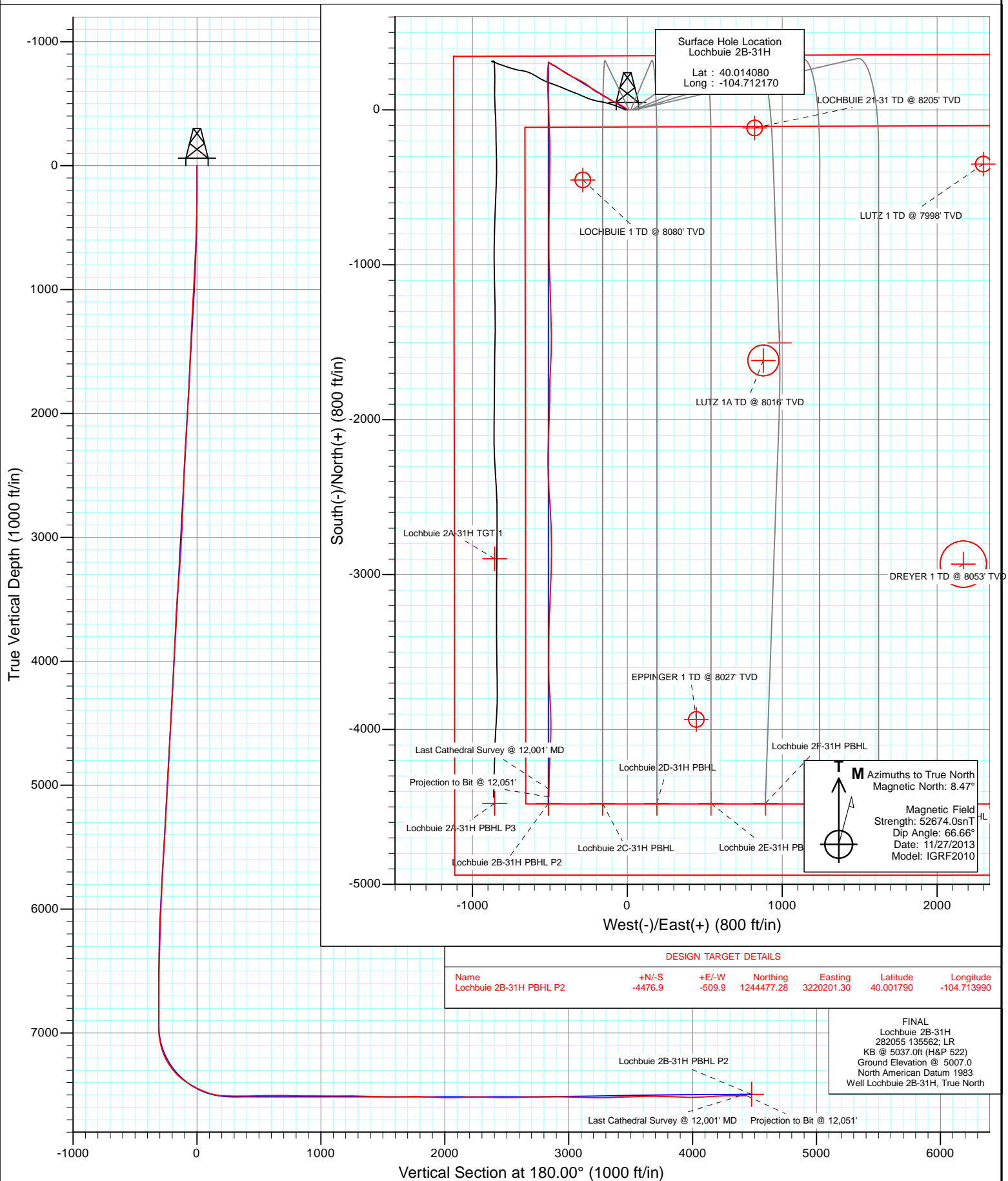


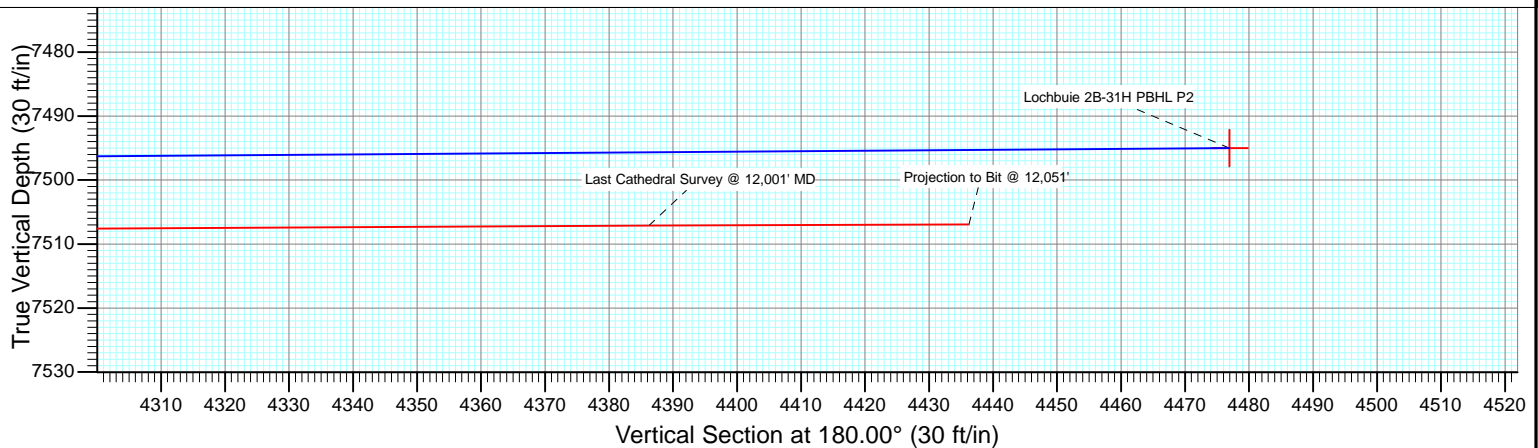
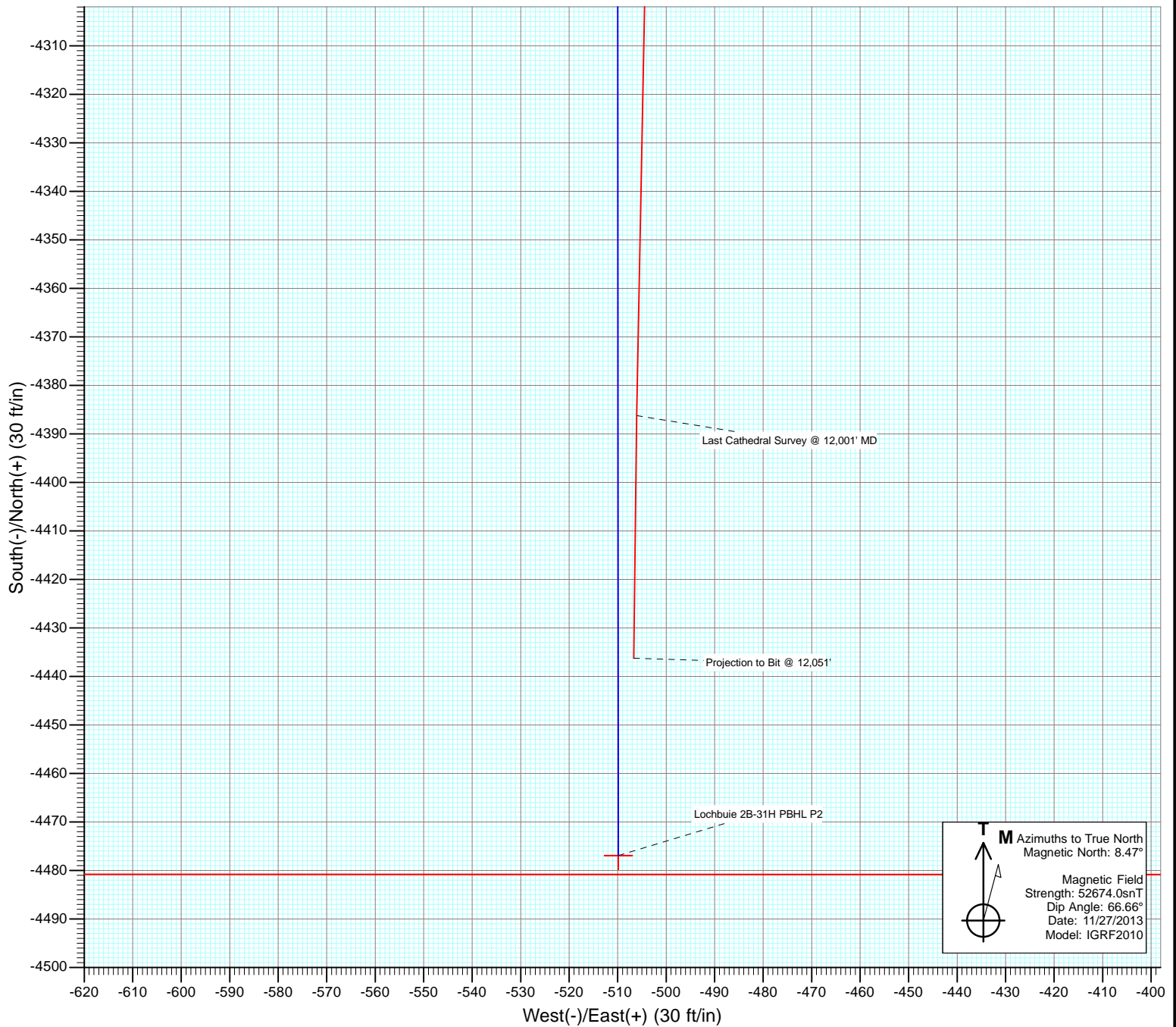


Project: DJ Wattenberg
Site: S31-T1N-R65W (Lochbuie)
Well: Lochbuie 2B-31H
Wellbore: Hz
Design: FINAL





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



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2B-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 2B-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 2B-31H					
Well Position	+N/-S	0.0 ft	Northing:	1,248,958.54 ft	Latitude:	40.014080
	+E/-W	0.0 ft	Easting:	3,220,671.37 ft	Longitude:	-104.712170
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	11/27/2013	8.47	66.66	52,674

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	12/10/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
133.0	12,051.0	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		
133.0	0.30	204.00	133.0	-0.3	-0.1	0.3	0.23	0.23		
256.0	0.10	217.00	256.0	-0.7	-0.3	0.7	0.17	-0.16		
348.0	1.20	325.50	348.0	0.0	-0.9	0.0	1.34	1.20		
440.0	1.90	328.80	440.0	2.1	-2.3	-2.1	0.77	0.76		
532.0	3.00	325.10	531.9	5.4	-4.4	-5.4	1.21	1.20		
624.0	3.10	312.10	623.7	9.1	-7.7	-9.1	0.76	0.11		
716.0	4.20	307.50	715.6	12.8	-12.2	-12.8	1.24	1.20		
807.0	4.70	299.20	806.3	16.6	-18.1	-16.6	0.89	0.55		
899.0	6.00	297.50	897.9	20.7	-25.6	-20.7	1.42	1.41		
991.0	7.10	300.00	989.3	25.7	-34.8	-25.7	1.23	1.20		
1,083.0	7.20	299.70	1,080.6	31.4	-44.8	-31.4	0.12	0.11		
1,175.0	6.10	303.10	1,171.9	37.0	-53.9	-37.0	1.27	-1.20		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2B-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 2B-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	6.00	299.30	1,263.4	42.0	-62.1	-42.0	0.45	-0.11	
1,358.0	5.80	295.10	1,353.9	46.3	-70.5	-46.3	0.52	-0.22	
1,447.0	5.50	294.40	1,442.5	49.9	-78.4	-49.9	0.35	-0.34	
1,545.0	5.30	292.30	1,540.1	53.6	-86.9	-53.6	0.29	-0.20	
1,639.0	5.10	290.90	1,633.7	56.7	-94.8	-56.7	0.25	-0.21	
1,734.0	6.00	294.60	1,728.2	60.3	-103.3	-60.3	1.02	0.95	
1,828.0	7.00	302.70	1,821.6	65.4	-112.5	-65.4	1.44	1.06	
1,923.0	7.20	302.00	1,915.9	71.7	-122.5	-71.7	0.23	0.21	
2,018.0	7.20	298.60	2,010.2	77.7	-132.7	-77.7	0.45	0.00	
2,112.0	7.10	296.70	2,103.4	83.2	-143.1	-83.2	0.27	-0.11	
2,207.0	7.20	297.60	2,197.7	88.6	-153.6	-88.6	0.16	0.11	
2,302.0	6.00	307.70	2,292.1	94.4	-162.8	-94.4	1.75	-1.26	
2,396.0	5.10	305.90	2,385.6	99.8	-170.1	-99.8	0.98	-0.96	
2,491.0	4.70	304.00	2,480.3	104.5	-176.7	-104.5	0.45	-0.42	
2,585.0	4.10	297.20	2,574.0	108.1	-182.9	-108.1	0.84	-0.64	
2,680.0	3.50	290.80	2,668.8	110.7	-188.7	-110.7	0.77	-0.63	
2,775.0	4.90	296.30	2,763.5	113.6	-195.0	-113.6	1.53	1.47	
2,869.0	5.30	302.00	2,857.2	117.6	-202.3	-117.6	0.69	0.43	
2,964.0	4.90	300.00	2,951.8	122.0	-209.5	-122.0	0.46	-0.42	
3,058.0	5.40	305.30	3,045.4	126.6	-216.6	-126.6	0.73	0.53	
3,153.0	5.30	309.80	3,140.0	131.9	-223.6	-131.9	0.45	-0.11	
3,248.0	7.60	311.10	3,234.4	138.9	-231.7	-138.9	2.43	2.42	
3,342.0	6.90	309.10	3,327.6	146.5	-240.8	-146.5	0.79	-0.74	
3,437.0	7.60	307.70	3,421.9	154.0	-250.2	-154.0	0.76	0.74	
3,531.0	6.50	305.40	3,515.2	160.9	-259.5	-160.9	1.21	-1.17	
3,626.0	5.40	304.60	3,609.7	166.5	-267.5	-166.5	1.16	-1.16	
3,720.0	4.60	298.80	3,703.3	170.8	-274.5	-170.8	1.01	-0.85	
3,815.0	4.70	305.90	3,798.0	175.0	-281.0	-175.0	0.61	0.11	
3,910.0	5.10	305.00	3,892.6	179.7	-287.6	-179.7	0.43	0.42	
4,004.0	6.10	296.20	3,986.2	184.3	-295.5	-184.3	1.40	1.06	
4,099.0	6.50	298.10	4,080.6	189.0	-304.7	-189.0	0.47	0.42	
4,194.0	6.80	295.60	4,175.0	194.0	-314.6	-194.0	0.44	0.32	
4,288.0	6.60	300.00	4,268.3	199.1	-324.3	-199.1	0.59	-0.21	
4,383.0	7.10	297.30	4,362.7	204.5	-334.2	-204.5	0.63	0.53	
4,477.0	6.70	296.70	4,456.0	209.6	-344.3	-209.6	0.43	-0.43	
4,572.0	6.80	291.00	4,550.3	214.1	-354.5	-214.1	0.71	0.11	
4,667.0	6.60	292.10	4,644.7	218.2	-364.8	-218.2	0.25	-0.21	
4,761.0	6.40	294.40	4,738.1	222.4	-374.5	-222.4	0.35	-0.21	
4,856.0	6.60	302.70	4,832.5	227.6	-384.0	-227.6	1.01	0.21	
4,951.0	5.70	301.60	4,926.9	233.0	-392.6	-233.0	0.96	-0.95	
5,045.0	5.90	311.10	5,020.4	238.6	-400.2	-238.6	1.04	0.21	
5,140.0	6.20	303.60	5,114.9	244.6	-408.1	-244.6	0.89	0.32	
5,234.0	5.00	302.10	5,208.5	249.6	-415.8	-249.6	1.29	-1.28	
5,329.0	5.50	301.00	5,303.1	254.2	-423.3	-254.2	0.54	0.53	
5,424.0	5.70	305.10	5,397.6	259.2	-431.0	-259.2	0.47	0.21	
5,518.0	6.70	303.30	5,491.0	264.9	-439.4	-264.9	1.08	1.06	
5,613.0	7.10	304.50	5,585.4	271.3	-448.9	-271.3	0.45	0.42	
5,708.0	5.80	308.00	5,679.8	277.6	-457.5	-277.6	1.43	-1.37	
5,802.0	5.00	302.90	5,773.3	282.7	-464.7	-282.7	0.99	-0.85	
5,897.0	4.40	298.80	5,868.0	286.7	-471.4	-286.7	0.72	-0.63	
5,991.0	4.60	287.70	5,961.7	289.6	-478.1	-289.6	0.95	0.21	
6,086.0	4.40	294.40	6,056.4	292.3	-485.1	-292.3	0.59	-0.21	
6,181.0	3.90	297.30	6,151.2	295.3	-491.2	-295.3	0.57	-0.53	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2B-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 2B-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
6,275.0	3.60	310.90	6,245.0	298.7	-496.3	-298.7	1.00	-0.32	
6,370.0	2.90	308.50	6,339.8	302.1	-500.5	-302.1	0.75	-0.74	
6,465.0	2.20	303.60	6,434.7	304.6	-503.9	-304.6	0.77	-0.74	
6,559.0	1.50	302.20	6,528.7	306.3	-506.4	-306.3	0.75	-0.74	
6,654.0	0.80	313.90	6,623.7	307.4	-507.9	-307.4	0.77	-0.74	
6,748.0	0.40	299.60	6,717.7	308.0	-508.7	-308.0	0.45	-0.43	
6,843.0	0.30	302.00	6,812.7	308.3	-509.2	-308.3	0.11	-0.11	
6,937.0	0.20	50.80	6,906.7	308.5	-509.3	-308.5	0.44	-0.11	
6,972.0	0.20	4.40	6,941.7	308.6	-509.2	-308.6	0.45	0.00	
7,003.0	1.40	173.40	6,972.7	308.3	-509.2	-308.3	5.15	3.87	
7,035.0	4.60	176.50	7,004.6	306.6	-509.0	-306.6	10.01	10.00	
7,066.0	8.30	184.10	7,035.4	303.2	-509.1	-303.2	12.22	11.94	
7,098.0	10.50	186.00	7,067.0	298.0	-509.6	-298.0	6.94	6.87	
7,129.0	13.60	186.30	7,097.3	291.5	-510.3	-291.5	10.00	10.00	
7,161.0	16.80	187.90	7,128.2	283.2	-511.3	-283.2	10.08	10.00	
7,192.0	20.10	186.70	7,157.6	273.5	-512.6	-273.5	10.71	10.65	
7,224.0	23.60	185.30	7,187.3	261.6	-513.8	-261.6	11.06	10.94	
7,255.0	27.60	184.00	7,215.2	248.3	-514.9	-248.3	13.03	12.90	
7,287.0	31.40	182.80	7,243.1	232.6	-515.8	-232.6	12.02	11.87	
7,318.0	34.70	180.20	7,269.1	215.7	-516.2	-215.7	11.58	10.65	
7,350.0	38.20	179.00	7,294.8	196.7	-516.1	-196.7	11.16	10.94	
7,382.0	42.50	177.60	7,319.2	176.0	-515.5	-176.0	13.73	13.44	
7,413.0	46.40	177.60	7,341.3	154.3	-514.6	-154.3	12.58	12.58	
7,445.0	50.00	177.50	7,362.6	130.4	-513.5	-130.4	11.25	11.25	
7,476.0	53.10	177.70	7,381.9	106.2	-512.5	-106.2	10.01	10.00	
7,508.0	56.30	177.30	7,400.4	80.1	-511.4	-80.1	10.05	10.00	
7,539.0	59.30	176.80	7,416.9	53.9	-510.0	-53.9	9.77	9.68	
7,571.0	61.90	178.00	7,432.6	26.1	-508.8	-26.1	8.76	8.12	
7,602.0	63.70	178.70	7,446.8	-1.5	-508.0	1.5	6.14	5.81	
7,634.0	65.20	178.30	7,460.6	-30.4	-507.2	30.4	4.82	4.69	
7,665.0	67.80	177.70	7,472.9	-58.8	-506.2	58.8	8.57	8.39	
7,697.0	70.80	177.10	7,484.3	-88.7	-504.9	88.7	9.54	9.37	
7,732.0	76.40	177.40	7,494.1	-122.2	-503.3	122.2	16.02	16.00	
7,816.0	86.20	179.30	7,506.8	-205.1	-500.9	205.1	11.88	11.66	
7,911.0	89.90	180.30	7,510.1	-300.0	-500.6	300.0	4.03	3.89	
8,006.0	91.50	180.80	7,508.9	-395.0	-501.5	395.0	1.76	1.68	
8,100.0	91.40	180.70	7,506.5	-489.0	-502.7	489.0	0.15	-0.11	
8,194.0	89.80	180.90	7,505.5	-583.0	-504.0	583.0	1.72	-1.70	
8,289.0	89.80	180.20	7,505.9	-678.0	-504.9	678.0	0.74	0.00	
8,383.0	88.80	180.80	7,507.0	-771.9	-505.7	771.9	1.24	-1.06	
8,478.0	89.90	180.20	7,508.1	-866.9	-506.6	866.9	1.32	1.16	
8,572.0	89.10	179.00	7,508.9	-960.9	-505.9	960.9	1.53	-0.85	
8,667.0	89.60	177.10	7,510.0	-1,055.8	-502.7	1,055.8	2.07	0.53	
8,762.0	91.50	178.00	7,509.1	-1,150.7	-498.6	1,150.7	2.21	2.00	
8,856.0	89.60	178.00	7,508.2	-1,244.7	-495.3	1,244.7	2.02	-2.02	
8,951.0	87.80	178.50	7,510.3	-1,339.6	-492.4	1,339.6	1.97	-1.89	
9,045.0	88.00	179.50	7,513.8	-1,433.5	-490.8	1,433.5	1.08	0.21	
9,140.0	89.30	180.70	7,516.0	-1,528.5	-491.0	1,528.5	1.86	1.37	
9,235.0	91.20	182.90	7,515.6	-1,623.4	-494.0	1,623.4	3.06	2.00	
9,329.0	91.20	182.70	7,513.6	-1,717.3	-498.5	1,717.3	0.21	0.00	
9,424.0	87.10	180.70	7,515.0	-1,812.2	-501.4	1,812.2	4.80	-4.32	
9,518.0	87.40	180.80	7,519.5	-1,906.1	-502.6	1,906.1	0.34	0.32	
9,613.0	88.00	181.70	7,523.4	-2,001.0	-504.7	2,001.0	1.14	0.63	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lochbuie 2B-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 2B-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
9,708.0	92.80	182.60	7,522.7	-2,095.9	-508.2	2,095.9	5.14	5.05	
9,802.0	92.00	181.40	7,518.8	-2,189.8	-511.5	2,189.8	1.53	-0.85	
9,897.0	88.90	179.30	7,518.0	-2,284.7	-512.1	2,284.7	3.94	-3.26	
9,991.0	88.40	178.10	7,520.2	-2,378.7	-510.0	2,378.7	1.38	-0.53	
10,086.0	89.20	176.30	7,522.2	-2,473.6	-505.3	2,473.6	2.07	0.84	
10,181.0	91.20	175.90	7,521.9	-2,568.3	-498.9	2,568.3	2.15	2.11	
10,275.0	92.40	177.10	7,518.9	-2,662.1	-493.1	2,662.1	1.80	1.28	
10,370.0	91.10	178.90	7,516.0	-2,757.0	-489.8	2,757.0	2.34	-1.37	
10,464.0	89.40	181.00	7,515.6	-2,851.0	-489.7	2,851.0	2.87	-1.81	
10,559.0	89.50	180.50	7,516.5	-2,946.0	-491.0	2,946.0	0.54	0.11	
10,653.0	88.00	182.80	7,518.6	-3,039.9	-493.7	3,039.9	2.92	-1.60	
10,748.0	88.10	182.40	7,521.8	-3,134.8	-498.0	3,134.8	0.43	0.11	
10,843.0	89.80	182.50	7,523.6	-3,229.6	-502.0	3,229.6	1.79	1.79	
10,937.0	91.60	181.10	7,522.4	-3,323.6	-505.0	3,323.6	2.43	1.91	
11,032.0	92.60	181.40	7,518.9	-3,418.5	-507.1	3,418.5	1.10	1.05	
11,127.0	92.10	180.20	7,515.0	-3,513.4	-508.4	3,513.4	1.37	-0.53	
11,221.0	92.00	179.50	7,511.7	-3,607.3	-508.1	3,607.3	0.75	-0.11	
11,316.0	88.80	176.70	7,511.0	-3,702.3	-505.0	3,702.3	4.48	-3.37	
11,411.0	88.40	176.60	7,513.3	-3,797.1	-499.4	3,797.1	0.43	-0.42	
11,505.0	86.90	177.70	7,517.2	-3,890.9	-494.8	3,890.9	1.98	-1.60	
11,600.0	89.60	180.50	7,520.1	-3,985.8	-493.3	3,985.8	4.09	2.84	
11,694.0	93.80	182.90	7,517.3	-4,079.7	-496.1	4,079.7	5.15	4.47	
11,789.0	93.70	182.50	7,511.1	-4,174.4	-500.5	4,174.4	0.43	-0.11	
11,883.0	90.40	181.50	7,507.7	-4,268.3	-503.8	4,268.3	3.67	-3.51	
12,001.0	90.20	180.70	7,507.1	-4,386.2	-506.1	4,386.2	0.70	-0.17	Last Cathedral Survey @ 12,001' MD
12,051.0	90.20	180.70	7,506.9	-4,436.2	-506.7	4,436.2	0.00	0.00	Projection to Bit @ 12,051'

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 2B-31H PBHL	0.00	0.00	7,495.0	-4,476.9	-509.9	1,244,477.28	3,220,201.30	40.001790	-104.713990
- actual wellpath misses target center by 42.5ft at 12051.0ft MD (7506.9 TVD, -4436.2 N, -506.7 E)									
- Point									
Lochbuie 2B-31H PBHL	0.00	0.00	7,521.0	-4,476.9	-509.9	1,244,477.28	3,220,201.30	40.001790	-104.713990
- actual wellpath misses target center by 43.2ft at 12051.0ft MD (7506.9 TVD, -4436.2 N, -506.7 E)									
- Point									

Design Annotations

	Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
			+N/-S (ft)	+E/-W (ft)	
	12,001.0	7,507.1	-4,386.2	-506.1	Last Cathedral Survey @ 12,001' MD
	12,051.0	7,506.9	-4,436.2	-506.7	Projection to Bit @ 12,051'

Checked By: _____ Approved By: _____ Date: _____