



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Melbon Ranch 3B-17H
Project:	DJ Wattenberg	TVD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Site:	NESE S17-T2N-R65W (Melbon Ranch)	MD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Well:	Melbon Ranch 3B-17H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Hz	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		NESE S17-T2N-R65W (Melbon Ranch)			
Site Position:		Northing:	1,293,771.71 ft	Latitude:	40.136880
From:	Lat/Long	Easting:	3,229,276.43 ft	Longitude:	-104.679970
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.53 °

Well	Melbon Ranch 3B-17H					
Well Position	+N/-S	0.0 ft	Northing:	1,293,036.96 ft	Latitude:	40.134980
	+E/-W	0.0 ft	Easting:	3,224,624.90 ft	Longitude:	-104.696630
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,958.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/16/2012	8.70	66.82	52,919

Design	Hz				
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	90.00	

Survey Program	Date	3/28/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
53.0	881.0	Survey #1 (Hz)	MWD	Geolink MWD	
954.0	11,980.0	Survey #3 (Hz)	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		
53.0	0.39	115.86	53.0	-0.1	0.2	0.2	0.74	0.74		
145.0	0.48	140.34	145.0	-0.5	0.7	0.7	0.22	0.10		
237.0	0.34	156.99	237.0	-1.1	1.0	1.0	0.20	-0.16		
329.0	0.29	170.89	329.0	-1.5	1.2	1.2	0.10	-0.05		
421.0	0.19	189.23	421.0	-1.9	1.2	1.2	0.13	-0.10		
513.0	0.09	205.13	513.0	-2.1	1.1	1.1	0.12	-0.11		
605.0	0.15	54.79	605.0	-2.1	1.2	1.2	0.26	0.07		
697.0	0.10	146.81	697.0	-2.1	1.4	1.4	0.20	-0.05		
789.0	0.23	139.85	789.0	-2.3	1.5	1.5	0.14	0.14		
881.0	0.43	137.83	881.0	-2.7	1.9	1.9	0.22	0.22	Last Gyro Survey @ 881' MD	
954.0	0.70	142.00	954.0	-3.3	2.3	2.3	0.37	0.36		

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Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Hz	Database:	USA EDM 5000 Multi Users DB

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1,046.0	1.80	331.10	1,046.0	-2.5	2.0	2.0	2.71	1.20	
1,138.0	4.00	333.60	1,137.9	1.7	-0.1	-0.1	2.39	2.39	
1,230.0	6.40	334.70	1,229.5	9.2	-3.8	-3.8	2.61	2.61	
1,321.0	8.50	331.40	1,319.7	19.7	-9.1	-9.1	2.35	2.31	
1,413.0	10.00	330.60	1,410.5	32.6	-16.3	-16.3	1.64	1.63	
1,507.0	10.20	330.80	1,503.0	47.0	-24.4	-24.4	0.22	0.21	
1,602.0	10.50	330.50	1,596.5	61.8	-32.8	-32.8	0.32	0.32	
1,697.0	11.20	330.80	1,689.8	77.4	-41.5	-41.5	0.74	0.74	
1,792.0	11.20	330.00	1,783.0	93.5	-50.6	-50.6	0.16	0.00	
1,887.0	11.00	328.00	1,876.2	109.2	-60.1	-60.1	0.46	-0.21	
1,982.0	9.60	324.30	1,969.7	123.3	-69.5	-69.5	1.63	-1.47	
2,078.0	9.80	329.20	2,064.3	136.8	-78.3	-78.3	0.88	0.21	
2,173.0	9.00	325.00	2,158.0	149.8	-86.7	-86.7	1.11	-0.84	
2,268.0	9.40	326.60	2,251.8	162.4	-95.3	-95.3	0.50	0.42	
2,363.0	8.80	328.70	2,345.6	175.1	-103.3	-103.3	0.72	-0.63	
2,458.0	9.30	328.80	2,439.4	187.9	-111.1	-111.1	0.53	0.53	
2,554.0	9.40	333.70	2,534.2	201.5	-118.6	-118.6	0.84	0.10	
2,649.0	8.90	333.30	2,627.9	215.0	-125.3	-125.3	0.53	-0.53	
2,744.0	8.30	334.00	2,721.9	227.8	-131.6	-131.6	0.64	-0.63	
2,807.0	8.10	332.90	2,784.2	235.8	-135.6	-135.6	0.40	-0.32	
2,871.0	9.00	333.20	2,847.5	244.3	-139.9	-139.9	1.41	1.41	
2,966.0	10.40	335.20	2,941.2	258.7	-146.9	-146.9	1.52	1.47	
3,061.0	10.20	334.60	3,034.6	274.1	-154.1	-154.1	0.24	-0.21	
3,157.0	9.50	335.00	3,129.2	288.9	-161.1	-161.1	0.73	-0.73	
3,252.0	9.50	327.40	3,222.9	302.7	-168.6	-168.6	1.32	0.00	
3,347.0	8.70	326.30	3,316.7	315.2	-176.8	-176.8	0.86	-0.84	
3,442.0	9.50	332.90	3,410.5	328.2	-184.4	-184.4	1.38	0.84	
3,538.0	8.20	332.90	3,505.4	341.3	-191.1	-191.1	1.35	-1.35	
3,601.0	7.80	330.00	3,567.8	349.0	-195.3	-195.3	0.90	-0.63	
3,664.0	8.20	325.70	3,630.2	356.5	-200.0	-200.0	1.14	0.63	
3,728.0	9.10	325.60	3,693.4	364.4	-205.4	-205.4	1.41	1.41	
3,823.0	9.10	325.90	3,787.2	376.8	-213.9	-213.9	0.05	0.00	
3,918.0	7.50	322.70	3,881.2	388.0	-221.8	-221.8	1.75	-1.68	
4,014.0	6.50	315.80	3,976.5	396.9	-229.4	-229.4	1.36	-1.04	
4,109.0	6.20	325.00	4,070.9	404.9	-236.1	-236.1	1.12	-0.32	
4,204.0	5.80	326.50	4,165.4	413.1	-241.7	-241.7	0.45	-0.42	
4,299.0	4.80	329.90	4,260.0	420.6	-246.3	-246.3	1.10	-1.05	
4,394.0	4.20	334.40	4,354.7	427.1	-249.8	-249.8	0.73	-0.63	
4,490.0	3.30	331.80	4,450.5	432.7	-252.7	-252.7	0.95	-0.94	
4,585.0	3.20	333.60	4,545.4	437.5	-255.1	-255.1	0.15	-0.11	
4,680.0	2.20	350.30	4,640.3	441.7	-256.6	-256.6	1.33	-1.05	
4,775.0	0.60	22.00	4,735.2	444.0	-256.7	-256.7	1.81	-1.68	
4,870.0	0.40	12.60	4,830.2	444.7	-256.5	-256.5	0.23	-0.21	
4,966.0	0.40	185.20	4,926.2	444.7	-256.4	-256.4	0.83	0.00	
5,061.0	1.70	201.30	5,021.2	443.1	-257.0	-257.0	1.39	1.37	
5,156.0	2.00	225.40	5,116.1	440.6	-258.7	-258.7	0.87	0.32	
5,251.0	2.70	243.20	5,211.1	438.4	-261.8	-261.8	1.06	0.74	
5,283.0	3.10	250.40	5,243.0	437.8	-263.3	-263.3	1.69	1.25	
5,378.0	0.70	296.70	5,338.0	437.2	-266.3	-266.3	2.81	-2.53	
5,473.0	0.40	319.30	5,433.0	437.7	-267.0	-267.0	0.38	-0.32	
5,568.0	0.40	340.20	5,528.0	438.3	-267.3	-267.3	0.15	0.00	
5,664.0	0.70	333.50	5,624.0	439.1	-267.7	-267.7	0.32	0.31	
5,759.0	1.10	328.70	5,719.0	440.4	-268.4	-268.4	0.43	0.42	

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5,854.0	0.70	355.40	5,813.9	441.8	-269.0	-269.0	0.60	-0.42	
5,949.0	0.60	340.00	5,908.9	442.8	-269.2	-269.2	0.21	-0.11	
6,044.0	0.40	312.30	6,003.9	443.5	-269.6	-269.6	0.32	-0.21	
6,140.0	0.60	296.50	6,099.9	444.0	-270.3	-270.3	0.25	0.21	
6,235.0	0.60	314.40	6,194.9	444.5	-271.1	-271.1	0.20	0.00	
6,330.0	0.60	351.60	6,289.9	445.4	-271.5	-271.5	0.40	0.00	
6,425.0	0.50	4.10	6,384.9	446.3	-271.6	-271.6	0.16	-0.11	
6,520.0	0.50	41.10	6,479.9	447.0	-271.3	-271.3	0.33	0.00	
6,584.0	0.30	39.60	6,543.9	447.3	-271.0	-271.0	0.31	-0.31	
6,616.0	0.50	35.00	6,575.9	447.5	-270.8	-270.8	0.63	0.62	
6,647.0	1.80	62.10	6,606.9	447.9	-270.3	-270.3	4.43	4.19	
6,679.0	4.10	74.50	6,638.9	448.4	-268.8	-268.8	7.42	7.19	
6,711.0	6.50	75.80	6,670.7	449.2	-265.9	-265.9	7.51	7.50	
6,743.0	8.90	75.20	6,702.4	450.2	-261.8	-261.8	7.50	7.50	
6,774.0	11.20	75.10	6,732.9	451.6	-256.5	-256.5	7.42	7.42	
6,806.0	13.60	76.80	6,764.2	453.3	-249.9	-249.9	7.59	7.50	
6,838.0	16.10	78.60	6,795.1	455.0	-241.9	-241.9	7.94	7.81	
6,870.0	18.50	81.00	6,825.7	456.7	-232.5	-232.5	7.82	7.50	
6,901.0	20.80	83.50	6,854.9	458.1	-222.2	-222.2	7.90	7.42	
6,933.0	23.40	84.30	6,884.5	459.4	-210.2	-210.2	8.18	8.12	
6,965.0	26.20	85.70	6,913.6	460.5	-196.8	-196.8	8.94	8.75	
6,996.0	29.00	88.60	6,941.0	461.2	-182.5	-182.5	10.02	9.03	
7,028.0	31.60	91.00	6,968.7	461.3	-166.3	-166.3	8.96	8.12	
7,060.0	34.90	92.30	6,995.4	460.7	-148.8	-148.8	10.55	10.31	
7,092.0	38.10	92.90	7,021.1	459.9	-129.8	-129.8	10.06	10.00	
7,123.0	41.50	93.30	7,045.0	458.8	-110.0	-110.0	11.00	10.97	
7,155.0	44.80	93.50	7,068.3	457.5	-88.1	-88.1	10.32	10.31	
7,189.0	47.80	95.30	7,091.8	455.6	-63.6	-63.6	9.62	8.82	
7,220.0	50.40	95.80	7,112.1	453.3	-40.3	-40.3	8.48	8.39	
7,252.0	53.60	96.10	7,131.8	450.7	-15.2	-15.2	10.03	10.00	
7,282.0	56.70	94.80	7,148.9	448.4	9.3	9.3	10.93	10.33	
7,314.0	61.10	94.20	7,165.4	446.2	36.6	36.6	13.84	13.75	
7,340.8	65.88	93.52	7,177.4	444.6	60.5	60.5	17.95	17.81	Formation 3
7,346.0	66.80	93.40	7,179.5	444.3	65.2	65.2	17.95	17.82	
7,377.0	72.40	93.00	7,190.3	442.7	94.2	94.2	18.10	18.06	
7,409.0	76.70	92.70	7,198.8	441.2	125.0	125.0	13.47	13.44	
7,441.0	79.20	93.10	7,205.5	439.6	156.3	156.3	7.91	7.81	
7,462.0	80.80	93.00	7,209.1	438.5	176.9	176.9	7.63	7.62	
7,510.0	85.00	93.10	7,215.1	436.0	224.5	224.5	8.75	8.75	
7,516.4	85.36	93.10	7,215.6	435.6	230.9	230.9	5.62	5.62	Formation 2
7,542.0	86.80	93.10	7,217.4	434.2	256.4	256.4	5.62	5.62	
7,574.0	88.10	93.80	7,218.8	432.3	288.3	288.3	4.61	4.06	
7,606.0	90.20	94.30	7,219.3	430.1	320.2	320.2	6.75	6.56	
7,616.9	90.73	93.95	7,219.2	429.3	331.1	331.1	5.82	4.84	Melbon Ranch 3B-17H TGT 1
7,637.0	91.70	93.30	7,218.7	428.0	351.1	351.1	5.82	4.84	
7,669.0	92.40	92.20	7,217.6	426.5	383.1	383.1	4.07	2.19	
7,701.0	92.60	90.80	7,216.2	425.6	415.0	415.0	4.42	0.62	
7,732.0	91.80	89.80	7,215.0	425.5	446.0	446.0	4.13	-2.58	
7,764.0	90.80	89.30	7,214.3	425.7	478.0	478.0	3.49	-3.12	
7,828.0	90.90	89.30	7,213.3	426.5	542.0	542.0	0.16	0.16	
7,891.0	91.20	89.00	7,212.2	427.4	605.0	605.0	0.67	0.48	
7,955.0	91.50	89.10	7,210.7	428.5	668.9	668.9	0.49	0.47	
8,018.0	91.40	88.80	7,209.1	429.7	731.9	731.9	0.50	-0.16	

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8,081.0	91.70	88.70	7,207.4	431.0	794.9	794.9	0.50	0.48	
8,118.5	91.64	88.88	7,206.3	431.8	832.3	832.3	0.49	-0.16	Melbon Ranch 3B-17H TGT 2
8,145.0	91.60	89.00	7,205.5	432.3	858.8	858.8	0.49	-0.16	
8,208.0	91.20	88.80	7,204.0	433.5	921.8	921.8	0.71	-0.63	
8,272.0	91.40	88.90	7,202.5	434.8	985.8	985.8	0.35	0.31	
8,335.0	91.30	89.50	7,201.1	435.7	1,048.7	1,048.7	0.97	-0.16	
8,399.0	90.30	89.10	7,200.2	436.5	1,112.7	1,112.7	1.68	-1.56	
8,462.0	89.80	89.30	7,200.1	437.4	1,175.7	1,175.7	0.85	-0.79	
8,526.0	89.80	89.00	7,200.3	438.3	1,239.7	1,239.7	0.47	0.00	
8,589.0	90.10	89.60	7,200.4	439.1	1,302.7	1,302.7	1.06	0.48	
8,618.3	90.70	90.07	7,200.2	439.2	1,332.0	1,332.0	2.60	2.06	Melbon Ranch 3B-17H TGT 3
8,652.0	91.40	90.60	7,199.6	439.0	1,365.7	1,365.7	2.60	2.06	
8,716.0	92.00	90.50	7,197.7	438.3	1,429.7	1,429.7	0.95	0.94	
8,779.0	91.30	90.60	7,195.9	437.7	1,492.7	1,492.7	1.12	-1.11	
8,843.0	90.50	90.60	7,194.9	437.1	1,556.6	1,556.6	1.25	-1.25	
8,906.0	90.60	90.30	7,194.2	436.6	1,619.6	1,619.6	0.50	0.16	
8,970.0	89.80	89.60	7,194.0	436.6	1,683.6	1,683.6	1.66	-1.25	
9,033.0	90.90	90.00	7,193.6	436.9	1,746.6	1,746.6	1.86	1.75	
9,097.0	91.40	90.40	7,192.4	436.6	1,810.6	1,810.6	1.00	0.78	
9,118.5	91.37	90.20	7,191.8	436.5	1,832.0	1,832.0	0.97	-0.16	Melbon Ranch 3B-17H TGT 4
9,160.0	91.30	89.80	7,190.9	436.5	1,873.6	1,873.6	0.97	-0.16	
9,224.0	89.50	89.00	7,190.4	437.2	1,937.6	1,937.6	3.08	-2.81	
9,287.0	89.90	89.70	7,190.8	437.9	2,000.6	2,000.6	1.28	0.63	
9,351.0	90.80	90.90	7,190.4	437.6	2,064.6	2,064.6	2.34	1.41	
9,414.0	90.40	90.40	7,189.7	436.9	2,127.6	2,127.6	1.02	-0.63	
9,478.0	90.40	89.80	7,189.3	436.7	2,191.6	2,191.6	0.94	0.00	
9,541.0	91.50	89.90	7,188.2	436.9	2,254.5	2,254.5	1.75	1.75	
9,605.0	90.60	89.70	7,187.0	437.1	2,318.5	2,318.5	1.44	-1.41	
9,618.6	90.77	89.81	7,186.9	437.2	2,332.1	2,332.1	1.50	1.27	Melbon Ranch 3B-17H TGT 5
9,668.0	91.40	90.20	7,185.9	437.2	2,381.5	2,381.5	1.50	1.27	
9,731.0	92.20	90.00	7,184.0	437.1	2,444.5	2,444.5	1.31	1.27	
9,795.0	91.80	89.50	7,181.7	437.4	2,508.4	2,508.4	1.00	-0.62	
9,858.0	91.50	90.20	7,179.9	437.5	2,571.4	2,571.4	1.21	-0.48	
9,922.0	91.00	89.80	7,178.5	437.5	2,635.4	2,635.4	1.00	-0.78	
9,985.0	90.30	89.70	7,177.8	437.8	2,698.4	2,698.4	1.12	-1.11	
10,049.0	89.50	89.40	7,177.9	438.3	2,762.4	2,762.4	1.33	-1.25	
10,112.0	89.20	89.00	7,178.6	439.2	2,825.4	2,825.4	0.79	-0.48	
10,118.6	89.25	89.07	7,178.7	439.3	2,832.0	2,832.0	1.34	0.78	Melbon Ranch 3B-17H TGT 6
10,176.0	89.70	89.70	7,179.2	439.9	2,889.4	2,889.4	1.34	0.78	
10,239.0	90.40	89.90	7,179.2	440.1	2,952.4	2,952.4	1.16	1.11	
10,303.0	91.00	89.70	7,178.4	440.3	3,016.4	3,016.4	0.99	0.94	
10,366.0	91.10	89.80	7,177.2	440.6	3,079.4	3,079.4	0.22	0.16	
10,430.0	91.50	89.80	7,175.8	440.8	3,143.3	3,143.3	0.62	0.62	
10,493.0	90.70	88.70	7,174.6	441.7	3,206.3	3,206.3	2.16	-1.27	
10,557.0	91.00	88.40	7,173.6	443.3	3,270.3	3,270.3	0.66	0.47	
10,618.9	90.90	88.30	7,172.6	445.1	3,332.1	3,332.1	0.22	-0.16	Melbon Ranch 3B-17H TGT 7
10,620.0	90.90	88.30	7,172.6	445.1	3,333.3	3,333.3	0.22	-0.16	
10,684.0	90.90	87.60	7,171.6	447.4	3,397.2	3,397.2	1.09	0.00	
10,747.0	90.90	88.10	7,170.6	449.8	3,460.2	3,460.2	0.79	0.00	
10,811.0	90.90	89.70	7,169.6	451.0	3,524.1	3,524.1	2.50	0.00	
10,874.0	91.10	89.70	7,168.5	451.3	3,587.1	3,587.1	0.32	0.32	
10,938.0	90.50	89.60	7,167.6	451.7	3,651.1	3,651.1	0.95	-0.94	
11,001.0	90.90	89.80	7,166.8	452.0	3,714.1	3,714.1	0.71	0.63	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Melbon Ranch 3B-17H
Project:	DJ Wattenberg	TVD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Site:	NESE S17-T2N-R65W (Melbon Ranch)	MD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Well:	Melbon Ranch 3B-17H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Hz	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
11,065.0	91.80	89.70	7,165.3	452.3	3,778.1	3,778.1	1.41	1.41	
11,119.1	91.29	89.96	7,163.9	452.5	3,832.1	3,832.1	1.06	-0.95	Melbon Ranch 3B-17H TGT 8
11,128.0	91.20	90.00	7,163.7	452.5	3,841.1	3,841.1	1.06	-0.95	
11,192.0	91.10	90.20	7,162.4	452.4	3,905.1	3,905.1	0.35	-0.16	
11,255.0	92.10	90.30	7,160.6	452.1	3,968.0	3,968.0	1.60	1.59	
11,318.0	91.00	89.90	7,158.9	452.0	4,031.0	4,031.0	1.86	-1.75	
11,382.0	90.70	90.20	7,158.0	451.9	4,095.0	4,095.0	0.66	-0.47	
11,446.0	90.80	90.20	7,157.1	451.7	4,159.0	4,159.0	0.16	0.16	
11,509.0	91.40	90.50	7,155.9	451.3	4,222.0	4,222.0	1.06	0.95	
11,572.0	91.40	89.70	7,154.4	451.2	4,285.0	4,285.0	1.27	0.00	
11,619.1	91.33	89.63	7,153.3	451.5	4,332.1	4,332.1	0.22	-0.16	Melbon Ranch 3B-17H TGT 9
11,635.0	91.30	89.60	7,152.9	451.6	4,347.9	4,347.9	0.22	-0.16	
11,699.0	91.50	89.70	7,151.3	452.0	4,411.9	4,411.9	0.35	0.31	
11,794.0	92.00	89.50	7,148.4	452.6	4,506.9	4,506.9	0.57	0.53	
11,857.0	90.90	88.10	7,146.8	454.0	4,569.8	4,569.8	2.83	-1.75	
11,918.9	90.90	87.83	7,145.9	456.2	4,631.7	4,631.7	0.44	0.00	Melbon Ranch 3B-17H TGT 10
11,925.0	90.90	87.80	7,145.8	456.4	4,637.8	4,637.8	0.44	0.00	
11,980.0	90.90	87.80	7,144.9	458.5	4,692.7	4,692.7	0.00	0.00	Last Cathedral Survey @ 11980' MD

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Melbon Ranch 3B-17H
Project:	DJ Wattenberg	TVD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Site:	NESE S17-T2N-R65W (Melbon Ranch)	MD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Well:	Melbon Ranch 3B-17H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Hz	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)		
Melbon Ranch 3B-17H 1	0.00	0.00	7,166.0	444.9	3,332.0	1,293,511.99	3,227,952.75	40.136201	-104.684713
- actual wellpath misses target center by 6.6ft at 10618.9ft MD (7172.6 TVD, 445.1 N, 3332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,158.0	444.9	3,832.0	1,293,516.52	3,228,452.73	40.136200	-104.682924
- actual wellpath misses target center by 9.6ft at 11119.1ft MD (7163.9 TVD, 452.5 N, 3832.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,190.0	444.9	1,832.0	1,293,498.40	3,226,452.81	40.136201	-104.690078
- actual wellpath misses target center by 8.5ft at 9118.4ft MD (7191.8 TVD, 436.5 N, 1832.0 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,198.0	444.9	1,332.0	1,293,493.87	3,225,952.83	40.136201	-104.691866
- actual wellpath misses target center by 6.1ft at 8618.3ft MD (7200.2 TVD, 439.2 N, 1332.0 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,206.0	444.9	832.0	1,293,489.34	3,225,452.85	40.136201	-104.693654
- actual wellpath misses target center by 13.0ft at 8118.5ft MD (7206.3 TVD, 431.8 N, 832.3 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,182.0	444.9	2,332.0	1,293,502.93	3,226,952.79	40.136201	-104.688289
- actual wellpath misses target center by 9.1ft at 9618.6ft MD (7186.9 TVD, 437.2 N, 2332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,214.0	444.9	332.0	1,293,484.81	3,224,952.87	40.136201	-104.695443
- actual wellpath misses target center by 16.4ft at 7616.8ft MD (7219.2 TVD, 429.3 N, 330.9 E)									
- Point									
Melbon Ranch 3B-17H F	0.00	0.00	7,202.0	444.9	4,632.9	1,293,523.78	3,229,253.56	40.136200	-104.680060
- actual wellpath misses target center by 57.3ft at 11918.8ft MD (7145.9 TVD, 456.2 N, 4631.6 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,142.0	444.9	4,632.0	1,293,523.77	3,229,252.69	40.136200	-104.680063
- actual wellpath misses target center by 11.9ft at 11918.9ft MD (7145.9 TVD, 456.2 N, 4631.7 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,150.0	444.9	4,332.0	1,293,521.05	3,228,952.71	40.136200	-104.681136
- actual wellpath misses target center by 7.4ft at 11619.1ft MD (7153.3 TVD, 451.5 N, 4332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,174.0	444.9	2,832.0	1,293,507.46	3,227,452.77	40.136201	-104.686501
- actual wellpath misses target center by 7.3ft at 10118.6ft MD (7178.7 TVD, 439.3 N, 2832.0 E)									
- Point									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,340.8	7,177.0	Formation 3		0.40	90.00
7,516.4	7,214.0	Formation 2		0.40	90.00

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
881.0	881.0	-2.7	1.9	Last Gyro Survey @ 881' MD	
11,980.0	7,144.9	458.5	4,692.7	Last Cathedral Survey @ 11980' MD	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Melbon Ranch 3B-17H
Project:	DJ Wattenberg	TVD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Site:	NESE S17-T2N-R65W (Melbon Ranch)	MD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Well:	Melbon Ranch 3B-17H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Hz	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)		
Melbon Ranch 3B-17H 1	0.00	0.00	7,166.0	444.9	3,332.0	1,293,511.99	3,227,952.75	40.136201	-104.684713
- actual wellpath misses target center by 6.6ft at 10618.9ft MD (7172.6 TVD, 445.1 N, 3332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,158.0	444.9	3,832.0	1,293,516.52	3,228,452.73	40.136200	-104.682924
- actual wellpath misses target center by 9.6ft at 11119.1ft MD (7163.9 TVD, 452.5 N, 3832.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,190.0	444.9	1,832.0	1,293,498.40	3,226,452.81	40.136201	-104.690078
- actual wellpath misses target center by 8.5ft at 9118.4ft MD (7191.8 TVD, 436.5 N, 1832.0 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,198.0	444.9	1,332.0	1,293,493.87	3,225,952.83	40.136201	-104.691866
- actual wellpath misses target center by 6.1ft at 8618.3ft MD (7200.2 TVD, 439.2 N, 1332.0 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,206.0	444.9	832.0	1,293,489.34	3,225,452.85	40.136201	-104.693654
- actual wellpath misses target center by 13.0ft at 8118.5ft MD (7206.3 TVD, 431.8 N, 832.3 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,182.0	444.9	2,332.0	1,293,502.93	3,226,952.79	40.136201	-104.688289
- actual wellpath misses target center by 9.1ft at 9618.6ft MD (7186.9 TVD, 437.2 N, 2332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,214.0	444.9	332.0	1,293,484.81	3,224,952.87	40.136201	-104.695443
- actual wellpath misses target center by 16.4ft at 7616.8ft MD (7219.2 TVD, 429.3 N, 330.9 E)									
- Point									
Melbon Ranch 3B-17H F	0.00	0.00	7,202.0	444.9	4,632.9	1,293,523.78	3,229,253.56	40.136200	-104.680060
- actual wellpath misses target center by 57.3ft at 11918.8ft MD (7145.9 TVD, 456.2 N, 4631.6 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,142.0	444.9	4,632.0	1,293,523.77	3,229,252.69	40.136200	-104.680063
- actual wellpath misses target center by 11.9ft at 11918.9ft MD (7145.9 TVD, 456.2 N, 4631.7 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,150.0	444.9	4,332.0	1,293,521.05	3,228,952.71	40.136200	-104.681136
- actual wellpath misses target center by 7.4ft at 11619.1ft MD (7153.3 TVD, 451.5 N, 4332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,174.0	444.9	2,832.0	1,293,507.46	3,227,452.77	40.136201	-104.686501
- actual wellpath misses target center by 7.3ft at 10118.6ft MD (7178.7 TVD, 439.3 N, 2832.0 E)									
- Point									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,340.8	7,177.0	Formation 3		0.40	90.00
7,516.4	7,214.0	Formation 2		0.40	90.00

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
881.0	881.0	-2.7	1.9	Last Gyro Survey @ 881' MD	
11,980.0	7,144.9	458.5	4,692.7	Last Cathedral Survey @ 11980' MD	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Melbon Ranch 3B-17H
Project:	DJ Wattenberg	TVD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Site:	NESE S17-T2N-R65W (Melbon Ranch)	MD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Well:	Melbon Ranch 3B-17H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Hz	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)		
Melbon Ranch 3B-17H 1	0.00	0.00	7,166.0	444.9	3,332.0	1,293,511.99	3,227,952.75	40.136201	-104.684713
- actual wellpath misses target center by 6.6ft at 10618.9ft MD (7172.6 TVD, 445.1 N, 3332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,158.0	444.9	3,832.0	1,293,516.52	3,228,452.73	40.136200	-104.682924
- actual wellpath misses target center by 9.6ft at 11119.1ft MD (7163.9 TVD, 452.5 N, 3832.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,190.0	444.9	1,832.0	1,293,498.40	3,226,452.81	40.136201	-104.690078
- actual wellpath misses target center by 8.5ft at 9118.4ft MD (7191.8 TVD, 436.5 N, 1832.0 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,198.0	444.9	1,332.0	1,293,493.87	3,225,952.83	40.136201	-104.691866
- actual wellpath misses target center by 6.1ft at 8618.3ft MD (7200.2 TVD, 439.2 N, 1332.0 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,206.0	444.9	832.0	1,293,489.34	3,225,452.85	40.136201	-104.693654
- actual wellpath misses target center by 13.0ft at 8118.5ft MD (7206.3 TVD, 431.8 N, 832.3 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,182.0	444.9	2,332.0	1,293,502.93	3,226,952.79	40.136201	-104.688289
- actual wellpath misses target center by 9.1ft at 9618.6ft MD (7186.9 TVD, 437.2 N, 2332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,214.0	444.9	332.0	1,293,484.81	3,224,952.87	40.136201	-104.695443
- actual wellpath misses target center by 16.4ft at 7616.8ft MD (7219.2 TVD, 429.3 N, 330.9 E)									
- Point									
Melbon Ranch 3B-17H F	0.00	0.00	7,202.0	444.9	4,632.9	1,293,523.78	3,229,253.56	40.136200	-104.680060
- actual wellpath misses target center by 57.3ft at 11918.8ft MD (7145.9 TVD, 456.2 N, 4631.6 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,142.0	444.9	4,632.0	1,293,523.77	3,229,252.69	40.136200	-104.680063
- actual wellpath misses target center by 11.9ft at 11918.9ft MD (7145.9 TVD, 456.2 N, 4631.7 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,150.0	444.9	4,332.0	1,293,521.05	3,228,952.71	40.136200	-104.681136
- actual wellpath misses target center by 7.4ft at 11619.1ft MD (7153.3 TVD, 451.5 N, 4332.1 E)									
- Point									
Melbon Ranch 3B-17H 1	0.00	0.00	7,174.0	444.9	2,832.0	1,293,507.46	3,227,452.77	40.136201	-104.686501
- actual wellpath misses target center by 7.3ft at 10118.6ft MD (7178.7 TVD, 439.3 N, 2832.0 E)									
- Point									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,340.8	7,177.0	Formation 3		0.40	90.00
7,516.4	7,214.0	Formation 2		0.40	90.00

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
881.0	881.0	-2.7	1.9	Last Gyro Survey @ 881' MD	
11,980.0	7,144.9	458.5	4,692.7	Last Cathedral Survey @ 11980' MD	

Checked By:

Approved By:

Date:

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Melbon Ranch 3B-17H
Project:	DJ Wattenberg	TVD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Site:	NESE S17-T2N-R65W (Melbon Ranch)	MD Reference:	KB=13' @ 4971.0ft (Ensign 135)
Well:	Melbon Ranch 3B-17H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Hz	Database:	USA EDM 5000 Multi Users DB