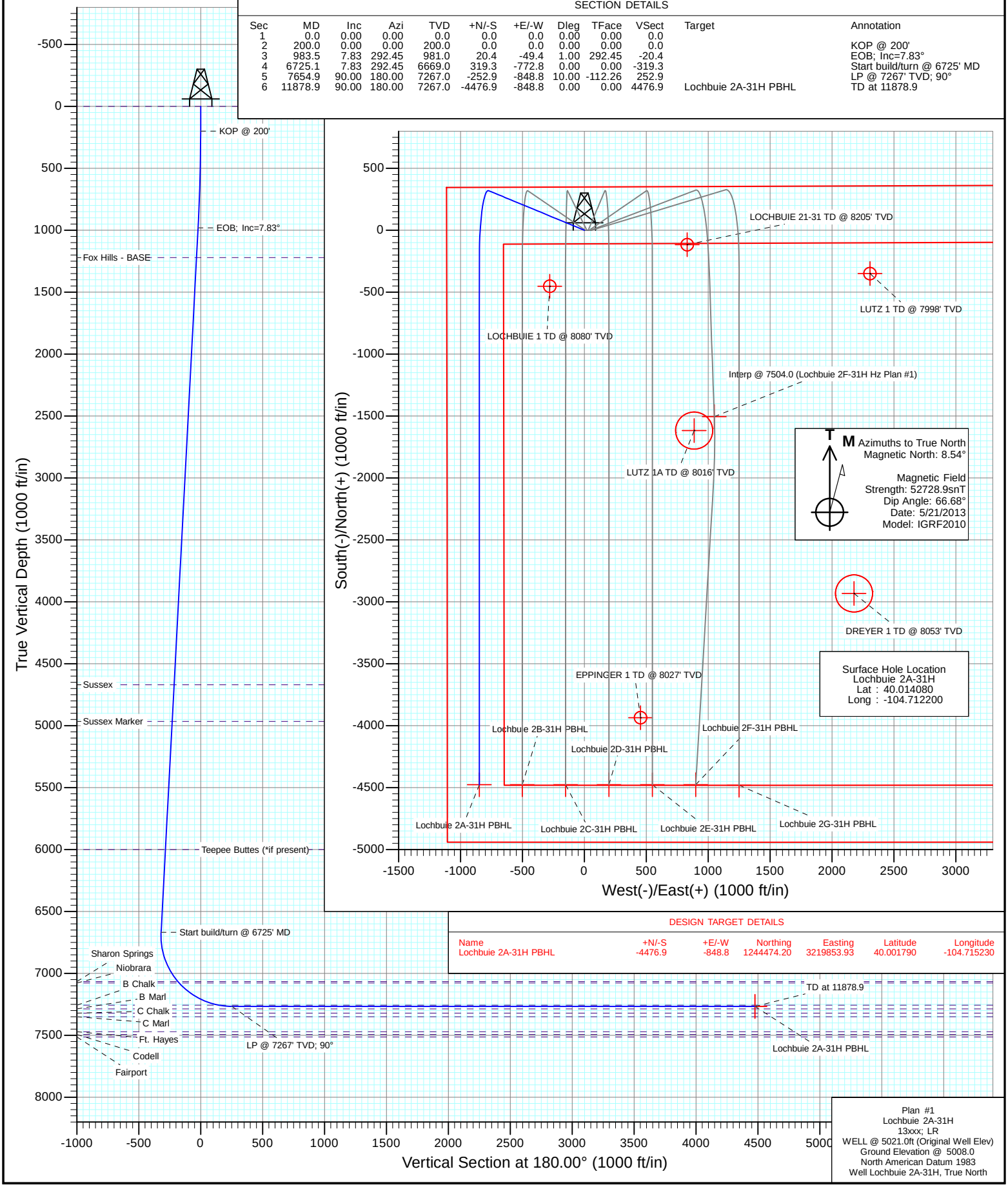
Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2A-31H
Wellbore: Hz
Design: Plan #1

encana

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	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0		KOP @ 200'
3	983.5	7.83	292.45	981.0	20.4	-49.4	1.00	292.45	-20.4		EOB; Inc=7.83°
4	6725.1	7.83	292.45	6669.0	319.3	-772.8	0.00	0.00	-319.3		Start build/turn @ 6725' MD
5	7654.9	90.00	180.00	7267.0	-252.9	-848.8	10.00	-112.26	252.9		LP @ 7267' TVD; 90°
6	11878.9	90.00	180.00	7267.0	-4476.9	-848.8	0.00	0.00	4476.9	Lochbuie 2A-31H PBHL	TD at 11878.9



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lochbuie 2A-31H PBHL	-4476.9	-848.8	1244474.20	3219853.93	40.001790	-104.715230

Plan #1
Lochbuie 2A-31H
13xxx; LR
WELL @ 5021.0ft (Original Well Elev)
Ground Elevation @ 5008.0
North American Datum 1983
Well Lochbuie 2A-31H, True North

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2A-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 2A-31H

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,248,958.48 ft	**Latitude:**	40.014080
	+E/-W	0.0 ft	**Easting:**	3,220,662.97 ft	**Longitude:**	-104.712200
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	5,008.0 ft

Wellbore Hz

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/21/2013	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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
983.5	7.83	292.45	981.0	20.4	-49.4	1.00	1.00	0.00	292.45	
6,725.1	7.83	292.45	6,669.0	319.3	-772.8	0.00	0.00	0.00	0.00	
7,654.9	90.00	180.00	7,267.0	-252.9	-848.8	10.00	8.84	-12.09	-112.26	
11,878.9	90.00	180.00	7,267.0	-4,476.9	-848.8	0.00	0.00	0.00	0.00	Lochbuie 2A-31H PBH

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2A-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	KOP @ 200'
300.0	1.00	292.45	300.0	0.3	-0.8	-0.3	1.00	1.00	
400.0	2.00	292.45	400.0	1.3	-3.2	-1.3	1.00	1.00	
500.0	3.00	292.45	499.9	3.0	-7.3	-3.0	1.00	1.00	
600.0	4.00	292.45	599.7	5.3	-12.9	-5.3	1.00	1.00	
700.0	5.00	292.45	699.4	8.3	-20.2	-8.3	1.00	1.00	
800.0	6.00	292.45	798.9	12.0	-29.0	-12.0	1.00	1.00	
900.0	7.00	292.45	898.3	16.3	-39.5	-16.3	1.00	1.00	
983.5	7.83	292.45	981.0	20.4	-49.4	-20.4	1.00	1.00	EOB; Inc=7.83°
1,000.0	7.83	292.45	997.4	21.3	-51.5	-21.3	0.00	0.00	
1,100.0	7.83	292.45	1,096.5	26.5	-64.1	-26.5	0.00	0.00	
1,200.0	7.83	292.45	1,195.5	31.7	-76.7	-31.7	0.00	0.00	
1,225.7	7.83	292.45	1,221.0	33.0	-79.9	-33.0	0.00	0.00	Fox Hills - BASE
1,300.0	7.83	292.45	1,294.6	36.9	-89.3	-36.9	0.00	0.00	
1,400.0	7.83	292.45	1,393.7	42.1	-101.9	-42.1	0.00	0.00	
1,500.0	7.83	292.45	1,492.7	47.3	-114.5	-47.3	0.00	0.00	
1,600.0	7.83	292.45	1,591.8	52.5	-127.1	-52.5	0.00	0.00	
1,700.0	7.83	292.45	1,690.9	57.7	-139.7	-57.7	0.00	0.00	
1,800.0	7.83	292.45	1,789.9	62.9	-152.3	-62.9	0.00	0.00	
1,900.0	7.83	292.45	1,889.0	68.1	-164.9	-68.1	0.00	0.00	
2,000.0	7.83	292.45	1,988.1	73.3	-177.5	-73.3	0.00	0.00	
2,100.0	7.83	292.45	2,087.1	78.5	-190.1	-78.5	0.00	0.00	
2,200.0	7.83	292.45	2,186.2	83.7	-202.7	-83.7	0.00	0.00	
2,300.0	7.83	292.45	2,285.3	88.9	-215.3	-88.9	0.00	0.00	
2,400.0	7.83	292.45	2,384.3	94.1	-227.9	-94.1	0.00	0.00	
2,500.0	7.83	292.45	2,483.4	99.4	-240.5	-99.4	0.00	0.00	
2,600.0	7.83	292.45	2,582.5	104.6	-253.1	-104.6	0.00	0.00	
2,700.0	7.83	292.45	2,681.5	109.8	-265.7	-109.8	0.00	0.00	
2,800.0	7.83	292.45	2,780.6	115.0	-278.3	-115.0	0.00	0.00	
2,900.0	7.83	292.45	2,879.7	120.2	-290.9	-120.2	0.00	0.00	
3,000.0	7.83	292.45	2,978.7	125.4	-303.5	-125.4	0.00	0.00	
3,100.0	7.83	292.45	3,077.8	130.6	-316.1	-130.6	0.00	0.00	
3,200.0	7.83	292.45	3,176.9	135.8	-328.7	-135.8	0.00	0.00	
3,300.0	7.83	292.45	3,275.9	141.0	-341.3	-141.0	0.00	0.00	
3,400.0	7.83	292.45	3,375.0	146.2	-353.9	-146.2	0.00	0.00	
3,500.0	7.83	292.45	3,474.1	151.4	-366.5	-151.4	0.00	0.00	
3,600.0	7.83	292.45	3,573.1	156.6	-379.1	-156.6	0.00	0.00	
3,700.0	7.83	292.45	3,672.2	161.8	-391.7	-161.8	0.00	0.00	
3,800.0	7.83	292.45	3,771.3	167.0	-404.3	-167.0	0.00	0.00	
3,900.0	7.83	292.45	3,870.3	172.2	-416.9	-172.2	0.00	0.00	
4,000.0	7.83	292.45	3,969.4	177.4	-429.5	-177.4	0.00	0.00	
4,100.0	7.83	292.45	4,068.5	182.6	-442.1	-182.6	0.00	0.00	
4,200.0	7.83	292.45	4,167.5	187.8	-454.7	-187.8	0.00	0.00	
4,300.0	7.83	292.45	4,266.6	193.0	-467.3	-193.0	0.00	0.00	
4,400.0	7.83	292.45	4,365.7	198.2	-479.9	-198.2	0.00	0.00	
4,500.0	7.83	292.45	4,464.7	203.5	-492.5	-203.5	0.00	0.00	
4,600.0	7.83	292.45	4,563.8	208.7	-505.1	-208.7	0.00	0.00	
4,700.0	7.83	292.45	4,662.9	213.9	-517.7	-213.9	0.00	0.00	
4,707.2	7.83	292.45	4,670.0	214.2	-518.6	-214.2	0.00	0.00	Sussex
4,800.0	7.83	292.45	4,761.9	219.1	-530.3	-219.1	0.00	0.00	

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Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2A-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	7.83	292.45	4,861.0	224.3	-542.9	-224.3	0.00	0.00	
5,000.0	7.83	292.45	4,960.1	229.5	-555.5	-229.5	0.00	0.00	
5,006.0	7.83	292.45	4,966.0	229.8	-556.2	-229.8	0.00	0.00	Sussex Marker
5,100.0	7.83	292.45	5,059.1	234.7	-568.1	-234.7	0.00	0.00	
5,200.0	7.83	292.45	5,158.2	239.9	-580.7	-239.9	0.00	0.00	
5,300.0	7.83	292.45	5,257.3	245.1	-593.3	-245.1	0.00	0.00	
5,400.0	7.83	292.45	5,356.3	250.3	-605.9	-250.3	0.00	0.00	
5,500.0	7.83	292.45	5,455.4	255.5	-618.5	-255.5	0.00	0.00	
5,600.0	7.83	292.45	5,554.5	260.7	-631.1	-260.7	0.00	0.00	
5,700.0	7.83	292.45	5,653.5	265.9	-643.7	-265.9	0.00	0.00	
5,800.0	7.83	292.45	5,752.6	271.1	-656.3	-271.1	0.00	0.00	
5,900.0	7.83	292.45	5,851.7	276.3	-668.9	-276.3	0.00	0.00	
6,000.0	7.83	292.45	5,950.7	281.5	-681.4	-281.5	0.00	0.00	
6,049.7	7.83	292.45	6,000.0	284.1	-687.7	-284.1	0.00	0.00	Teepee Buttes (*if present)
6,100.0	7.83	292.45	6,049.8	286.7	-694.0	-286.7	0.00	0.00	
6,200.0	7.83	292.45	6,148.9	291.9	-706.6	-291.9	0.00	0.00	
6,300.0	7.83	292.45	6,247.9	297.1	-719.2	-297.1	0.00	0.00	
6,400.0	7.83	292.45	6,347.0	302.3	-731.8	-302.3	0.00	0.00	
6,500.0	7.83	292.45	6,446.1	307.5	-744.4	-307.5	0.00	0.00	
6,600.0	7.83	292.45	6,545.1	312.8	-757.0	-312.8	0.00	0.00	
6,700.0	7.83	292.45	6,644.2	318.0	-769.6	-318.0	0.00	0.00	
6,725.1	7.83	292.45	6,669.0	319.3	-772.8	-319.3	0.00	0.00	Start build/turn @ 6725' MD
6,800.0	8.53	237.99	6,743.3	318.3	-782.2	-318.3	10.00	0.93	
6,900.0	16.18	205.99	6,841.0	301.8	-794.7	-301.8	10.00	7.65	
7,000.0	25.49	195.47	6,934.4	268.4	-806.5	-268.4	10.00	9.31	
7,100.0	35.17	190.40	7,020.6	219.2	-817.5	-219.2	10.00	9.67	
7,157.6	40.81	188.47	7,066.0	184.3	-823.3	-184.3	10.00	9.79	Sharon Springs
7,173.6	42.38	188.01	7,078.0	173.7	-824.8	-173.7	10.00	9.82	Niobrara
7,200.0	44.97	187.31	7,097.1	155.7	-827.2	-155.7	10.00	9.83	
7,300.0	54.84	185.14	7,161.4	79.7	-835.4	-79.7	10.00	9.86	
7,400.0	64.73	183.44	7,211.7	-6.3	-841.8	6.3	10.00	9.89	
7,500.0	74.64	182.00	7,246.4	-99.9	-846.2	99.9	10.00	9.91	
7,547.3	79.32	181.37	7,257.0	-145.9	-847.6	145.9	10.00	9.92	B Chalk
7,600.0	84.55	180.69	7,264.4	-198.1	-848.5	198.1	10.00	9.92	
7,654.9	90.00	180.00	7,267.0	-252.9	-848.8	252.9	10.00	9.92	LP @ 7267' TVD; 90°
7,700.0	90.00	180.00	7,267.0	-298.0	-848.8	298.0	0.00	0.00	
7,800.0	90.00	180.00	7,267.0	-398.0	-848.8	398.0	0.00	0.00	
7,900.0	90.00	180.00	7,267.0	-498.0	-848.8	498.0	0.00	0.00	
8,000.0	90.00	180.00	7,267.0	-598.0	-848.8	598.0	0.00	0.00	
8,100.0	90.00	180.00	7,267.0	-698.0	-848.8	698.0	0.00	0.00	
8,200.0	90.00	180.00	7,267.0	-798.0	-848.8	798.0	0.00	0.00	
8,300.0	90.00	180.00	7,267.0	-898.0	-848.8	898.0	0.00	0.00	
8,400.0	90.00	180.00	7,267.0	-998.0	-848.8	998.0	0.00	0.00	
8,500.0	90.00	180.00	7,267.0	-1,098.0	-848.8	1,098.0	0.00	0.00	
8,600.0	90.00	180.00	7,267.0	-1,198.0	-848.8	1,198.0	0.00	0.00	
8,700.0	90.00	180.00	7,267.0	-1,298.0	-848.8	1,298.0	0.00	0.00	
8,800.0	90.00	180.00	7,267.0	-1,398.0	-848.8	1,398.0	0.00	0.00	
8,900.0	90.00	180.00	7,267.0	-1,498.0	-848.8	1,498.0	0.00	0.00	
9,000.0	90.00	180.00	7,267.0	-1,598.0	-848.8	1,598.0	0.00	0.00	
9,100.0	90.00	180.00	7,267.0	-1,698.0	-848.8	1,698.0	0.00	0.00	
9,200.0	90.00	180.00	7,267.0	-1,798.0	-848.8	1,798.0	0.00	0.00	
9,300.0	90.00	180.00	7,267.0	-1,898.0	-848.8	1,898.0	0.00	0.00	

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Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2A-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	-1,998.0	-848.8	1,998.0	0.00	0.00	
9,500.0	90.00	180.00	7,267.0	-2,098.0	-848.8	2,098.0	0.00	0.00	
9,600.0	90.00	180.00	7,267.0	-2,198.0	-848.8	2,198.0	0.00	0.00	
9,700.0	90.00	180.00	7,267.0	-2,298.0	-848.8	2,298.0	0.00	0.00	
9,800.0	90.00	180.00	7,267.0	-2,398.0	-848.8	2,398.0	0.00	0.00	
9,900.0	90.00	180.00	7,267.0	-2,498.0	-848.8	2,498.0	0.00	0.00	
10,000.0	90.00	180.00	7,267.0	-2,598.0	-848.8	2,598.0	0.00	0.00	
10,100.0	90.00	180.00	7,267.0	-2,698.0	-848.8	2,698.0	0.00	0.00	
10,200.0	90.00	180.00	7,267.0	-2,798.0	-848.8	2,798.0	0.00	0.00	
10,300.0	90.00	180.00	7,267.0	-2,898.0	-848.8	2,898.0	0.00	0.00	
10,400.0	90.00	180.00	7,267.0	-2,998.0	-848.8	2,998.0	0.00	0.00	
10,500.0	90.00	180.00	7,267.0	-3,098.0	-848.8	3,098.0	0.00	0.00	
10,600.0	90.00	180.00	7,267.0	-3,198.0	-848.8	3,198.0	0.00	0.00	
10,700.0	90.00	180.00	7,267.0	-3,298.0	-848.8	3,298.0	0.00	0.00	
10,800.0	90.00	180.00	7,267.0	-3,398.0	-848.8	3,398.0	0.00	0.00	
10,900.0	90.00	180.00	7,267.0	-3,498.0	-848.8	3,498.0	0.00	0.00	
11,000.0	90.00	180.00	7,267.0	-3,598.0	-848.8	3,598.0	0.00	0.00	
11,100.0	90.00	180.00	7,267.0	-3,698.0	-848.8	3,698.0	0.00	0.00	
11,200.0	90.00	180.00	7,267.0	-3,798.0	-848.8	3,798.0	0.00	0.00	
11,300.0	90.00	180.00	7,267.0	-3,898.0	-848.8	3,898.0	0.00	0.00	
11,400.0	90.00	180.00	7,267.0	-3,998.0	-848.8	3,998.0	0.00	0.00	
11,500.0	90.00	180.00	7,267.0	-4,098.0	-848.8	4,098.0	0.00	0.00	
11,600.0	90.00	180.00	7,267.0	-4,198.0	-848.8	4,198.0	0.00	0.00	
11,700.0	90.00	180.00	7,267.0	-4,298.0	-848.8	4,298.0	0.00	0.00	
11,800.0	90.00	180.00	7,267.0	-4,398.0	-848.8	4,398.0	0.00	0.00	
11,878.9	90.00	180.00	7,267.0	-4,476.9	-848.8	4,476.9	0.00	0.00	TD at 11878.9 - Lochbuie 2A-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 2A-31H PBHL - plan hits target center - Point	0.00	0.00	7,267.0	-4,476.9	-848.8	1,244,474.20	3,219,853.93	40.001790	-104.715230

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
0.0	0.0	Shannon			
1,225.7	1,221.0	Fox Hills - BASE			
4,707.2	4,670.0	Sussex			
5,006.0	4,966.0	Sussex Marker			
6,049.7	6,000.0	Teepee Buttes (*if present)			
7,157.6	7,066.0	Sharon Springs			
7,173.6	7,078.0	Niobrara			
7,547.3	7,257.0	B Chalk			

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site:	S31-T1N-R65W (Lochbuie)	**North Reference:**	True
Well:	Lochbuie 2A-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
200.0	200.0	0.0	0.0	KOP @ 200'
983.5	981.0	20.4	-49.4	EOB; Inc=7.83°
6,725.1	6,669.0	319.3	-772.8	Start build/turn @ 6725' MD
7,654.9	7,267.0	-252.9	-848.8	LP @ 7267' TVD; 90°
11,878.9	7,267.0	-4,476.9	-848.8	TD at 11878.9

EnCana Oil & Gas (USA) Inc

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

Anticollision Report

22 May, 2013

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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	11,878.9	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						Out of range
LOCHBUIE 1 (EXISTING) - ENCANA WELL - NO SURV						Out of range
LOCHBUIE 21-31 (EXISTING) - ENCANA WELL - NO SU						Out of range
Lochbuie 2B-31H - Hz - Plan #1	200.0	199.0	8.4	7.8	12.908	CC, ES
Lochbuie 2B-31H - Hz - Plan #1	11,878.9	12,081.4	421.1	285.2	3.099	SF
Lochbuie 2C-31H - Hz - Plan #1	200.0	199.0	19.6	19.0	30.118	CC, ES
Lochbuie 2C-31H - Hz - Plan #1	700.0	699.4	36.4	34.0	15.059	SF
Lochbuie 2D-31H - Hz - Plan #1	200.0	199.0	30.8	30.2	47.328	CC, ES
Lochbuie 2D-31H - Hz - Plan #1	600.0	598.7	44.0	42.0	21.505	SF
Lochbuie 2E-31H - Hz - Plan #1	200.0	199.0	39.2	38.6	60.235	CC, ES
Lochbuie 2E-31H - Hz - Plan #1	600.0	598.0	53.0	51.0	25.902	SF
Lochbuie 2F-31H - Hz - Plan #1	200.0	199.0	50.4	49.8	77.445	CC, ES
Lochbuie 2F-31H - Hz - Plan #1	700.0	696.1	74.1	71.7	30.929	SF
Lochbuie 2G-31H - Hz - Plan #1	200.0	199.0	58.8	58.2	90.353	CC, ES
Lochbuie 2G-31H - Hz - Plan #1	600.0	593.4	84.8	82.8	41.492	SF
LUTZ 1 (EXISTING) - ENCANA WELL - NO SURVEYS						Out of range
LUTZ 1A (EXISTING) - VESSELS WELL - NO SURVEYS						Out of range

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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	90.06	0.0	8.4	8.5				
100.0	100.0	99.0	99.0	0.2	0.2	90.06	0.0	8.4	8.4	8.1	0.30	27.809	
200.0	200.0	199.0	199.0	0.3	0.3	90.06	0.0	8.4	8.4	7.8	0.65	12.908	CC, ES
300.0	300.0	299.0	299.0	0.5	0.5	159.67	0.0	8.4	9.2	8.2	1.00	9.215	
400.0	400.0	399.1	399.1	0.7	0.7	162.04	0.5	7.7	11.0	9.6	1.35	8.117	
500.0	499.9	499.3	499.3	0.9	0.9	162.23	2.0	5.5	12.9	11.1	1.70	7.555	
600.0	599.7	599.5	599.3	1.1	1.0	161.09	4.4	1.9	14.9	12.8	2.06	7.245	
700.0	699.4	699.7	699.4	1.3	1.2	159.11	7.9	-3.1	17.1	14.7	2.42	7.072	
800.0	798.9	799.9	799.3	1.5	1.4	156.63	12.3	-9.6	19.5	16.7	2.79	6.980	
900.0	898.3	899.9	898.9	1.8	1.7	155.03	17.3	-16.9	22.7	19.5	3.18	7.141	
1,000.0	997.4	999.8	998.4	2.0	1.9	155.40	22.3	-24.2	27.4	23.9	3.56	7.712	
1,100.0	1,096.5	1,099.6	1,097.8	2.3	2.1	156.11	27.3	-31.5	32.7	28.8	3.94	8.313	
1,200.0	1,195.5	1,199.5	1,197.3	2.6	2.3	156.62	32.3	-38.8	38.0	33.7	4.32	8.807	
1,300.0	1,294.6	1,299.4	1,296.8	2.9	2.6	157.01	37.3	-46.1	43.4	38.7	4.70	9.220	
1,400.0	1,393.7	1,399.2	1,396.2	3.2	2.8	157.31	42.3	-53.4	48.7	43.6	5.09	9.570	
1,500.0	1,492.7	1,499.1	1,495.7	3.5	3.0	157.55	47.3	-60.7	54.0	48.5	5.47	9.870	
1,600.0	1,591.8	1,598.9	1,595.2	3.8	3.2	157.75	52.3	-68.0	59.3	53.5	5.85	10.131	
1,700.0	1,690.9	1,698.8	1,694.6	4.0	3.5	157.92	57.3	-75.3	64.6	58.4	6.24	10.359	
1,800.0	1,789.9	1,798.6	1,794.1	4.3	3.7	158.06	62.3	-82.6	69.9	63.3	6.62	10.561	
1,900.0	1,889.0	1,898.5	1,893.6	4.6	3.9	158.18	67.3	-89.9	75.3	68.3	7.01	10.740	
2,000.0	1,988.1	1,998.4	1,993.0	4.9	4.2	158.29	72.3	-97.1	80.6	73.2	7.39	10.900	
2,100.0	2,087.1	2,098.2	2,092.5	5.2	4.4	158.38	77.3	-104.4	85.9	78.1	7.78	11.044	
2,200.0	2,186.2	2,198.1	2,191.9	5.5	4.6	158.46	82.3	-111.7	91.2	83.1	8.16	11.175	
2,300.0	2,285.3	2,297.9	2,291.4	5.8	4.9	158.53	87.3	-119.0	96.5	88.0	8.55	11.293	
2,400.0	2,384.3	2,397.8	2,390.9	6.1	5.1	158.60	92.4	-126.3	101.9	92.9	8.93	11.402	
2,500.0	2,483.4	2,497.7	2,490.3	6.4	5.3	158.66	97.4	-133.6	107.2	97.9	9.32	11.501	
2,600.0	2,582.5	2,597.5	2,589.8	6.7	5.6	158.71	102.4	-140.9	112.5	102.8	9.70	11.592	
2,700.0	2,681.5	2,697.4	2,689.3	7.0	5.8	158.76	107.4	-148.2	117.8	107.7	10.09	11.677	
2,800.0	2,780.6	2,797.2	2,788.7	7.3	6.0	158.80	112.4	-155.5	123.1	112.7	10.48	11.755	
2,900.0	2,879.7	2,897.1	2,888.2	7.6	6.3	158.84	117.4	-162.8	128.4	117.6	10.86	11.827	
3,000.0	2,978.7	2,996.9	2,987.7	7.9	6.5	158.88	122.4	-170.1	133.8	122.5	11.25	11.895	
3,100.0	3,077.8	3,096.8	3,087.1	8.2	6.7	158.91	127.4	-177.4	139.1	127.5	11.63	11.957	
3,200.0	3,176.9	3,196.7	3,186.6	8.5	7.0	158.94	132.4	-184.7	144.4	132.4	12.02	12.016	
3,300.0	3,275.9	3,296.5	3,286.1	8.8	7.2	158.97	137.4	-192.0	149.7	137.3	12.40	12.071	
3,400.0	3,375.0	3,396.4	3,385.5	9.0	7.4	159.00	142.4	-199.3	155.0	142.3	12.79	12.123	
3,500.0	3,474.1	3,496.2	3,485.0	9.3	7.6	159.03	147.4	-206.6	160.4	147.2	13.18	12.172	
3,600.0	3,573.1	3,596.1	3,584.5	9.6	7.9	159.05	152.4	-213.9	165.7	152.1	13.56	12.218	
3,700.0	3,672.2	3,696.0	3,683.9	9.9	8.1	159.07	157.4	-221.2	171.0	157.1	13.95	12.261	
3,800.0	3,771.3	3,795.8	3,783.4	10.2	8.3	159.09	162.4	-228.5	176.3	162.0	14.33	12.302	
3,900.0	3,870.3	3,895.7	3,882.9	10.5	8.6	159.11	167.4	-235.8	181.6	166.9	14.72	12.341	
4,000.0	3,969.4	3,995.5	3,982.3	10.8	8.8	159.13	172.4	-243.1	187.0	171.9	15.10	12.378	
4,100.0	4,068.5	4,095.4	4,081.8	11.1	9.0	159.15	177.4	-250.4	192.3	176.8	15.49	12.413	
4,200.0	4,167.5	4,195.2	4,181.3	11.4	9.3	159.17	182.4	-257.7	197.6	181.7	15.88	12.447	
4,300.0	4,266.6	4,295.1	4,280.7	11.7	9.5	159.18	187.4	-265.0	202.9	186.7	16.26	12.478	
4,400.0	4,365.7	4,395.0	4,380.2	12.0	9.7	159.20	192.4	-272.3	208.2	191.6	16.65	12.509	
4,500.0	4,464.7	4,494.8	4,479.7	12.3	10.0	159.21	197.4	-279.6	213.6	196.5	17.03	12.538	
4,600.0	4,563.8	4,594.7	4,579.1	12.6	10.2	159.23	202.4	-286.9	218.9	201.5	17.42	12.565	
4,700.0	4,662.9	4,694.5	4,678.6	12.9	10.4	159.24	207.4	-294.2	224.2	206.4	17.81	12.592	
4,800.0	4,761.9	4,794.4	4,778.1	13.2	10.7	159.25	212.4	-301.5	229.5	211.3	18.19	12.617	
4,900.0	4,861.0	4,894.3	4,877.5	13.5	10.9	159.26	217.4	-308.8	234.8	216.3	18.58	12.641	
5,000.0	4,960.1	4,994.1	4,977.0	13.8	11.1	159.27	222.4	-316.1	240.2	221.2	18.96	12.664	
5,100.0	5,059.1	5,094.0	5,076.5	14.1	11.4	159.29	227.4	-323.4	245.5	226.1	19.35	12.686	

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 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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
5,200.0	5,158.2	5,193.8	5,175.9	14.4	11.6	159.30	232.4	-330.7	250.8	231.1	19.74	12.708	
5,300.0	5,257.3	5,293.7	5,275.4	14.7	11.8	159.31	237.4	-338.0	256.1	236.0	20.12	12.728	
5,400.0	5,356.3	5,393.5	5,374.9	15.0	12.1	159.32	242.4	-345.3	261.4	240.9	20.51	12.748	
5,500.0	5,455.4	5,493.4	5,474.3	15.3	12.3	159.32	247.4	-352.6	266.8	245.9	20.89	12.767	
5,600.0	5,554.5	5,593.3	5,573.8	15.6	12.5	159.33	252.4	-359.9	272.1	250.8	21.28	12.786	
5,700.0	5,653.5	5,693.1	5,673.2	15.9	12.8	159.34	257.4	-367.2	277.4	255.7	21.67	12.803	
5,800.0	5,752.6	5,793.0	5,772.7	16.2	13.0	159.35	262.4	-374.4	282.7	260.7	22.05	12.821	
5,900.0	5,851.7	5,892.8	5,872.2	16.4	13.2	159.36	267.4	-381.7	288.0	265.6	22.44	12.837	
6,000.0	5,950.7	5,992.7	5,971.6	16.7	13.5	159.37	272.4	-389.0	293.4	270.5	22.82	12.853	
6,100.0	6,049.8	6,092.6	6,071.1	17.0	13.7	159.37	277.4	-396.3	298.7	275.5	23.21	12.868	
6,200.0	6,148.9	6,192.4	6,170.6	17.3	13.9	159.38	282.4	-403.6	304.0	280.4	23.60	12.883	
6,300.0	6,247.9	6,292.3	6,270.0	17.6	14.2	159.39	287.4	-410.9	309.3	285.3	23.98	12.898	
6,400.0	6,347.0	6,392.1	6,369.5	17.9	14.4	159.39	292.4	-418.2	314.6	290.3	24.37	12.912	
6,500.0	6,446.1	6,492.0	6,469.0	18.2	14.6	159.40	297.4	-425.5	320.0	295.2	24.76	12.925	
6,600.0	6,545.1	6,591.8	6,568.4	18.5	14.9	159.41	302.4	-432.8	325.3	300.1	25.14	12.938	
6,700.0	6,644.2	6,691.7	6,667.9	18.8	15.1	159.41	307.4	-440.1	330.6	305.1	25.53	12.951	
6,800.0	6,743.3	6,791.4	6,767.2	19.1	15.3	-147.04	312.4	-447.4	335.8	309.9	25.93	12.949	
6,900.0	6,841.0	6,888.8	6,864.2	19.2	15.6	-118.65	317.3	-454.5	341.4	314.8	26.58	12.841	
7,000.0	6,934.4	6,986.2	6,961.3	19.3	15.8	-113.60	319.3	-461.6	349.7	322.5	27.26	12.830	
7,100.0	7,020.6	7,092.0	7,065.6	19.4	15.8	-114.09	304.3	-469.3	361.4	333.9	27.45	13.167	
7,200.0	7,097.1	7,206.7	7,173.5	19.4	15.9	-116.23	266.6	-477.2	375.3	348.2	27.03	13.883	
7,300.0	7,161.4	7,331.8	7,280.0	19.5	15.8	-118.82	202.0	-485.0	389.9	363.8	26.13	14.920	
7,400.0	7,211.7	7,468.1	7,377.1	19.7	15.8	-121.27	107.1	-492.2	403.5	378.4	25.13	16.059	
7,500.0	7,246.4	7,615.2	7,453.7	20.0	16.0	-123.18	-17.9	-497.8	414.2	389.6	24.63	16.815	
7,600.0	7,264.4	7,770.4	7,497.4	20.4	16.6	-124.26	-166.3	-501.0	420.2	394.9	25.28	16.621	
7,700.0	7,267.0	7,902.5	7,504.0	20.9	17.4	-124.42	-298.0	-501.5	421.1	394.3	26.83	15.695	
7,800.0	7,267.0	8,002.5	7,504.0	21.5	18.1	-124.42	-398.0	-501.5	421.1	392.8	28.30	14.881	
7,900.0	7,267.0	8,102.5	7,504.0	22.3	19.0	-124.42	-498.0	-501.5	421.1	391.1	29.98	14.048	
8,000.0	7,267.0	8,202.5	7,504.0	23.1	20.0	-124.42	-598.0	-501.5	421.1	389.3	31.83	13.230	
8,100.0	7,267.0	8,302.5	7,504.0	24.1	21.2	-124.42	-698.0	-501.5	421.1	387.3	33.83	12.447	
8,200.0	7,267.0	8,402.5	7,504.0	25.1	22.4	-124.42	-798.0	-501.5	421.1	385.1	35.96	11.711	
8,300.0	7,267.0	8,502.5	7,504.0	26.3	23.6	-124.42	-898.0	-501.5	421.1	382.9	38.18	11.028	
8,400.0	7,267.0	8,602.5	7,504.0	27.5	24.9	-124.42	-998.0	-501.5	421.1	380.6	40.50	10.398	
8,500.0	7,267.0	8,702.5	7,504.0	28.7	26.3	-124.42	-1,098.0	-501.5	421.1	378.2	42.88	9.820	
8,600.0	7,267.0	8,802.5	7,504.0	30.0	27.7	-124.42	-1,198.0	-501.5	421.1	375.8	45.33	9.290	
8,700.0	7,267.0	8,902.5	7,504.0	31.4	29.2	-124.42	-1,298.0	-501.5	421.1	373.3	47.82	8.805	
8,800.0	7,267.0	9,002.5	7,504.0	32.7	30.7	-124.42	-1,398.0	-501.5	421.1	370.7	50.36	8.361	
8,900.0	7,267.0	9,102.5	7,504.0	34.2	32.2	-124.42	-1,498.0	-501.5	421.1	368.1	52.94	7.954	
9,000.0	7,267.0	9,202.5	7,504.0	35.6	33.7	-124.42	-1,598.0	-501.5	421.1	365.5	55.55	7.580	
9,100.0	7,267.0	9,302.5	7,504.0	37.1	35.3	-124.42	-1,698.0	-501.5	421.1	362.9	58.19	7.237	
9,200.0	7,267.0	9,402.5	7,504.0	38.6	36.9	-124.42	-1,798.0	-501.5	421.1	360.2	60.85	6.920	
9,300.0	7,267.0	9,502.5	7,504.0	40.1	38.4	-124.42	-1,898.0	-501.5	421.1	357.6	63.53	6.628	
9,400.0	7,267.0	9,602.5	7,504.0	41.6	40.1	-124.42	-1,998.0	-501.5	421.1	354.9	66.23	6.358	
9,500.0	7,267.0	9,702.5	7,504.0	43.2	41.7	-124.42	-2,098.0	-501.5	421.1	352.1	68.95	6.107	
9,600.0	7,267.0	9,802.5	7,504.0	44.8	43.3	-124.42	-2,198.0	-501.5	421.1	349.4	71.68	5.874	
9,700.0	7,267.0	9,902.5	7,504.0	46.4	44.9	-124.42	-2,298.0	-501.5	421.1	346.7	74.43	5.658	
9,800.0	7,267.0	10,002.5	7,504.0	47.9	46.6	-124.42	-2,398.0	-501.5	421.1	343.9	77.18	5.456	
9,900.0	7,267.0	10,102.5	7,504.0	49.6	48.2	-124.42	-2,498.0	-501.5	421.1	341.1	79.95	5.267	
10,000.0	7,267.0	10,202.5	7,504.0	51.2	49.9	-124.42	-2,598.0	-501.5	421.1	338.4	82.72	5.090	
10,100.0	7,267.0	10,302.5	7,504.0	52.8	51.6	-124.42	-2,698.0	-501.5	421.1	335.6	85.51	4.925	
10,200.0	7,267.0	10,402.5	7,504.0	54.4	53.2	-124.42	-2,798.0	-501.5	421.1	332.8	88.30	4.769	
10,300.0	7,267.0	10,502.5	7,504.0	56.1	54.9	-124.42	-2,898.0	-501.5	421.1	330.0	91.10	4.622	

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 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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
10,400.0	7,267.0	10,602.5	7,504.0	57.7	56.6	-124.42	-2,998.0	-501.5	421.1	327.2	93.91	4.484	
10,500.0	7,267.0	10,702.5	7,504.0	59.4	58.3	-124.42	-3,098.0	-501.5	421.1	324.4	96.72	4.354	
10,600.0	7,267.0	10,802.5	7,504.0	61.0	60.0	-124.42	-3,198.0	-501.5	421.1	321.6	99.53	4.231	
10,700.0	7,267.0	10,902.5	7,504.0	62.7	61.6	-124.42	-3,298.0	-501.5	421.1	318.7	102.35	4.114	
10,800.0	7,267.0	11,002.5	7,504.0	64.3	63.3	-124.42	-3,398.0	-501.5	421.1	315.9	105.18	4.004	
10,900.0	7,267.0	11,102.5	7,504.0	66.0	65.0	-124.42	-3,498.0	-501.5	421.1	313.1	108.01	3.899	
11,000.0	7,267.0	11,202.5	7,504.0	67.7	66.7	-124.42	-3,598.0	-501.5	421.1	310.3	110.84	3.799	
11,100.0	7,267.0	11,302.5	7,504.0	69.4	68.5	-124.42	-3,698.0	-501.5	421.1	307.4	113.68	3.704	
11,200.0	7,267.0	11,402.5	7,504.0	71.1	70.2	-124.42	-3,798.0	-501.5	421.1	304.6	116.52	3.614	
11,300.0	7,267.0	11,502.5	7,504.0	72.8	71.9	-124.42	-3,898.0	-501.5	421.1	301.7	119.36	3.528	
11,400.0	7,267.0	11,602.5	7,504.0	74.4	73.6	-124.42	-3,998.0	-501.5	421.1	298.9	122.21	3.446	
11,500.0	7,267.0	11,702.5	7,504.0	76.1	75.3	-124.42	-4,098.0	-501.5	421.1	296.0	125.05	3.367	
11,600.0	7,267.0	11,802.5	7,504.0	77.8	77.0	-124.42	-4,198.0	-501.5	421.1	293.2	127.91	3.292	
11,700.0	7,267.0	11,902.5	7,504.0	79.5	78.7	-124.42	-4,298.0	-501.5	421.1	290.3	130.76	3.220	
11,800.0	7,267.0	12,002.5	7,504.0	81.2	80.4	-124.42	-4,398.0	-501.5	421.1	287.5	133.61	3.152	
11,878.9	7,267.0	12,081.4	7,504.0	82.6	81.8	-124.42	-4,476.9	-501.5	421.1	285.2	135.87	3.099	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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	90.05	0.0	19.6	19.6				
100.0	100.0	99.0	99.0	0.2	0.2	90.05	0.0	19.6	19.6	19.3	0.30	64.887	
200.0	200.0	199.0	199.0	0.3	0.3	90.05	0.0	19.6	19.6	19.0	0.65	30.118	CC, ES
300.0	300.0	299.0	299.0	0.5	0.5	158.53	0.0	19.6	20.4	19.4	1.00	20.414	
400.0	400.0	399.0	399.0	0.7	0.7	160.93	0.0	19.6	22.9	21.5	1.35	16.951	
500.0	499.9	499.1	499.1	0.9	0.8	162.38	0.8	19.2	26.6	24.9	1.70	15.642	
600.0	599.7	599.3	599.2	1.1	1.0	161.65	3.1	18.1	31.1	29.0	2.05	15.135	
700.0	699.4	699.4	699.3	1.3	1.2	159.59	7.0	16.2	36.4	34.0	2.41	15.059	SF
800.0	798.9	799.3	799.0	1.5	1.4	157.28	12.1	13.7	42.7	39.9	2.79	15.327	
900.0	898.3	899.0	898.5	1.8	1.6	156.28	17.4	11.1	50.6	47.5	3.16	16.009	
1,000.0	997.4	998.5	997.9	2.0	1.8	156.22	22.6	8.6	60.2	56.6	3.54	16.976	
1,100.0	1,096.5	1,098.0	1,097.2	2.3	2.0	156.40	27.8	6.1	70.2	66.3	3.93	17.880	
1,200.0	1,195.5	1,197.5	1,196.5	2.6	2.2	156.53	33.0	3.5	80.3	76.0	4.31	18.617	
1,300.0	1,294.6	1,297.0	1,295.8	2.9	2.4	156.63	38.2	1.0	90.4	85.7	4.70	19.227	
1,400.0	1,393.7	1,396.5	1,395.2	3.2	2.6	156.72	43.4	-1.5	100.4	95.3	5.09	19.741	
1,500.0	1,492.7	1,496.0	1,494.5	3.5	2.8	156.79	48.6	-4.1	110.5	105.0	5.48	20.180	
1,600.0	1,591.8	1,595.5	1,593.8	3.8	3.0	156.84	53.8	-6.6	120.6	114.7	5.86	20.558	
1,700.0	1,690.9	1,695.0	1,693.1	4.0	3.2	156.89	59.0	-9.1	130.6	124.4	6.25	20.888	
1,800.0	1,789.9	1,794.4	1,792.5	4.3	3.4	156.93	64.2	-11.7	140.7	134.1	6.64	21.178	
1,900.0	1,889.0	1,893.9	1,891.8	4.6	3.6	156.97	69.4	-14.2	150.8	143.7	7.03	21.435	
2,000.0	1,988.1	1,993.4	1,991.1	4.9	3.8	157.00	74.6	-16.7	160.8	153.4	7.42	21.664	
2,100.0	2,087.1	2,092.9	2,090.4	5.2	4.0	157.03	79.8	-19.3	170.9	163.1	7.81	21.869	
2,200.0	2,186.2	2,192.4	2,189.8	5.5	4.2	157.05	85.0	-21.8	181.0	172.8	8.21	22.055	
2,300.0	2,285.3	2,291.9	2,289.1	5.8	4.4	157.07	90.2	-24.3	191.0	182.4	8.60	22.223	
2,400.0	2,384.3	2,391.4	2,388.4	6.1	4.6	157.09	95.4	-26.9	201.1	192.1	8.99	22.376	
2,500.0	2,483.4	2,490.9	2,487.7	6.4	4.8	157.11	100.6	-29.4	211.2	201.8	9.38	22.516	
2,600.0	2,582.5	2,590.4	2,587.0	6.7	5.0	157.13	105.8	-31.9	221.2	211.5	9.77	22.644	
2,700.0	2,681.5	2,689.9	2,686.4	7.0	5.2	157.14	111.0	-34.5	231.3	221.2	10.16	22.762	
2,800.0	2,780.6	2,789.4	2,785.7	7.3	5.4	157.15	116.2	-37.0	241.4	230.8	10.55	22.872	
2,900.0	2,879.7	2,888.9	2,885.0	7.6	5.6	157.17	121.4	-39.5	251.5	240.5	10.95	22.973	
3,000.0	2,978.7	2,988.3	2,984.3	7.9	5.8	157.18	126.6	-42.1	261.5	250.2	11.34	23.067	
3,100.0	3,077.8	3,087.8	3,083.7	8.2	6.0	157.19	131.8	-44.6	271.6	259.9	11.73	23.155	
3,200.0	3,176.9	3,187.3	3,183.0	8.5	6.2	157.20	137.0	-47.1	281.7	269.5	12.12	23.237	
3,300.0	3,275.9	3,286.8	3,282.3	8.8	6.4	157.21	142.2	-49.7	291.7	279.2	12.51	23.314	
3,400.0	3,375.0	3,386.3	3,381.6	9.0	6.6	157.22	147.4	-52.2	301.8	288.9	12.90	23.386	
3,500.0	3,474.1	3,485.8	3,481.0	9.3	6.8	157.22	152.6	-54.7	311.9	298.6	13.30	23.454	
3,600.0	3,573.1	3,585.3	3,580.3	9.6	7.0	157.23	157.8	-57.3	321.9	308.2	13.69	23.518	
3,700.0	3,672.2	3,684.8	3,679.6	9.9	7.2	157.24	163.0	-59.8	332.0	317.9	14.08	23.578	
3,800.0	3,771.3	3,784.3	3,778.9	10.2	7.4	157.25	168.2	-62.3	342.1	327.6	14.47	23.634	
3,900.0	3,870.3	3,883.8	3,878.3	10.5	7.6	157.25	173.4	-64.9	352.1	337.3	14.87	23.688	
4,000.0	3,969.4	3,983.3	3,977.6	10.8	7.8	157.26	178.6	-67.4	362.2	346.9	15.26	23.739	
4,100.0	4,068.5	4,082.8	4,076.9	11.1	8.0	157.26	183.8	-69.9	372.3	356.6	15.65	23.788	
4,200.0	4,167.5	4,182.2	4,176.2	11.4	8.2	157.27	189.0	-72.5	382.3	366.3	16.04	23.834	
4,300.0	4,266.6	4,281.7	4,275.5	11.7	8.4	157.27	194.2	-75.0	392.4	376.0	16.43	23.877	
4,400.0	4,365.7	4,381.2	4,374.9	12.0	8.6	157.28	199.4	-77.5	402.5	385.7	16.83	23.919	
4,500.0	4,464.7	4,480.7	4,474.2	12.3	8.8	157.28	204.6	-80.1	412.5	395.3	17.22	23.959	
4,600.0	4,563.8	4,580.2	4,573.5	12.6	9.0	157.29	209.8	-82.6	422.6	405.0	17.61	23.997	
4,700.0	4,662.9	4,679.7	4,672.8	12.9	9.2	157.29	215.0	-85.1	432.7	414.7	18.00	24.033	
4,800.0	4,761.9	4,779.2	4,772.2	13.2	9.4	157.30	220.2	-87.7	442.8	424.4	18.40	24.068	
4,900.0	4,861.0	4,878.7	4,871.5	13.5	9.6	157.30	225.4	-90.2	452.8	434.0	18.79	24.101	
5,000.0	4,960.1	4,978.2	4,970.8	13.8	9.8	157.30	230.6	-92.7	462.9	443.7	19.18	24.133	
5,100.0	5,059.1	5,077.7	5,070.1	14.1	10.0	157.31	235.8	-95.3	473.0	453.4	19.57	24.163	

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 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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	5,158.2	5,177.2	5,169.5	14.4	10.2	157.31	241.0	-97.8	483.0	463.1	19.97	24.193	
5,300.0	5,257.3	5,276.7	5,268.8	14.7	10.4	157.31	246.2	-100.3	493.1	472.7	20.36	24.221	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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	90.05	0.0	30.8	30.8				
100.0	100.0	99.0	99.0	0.2	0.2	90.05	0.0	30.8	30.8	30.5	0.30	101.965	
200.0	200.0	199.0	199.0	0.3	0.3	90.05	0.0	30.8	30.8	30.2	0.65	47.328	CC, ES
300.0	300.0	299.0	299.0	0.5	0.5	158.20	0.0	30.8	31.6	30.6	1.00	31.616	
400.0	400.0	399.0	399.0	0.7	0.7	159.83	0.0	30.8	34.1	32.7	1.35	25.243	
500.0	499.9	498.9	498.9	0.9	0.8	162.07	0.0	30.8	38.2	36.5	1.70	22.479	
600.0	599.7	598.7	598.7	1.1	1.0	164.50	0.0	30.8	44.0	42.0	2.05	21.505	SF
700.0	699.4	698.4	698.4	1.3	1.2	166.81	0.0	30.8	51.6	49.2	2.40	21.555	
800.0	798.9	797.9	797.9	1.5	1.4	168.85	0.0	30.8	61.0	58.3	2.74	22.247	
900.0	898.3	897.3	897.3	1.8	1.5	170.57	0.0	30.8	72.2	69.1	3.09	23.368	
1,000.0	997.4	996.4	996.4	2.0	1.7	171.99	0.0	30.8	85.0	81.6	3.43	24.777	
1,100.0	1,096.5	1,095.5	1,095.5	2.3	1.9	173.09	0.0	30.8	98.6	94.8	3.78	26.079	
1,200.0	1,195.5	1,194.5	1,194.5	2.6	2.1	173.93	0.0	30.8	112.1	108.0	4.13	27.170	
1,300.0	1,294.6	1,293.6	1,293.6	2.9	2.2	174.59	0.0	30.8	125.7	121.2	4.47	28.096	
1,400.0	1,393.7	1,392.7	1,392.7	3.2	2.4	175.12	0.0	30.8	139.2	134.4	4.82	28.892	
1,500.0	1,492.7	1,491.7	1,491.7	3.5	2.6	175.55	0.0	30.8	152.8	147.7	5.17	29.584	
1,600.0	1,591.8	1,590.8	1,590.8	3.8	2.8	175.92	0.0	30.8	166.4	160.9	5.51	30.189	
1,700.0	1,690.9	1,689.9	1,689.9	4.0	2.9	176.23	0.0	30.8	180.0	174.2	5.86	30.725	
1,800.0	1,789.9	1,788.9	1,788.9	4.3	3.1	176.49	0.0	30.8	193.6	187.4	6.21	31.201	
1,900.0	1,889.0	1,888.0	1,888.0	4.6	3.3	176.72	0.0	30.8	207.2	200.7	6.55	31.627	
2,000.0	1,988.1	1,987.1	1,987.1	4.9	3.4	176.92	0.0	30.8	220.8	214.0	6.90	32.011	
2,100.0	2,087.1	2,086.1	2,086.1	5.2	3.6	177.10	0.0	30.8	234.5	227.2	7.25	32.358	
2,200.0	2,186.2	2,185.2	2,185.2	5.5	3.8	177.26	0.0	30.8	248.1	240.5	7.59	32.674	
2,300.0	2,285.3	2,284.3	2,284.3	5.8	4.0	177.40	0.0	30.8	261.7	253.8	7.94	32.962	
2,400.0	2,384.3	2,383.3	2,383.3	6.1	4.1	177.53	0.0	30.8	275.3	267.0	8.29	33.227	
2,500.0	2,483.4	2,482.4	2,482.4	6.4	4.3	177.65	0.0	30.8	288.9	280.3	8.63	33.470	
2,600.0	2,582.5	2,581.5	2,581.5	6.7	4.5	177.76	0.0	30.8	302.6	293.6	8.98	33.695	
2,700.0	2,681.5	2,680.5	2,680.5	7.0	4.7	177.85	0.0	30.8	316.2	306.8	9.33	33.903	
2,800.0	2,780.6	2,779.6	2,779.6	7.3	4.8	177.94	0.0	30.8	329.8	320.1	9.67	34.096	
2,900.0	2,879.7	2,878.7	2,878.7	7.6	5.0	178.02	0.0	30.8	343.4	333.4	10.02	34.276	
3,000.0	2,978.7	2,977.7	2,977.7	7.9	5.2	178.10	0.0	30.8	357.0	346.7	10.37	34.444	
3,100.0	3,077.8	3,076.8	3,076.8	8.2	5.3	178.17	0.0	30.8	370.7	360.0	10.71	34.601	
3,200.0	3,176.9	3,175.9	3,175.9	8.5	5.5	178.23	0.0	30.8	384.3	373.2	11.06	34.749	
3,300.0	3,275.9	3,274.9	3,274.9	8.8	5.7	178.29	0.0	30.8	397.9	386.5	11.41	34.887	
3,400.0	3,375.0	3,374.0	3,374.0	9.0	5.9	178.35	0.0	30.8	411.5	399.8	11.75	35.017	
3,500.0	3,474.1	3,473.1	3,473.1	9.3	6.0	178.40	0.0	30.8	425.2	413.1	12.10	35.140	
3,600.0	3,573.1	3,572.1	3,572.1	9.6	6.2	178.45	0.0	30.8	438.8	426.4	12.45	35.256	
3,700.0	3,672.2	3,671.2	3,671.2	9.9	6.4	178.50	0.0	30.8	452.4	439.6	12.79	35.366	
3,800.0	3,771.3	3,770.3	3,770.3	10.2	6.6	178.54	0.0	30.8	466.1	452.9	13.14	35.470	
3,900.0	3,870.3	3,869.3	3,869.3	10.5	6.7	178.58	0.0	30.8	479.7	466.2	13.49	35.568	
4,000.0	3,969.4	3,968.4	3,968.4	10.8	6.9	178.62	0.0	30.8	493.3	479.5	13.83	35.662	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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 2E-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	39.2	39.2				
100.0	100.0	99.0	99.0	0.2	0.2	90.05	0.0	39.2	39.2	38.9	0.30	129.773	
200.0	200.0	199.0	199.0	0.3	0.3	90.05	0.0	39.2	39.2	38.6	0.65	60.235	CC, ES
300.0	300.0	299.0	299.0	0.5	0.5	158.08	0.0	39.2	40.0	39.0	1.00	40.017	
400.0	400.0	399.0	399.0	0.7	0.7	159.39	0.0	39.2	42.5	41.1	1.35	31.466	
500.0	499.9	498.9	498.9	0.9	0.8	161.26	0.0	39.2	46.6	44.9	1.70	27.411	
600.0	599.7	598.0	598.0	1.1	1.0	162.79	0.4	39.9	53.0	51.0	2.05	25.902	SF
700.0	699.4	696.8	696.7	1.3	1.2	163.37	1.9	42.0	62.5	60.1	2.40	26.075	
800.0	798.9	795.1	795.0	1.5	1.4	163.30	4.3	45.5	74.9	72.2	2.75	27.258	
900.0	898.3	892.8	892.5	1.8	1.6	162.86	7.6	50.3	90.3	87.2	3.11	29.084	
1,000.0	997.4	989.8	989.3	2.0	1.8	162.23	11.9	56.4	108.6	105.1	3.47	31.320	
1,100.0	1,096.5	1,087.0	1,085.9	2.3	2.0	161.48	16.9	63.8	128.6	124.8	3.84	33.508	
1,200.0	1,195.5	1,184.9	1,183.4	2.6	2.2	160.85	22.2	71.5	148.9	144.7	4.22	35.323	
1,300.0	1,294.6	1,282.8	1,280.9	2.9	2.4	160.38	27.5	79.1	169.2	164.6	4.59	36.825	
1,400.0	1,393.7	1,380.7	1,378.4	3.2	2.6	160.01	32.8	86.8	189.4	184.5	4.97	38.086	
1,500.0	1,492.7	1,478.6	1,475.8	3.5	2.8	159.71	38.1	94.4	209.7	204.4	5.36	39.160	
1,600.0	1,591.8	1,576.5	1,573.3	3.8	3.1	159.46	43.3	102.1	230.0	224.3	5.74	40.084	
1,700.0	1,690.9	1,674.4	1,670.8	4.0	3.3	159.25	48.6	109.7	250.3	244.2	6.12	40.888	
1,800.0	1,789.9	1,772.4	1,768.3	4.3	3.5	159.08	53.9	117.4	270.6	264.1	6.51	41.592	
1,900.0	1,889.0	1,870.3	1,865.7	4.6	3.8	158.92	59.2	125.0	290.9	284.0	6.89	42.215	
2,000.0	1,988.1	1,968.2	1,963.2	4.9	4.0	158.79	64.5	132.7	311.2	303.9	7.28	42.769	
2,100.0	2,087.1	2,066.1	2,060.7	5.2	4.2	158.68	69.7	140.3	331.5	323.9	7.66	43.265	
2,200.0	2,186.2	2,164.0	2,158.1	5.5	4.5	158.57	75.0	148.0	351.8	343.8	8.05	43.711	
2,300.0	2,285.3	2,261.9	2,255.6	5.8	4.7	158.48	80.3	155.6	372.1	363.7	8.44	44.115	
2,400.0	2,384.3	2,359.9	2,353.1	6.1	4.9	158.40	85.6	163.3	392.4	383.6	8.82	44.483	
2,500.0	2,483.4	2,457.8	2,450.6	6.4	5.1	158.33	90.9	170.9	412.8	403.5	9.21	44.818	
2,600.0	2,582.5	2,555.7	2,548.0	6.7	5.4	158.26	96.2	178.6	433.1	423.5	9.60	45.126	
2,700.0	2,681.5	2,653.6	2,645.5	7.0	5.6	158.20	101.4	186.3	453.4	443.4	9.98	45.409	
2,800.0	2,780.6	2,751.5	2,743.0	7.3	5.8	158.14	106.7	193.9	473.7	463.3	10.37	45.670	
2,900.0	2,879.7	2,849.4	2,840.5	7.6	6.1	158.09	112.0	201.6	494.0	483.2	10.76	45.912	

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 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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	90.05	0.0	50.4	50.4				
100.0	100.0	99.0	99.0	0.2	0.2	90.05	0.0	50.4	50.4	50.1	0.30	166.851	
200.0	200.0	199.0	199.0	0.3	0.3	90.05	0.0	50.4	50.4	49.8	0.65	77.445	CC, ES
300.0	300.0	299.0	299.0	0.5	0.5	157.97	0.0	50.4	51.2	50.2	1.00	51.219	
400.0	400.0	399.0	399.0	0.7	0.7	159.01	0.0	50.4	53.7	52.3	1.35	39.764	
500.0	499.9	498.9	498.9	0.9	0.8	160.55	0.0	50.4	57.8	56.1	1.70	33.991	
600.0	599.7	597.7	597.7	1.1	1.0	162.02	0.3	51.2	64.3	62.3	2.05	31.410	
700.0	699.4	696.1	696.1	1.3	1.2	163.00	1.2	53.6	74.1	71.7	2.40	30.929	SF
800.0	798.9	794.1	793.9	1.5	1.4	163.55	2.6	57.5	87.1	84.3	2.74	31.728	
900.0	898.3	891.3	891.0	1.8	1.6	163.78	4.7	62.9	103.2	100.1	3.09	33.355	
1,000.0	997.4	987.7	987.2	2.0	1.8	163.79	7.4	69.8	122.5	119.0	3.45	35.527	
1,100.0	1,096.5	1,083.5	1,082.5	2.3	2.0	163.60	10.5	78.2	143.7	139.9	3.81	37.770	
1,200.0	1,195.5	1,178.6	1,177.0	2.6	2.2	163.21	14.3	87.9	166.5	162.3	4.17	39.941	
1,300.0	1,294.6	1,273.0	1,270.6	2.9	2.4	162.69	18.5	99.1	190.7	186.1	4.53	42.050	
1,400.0	1,393.7	1,366.7	1,363.4	3.2	2.7	162.11	23.3	111.5	216.3	211.4	4.90	44.113	
1,500.0	1,492.7	1,463.1	1,458.7	3.5	3.0	161.55	28.5	125.1	242.6	237.3	5.28	45.952	
1,600.0	1,591.8	1,559.6	1,554.1	3.8	3.2	161.10	33.6	138.6	268.9	263.3	5.66	47.541	
1,700.0	1,690.9	1,656.0	1,649.4	4.0	3.5	160.74	38.8	152.2	295.3	289.3	6.04	48.924	
1,800.0	1,789.9	1,752.5	1,744.8	4.3	3.8	160.43	44.0	165.7	321.7	315.2	6.42	50.140	
1,900.0	1,889.0	1,848.9	1,840.1	4.6	4.1	160.17	49.1	179.3	348.0	341.2	6.80	51.216	
2,000.0	1,988.1	1,945.4	1,935.5	4.9	4.4	159.95	54.3	192.8	374.4	367.2	7.18	52.175	
2,100.0	2,087.1	2,041.8	2,030.8	5.2	4.7	159.75	59.5	206.4	400.8	393.2	7.56	53.035	
2,200.0	2,186.2	2,138.2	2,126.2	5.5	5.0	159.58	64.7	219.9	427.2	419.2	7.94	53.810	
2,300.0	2,285.3	2,234.7	2,221.5	5.8	5.3	159.43	69.8	233.5	453.6	445.2	8.32	54.512	
2,400.0	2,384.3	2,331.1	2,316.9	6.1	5.6	159.30	75.0	247.1	480.0	471.3	8.70	55.151	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lochbuie 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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	-0.1	58.8	58.8				
100.0	100.0	99.0	99.0	0.2	0.2	90.05	-0.1	58.8	58.8	58.5	0.30	194.660	
200.0	200.0	199.0	199.0	0.3	0.3	90.05	-0.1	58.8	58.8	58.2	0.65	90.353	CC, ES
300.0	300.0	298.0	298.0	0.5	0.5	157.68	0.2	59.6	60.4	59.4	1.00	60.530	
400.0	400.0	396.9	396.8	0.7	0.7	157.87	0.9	62.1	65.3	64.0	1.35	48.517	
500.0	499.9	495.4	495.3	0.9	0.9	158.13	2.1	66.1	73.5	71.8	1.69	43.339	
600.0	599.7	593.4	593.1	1.1	1.1	158.41	3.9	71.7	84.8	82.8	2.04	41.492	SF
700.0	699.4	690.9	690.3	1.3	1.3	158.66	6.0	78.9	99.4	97.0	2.40	41.505	
800.0	798.9	787.5	786.5	1.5	1.5	158.88	8.6	87.6	117.2	114.5	2.75	42.650	
900.0	898.3	883.3	881.7	1.8	1.7	159.05	11.7	97.8	138.2	135.1	3.10	44.523	
1,000.0	997.4	978.0	975.6	2.0	2.0	159.19	15.2	109.3	162.3	158.8	3.46	46.872	
1,100.0	1,096.5	1,071.8	1,068.5	2.3	2.3	159.25	19.1	122.2	188.4	184.6	3.83	49.250	
1,200.0	1,195.5	1,164.8	1,160.3	2.6	2.6	159.17	23.4	136.4	216.0	211.8	4.19	51.546	
1,300.0	1,294.6	1,257.0	1,251.0	2.9	2.9	158.98	28.0	151.9	245.1	240.5	4.56	53.778	
1,400.0	1,393.7	1,351.4	1,343.8	3.2	3.2	158.76	33.1	168.8	275.2	270.3	4.93	55.817	
1,500.0	1,492.7	1,446.8	1,437.4	3.5	3.5	158.57	38.3	185.9	305.4	300.1	5.31	57.549	
1,600.0	1,591.8	1,542.1	1,531.1	3.8	3.9	158.42	43.4	203.0	335.5	329.9	5.68	59.044	
1,700.0	1,690.9	1,637.4	1,624.7	4.0	4.2	158.30	48.6	220.0	365.7	359.6	6.06	60.346	
1,800.0	1,789.9	1,732.8	1,718.4	4.3	4.6	158.19	53.8	237.1	395.9	389.4	6.44	61.490	
1,900.0	1,889.0	1,828.1	1,812.0	4.6	4.9	158.10	58.9	254.2	426.0	419.2	6.82	62.504	
2,000.0	1,988.1	1,923.5	1,905.7	4.9	5.3	158.02	64.1	271.3	456.2	449.0	7.19	63.407	
2,100.0	2,087.1	2,018.8	1,999.4	5.2	5.6	157.95	69.2	288.4	486.4	478.8	7.57	64.217	

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 2A-31H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Reference Site:	S31-T1N-R65W (Lochbuie)	**MD Reference:**	WELL @ 5021.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lochbuie 2A-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 @ 5021.0ft (Original Well Elev)	Coordinates are relative to: Lochbuie 2A-31H
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: 0.51°