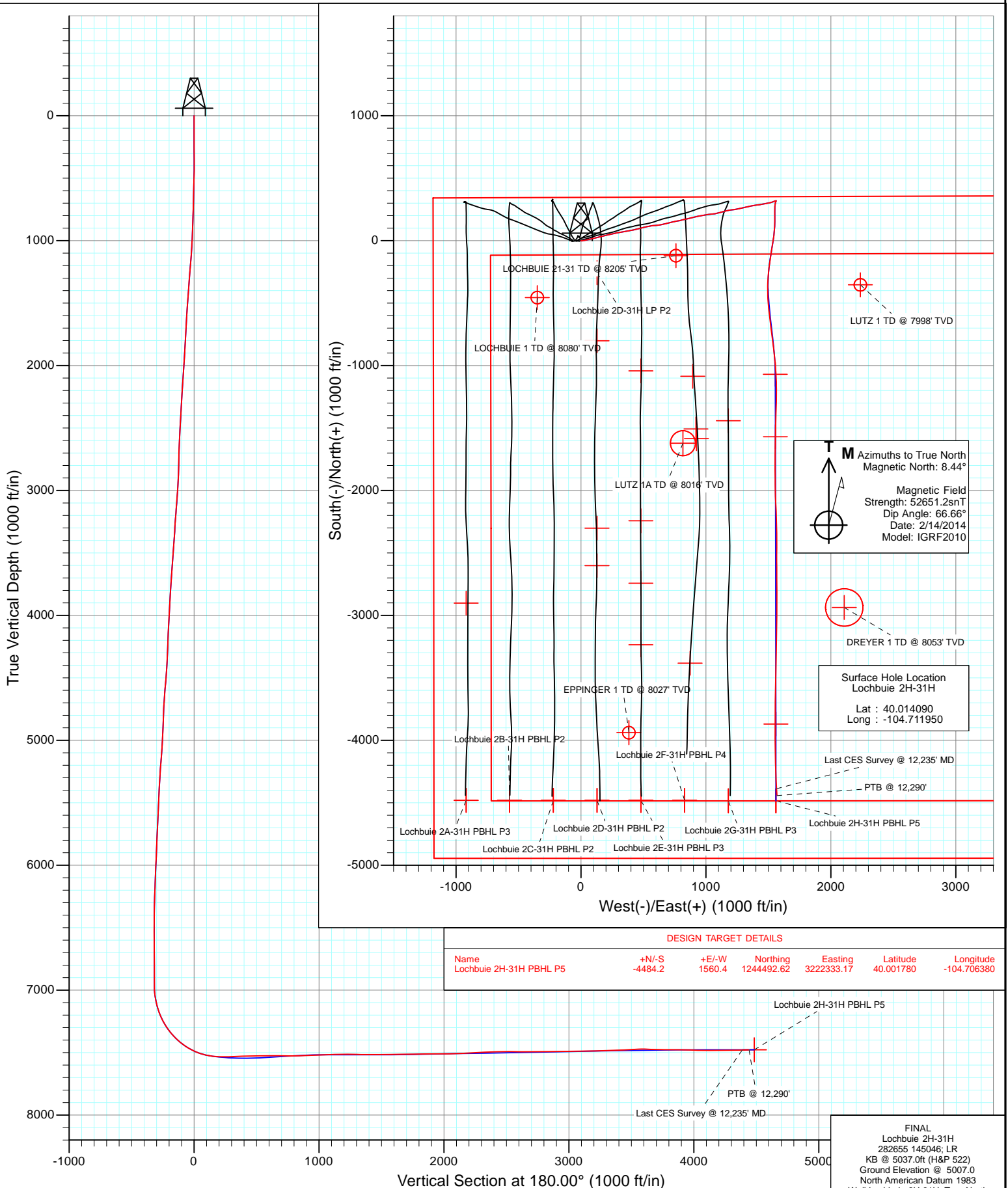


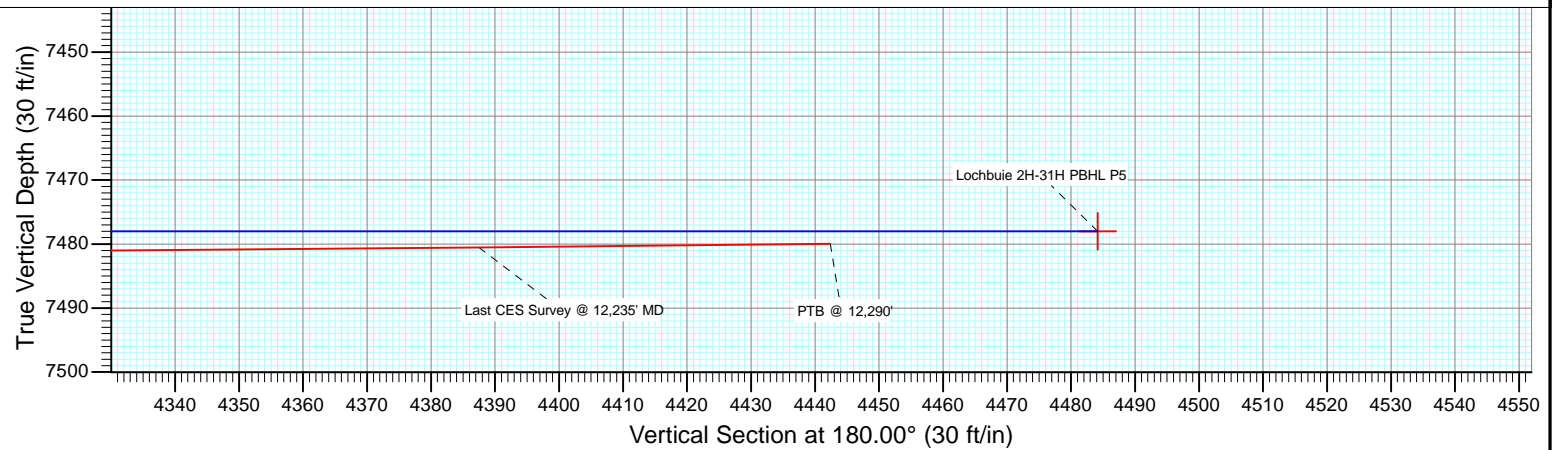
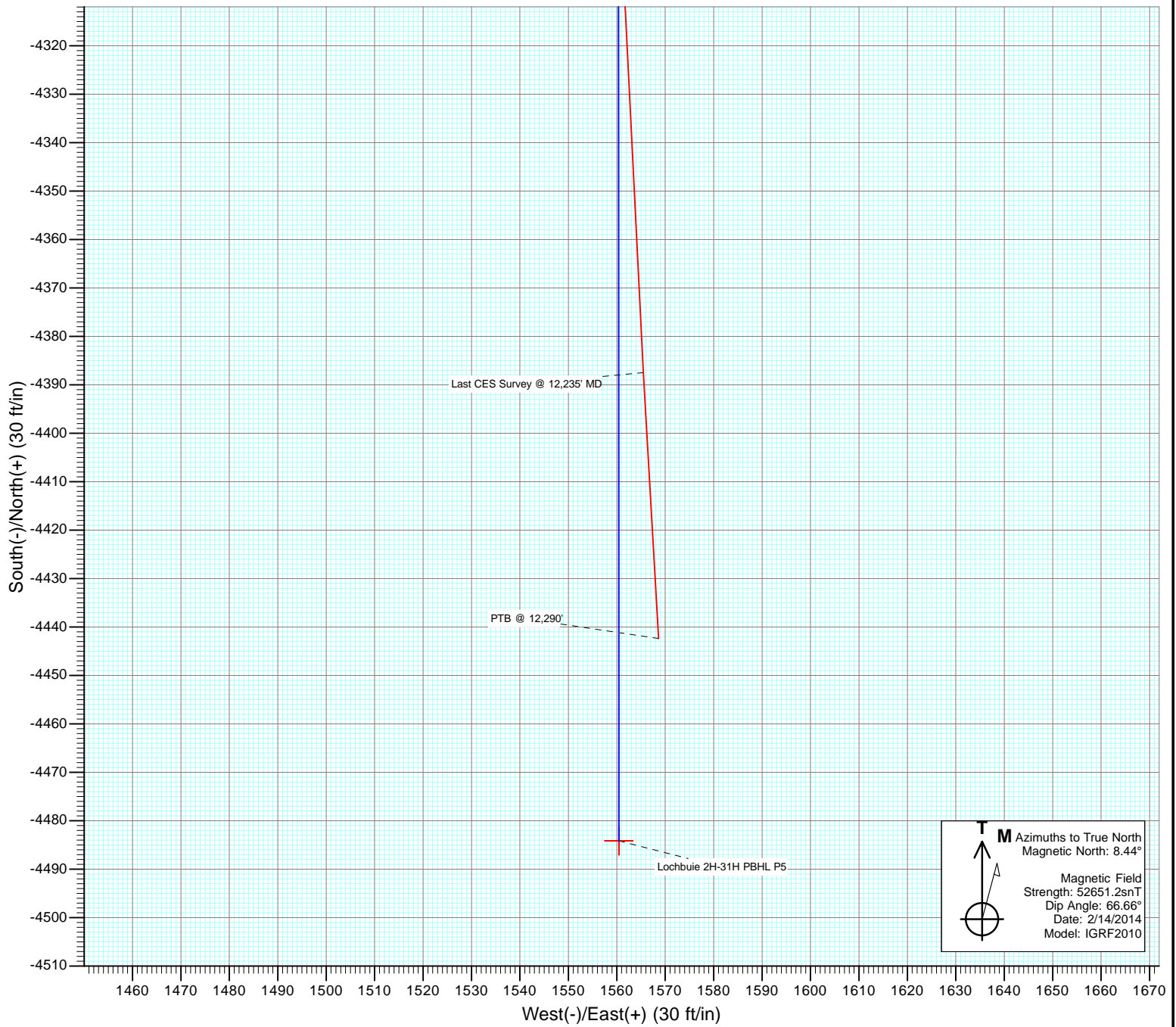


Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2H-31H
Wellbore: Hz
Design: FINAL





Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2H-31H
Wellbore: Hz
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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 2H-31H					
Well Position	+N/-S	0.0 ft	Northing:	1,248,962.74 ft	Latitude:	40.014090
	+E/-W	0.0 ft	Easting:	3,220,732.96 ft	Longitude:	-104.711950
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	2/14/2014	8.44	66.66	52,651

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	180.00	

Survey Program	Date	2/25/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
165.0	12,290.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
165.0	0.60	104.00	165.0	-0.2	0.8	0.2	0.36	0.36		
258.0	1.40	112.10	258.0	-0.8	2.4	0.8	0.87	0.86		
350.0	2.20	101.20	349.9	-1.5	5.1	1.5	0.94	0.87		
442.0	3.60	75.10	441.8	-1.1	9.7	1.1	2.05	1.52		
534.0	5.10	74.40	533.6	0.7	16.4	-0.7	1.63	1.63		
626.0	6.80	79.90	625.1	2.8	25.7	-2.8	1.95	1.85		
718.0	8.70	77.70	716.2	5.2	37.9	-5.2	2.09	2.07		
810.0	9.60	79.50	807.0	8.1	52.2	-8.1	1.03	0.98		
902.0	10.20	79.40	897.7	11.0	67.7	-11.0	0.65	0.65		
996.0	12.50	78.20	989.8	14.6	85.9	-14.6	2.46	2.45		
1,086.0	15.30	76.70	1,077.2	19.3	107.0	-19.3	3.14	3.11		
1,178.0	17.70	75.20	1,165.4	25.7	132.3	-25.7	2.65	2.61		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,269.0	19.40	75.20	1,251.7	33.1	160.3	-33.1	1.87	1.87	
1,361.0	17.50	78.00	1,338.9	39.9	188.6	-39.9	2.28	-2.07	
1,453.0	16.80	76.30	1,426.8	45.9	215.1	-45.9	0.94	-0.76	
1,544.0	16.70	75.40	1,514.0	52.3	240.5	-52.3	0.31	-0.11	
1,639.0	16.80	78.30	1,604.9	58.5	267.1	-58.5	0.89	0.11	
1,733.0	17.70	80.90	1,694.7	63.5	294.6	-63.5	1.26	0.96	
1,827.0	18.00	80.70	1,784.2	68.2	323.0	-68.2	0.33	0.32	
1,922.0	18.50	80.30	1,874.4	73.1	352.3	-73.1	0.54	0.53	
2,016.0	19.10	79.70	1,963.4	78.3	382.2	-78.3	0.67	0.64	
2,111.0	18.20	77.30	2,053.4	84.4	411.9	-84.4	1.24	-0.95	
2,205.0	16.70	76.80	2,143.1	90.7	439.4	-90.7	1.60	-1.60	
2,300.0	14.00	76.50	2,234.7	96.5	463.9	-96.5	2.84	-2.84	
2,395.0	13.30	75.10	2,327.0	102.0	485.6	-102.0	0.81	-0.74	
2,489.0	13.20	78.00	2,418.5	107.0	506.6	-107.0	0.71	-0.11	
2,584.0	13.60	77.40	2,510.9	111.7	528.1	-111.7	0.45	0.42	
2,678.0	14.00	77.40	2,602.2	116.6	550.0	-116.6	0.43	0.43	
2,773.0	14.50	84.20	2,694.3	120.3	573.0	-120.3	1.84	0.53	
2,868.0	14.90	88.10	2,786.2	121.9	597.0	-121.9	1.12	0.42	
2,962.0	16.70	81.80	2,876.6	124.2	622.5	-124.2	2.64	1.91	
3,057.0	17.20	76.80	2,967.5	129.4	649.7	-129.4	1.62	0.53	
3,152.0	16.70	75.70	3,058.4	135.9	676.6	-135.9	0.63	-0.53	
3,246.0	16.70	76.10	3,148.4	142.5	702.8	-142.5	0.12	0.00	
3,341.0	19.60	77.60	3,238.7	149.2	731.6	-149.2	3.09	3.05	
3,435.0	17.60	80.40	3,327.8	155.0	761.0	-155.0	2.33	-2.13	
3,530.0	17.80	78.10	3,418.3	160.4	789.4	-160.4	0.77	0.21	
3,624.0	18.20	75.50	3,507.7	167.0	817.7	-167.0	0.95	0.43	
3,719.0	17.40	76.70	3,598.1	174.0	845.8	-174.0	0.93	-0.84	
3,814.0	17.70	78.00	3,688.7	180.3	873.8	-180.3	0.52	0.32	
3,908.0	15.20	76.10	3,778.8	186.2	899.7	-186.2	2.72	-2.66	
4,003.0	14.20	78.10	3,870.7	191.6	923.2	-191.6	1.18	-1.05	
4,097.0	14.70	77.80	3,961.8	196.5	946.2	-196.5	0.54	0.53	
4,192.0	15.60	78.50	4,053.5	201.6	970.5	-201.6	0.97	0.95	
4,287.0	15.30	80.60	4,145.0	206.2	995.3	-206.2	0.67	-0.32	
4,381.0	17.10	83.10	4,235.3	209.9	1,021.3	-209.9	2.05	1.91	
4,476.0	19.10	85.00	4,325.6	212.9	1,050.7	-212.9	2.19	2.11	
4,571.0	19.20	77.30	4,415.3	217.7	1,081.4	-217.7	2.66	0.11	
4,665.0	18.30	75.70	4,504.4	224.7	1,110.8	-224.7	1.10	-0.96	
4,760.0	15.70	73.50	4,595.2	232.1	1,137.5	-232.1	2.82	-2.74	
4,854.0	16.00	76.10	4,685.6	238.8	1,162.3	-238.8	0.82	0.32	
4,949.0	13.30	80.30	4,777.5	243.8	1,185.8	-243.8	3.05	-2.84	
5,043.0	14.90	84.30	4,868.7	246.8	1,208.5	-246.8	1.99	1.70	
5,138.0	17.40	81.80	4,959.9	250.0	1,234.7	-250.0	2.73	2.63	
5,232.0	19.10	78.90	5,049.2	255.0	1,263.7	-255.0	2.05	1.81	
5,327.0	17.90	74.80	5,139.3	261.8	1,293.1	-261.8	1.86	-1.26	
5,422.0	17.20	75.90	5,229.9	269.1	1,320.8	-269.1	0.82	-0.74	
5,516.0	17.10	80.60	5,319.7	274.7	1,347.9	-274.7	1.48	-0.11	
5,611.0	15.20	79.20	5,411.0	279.3	1,373.9	-279.3	2.04	-2.00	
5,705.0	16.00	81.40	5,501.5	283.6	1,398.8	-283.6	1.06	0.85	
5,800.0	16.50	81.40	5,592.7	287.6	1,425.1	-287.6	0.53	0.53	
5,894.0	13.80	80.40	5,683.4	291.4	1,449.4	-291.4	2.89	-2.87	
5,989.0	13.30	80.40	5,775.8	295.1	1,471.3	-295.1	0.53	-0.53	
6,084.0	12.60	78.10	5,868.4	299.1	1,492.2	-299.1	0.91	-0.74	
6,178.0	10.20	75.70	5,960.5	303.3	1,510.3	-303.3	2.60	-2.55	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
6,273.0	8.60	73.50	6,054.2	307.4	1,525.3	-307.4	1.73	-1.68	
6,367.0	7.10	74.50	6,147.3	310.9	1,537.6	-310.9	1.60	-1.60	
6,462.0	4.90	61.80	6,241.8	314.4	1,546.8	-314.4	2.69	-2.32	
6,557.0	3.70	69.00	6,336.6	317.4	1,553.3	-317.4	1.38	-1.26	
6,651.0	3.30	79.80	6,430.4	319.0	1,558.8	-319.0	0.82	-0.43	
6,746.0	1.40	103.30	6,525.3	319.2	1,562.6	-319.2	2.20	-2.00	
6,840.0	0.70	171.40	6,619.3	318.4	1,563.8	-318.4	1.39	-0.74	
6,935.0	0.50	237.50	6,714.3	317.6	1,563.5	-317.6	0.71	-0.21	
7,029.0	0.70	278.10	6,808.3	317.4	1,562.6	-317.4	0.49	0.21	
7,124.0	0.90	296.80	6,903.3	317.8	1,561.4	-317.8	0.34	0.21	
7,222.0	2.80	204.10	7,001.2	316.0	1,559.7	-316.0	3.04	1.94	
7,270.0	9.10	196.20	7,048.9	311.3	1,558.2	-311.3	13.20	13.12	
7,317.0	12.10	191.80	7,095.1	302.9	1,556.1	-302.9	6.61	6.38	
7,365.0	16.40	187.70	7,141.7	291.2	1,554.2	-291.2	9.20	8.96	
7,412.0	20.70	186.50	7,186.2	276.4	1,552.4	-276.4	9.18	9.15	
7,459.0	26.00	179.80	7,229.3	257.8	1,551.5	-257.8	12.60	11.28	
7,506.0	30.20	178.10	7,270.8	235.7	1,551.9	-235.7	9.10	8.94	
7,554.0	34.80	180.10	7,311.3	209.9	1,552.3	-209.9	9.84	9.58	
7,601.0	40.40	181.10	7,348.5	181.3	1,552.0	-181.3	11.99	11.91	
7,648.0	45.80	180.90	7,382.8	149.2	1,551.4	-149.2	11.49	11.49	
7,696.0	49.50	182.90	7,415.1	113.7	1,550.2	-113.7	8.30	7.71	
7,744.0	54.40	184.80	7,444.7	76.0	1,547.6	-76.0	10.67	10.21	
7,791.0	60.50	186.70	7,470.0	36.6	1,543.7	-36.6	13.42	12.98	
7,838.0	66.90	189.30	7,490.8	-5.1	1,537.8	5.1	14.49	13.62	
7,885.0	72.00	189.70	7,507.3	-48.4	1,530.5	48.4	10.88	10.85	
7,942.0	77.60	189.10	7,522.2	-102.7	1,521.5	102.7	9.88	9.82	
7,980.0	82.50	189.20	7,528.8	-139.6	1,515.6	139.6	12.90	12.89	
8,095.0	92.10	185.30	7,534.2	-253.4	1,501.1	253.4	9.01	8.35	
8,189.0	91.40	181.90	7,531.3	-347.2	1,495.2	347.2	3.69	-0.74	
8,284.0	92.00	177.50	7,528.5	-442.1	1,495.7	442.1	4.67	0.63	
8,378.0	90.50	174.40	7,526.5	-535.9	1,502.4	535.9	3.66	-1.60	
8,473.0	90.20	173.10	7,525.9	-630.3	1,512.7	630.3	1.40	-0.32	
8,568.0	89.00	172.30	7,526.5	-724.5	1,524.8	724.5	1.52	-1.26	
8,662.0	90.20	172.80	7,527.2	-817.7	1,537.0	817.7	1.38	1.28	
8,757.0	93.20	174.10	7,524.4	-912.0	1,547.8	912.0	3.44	3.16	
8,851.0	93.00	175.40	7,519.3	-1,005.5	1,556.4	1,005.5	1.40	-0.21	
8,946.0	90.90	177.70	7,516.1	-1,100.3	1,562.1	1,100.3	3.28	-2.21	
9,040.0	90.70	179.80	7,514.8	-1,194.2	1,564.1	1,194.2	2.24	-0.21	
9,135.0	88.40	181.30	7,515.5	-1,289.2	1,563.2	1,289.2	2.89	-2.42	
9,230.0	90.20	181.70	7,516.7	-1,384.2	1,560.7	1,384.2	1.94	1.89	
9,324.0	90.30	181.10	7,516.2	-1,478.1	1,558.4	1,478.1	0.65	0.11	
9,419.0	90.70	181.10	7,515.4	-1,573.1	1,556.6	1,573.1	0.42	0.42	
9,513.0	90.50	181.10	7,514.4	-1,667.1	1,554.8	1,667.1	0.21	-0.21	
9,608.0	91.00	180.00	7,513.2	-1,762.1	1,553.9	1,762.1	1.27	0.53	
9,702.0	91.10	180.10	7,511.5	-1,856.1	1,553.8	1,856.1	0.15	0.11	
9,797.0	90.00	178.80	7,510.6	-1,951.1	1,554.7	1,951.1	1.79	-1.16	
9,892.0	90.40	178.50	7,510.2	-2,046.0	1,557.0	2,046.0	0.53	0.42	
9,986.0	93.10	177.50	7,507.4	-2,139.9	1,560.2	2,139.9	3.06	2.87	
10,081.0	93.30	177.50	7,502.1	-2,234.7	1,564.4	2,234.7	0.21	0.21	
10,175.0	92.20	179.60	7,497.5	-2,328.5	1,566.8	2,328.5	2.52	-1.17	
10,270.0	91.90	179.90	7,494.1	-2,423.5	1,567.2	2,423.5	0.45	-0.32	
10,365.0	89.80	180.50	7,492.7	-2,518.5	1,566.8	2,518.5	2.30	-2.21	
10,459.0	88.60	179.20	7,494.0	-2,612.5	1,567.1	2,612.5	1.88	-1.28	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
10,554.0	90.70	180.50	7,494.6	-2,707.4	1,567.3	2,707.4	2.60	2.21	
10,648.0	90.90	179.90	7,493.3	-2,801.4	1,567.0	2,801.4	0.67	0.21	
10,743.0	90.60	179.30	7,492.1	-2,896.4	1,567.7	2,896.4	0.71	-0.32	
10,837.0	91.10	181.00	7,490.7	-2,990.4	1,567.4	2,990.4	1.88	0.53	
10,932.0	90.20	180.10	7,489.6	-3,085.4	1,566.5	3,085.4	1.34	-0.95	
11,027.0	91.30	180.60	7,488.4	-3,180.4	1,565.9	3,180.4	1.27	1.16	
11,121.0	90.80	181.60	7,486.6	-3,274.3	1,564.1	3,274.3	1.19	-0.53	
11,216.0	93.50	181.30	7,483.1	-3,369.2	1,561.7	3,369.2	2.86	2.84	
11,310.0	93.80	180.80	7,477.1	-3,463.0	1,560.0	3,463.0	0.62	0.32	
11,405.0	91.00	181.70	7,473.1	-3,557.9	1,557.9	3,557.9	3.10	-2.95	
11,500.0	87.60	181.20	7,474.3	-3,652.9	1,555.5	3,652.9	3.62	-3.58	
11,594.0	88.70	180.50	7,477.3	-3,746.8	1,554.1	3,746.8	1.39	1.17	
11,689.0	90.10	180.70	7,478.3	-3,841.8	1,553.1	3,841.8	1.49	1.47	
11,783.0	88.10	179.40	7,479.8	-3,935.8	1,553.1	3,935.8	2.54	-2.13	
11,878.0	89.00	178.90	7,482.2	-4,030.7	1,554.5	4,030.7	1.08	0.95	
11,972.0	89.10	178.40	7,483.7	-4,124.7	1,556.7	4,124.7	0.54	0.11	
12,067.0	91.90	178.90	7,482.9	-4,219.7	1,558.9	4,219.7	2.99	2.95	
12,161.0	90.30	177.60	7,481.1	-4,313.6	1,561.8	4,313.6	2.19	-1.70	
12,235.0	90.60	176.70	7,480.5	-4,387.5	1,565.5	4,387.5	1.28	0.41	Last CES Survey @ 12,235' MD
12,290.0	90.60	176.70	7,479.9	-4,442.4	1,568.6	4,442.4	0.00	0.00	PTB @ 12,290'

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Lochbuie 2H-31H 8900'	0.00	0.00	7,518.0	-1,069.8	1,555.2	1,247,906.79	3,222,297.57	40.011153	-104.706398
- actual wellpath misses target center by 5.6ft at 8915.1ft MD (7516.7 TVD, -1069.4 N, 1560.6 E)									
- Point									
Lochbuie 2H-31H PBHL	0.00	0.00	7,504.0	-4,484.2	1,560.4	1,244,492.62	3,222,333.17	40.001780	-104.706380
- actual wellpath misses target center by 48.9ft at 12290.0ft MD (7479.9 TVD, -4442.4 N, 1568.6 E)									
- Point									
Lochbuie 2H-31H PBHL	0.00	0.00	7,510.0	-4,484.2	1,560.4	1,244,492.62	3,222,333.17	40.001780	-104.706380
- actual wellpath misses target center by 52.1ft at 12290.0ft MD (7479.9 TVD, -4442.4 N, 1568.6 E)									
- Point									
Lochbuie 2H-31H 9400'	0.00	0.00	7,518.0	-1,569.8	1,556.6	1,247,406.82	3,222,303.48	40.009780	-104.706393
- actual wellpath misses target center by 2.5ft at 9415.7ft MD (7515.5 TVD, -1569.8 N, 1556.7 E)									
- Point									
Lochbuie 2H-31H PBHL	0.00	0.00	7,478.0	-4,484.2	1,560.4	1,244,492.62	3,222,333.17	40.001780	-104.706380
- actual wellpath misses target center by 42.6ft at 12290.0ft MD (7479.9 TVD, -4442.4 N, 1568.6 E)									
- Point									
Lochbuie 2H-31H 11,700'	0.00	0.00	7,478.0	-3,869.8	1,560.3	1,245,106.95	3,222,327.58	40.003466	-104.706380
- actual wellpath misses target center by 7.4ft at 11717.0ft MD (7478.4 TVD, -3869.8 N, 1552.9 E)									
- Point									

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
12,235.0	7,480.5	-4,387.5	1,565.5	Last CES Survey @ 12,235' MD
12,290.0	7,479.9	-4,442.4	1,568.6	PTB @ 12,290'

Checked By: _____ Approved By: _____ Date: _____

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S31-T1N-R65W (Lochbuie)

Lochbuie 2H-31H

Hz

Design: FINAL

Survey Report - Geographic

25 February, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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 2H-31H					
Well Position	+N/-S	0.0 ft	Northing:	1,248,962.74 ft	Latitude:	40.014090
	+E/-W	0.0 ft	Easting:	3,220,732.96 ft	Longitude:	-104.711950
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	2/14/2014	8.44	66.66	52,651

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	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	

Survey Program	Date	2/25/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
165.0	12,290.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,248,962.74	3,220,732.96	40.014090	-104.711950
165.0	0.60	104.00	165.0	-0.2	0.8	1,248,962.54	3,220,733.80	40.014089	-104.711947
258.0	1.40	112.10	258.0	-0.8	2.4	1,248,962.00	3,220,735.33	40.014088	-104.711942
350.0	2.20	101.20	349.9	-1.5	5.1	1,248,961.26	3,220,738.11	40.014086	-104.711932
442.0	3.60	75.10	441.8	-1.1	9.7	1,248,961.70	3,220,742.63	40.014087	-104.711916
534.0	5.10	74.40	533.6	0.7	16.4	1,248,963.60	3,220,749.35	40.014092	-104.711892
626.0	6.80	79.90	625.1	2.8	25.7	1,248,965.74	3,220,758.63	40.014098	-104.711859
718.0	8.70	77.70	716.2	5.2	37.9	1,248,968.29	3,220,770.77	40.014104	-104.711815
810.0	9.60	79.50	807.0	8.1	52.2	1,248,971.30	3,220,785.08	40.014112	-104.711764
902.0	10.20	79.40	897.7	11.0	67.7	1,248,974.33	3,220,800.61	40.014120	-104.711708
996.0	12.50	78.20	989.8	14.6	85.9	1,248,978.10	3,220,818.72	40.014130	-104.711644
1,086.0	15.30	76.70	1,077.2	19.3	107.0	1,248,983.01	3,220,839.77	40.014143	-104.711568

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
1,178.0	17.70	75.20	1,165.4	25.7	132.3	1,248,989.61	3,220,865.05	40.014161	-104.711478
1,269.0	19.40	75.20	1,251.7	33.1	160.3	1,248,997.25	3,220,892.97	40.014181	-104.711378
1,361.0	17.50	78.00	1,338.9	39.9	188.6	1,249,004.28	3,220,921.21	40.014199	-104.711277
1,453.0	16.80	76.30	1,426.8	45.9	215.1	1,249,010.54	3,220,947.61	40.014216	-104.711182
1,544.0	16.70	75.40	1,514.0	52.3	240.5	1,249,017.18	3,220,972.98	40.014234	-104.711092
1,639.0	16.80	78.30	1,604.9	58.5	267.1	1,249,023.64	3,220,999.58	40.014251	-104.710997
1,733.0	17.70	80.90	1,694.7	63.5	294.6	1,249,028.90	3,221,026.94	40.014264	-104.710899
1,827.0	18.00	80.70	1,784.2	68.2	323.0	1,249,033.76	3,221,055.34	40.014277	-104.710797
1,922.0	18.50	80.30	1,874.4	73.1	352.3	1,249,038.93	3,221,084.64	40.014291	-104.710692
2,016.0	19.10	79.70	1,963.4	78.3	382.2	1,249,044.46	3,221,114.43	40.014305	-104.710586
2,111.0	18.20	77.30	2,053.4	84.4	411.9	1,249,050.76	3,221,144.14	40.014322	-104.710480
2,205.0	16.70	76.80	2,143.1	90.7	439.4	1,249,057.32	3,221,171.55	40.014339	-104.710381
2,300.0	14.00	76.50	2,234.7	96.5	463.9	1,249,063.33	3,221,195.97	40.014355	-104.710294
2,395.0	13.30	75.10	2,327.0	102.0	485.6	1,249,069.02	3,221,217.65	40.014370	-104.710217
2,489.0	13.20	78.00	2,418.5	107.0	506.6	1,249,074.22	3,221,238.55	40.014384	-104.710142
2,584.0	13.60	77.40	2,510.9	111.7	528.1	1,249,079.10	3,221,260.02	40.014397	-104.710065
2,678.0	14.00	77.40	2,602.2	116.6	550.0	1,249,084.19	3,221,281.86	40.014410	-104.709987
2,773.0	14.50	84.20	2,694.3	120.3	573.0	1,249,088.10	3,221,304.87	40.014420	-104.709905
2,868.0	14.90	88.10	2,786.2	121.9	597.0	1,249,089.92	3,221,328.90	40.014425	-104.709819
2,962.0	16.70	81.80	2,876.6	124.2	622.5	1,249,092.47	3,221,354.33	40.014431	-104.709728
3,057.0	17.20	76.80	2,967.5	129.4	649.7	1,249,097.87	3,221,381.47	40.014445	-104.709631
3,152.0	16.70	75.70	3,058.4	135.9	676.6	1,249,104.69	3,221,408.31	40.014463	-104.709535
3,246.0	16.70	76.10	3,148.4	142.5	702.8	1,249,111.50	3,221,434.45	40.014481	-104.709441
3,341.0	19.60	77.60	3,238.7	149.2	731.6	1,249,118.46	3,221,463.20	40.014500	-104.709338
3,435.0	17.60	80.40	3,327.8	155.0	761.0	1,249,124.47	3,221,492.57	40.014515	-104.709233
3,530.0	17.80	78.10	3,418.3	160.4	789.4	1,249,130.12	3,221,520.89	40.014530	-104.709132
3,624.0	18.20	75.50	3,507.7	167.0	817.7	1,249,137.01	3,221,549.10	40.014548	-104.709031
3,719.0	17.40	76.70	3,598.1	174.0	845.8	1,249,144.24	3,221,577.22	40.014568	-104.708930
3,814.0	17.70	78.00	3,688.7	180.3	873.8	1,249,150.76	3,221,605.12	40.014585	-104.708831
3,908.0	15.20	76.10	3,778.8	186.2	899.7	1,249,156.92	3,221,631.01	40.014601	-104.708738
4,003.0	14.20	78.10	3,870.7	191.6	923.2	1,249,162.52	3,221,654.45	40.014616	-104.708654
4,097.0	14.70	77.80	3,961.8	196.5	946.2	1,249,167.62	3,221,677.34	40.014629	-104.708572
4,192.0	15.60	78.50	4,053.5	201.6	970.5	1,249,172.93	3,221,701.60	40.014643	-104.708485
4,287.0	15.30	80.60	4,145.0	206.2	995.3	1,249,177.75	3,221,726.44	40.014656	-104.708397
4,381.0	17.10	83.10	4,235.3	209.9	1,021.3	1,249,181.67	3,221,752.36	40.014666	-104.708304
4,476.0	19.10	85.00	4,325.6	212.9	1,050.7	1,249,184.96	3,221,781.69	40.014674	-104.708199
4,571.0	19.20	77.30	4,415.3	217.7	1,081.4	1,249,190.02	3,221,812.37	40.014688	-104.708089
4,665.0	18.30	75.70	4,504.4	224.7	1,110.8	1,249,197.33	3,221,841.69	40.014707	-104.707985
4,760.0	15.70	73.50	4,595.2	232.1	1,137.5	1,249,204.90	3,221,868.40	40.014727	-104.707889
4,854.0	16.00	76.10	4,685.6	238.8	1,162.3	1,249,211.84	3,221,893.11	40.014745	-104.707801
4,949.0	13.30	80.30	4,777.5	243.8	1,185.8	1,249,217.04	3,221,916.55	40.014759	-104.707717
5,043.0	14.90	84.30	4,868.7	246.8	1,208.5	1,249,220.26	3,221,939.21	40.014767	-104.707636
5,138.0	17.40	81.80	4,959.9	250.0	1,234.7	1,249,223.74	3,221,965.40	40.014776	-104.707542
5,232.0	19.10	78.90	5,049.2	255.0	1,263.7	1,249,228.96	3,221,994.36	40.014790	-104.707439
5,327.0	17.90	74.80	5,139.3	261.8	1,293.1	1,249,236.04	3,222,023.64	40.014809	-104.707334
5,422.0	17.20	75.90	5,229.9	269.1	1,320.8	1,249,243.54	3,222,051.29	40.014829	-104.707235
5,516.0	17.10	80.60	5,319.7	274.7	1,347.9	1,249,249.42	3,222,078.35	40.014844	-104.707138
5,611.0	15.20	79.20	5,411.0	279.3	1,373.9	1,249,254.27	3,222,104.32	40.014857	-104.707045
5,705.0	16.00	81.40	5,501.5	283.6	1,398.8	1,249,258.73	3,222,129.20	40.014868	-104.706956
5,800.0	16.50	81.40	5,592.7	287.6	1,425.1	1,249,262.94	3,222,155.45	40.014879	-104.706862
5,894.0	13.80	80.40	5,683.4	291.4	1,449.4	1,249,267.03	3,222,179.67	40.014890	-104.706776
5,989.0	13.30	80.40	5,775.8	295.1	1,471.3	1,249,270.93	3,222,201.58	40.014900	-104.706697
6,084.0	12.60	78.10	5,868.4	299.1	1,492.2	1,249,275.08	3,222,222.46	40.014911	-104.706623
6,178.0	10.20	75.70	5,960.5	303.3	1,510.3	1,249,279.41	3,222,240.52	40.014922	-104.706558
6,273.0	8.60	73.50	6,054.2	307.4	1,525.3	1,249,283.64	3,222,255.45	40.014934	-104.706505

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
6,367.0	7.10	74.50	6,147.3	310.9	1,537.6	1,249,287.29	3,222,267.75	40.014943	-104.706461
6,462.0	4.90	61.80	6,241.8	314.4	1,546.8	1,249,290.86	3,222,276.96	40.014953	-104.706428
6,557.0	3.70	69.00	6,336.6	317.4	1,553.3	1,249,293.94	3,222,283.37	40.014961	-104.706405
6,651.0	3.30	79.80	6,430.4	319.0	1,558.8	1,249,295.55	3,222,288.85	40.014966	-104.706385
6,746.0	1.40	103.30	6,525.3	319.2	1,562.6	1,249,295.80	3,222,292.67	40.014966	-104.706371
6,840.0	0.70	171.40	6,619.3	318.4	1,563.8	1,249,294.98	3,222,293.88	40.014964	-104.706367
6,935.0	0.50	237.50	6,714.3	317.6	1,563.5	1,249,294.18	3,222,293.62	40.014962	-104.706368
7,029.0	0.70	278.10	6,808.3	317.4	1,562.6	1,249,294.03	3,222,292.71	40.014961	-104.706371
7,124.0	0.90	296.80	6,903.3	317.8	1,561.4	1,249,294.44	3,222,291.46	40.014962	-104.706376
7,222.0	2.80	204.10	7,001.2	316.0	1,559.7	1,249,292.59	3,222,289.82	40.014957	-104.706382
7,270.0	9.10	196.20	7,048.9	311.3	1,558.2	1,249,287.85	3,222,288.32	40.014944	-104.706387
7,317.0	12.10	191.80	7,095.1	302.9	1,556.1	1,249,279.44	3,222,286.35	40.014921	-104.706394
7,365.0	16.40	187.70	7,141.7	291.2	1,554.2	1,249,267.78	3,222,284.51	40.014889	-104.706401
7,412.0	20.70	186.50	7,186.2	276.4	1,552.4	1,249,252.93	3,222,282.82	40.014849	-104.706408
7,459.0	26.00	179.80	7,229.3	257.8	1,551.5	1,249,234.35	3,222,282.08	40.014798	-104.706411
7,506.0	30.20	178.10	7,270.8	235.7	1,551.9	1,249,212.24	3,222,282.70	40.014737	-104.706410
7,554.0	34.80	180.10	7,311.3	209.9	1,552.3	1,249,186.46	3,222,283.31	40.014666	-104.706408
7,601.0	40.40	181.10	7,348.5	181.3	1,552.0	1,249,157.80	3,222,283.24	40.014588	-104.706409
7,648.0	45.80	180.90	7,382.8	149.2	1,551.4	1,249,125.69	3,222,282.97	40.014499	-104.706411
7,696.0	49.50	182.90	7,415.1	113.7	1,550.2	1,249,090.23	3,222,282.09	40.014402	-104.706416
7,744.0	54.40	184.80	7,444.7	76.0	1,547.6	1,249,052.52	3,222,279.87	40.014299	-104.706425
7,791.0	60.50	186.70	7,470.0	36.6	1,543.7	1,249,013.09	3,222,276.23	40.014190	-104.706439
7,838.0	66.90	189.30	7,490.8	-5.1	1,537.8	1,248,971.34	3,222,270.72	40.014076	-104.706460
7,885.0	72.00	189.70	7,507.3	-48.4	1,530.5	1,248,927.90	3,222,263.84	40.013957	-104.706486
7,942.0	77.60	189.10	7,522.2	-102.7	1,521.5	1,248,873.58	3,222,255.35	40.013808	-104.706518
7,980.0	82.50	189.20	7,528.8	-139.6	1,515.6	1,248,836.59	3,222,249.72	40.013707	-104.706539
8,095.0	92.10	185.30	7,534.2	-253.4	1,501.1	1,248,722.65	3,222,236.27	40.013394	-104.706591
8,189.0	91.40	181.90	7,531.3	-347.2	1,495.2	1,248,628.84	3,222,231.21	40.013137	-104.706612
8,284.0	92.00	177.50	7,528.5	-442.1	1,495.7	1,248,533.92	3,222,232.55	40.012876	-104.706610
8,378.0	90.50	174.40	7,526.5	-535.9	1,502.4	1,248,440.25	3,222,240.02	40.012619	-104.706587
8,473.0	90.20	173.10	7,525.9	-630.3	1,512.7	1,248,345.91	3,222,251.20	40.012360	-104.706550
8,568.0	89.00	172.30	7,526.5	-724.5	1,524.8	1,248,251.80	3,222,264.11	40.012101	-104.706507
8,662.0	90.20	172.80	7,527.2	-817.7	1,537.0	1,248,158.71	3,222,277.12	40.011845	-104.706463
8,757.0	93.20	174.10	7,524.4	-912.0	1,547.8	1,248,064.48	3,222,288.79	40.011586	-104.706425
8,851.0	93.00	175.40	7,519.3	-1,005.5	1,556.4	1,247,971.10	3,222,298.21	40.011330	-104.706394
8,946.0	90.90	177.70	7,516.1	-1,100.3	1,562.1	1,247,876.39	3,222,304.76	40.011069	-104.706374
9,040.0	90.70	179.80	7,514.8	-1,194.2	1,564.1	1,247,782.45	3,222,307.65	40.010812	-104.706366
9,135.0	88.40	181.30	7,515.5	-1,289.2	1,563.2	1,247,687.46	3,222,307.58	40.010551	-104.706370
9,230.0	90.20	181.70	7,516.7	-1,384.2	1,560.7	1,247,592.48	3,222,305.94	40.010290	-104.706378
9,324.0	90.30	181.10	7,516.2	-1,478.1	1,558.4	1,247,498.50	3,222,304.48	40.010032	-104.706387
9,419.0	90.70	181.10	7,515.4	-1,573.1	1,556.6	1,247,403.51	3,222,303.50	40.009771	-104.706393
9,513.0	90.50	181.10	7,514.4	-1,667.1	1,554.8	1,247,309.52	3,222,302.53	40.009513	-104.706400
9,608.0	91.00	180.00	7,513.2	-1,762.1	1,553.9	1,247,214.53	3,222,302.46	40.009253	-104.706403
9,702.0	91.10	180.10	7,511.5	-1,856.1	1,553.8	1,247,120.54	3,222,303.21	40.008995	-104.706403
9,797.0	90.00	178.80	7,510.6	-1,951.1	1,554.7	1,247,025.57	3,222,304.97	40.008734	-104.706400
9,892.0	90.40	178.50	7,510.2	-2,046.0	1,557.0	1,246,930.62	3,222,308.05	40.008473	-104.706392
9,986.0	93.10	177.50	7,507.4	-2,139.9	1,560.2	1,246,836.76	3,222,312.16	40.008215	-104.706380
10,081.0	93.30	177.50	7,502.1	-2,234.7	1,564.4	1,246,742.04	3,222,317.14	40.007955	-104.706366
10,175.0	92.20	179.60	7,497.5	-2,328.5	1,566.8	1,246,648.21	3,222,320.35	40.007698	-104.706357
10,270.0	91.90	179.90	7,494.1	-2,423.5	1,567.2	1,246,553.28	3,222,321.61	40.007437	-104.706356
10,365.0	89.80	180.50	7,492.7	-2,518.5	1,566.8	1,246,458.30	3,222,322.12	40.007176	-104.706357
10,459.0	88.60	179.20	7,494.0	-2,612.5	1,567.1	1,246,364.32	3,222,323.20	40.006918	-104.706356
10,554.0	90.70	180.50	7,494.6	-2,707.4	1,567.3	1,246,269.33	3,222,324.30	40.006658	-104.706355
10,648.0	90.90	179.90	7,493.3	-2,801.4	1,567.0	1,246,175.34	3,222,324.80	40.006399	-104.706356
10,743.0	90.60	179.30	7,492.1	-2,896.4	1,567.7	1,246,080.36	3,222,326.31	40.006139	-104.706354

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2H-31H
Project:	DJ Wattenberg	TVD Reference:	KB @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KB @ 5037.0ft (H&P 522)
Well:	Lochbuie 2H-31H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
10,837.0	91.10	181.00	7,490.7	-2,990.4	1,567.4	1,245,986.38	3,222,326.90	40.005881	-104.706355
10,932.0	90.20	180.10	7,489.6	-3,085.4	1,566.5	1,245,891.39	3,222,326.83	40.005620	-104.706358
11,027.0	91.30	180.60	7,488.4	-3,180.4	1,565.9	1,245,796.40	3,222,327.10	40.005359	-104.706360
11,121.0	90.80	181.60	7,486.6	-3,274.3	1,564.1	1,245,702.42	3,222,326.13	40.005101	-104.706367
11,216.0	93.50	181.30	7,483.1	-3,369.2	1,561.7	1,245,607.51	3,222,324.57	40.004841	-104.706375
11,310.0	93.80	180.80	7,477.1	-3,463.0	1,560.0	1,245,513.70	3,222,323.68	40.004583	-104.706382
11,405.0	91.00	181.70	7,473.1	-3,557.9	1,557.9	1,245,418.80	3,222,322.45	40.004323	-104.706389
11,500.0	87.60	181.20	7,474.3	-3,652.9	1,555.5	1,245,323.84	3,222,320.89	40.004062	-104.706398
11,594.0	88.70	180.50	7,477.3	-3,746.8	1,554.1	1,245,229.89	3,222,320.34	40.003804	-104.706403
11,689.0	90.10	180.70	7,478.3	-3,841.8	1,553.1	1,245,134.90	3,222,320.19	40.003544	-104.706406
11,783.0	88.10	179.40	7,479.8	-3,935.8	1,553.1	1,245,040.92	3,222,320.94	40.003286	-104.706406
11,878.0	89.00	178.90	7,482.2	-4,030.7	1,554.5	1,244,945.98	3,222,323.19	40.003025	-104.706401
11,972.0	89.10	178.40	7,483.7	-4,124.7	1,556.7	1,244,852.04	3,222,326.24	40.002767	-104.706394
12,067.0	91.90	178.90	7,482.9	-4,219.7	1,558.9	1,244,757.10	3,222,329.32	40.002506	-104.706386
12,161.0	90.30	177.60	7,481.1	-4,313.6	1,561.8	1,244,663.20	3,222,333.03	40.002248	-104.706375
12,235.0	90.60	176.70	7,480.5	-4,387.5	1,565.5	1,244,589.35	3,222,337.36	40.002046	-104.706362
Last CES Survey @ 12,235' MD									
12,290.0	90.60	176.70	7,479.9	-4,442.4	1,568.6	1,244,534.48	3,222,341.02	40.001895	-104.706351
PTB @ 12,290'									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Lochbuie 2H-31H PBHL	0.00	0.00	7,478.0	-4,484.2	1,560.4	1,244,492.62	3,222,333.17	40.001780	-104.706380
- actual wellpath misses target center by 42.6ft at 12290.0ft MD (7479.9 TVD, -4442.4 N, 1568.6 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
12,235.0	7,480.5	-4,387.5	1,565.5	Last CES Survey @ 12,235' MD	
12,290.0	7,479.9	-4,442.4	1,568.6	PTB @ 12,290'	

Checked By: _____ Approved By: _____ Date: _____