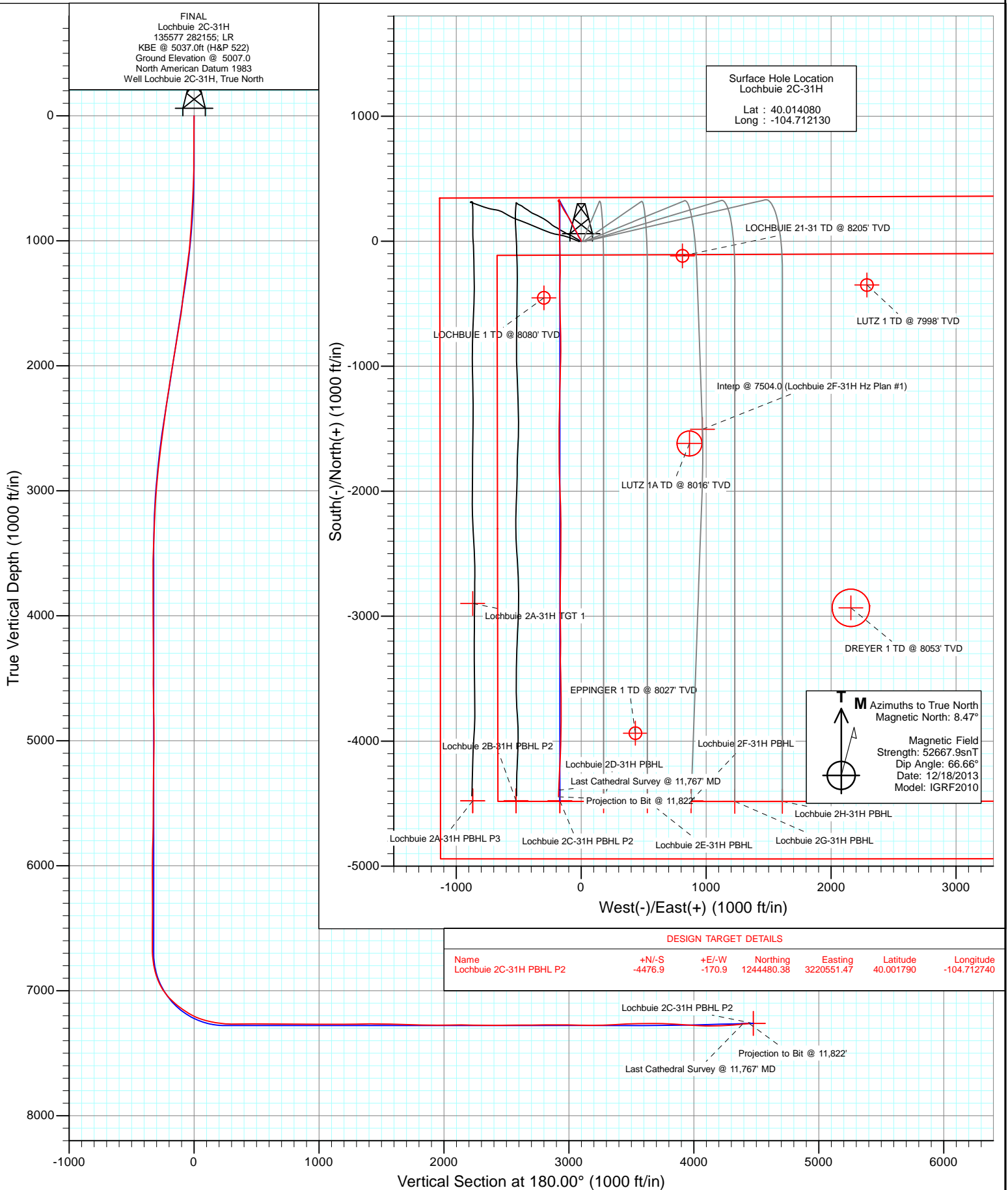


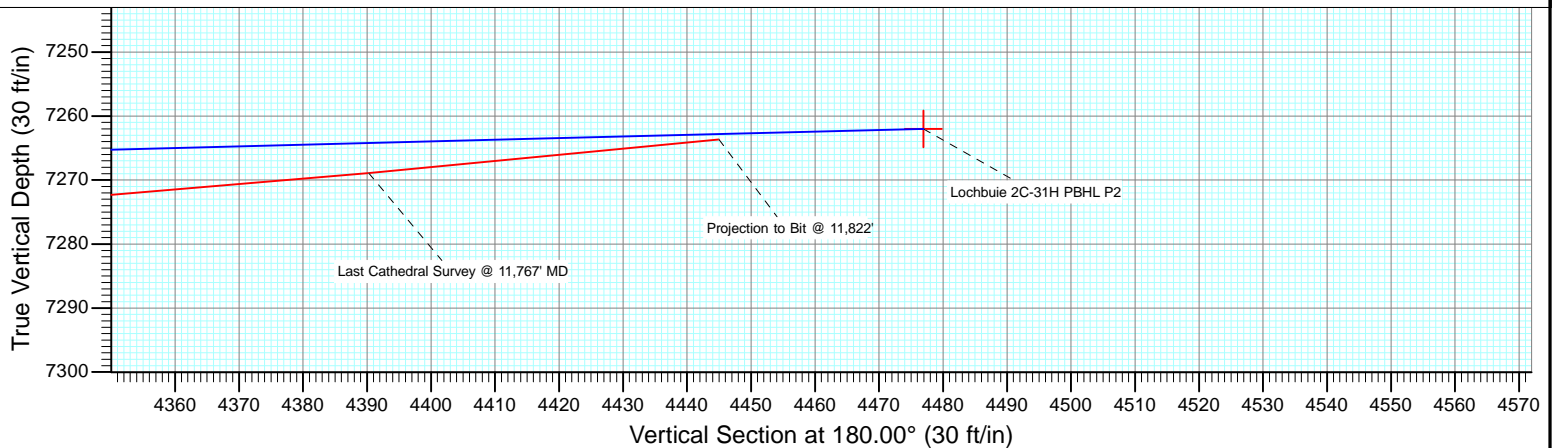
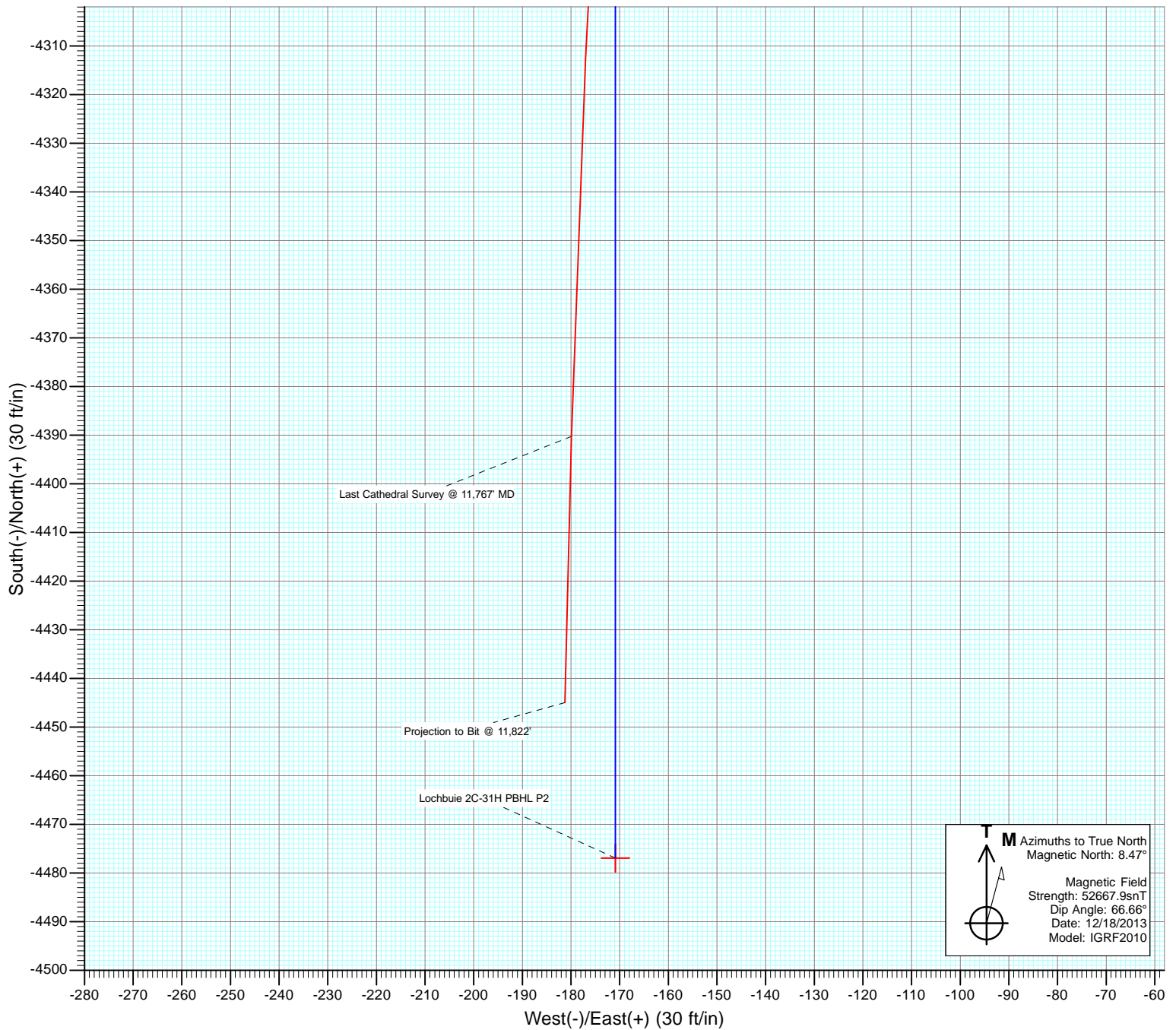


Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2C-31H
Wellbore: Hz
Design: FINAL





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



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2C-31H
Project:	DJ Wattenberg	TVD Reference:	KBE @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KBE @ 5037.0ft (H&P 522)
Well:	Lochbuie 2C-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 2C-31H					
Well Position	+N/-S	0.0 ft	Northing:	1,248,958.63 ft	Latitude:	40.014080
	+E/-W	0.0 ft	Easting:	3,220,682.58 ft	Longitude:	-104.712130
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	12/18/2013	8.47	66.66	52,668

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	12/21/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
165.0	11,822.0	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	0.30	35.00	165.0	0.4	0.2	-0.4	0.18	0.18		
256.0	0.30	3.60	256.0	0.8	0.4	-0.8	0.18	0.00		
348.0	0.10	281.10	348.0	1.0	0.3	-1.0	0.33	-0.22		
440.0	1.30	316.10	440.0	1.8	-0.5	-1.8	1.33	1.30		
532.0	2.50	352.70	531.9	4.6	-1.4	-4.6	1.79	1.30		
624.0	2.60	344.70	623.8	8.6	-2.3	-8.6	0.40	0.11		
716.0	3.40	335.60	715.7	13.1	-3.9	-13.1	1.01	0.87		
808.0	3.90	330.00	807.5	18.2	-6.6	-18.2	0.67	0.54		
899.0	4.60	322.30	898.3	23.8	-10.4	-23.8	0.99	0.77		
991.0	5.50	325.30	989.9	30.4	-15.2	-30.4	1.02	0.98		
1,083.0	7.00	327.30	1,081.4	38.7	-20.7	-38.7	1.65	1.63		
1,175.0	8.90	335.40	1,172.5	49.9	-26.7	-49.9	2.39	2.07		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2C-31H
Project:	DJ Wattenberg	TVD Reference:	KBE @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KBE @ 5037.0ft (H&P 522)
Well:	Lochbuie 2C-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
1,267.0	9.00	334.40	1,263.4	62.9	-32.8	-62.9	0.20	0.11	
1,359.0	8.50	333.50	1,354.3	75.4	-38.9	-75.4	0.56	-0.54	
1,458.0	7.20	325.60	1,452.4	87.1	-45.7	-87.1	1.70	-1.31	
1,546.0	8.70	329.60	1,539.5	97.4	-52.2	-97.4	1.82	1.70	
1,640.0	10.30	333.30	1,632.2	111.0	-59.5	-111.0	1.82	1.70	
1,735.0	10.20	334.80	1,725.7	126.2	-66.9	-126.2	0.30	-0.11	
1,829.0	10.60	334.00	1,818.2	141.5	-74.3	-141.5	0.45	0.43	
1,924.0	11.10	334.70	1,911.5	157.6	-82.0	-157.6	0.54	0.53	
2,018.0	10.30	329.60	2,003.8	173.1	-90.1	-173.1	1.32	-0.85	
2,113.0	10.20	327.50	2,097.3	187.5	-98.9	-187.5	0.41	-0.11	
2,208.0	10.30	327.80	2,190.8	201.8	-108.0	-201.8	0.12	0.11	
2,302.0	9.90	328.20	2,283.4	215.8	-116.7	-215.8	0.43	-0.43	
2,397.0	9.40	327.70	2,377.0	229.3	-125.2	-229.3	0.53	-0.53	
2,492.0	9.00	328.20	2,470.8	242.1	-133.2	-242.1	0.43	-0.42	
2,586.0	8.60	328.30	2,563.7	254.4	-140.8	-254.4	0.43	-0.43	
2,681.0	8.00	332.60	2,657.7	266.3	-147.6	-266.3	0.91	-0.63	
2,775.0	7.10	330.20	2,750.9	277.1	-153.5	-277.1	1.01	-0.96	
2,870.0	7.00	338.50	2,845.2	287.6	-158.5	-287.6	1.08	-0.11	
2,965.0	5.70	338.40	2,939.6	297.4	-162.4	-297.4	1.37	-1.37	
3,059.0	4.20	333.30	3,033.2	304.8	-165.6	-304.8	1.66	-1.60	
3,154.0	3.50	326.60	3,128.0	310.3	-168.8	-310.3	0.87	-0.74	
3,248.0	2.90	328.50	3,221.9	314.7	-171.6	-314.7	0.65	-0.64	
3,343.0	2.60	332.30	3,316.7	318.7	-173.9	-318.7	0.37	-0.32	
3,438.0	2.40	333.10	3,411.7	322.4	-175.8	-322.4	0.21	-0.21	
3,532.0	2.20	331.80	3,505.6	325.7	-177.5	-325.7	0.22	-0.21	
3,627.0	0.70	327.50	3,600.5	327.8	-178.7	-327.8	1.58	-1.58	
3,721.0	0.50	145.10	3,694.5	328.0	-178.8	-328.0	1.28	-0.21	
3,816.0	0.40	137.30	3,789.5	327.4	-178.3	-327.4	0.12	-0.11	
3,910.0	0.30	116.20	3,883.5	327.0	-177.9	-327.0	0.17	-0.11	
4,005.0	0.30	121.10	3,978.5	326.8	-177.4	-326.8	0.03	0.00	
4,100.0	0.40	187.70	4,073.5	326.3	-177.3	-326.3	0.41	0.11	
4,194.0	0.40	152.90	4,167.5	325.7	-177.2	-325.7	0.25	0.00	
4,289.0	0.40	146.80	4,262.5	325.1	-176.8	-325.1	0.04	0.00	
4,384.0	0.20	288.60	4,357.5	324.9	-176.8	-324.9	0.60	-0.21	
4,478.0	0.40	276.90	4,451.5	325.0	-177.3	-325.0	0.22	0.21	
4,573.0	0.50	268.60	4,546.5	325.0	-178.0	-325.0	0.13	0.11	
4,667.0	1.40	267.80	4,640.5	325.0	-179.6	-325.0	0.96	0.96	
4,762.0	1.00	192.30	4,735.5	324.1	-180.9	-324.1	1.58	-0.42	
4,857.0	1.50	166.10	4,830.5	322.1	-180.8	-322.1	0.79	0.53	
4,951.0	1.10	202.50	4,924.5	320.1	-180.8	-320.1	0.95	-0.43	
5,046.0	1.50	280.10	5,019.4	319.5	-182.4	-319.5	1.75	0.42	
5,141.0	1.30	352.80	5,114.4	320.8	-183.8	-320.8	1.76	-0.21	
5,235.0	1.70	350.60	5,208.4	323.2	-184.1	-323.2	0.43	0.43	
5,330.0	1.50	71.10	5,303.4	325.0	-183.2	-325.0	2.18	-0.21	
5,424.0	0.70	100.50	5,397.3	325.3	-181.5	-325.3	1.02	-0.85	
5,519.0	0.00	118.50	5,492.3	325.2	-180.9	-325.2	0.74	-0.74	
5,614.0	0.40	340.40	5,587.3	325.5	-181.0	-325.5	0.42	0.42	
5,708.0	1.20	359.50	5,681.3	326.8	-181.1	-326.8	0.89	0.85	
5,803.0	1.80	36.30	5,776.3	329.0	-180.2	-329.0	1.16	0.63	
5,897.0	2.00	36.80	5,870.2	331.5	-178.4	-331.5	0.21	0.21	
5,992.0	0.50	52.10	5,965.2	333.1	-177.1	-333.1	1.60	-1.58	
6,087.0	1.30	111.90	6,060.2	332.9	-175.7	-332.9	1.19	0.84	
6,181.0	0.80	95.10	6,154.2	332.5	-174.1	-332.5	0.62	-0.53	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2C-31H
Project:	DJ Wattenberg	TVD Reference:	KBE @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KBE @ 5037.0ft (H&P 522)
Well:	Lochbuie 2C-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
6,276.0	0.70	274.10	6,249.2	332.4	-174.0	-332.4	1.58	-0.11	
6,371.0	0.30	232.80	6,344.2	332.3	-174.8	-332.3	0.54	-0.42	
6,465.0	0.40	335.80	6,438.2	332.5	-175.1	-332.5	0.59	0.11	
6,560.0	0.50	322.10	6,533.2	333.1	-175.5	-333.1	0.15	0.11	
6,654.0	0.60	315.30	6,627.2	333.8	-176.1	-333.8	0.13	0.11	
6,716.0	1.30	202.30	6,689.2	333.4	-176.6	-333.4	2.63	1.13	
6,748.0	4.20	187.40	6,721.1	331.9	-176.9	-331.9	9.26	9.06	
6,779.0	6.50	181.60	6,752.0	329.0	-177.1	-329.0	7.61	7.42	
6,811.0	9.10	177.50	6,783.7	324.6	-177.0	-324.6	8.30	8.12	
6,843.0	12.00	177.30	6,815.2	318.8	-176.8	-318.8	9.06	9.06	
6,874.0	14.50	178.50	6,845.3	311.7	-176.5	-311.7	8.11	8.06	
6,906.0	17.80	178.50	6,876.1	302.8	-176.3	-302.8	10.31	10.31	
6,937.0	21.10	178.70	6,905.3	292.5	-176.0	-292.5	10.65	10.65	
6,969.0	24.70	177.70	6,934.8	280.0	-175.6	-280.0	11.32	11.25	
7,000.0	28.20	178.50	6,962.5	266.2	-175.2	-266.2	11.35	11.29	
7,032.0	32.00	178.60	6,990.2	250.2	-174.8	-250.2	11.88	11.87	
7,063.0	36.00	178.50	7,015.9	232.9	-174.3	-232.9	12.90	12.90	
7,095.0	40.00	179.00	7,041.1	213.2	-173.9	-213.2	12.54	12.50	
7,126.0	43.60	180.10	7,064.2	192.5	-173.8	-192.5	11.85	11.61	
7,158.0	47.20	181.20	7,086.7	169.7	-174.0	-169.7	11.51	11.25	
7,189.0	50.20	180.00	7,107.1	146.5	-174.3	-146.5	10.10	9.68	
7,221.0	52.60	179.00	7,127.1	121.4	-174.0	-121.4	7.89	7.50	
7,252.0	54.30	178.80	7,145.5	96.6	-173.6	-96.6	5.51	5.48	
7,284.0	56.40	179.30	7,163.7	70.2	-173.1	-70.2	6.69	6.56	
7,315.0	59.30	179.40	7,180.2	44.0	-172.8	-44.0	9.36	9.35	
7,347.0	61.60	179.50	7,196.0	16.2	-172.6	-16.2	7.19	7.19	
7,379.0	64.70	178.90	7,210.5	-12.4	-172.2	12.4	9.83	9.69	
7,410.0	69.30	178.40	7,222.6	-40.9	-171.5	40.9	14.91	14.84	
7,442.0	73.40	178.40	7,232.8	-71.2	-170.6	71.2	12.81	12.81	
7,473.0	76.10	178.60	7,241.0	-101.1	-169.9	101.1	8.73	8.71	
7,505.0	77.80	178.50	7,248.2	-132.3	-169.1	132.3	5.32	5.31	
7,542.0	80.20	179.30	7,255.2	-168.6	-168.4	168.6	6.82	6.49	
7,622.0	85.70	181.40	7,265.1	-247.9	-168.9	247.9	7.35	6.87	
7,717.0	90.80	181.80	7,268.0	-342.8	-171.5	342.8	5.38	5.37	
7,812.0	90.50	178.70	7,266.9	-437.8	-171.9	437.8	3.28	-0.32	
7,906.0	89.80	179.00	7,266.6	-531.8	-170.0	531.8	0.81	-0.74	
8,001.0	90.40	178.10	7,266.5	-626.8	-167.6	626.8	1.14	0.63	
8,095.0	89.00	178.50	7,267.0	-720.7	-164.8	720.7	1.55	-1.49	
8,190.0	89.00	179.90	7,268.6	-815.7	-163.5	815.7	1.47	0.00	
8,284.0	89.60	181.40	7,269.8	-909.7	-164.6	909.7	1.72	0.64	
8,379.0	90.60	180.70	7,269.6	-1,004.6	-166.3	1,004.6	1.28	1.05	
8,473.0	89.60	182.00	7,269.4	-1,098.6	-168.5	1,098.6	1.74	-1.06	
8,568.0	90.30	181.40	7,269.5	-1,193.6	-171.4	1,193.6	0.97	0.74	
8,662.0	91.50	180.50	7,268.0	-1,287.5	-172.9	1,287.5	1.60	1.28	
8,757.0	90.90	181.60	7,266.1	-1,382.5	-174.7	1,382.5	1.32	-0.63	
8,851.0	88.30	180.30	7,266.7	-1,476.5	-176.2	1,476.5	3.09	-2.77	
8,946.0	89.60	179.90	7,268.5	-1,571.5	-176.4	1,571.5	1.43	1.37	
9,041.0	88.00	180.20	7,270.4	-1,666.4	-176.5	1,666.4	1.71	-1.68	
9,135.0	88.40	179.20	7,273.4	-1,760.4	-176.0	1,760.4	1.15	0.43	
9,230.0	89.20	178.80	7,275.4	-1,855.4	-174.3	1,855.4	0.94	0.84	
9,324.0	89.70	178.10	7,276.3	-1,949.3	-171.8	1,949.3	0.92	0.53	
9,419.0	91.10	177.70	7,275.6	-2,044.2	-168.3	2,044.2	1.53	1.47	
9,514.0	90.20	178.30	7,274.5	-2,139.2	-165.0	2,139.2	1.14	-0.95	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2C-31H
Project:	DJ Wattenberg	TVD Reference:	KBE @ 5037.0ft (H&P 522)
Site:	S31-T1N-R65W (Lochbuie)	MD Reference:	KBE @ 5037.0ft (H&P 522)
Well:	Lochbuie 2C-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
9,608.0	88.00	179.00	7,276.0	-2,233.1	-162.8	2,233.1	2.46	-2.34	
9,703.0	89.80	181.10	7,277.8	-2,328.1	-162.8	2,328.1	2.91	1.89	
9,797.0	90.30	179.90	7,277.8	-2,422.1	-163.7	2,422.1	1.38	0.53	
9,892.0	90.80	180.10	7,276.9	-2,517.1	-163.7	2,517.1	0.57	0.53	
9,987.0	90.60	181.40	7,275.7	-2,612.1	-164.9	2,612.1	1.38	-0.21	
10,081.0	89.80	180.50	7,275.4	-2,706.1	-166.5	2,706.1	1.28	-0.85	
10,176.0	90.70	181.30	7,274.9	-2,801.1	-168.0	2,801.1	1.27	0.95	
10,270.0	90.40	179.70	7,274.0	-2,895.0	-168.8	2,895.0	1.73	-0.32	
10,365.0	88.90	179.10	7,274.6	-2,990.0	-167.8	2,990.0	1.70	-1.58	
10,459.0	88.80	178.70	7,276.5	-3,084.0	-166.0	3,084.0	0.44	-0.11	
10,554.0	89.70	179.70	7,277.8	-3,179.0	-164.7	3,179.0	1.42	0.95	
10,648.0	91.80	181.10	7,276.5	-3,273.0	-165.3	3,273.0	2.68	2.23	
10,743.0	93.50	179.90	7,272.1	-3,367.8	-166.1	3,367.8	2.19	1.79	
10,838.0	93.00	178.20	7,266.7	-3,462.7	-164.6	3,462.7	1.86	-0.53	
10,933.0	89.90	178.10	7,264.3	-3,557.6	-161.5	3,557.6	3.26	-3.26	
11,027.0	90.60	180.40	7,263.9	-3,651.6	-160.3	3,651.6	2.56	0.74	
11,122.0	88.80	179.90	7,264.4	-3,746.6	-160.5	3,746.6	1.97	-1.89	
11,216.0	86.90	180.40	7,268.0	-3,840.5	-160.8	3,840.5	2.09	-2.02	
11,311.0	85.70	181.00	7,274.1	-3,935.3	-161.9	3,935.3	1.41	-1.26	
11,406.0	87.30	181.80	7,279.9	-4,030.1	-164.2	4,030.1	1.88	1.68	
11,500.0	89.60	182.50	7,282.4	-4,124.0	-167.8	4,124.0	2.56	2.45	
11,595.0	92.40	183.10	7,280.8	-4,218.8	-172.4	4,218.8	3.01	2.95	
11,689.0	94.10	182.50	7,275.4	-4,312.6	-177.0	4,312.6	1.92	1.81	
11,767.0	95.50	181.80	7,268.9	-4,390.2	-179.9	4,390.2	2.01	1.79	Last Cathedral Survey @ 11,767' MD Projection to Bit @ 11,822'
11,822.0	95.50	181.00	7,263.6	-4,445.0	-181.2	4,445.0	1.45	0.00	

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
- Shape									Latitude Longitude
Lochbuie 2C-31H PBHL		0.00	0.00	7,284.0	-4,476.9	-170.9	1,244,480.38	3,220,551.47	40.001790 -104.712740
- actual wellpath misses target center by 39.3ft at 11822.0ft MD (7263.6 TVD, -4445.0 N, -181.2 E)									
- Point									
Lochbuie 2C-31H PBHL		0.00	0.00	7,262.0	-4,476.9	-170.9	1,244,480.38	3,220,551.47	40.001790 -104.712740
- actual wellpath misses target center by 33.6ft at 11822.0ft MD (7263.6 TVD, -4445.0 N, -181.2 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
11,767.0	7,268.9	-4,390.2	-179.9	Last Cathedral Survey @ 11,767' MD	
11,822.0	7,263.6	-4,445.0	-181.2	Projection to Bit @ 11,822'	

Checked By: _____ Approved By: _____ Date: _____