	500.0	500.0	0.8	0.8	90.04	0.0	11.2	11.2	9.5	1.70	6.591	CC
600.0	600.0	599.8	599.8	1.0	1.0	35.59	0.3	12.0	11.3	9.3	2.05	5.516	
700.0	700.0	699.6	699.6	1.2	1.2	38.30	1.2	14.5	11.6	9.2	2.40	4.840	ES
800.0	799.9	799.4	799.3	1.4	1.4	42.49	2.8	18.5	12.2	9.4	2.75	4.423	
900.0	899.7	899.2	898.9	1.6	1.6	47.70	4.9	24.2	13.1	10.0	3.12	4.191	
1,000.0	999.4	999.0	998.4	1.8	1.8	53.38	7.7	31.5	14.4	10.9	3.51	4.096	
1,100.0	1,098.9	1,098.8	1,097.7	2.0	2.0	58.22	11.1	40.4	16.2	12.3	3.92	4.142	
1,200.0	1,198.5	1,198.5	1,196.8	2.2	2.2	58.65	15.2	50.9	19.3	15.0	4.33	4.451	
1,300.0	1,298.0	1,298.2	1,295.6	2.4	2.5	55.96	19.8	63.1	23.6	18.9	4.74	4.978	
1,400.0	1,397.6	1,397.8	1,394.1	2.7	2.8	52.02	25.0	76.7	29.2	24.1	5.14	5.690	
1,500.0	1,497.1	1,497.6	1,492.8	2.9	3.1	48.98	30.3	90.7	35.3	29.7	5.53	6.380	
1,600.0	1,596.7	1,597.4	1,591.5	3.1	3.3	46.84	35.7	104.7	41.4	35.4	5.92	6.990	
1,700.0	1,696.2	1,697.2	1,690.1	3.4	3.6	45.24	41.0	118.8	47.5	41.2	6.31	7.530	
1,800.0	1,795.8	1,797.0	1,788.8	3.6	3.9	44.02	46.4	132.8	53.7	47.0	6.70	8.010	
1,900.0	1,895.3	1,896.8	1,887.5	3.8	4.2	43.04	51.7	146.8	59.9	52.8	7.10	8.440	
2,000.0	1,994.9	1,996.6	1,986.1	4.1	4.5	42.25	57.1	160.8	66.1	58.6	7.49	8.825	
2,100.0	2,094.4	2,096.4	2,084.8	4.3	4.8	41.60	62.4	174.9	72.3	64.4	7.88	9.173	
2,200.0	2,194.0	2,196.2	2,183.5	4.5	5.2	41.05	67.8	188.9	78.5	70.3	8.28	9.489	
2,300.0	2,293.5	2,296.0	2,282.1	4.8	5.5	40.58	73.1	202.9	84.8	76.1	8.67	9.776	
2,400.0	2,393.1	2,395.8	2,380.8	5.0	5.8	40.17	78.5	216.9	91.0	81.9	9.07	10.038	
2,500.0	2,492.6	2,495.6	2,479.5	5.2	6.1	39.82	83.9	230.9	97.3	87.8	9.46	10.279	
2,600.0	2,592.2	2,595.4	2,578.1	5.5	6.4	39.51	89.2	245.0	103.5	93.6	9.86	10.501	
2,700.0	2,691.7	2,695.2	2,676.8	5.7	6.7	39.23	94.6	259.0	109.8	99.5	10.25	10.705	
2,800.0	2,791.2	2,795.0	2,775.5	6.0	7.0	38.98	99.9	273.0	116.0	105.4	10.65	10.895	
2,900.0	2,890.8	2,894.8	2,874.2	6.2	7.3	38.76	105.3	287.0	122.3	111.2	11.04	11.071	
3,000.0	2,990.3	2,994.6	2,972.8	6.4	7.6	38.56	110.6	301.1	128.5	117.1	11.44	11.234	
3,100.0	3,089.9	3,094.4	3,071.5	6.7	7.9	38.38	116.0	315.1	134.8	122.9	11.83	11.387	
3,200.0	3,189.4	3,194.2	3,170.2	6.9	8.3	38.22	121.3	329.1	141.0	128.8	12.23	11.530	
3,300.0	3,289.0	3,294.0	3,268.8	7.2	8.6	38.07	126.7	343.1	147.3	134.7	12.63	11.664	
3,400.0	3,388.5	3,393.8	3,367.5	7.4	8.9	37.93	132.0	357.2	153.5	140.5	13.02	11.790	
3,500.0	3,488.1	3,493.7	3,466.2	7.6	9.2	37.80	137.4	371.2	159.8	146.4	13.42	11.909	
3,600.0	3,587.6	3,593.5	3,564.8	7.9	9.5	37.68	142.7	385.2	166.1	152.2	13.82	12.020	
3,700.0	3,687.2	3,693.3	3,663.5	8.1	9.8	37.57	148.1	399.2	172.3	158.1	14.21	12.126	
3,800.0	3,786.7	3,793.1	3,762.2	8.4	10.1	37.47	153.4	413.2	178.6	164.0	14.61	12.225	
3,900.0	3,886.3	3,892.9	3,860.8	8.6	10.5	37.38	158.8	427.3	184.8	169.8	15.00	12.320	
4,000.0	3,985.8	3,992.7	3,959.5	8.8	10.8	37.29	164.1	441.3	191.1	175.7	15.40	12.409	
4,100.0	4,085.4	4,092.5	4,058.2	9.1	11.1	37.21	169.5	455.3	197.4	181.6	15.80	12.495	
4,200.0	4,184.9	4,192.3	4,156.8	9.3	11.4	37.13	174.8	469.3	203.6	187.4	16.19	12.575	
4,300.0	4,284.5	4,292.1	4,255.5	9.6	11.7	37.06	180.2	483.4	209.9	193.3	16.59	12.652	
4,400.0	4,384.0	4,391.9	4,354.2	9.8	12.0	36.99	185.5	497.4	216.2	199.2	16.99	12.726	
4,500.0	4,483.6	4,491.7	4,452.8	10.0	12.3	36.92	190.9	511.4	222.4	205.0	17.38	12.796	
4,600.0	4,583.1	4,591.5	4,551.5	10.3	12.7	36.86	196.2	525.4	228.7	210.9	17.78	12.863	
4,700.0	4,682.7	4,691.3	4,650.2	10.5	13.0	36.80	201.6	539.4	235.0	216.8	18.18	12.927	
4,800.0	4,782.2	4,791.1	4,748.8	10.8	13.3	36.75	206.9	553.5	241.2	222.7	18.57	12.988	
4,900.0	4,881.8	4,890.9	4,847.5	11.0	13.6	36.69	212.3	567.5	247.5	228.5	18.97	13.047	
5,000.0	4,981.3	4,990.7	4,946.2	11.2	13.9	36.64	217.6	581.5	253.8	234.4	19.37	13.103	
5,100.0	5,080.9	5,090.5	5,044.9	11.5	14.2	36.60	223.0	595.5	260.0	240.3	19.76	13.157	

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 Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2F-31H - 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	5,180.4	5,190.3	5,143.5	11.7	14.6	36.55	228.3	609.6	266.3	246.1	20.16	13.209	
5,300.0	5,280.0	5,290.1	5,242.2	12.0	14.9	36.51	233.7	623.6	272.6	252.0	20.56	13.259	
5,400.0	5,379.5	5,389.9	5,340.9	12.2	15.2	36.47	239.0	637.6	278.8	257.9	20.95	13.307	
5,500.0	5,479.0	5,489.7	5,439.5	12.4	15.5	36.43	244.4	651.6	285.1	263.7	21.35	13.353	
5,600.0	5,578.6	5,589.5	5,538.2	12.7	15.8	36.39	249.7	665.7	291.4	269.6	21.75	13.398	
5,700.0	5,678.1	5,689.3	5,636.9	12.9	16.1	36.35	255.1	679.7	297.6	275.5	22.14	13.441	
5,800.0	5,777.7	5,789.1	5,735.5	13.2	16.4	36.32	260.4	693.7	303.9	281.3	22.54	13.482	
5,900.0	5,877.2	5,888.9	5,834.2	13.4	16.8	36.29	265.8	707.7	310.2	287.2	22.94	13.522	
6,000.0	5,976.8	5,988.7	5,932.9	13.6	17.1	36.25	271.2	721.7	316.4	293.1	23.33	13.561	
6,100.0	6,076.3	6,088.5	6,031.5	13.9	17.4	36.22	276.5	735.8	322.7	299.0	23.73	13.598	
6,200.0	6,175.9	6,188.3	6,130.2	14.1	17.7	36.19	281.9	749.8	329.0	304.8	24.13	13.634	
6,300.0	6,275.4	6,288.1	6,228.9	14.4	18.0	36.17	287.2	763.8	335.2	310.7	24.52	13.669	
6,400.0	6,375.0	6,387.9	6,327.5	14.6	18.3	36.14	292.6	777.8	341.5	316.6	24.92	13.703	
6,500.0	6,474.5	6,487.7	6,426.2	14.8	18.7	36.11	297.9	791.9	347.8	322.4	25.32	13.736	
6,600.0	6,574.1	6,587.6	6,524.9	15.1	19.0	36.09	303.3	805.9	354.0	328.3	25.71	13.768	
6,700.0	6,673.6	6,687.4	6,623.5	15.3	19.3	27.93	308.6	819.9	360.3	334.2	26.12	13.795	
6,800.0	6,773.1	6,786.5	6,721.6	15.5	19.6	-59.25	313.9	833.8	366.4	340.2	26.23	13.967	
6,900.0	6,870.2	6,882.4	6,816.4	15.5	19.9	-78.28	319.1	847.3	373.4	347.6	25.88	14.431	
7,000.0	6,962.0	6,972.1	6,905.0	15.5	20.2	-87.83	323.9	859.9	384.7	359.3	25.38	15.155	
7,100.0	7,045.7	7,071.2	7,003.0	15.5	20.5	-95.63	321.4	874.1	402.7	377.8	24.94	16.150	
7,200.0	7,118.8	7,183.3	7,111.2	15.4	20.7	-102.13	298.1	890.5	426.0	401.3	24.66	17.278	
7,300.0	7,179.0	7,312.3	7,227.3	15.5	20.8	-107.73	245.6	909.0	452.2	427.7	24.50	18.459	
7,400.0	7,224.6	7,463.6	7,344.4	15.7	21.0	-112.45	152.6	929.2	478.1	453.7	24.47	19.543	
7,500.0	7,254.0	7,641.0	7,445.2	16.1	21.3	-115.92	8.8	948.7	499.7	475.0	24.69	20.242	
10,400.0	7,267.0	10,718.4	7,504.0	57.0	59.2	-118.64	-3,056.2	943.8	495.1	394.8	100.24	4.939	
10,500.0	7,267.0	10,818.3	7,504.0	58.7	60.9	-118.97	-3,155.9	937.9	489.9	387.0	102.94	4.759	
10,600.0	7,267.0	10,918.1	7,504.0	60.4	62.5	-119.31	-3,255.5	932.0	484.8	379.1	105.62	4.590	
10,700.0	7,267.0	11,017.9	7,504.0	62.1	64.1	-119.65	-3,355.2	926.1	479.6	371.4	108.27	4.430	
10,800.0	7,267.0	11,117.7	7,504.0	63.8	65.7	-120.01	-3,454.8	920.3	474.5	363.6	110.90	4.279	
10,900.0	7,267.0	11,217.6	7,504.0	65.5	67.4	-120.36	-3,554.5	914.4	469.5	356.0	113.50	4.136	
11,000.0	7,267.0	11,317.4	7,504.0	67.2	69.0	-120.73	-3,654.1	908.5	464.4	348.3	116.06	4.001	
11,100.0	7,267.0	11,417.2	7,504.0	68.9	70.7	-121.11	-3,753.8	902.7	459.3	340.7	118.59	3.873	
11,200.0	7,267.0	11,517.0	7,504.0	70.6	72.3	-121.49	-3,853.4	896.8	454.3	333.2	121.09	3.752	
11,300.0	7,267.0	11,616.9	7,504.0	72.3	74.0	-121.88	-3,953.1	890.9	449.3	325.7	123.55	3.637	
11,400.0	7,267.0	11,716.7	7,504.0	74.0	75.7	-122.28	-4,052.8	885.0	444.3	318.3	125.97	3.527	
11,500.0	7,267.0	11,816.5	7,504.0	75.7	77.3	-122.69	-4,152.4	879.2	439.3	311.0	128.36	3.423	
11,600.0	7,267.0	11,916.4	7,504.0	77.5	79.0	-123.11	-4,252.1	873.3	434.4	303.7	130.69	3.324	
11,700.0	7,267.0	12,016.2	7,504.0	79.2	80.7	-123.54	-4,351.7	867.4	429.5	296.5	132.99	3.230	
11,800.0	7,267.0	12,116.0	7,504.0	80.9	82.3	-123.98	-4,451.4	861.6	424.6	289.4	135.23	3.140	
11,846.2	7,267.0	12,141.6	7,504.0	81.7	82.8	-124.09	-4,476.9	860.1	422.8	286.7	136.10	3.107	
11,846.2	7,267.0	12,141.6	7,504.0	81.7	82.8	-124.09	-4,476.9	860.1	422.8	286.7	136.10	3.107	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2G-31H - 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	90.05	0.0	19.6	19.6				
100.0	100.0	100.0	100.0	0.2	0.2	90.05	0.0	19.6	19.6	19.3	0.30	64.562	
200.0	200.0	200.0	200.0	0.3	0.3	90.05	0.0	19.6	19.6	19.0	0.65	30.037	CC, ES
300.0	300.0	299.7	299.7	0.5	0.5	89.35	0.2	20.4	20.4	19.4	1.00	20.408	
400.0	400.0	399.3	399.2	0.7	0.7	87.54	1.0	22.9	23.0	21.6	1.35	16.977	
500.0	500.0	498.7	498.6	0.8	0.9	85.28	2.2	27.1	27.2	25.5	1.71	15.929	
600.0	600.0	598.1	597.8	1.0	1.1	28.39	4.0	32.8	32.4	30.3	2.05	15.819	
700.0	700.0	697.4	696.7	1.2	1.3	28.08	6.2	40.3	37.8	35.4	2.40	15.755	SF
800.0	799.9	796.5	795.4	1.4	1.5	28.52	8.9	49.3	43.3	40.6	2.75	15.756	
900.0	899.7	895.6	893.9	1.6	1.8	29.44	12.2	60.0	49.0	45.9	3.10	15.791	
1,000.0	999.4	994.5	992.0	1.8	2.0	30.68	15.9	72.3	54.9	51.5	3.47	15.842	
1,100.0	1,098.9	1,093.3	1,089.7	2.0	2.3	32.03	20.1	86.1	61.3	57.4	3.84	15.957	
1,200.0	1,198.5	1,191.9	1,187.0	2.2	2.6	32.83	24.7	101.6	69.2	64.9	4.22	16.396	
1,300.0	1,298.0	1,290.4	1,283.8	2.4	3.0	33.14	29.9	118.6	78.7	74.1	4.60	17.115	
1,400.0	1,397.6	1,389.9	1,381.6	2.7	3.3	33.27	35.2	136.5	88.9	83.9	4.98	17.842	
1,500.0	1,497.1	1,489.4	1,479.3	2.9	3.7	33.37	40.6	154.3	99.0	93.7	5.37	18.459	
1,600.0	1,596.7	1,588.8	1,577.0	3.1	4.0	33.45	46.0	172.1	109.2	103.5	5.75	18.989	
1,700.0	1,696.2	1,688.3	1,674.7	3.4	4.4	33.52	51.4	189.9	119.4	113.3	6.14	19.448	
1,800.0	1,795.8	1,787.8	1,772.4	3.6	4.8	33.57	56.8	207.8	129.6	123.0	6.53	19.851	
1,900.0	1,895.3	1,887.3	1,870.2	3.8	5.1	33.62	62.2	225.6	139.8	132.8	6.92	20.205	
2,000.0	1,994.9	1,986.8	1,967.9	4.1	5.5	33.66	67.5	243.4	149.9	142.6	7.31	20.520	
2,100.0	2,094.4	2,086.2	2,065.6	4.3	5.9	33.70	72.9	261.3	160.1	152.4	7.70	20.802	
2,200.0	2,194.0	2,185.7	2,163.3	4.5	6.2	33.73	78.3	279.1	170.3	162.2	8.09	21.055	
2,300.0	2,293.5	2,285.2	2,261.1	4.8	6.6	33.76	83.7	296.9	180.5	172.0	8.48	21.283	
2,400.0	2,393.1	2,384.7	2,358.8	5.0	7.0	33.79	89.1	314.7	190.6	181.8	8.87	21.491	
2,500.0	2,492.6	2,484.2	2,456.5	5.2	7.3	33.81	94.4	332.6	200.8	191.6	9.26	21.680	
2,600.0	2,592.2	2,583.6	2,554.2	5.5	7.7	33.83	99.8	350.4	211.0	201.3	9.66	21.853	
2,700.0	2,691.7	2,683.1	2,651.9	5.7	8.1	33.85	105.2	368.2	221.2	211.1	10.05	22.012	
2,800.0	2,791.2	2,782.6	2,749.7	6.0	8.5	33.87	110.6	386.1	231.4	220.9	10.44	22.159	
2,900.0	2,890.8	2,882.1	2,847.4	6.2	8.8	33.88	116.0	403.9	241.5	230.7	10.83	22.295	
3,000.0	2,990.3	2,981.6	2,945.1	6.4	9.2	33.90	121.3	421.7	251.7	240.5	11.23	22.421	
3,100.0	3,089.9	3,081.1	3,042.8	6.7	9.6	33.91	126.7	439.5	261.9	250.3	11.62	22.538	
3,200.0	3,189.4	3,180.5	3,140.5	6.9	9.9	33.92	132.1	457.4	272.1	260.1	12.01	22.647	
3,300.0	3,289.0	3,280.0	3,238.3	7.2	10.3	33.93	137.5	475.2	282.2	269.8	12.41	22.749	
3,400.0	3,388.5	3,379.5	3,336.0	7.4	10.7	33.94	142.9	493.0	292.4	279.6	12.80	22.844	
3,500.0	3,488.1	3,479.0	3,433.7	7.6	11.0	33.95	148.2	510.9	302.6	289.4	13.19	22.934	
3,600.0	3,587.6	3,578.5	3,531.4	7.9	11.4	33.96	153.6	528.7	312.8	299.2	13.59	23.018	
3,700.0	3,687.2	3,677.9	3,629.2	8.1	11.8	33.97	159.0	546.5	323.0	309.0	13.98	23.097	
3,800.0	3,786.7	3,777.4	3,726.9	8.4	12.2	33.98	164.4	564.4	333.1	318.8	14.38	23.172	
3,900.0	3,886.3	3,876.9	3,824.6	8.6	12.5	33.99	169.8	582.2	343.3	328.5	14.77	23.243	
4,000.0	3,985.8	3,976.4	3,922.3	8.8	12.9	34.00	175.2	600.0	353.5	338.3	15.17	23.310	
4,100.0	4,085.4	4,075.9	4,020.0	9.1	13.3	34.00	180.5	617.8	363.7	348.1	15.56	23.373	
4,200.0	4,184.9	4,175.3	4,117.8	9.3	13.6	34.01	185.9	635.7	373.9	357.9	15.95	23.433	
4,300.0	4,284.5	4,274.8	4,215.5	9.6	14.0	34.02	191.3	653.5	384.0	367.7	16.35	23.491	
4,400.0	4,384.0	4,374.3	4,313.2	9.8	14.4	34.02	196.7	671.3	394.2	377.5	16.74	23.545	
4,500.0	4,483.6	4,473.8	4,410.9	10.0	14.8	34.03	202.1	689.2	404.4	387.3	17.14	23.597	
4,600.0	4,583.1	4,573.3	4,508.7	10.3	15.1	34.03	207.4	707.0	414.6	397.0	17.53	23.646	
4,700.0	4,682.7	4,672.7	4,606.4	10.5	15.5	34.04	212.8	724.8	424.7	406.8	17.93	23.694	
4,800.0	4,782.2	4,772.2	4,704.1	10.8	15.9	34.04	218.2	742.6	434.9	416.6	18.32	23.739	
4,900.0	4,881.8	4,871.7	4,801.8	11.0	16.3	34.05	223.6	760.5	445.1	426.4	18.72	23.782	
5,000.0	4,981.3	4,971.2	4,899.5	11.2	16.6	34.05	229.0	778.3	455.3	436.2	19.11	23.823	
5,100.0	5,080.9	5,070.7	4,997.3	11.5	17.0	34.05	234.3	796.1	465.5	446.0	19.51	23.863	

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 Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - Lochbuie 2G-31H - 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	5,180.4	5,170.1	5,095.0	11.7	17.4	34.06	239.7	814.0	475.6	455.7	19.90	23.901	
5,300.0	5,280.0	5,269.6	5,192.7	12.0	17.7	34.06	245.1	831.8	485.8	465.5	20.30	23.938	
5,400.0	5,379.5	5,369.1	5,290.4	12.2	18.1	34.07	250.5	849.6	496.0	475.3	20.69	23.973	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 S31-T1N-R65W (Lochbuie) - LUTZ 1A (EXISTING) - VESSELS WELL - NO SURVEYS

Offset Site Error: 0.0 ft

Survey Program: 8016-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
8,700.0	7,267.0	7,239.0	7,239.0	29.5	12.6	-90.00	-1,617.7	847.1	442.8	402.1	40.70	10.880	
8,800.0	7,267.0	7,239.0	7,239.0	31.0	12.6	-90.00	-1,617.7	847.1	385.6	343.3	42.28	9.121	
8,900.0	7,267.0	7,239.0	7,239.0	32.5	12.6	-90.00	-1,617.7	847.1	348.3	304.4	43.87	7.938	
8,987.1	7,267.0	7,239.0	7,239.0	33.8	12.6	-90.00	-1,617.7	847.1	337.2	291.9	45.27	7.448	CC, ES
9,000.0	7,267.0	7,239.0	7,239.0	34.0	12.6	-90.00	-1,617.7	847.1	337.4	292.0	45.48	7.420	SF
9,100.0	7,267.0	7,239.0	7,239.0	35.6	12.6	-90.00	-1,617.7	847.1	355.6	308.5	47.10	7.550	
9,200.0	7,267.0	7,239.0	7,239.0	37.2	12.6	-90.00	-1,617.7	847.1	398.8	350.1	48.74	8.183	
9,300.0	7,267.0	7,239.0	7,239.0	38.8	12.6	-90.00	-1,617.7	847.1	460.0	409.7	50.39	9.130	

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 Lochbuie 2E-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5020.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2E-31H	**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 @ 5020.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Lochbuie 2E-31H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.51°