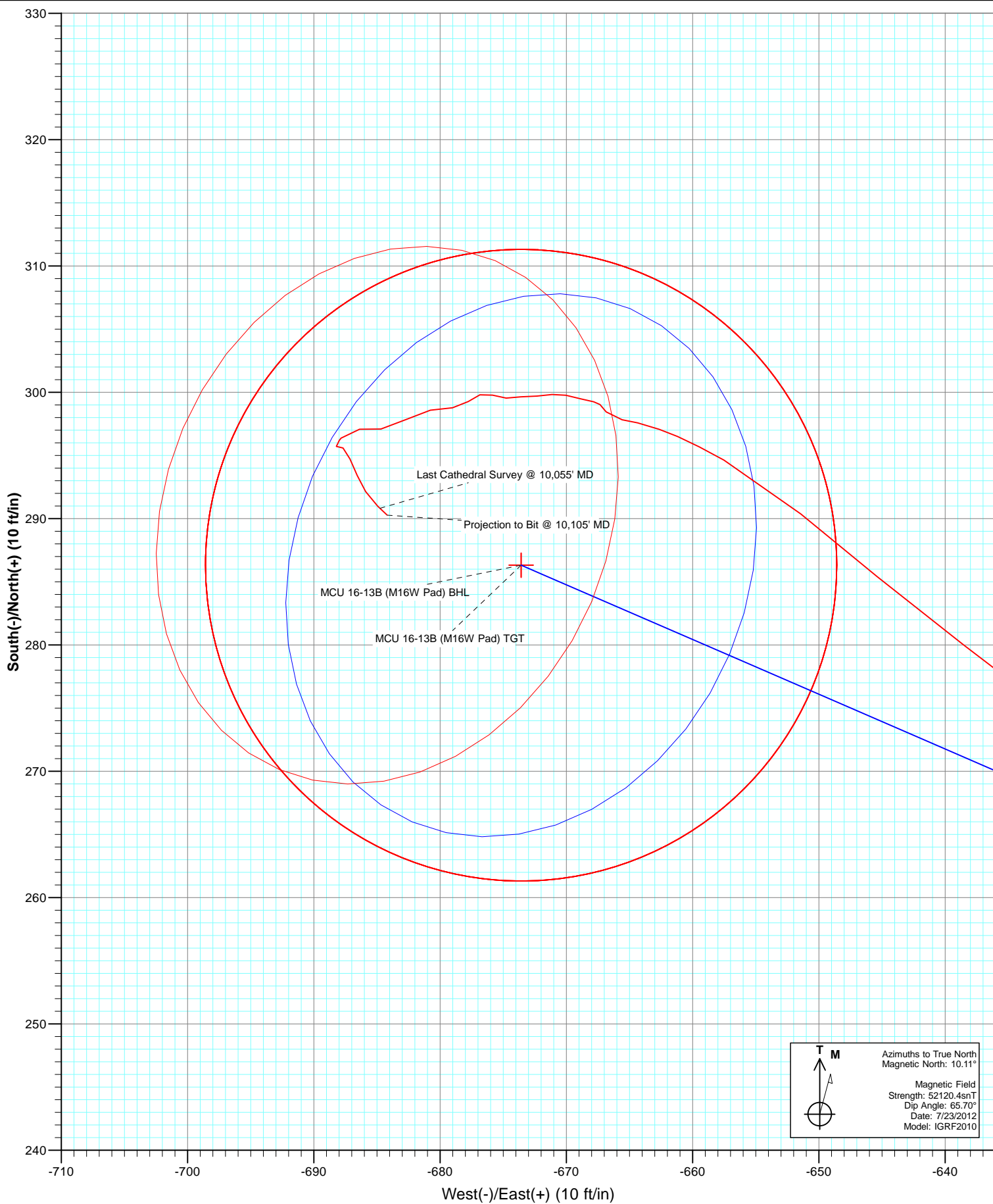


Azimuths to True North
 Magnetic North: 10.11°

Magnetic Field
 Strength: 52120.4snT
 Dip Angle: 65.70°
 Date: 7/23/2012
 Model: IGRF2010



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13B (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Well:	MCU 16-13B (M16W Pad)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Mamm Creek		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	M16W Pad (SWSW S16-T7S-R93W)			
Site Position:		Northing:	1,593,196.15 ft	Latitude: 39.439834
From:	Lat/Long	Easting:	2,355,193.71 ft	Longitude: -107.783358
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: -1.44 °

Well	MCU 16-13B (M16W Pad)			
Well Position	+N/-S	0.0 ft	Northing:	1,593,308.01 ft
	+E/-W	0.0 ft	Easting:	2,355,251.61 ft
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft
			Ground Level:	7,881.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/23/2012	10.11	65.70	52,120

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	293.03

Survey Program	Date	8/6/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
175.0	1,520.0	Survey #1 (DD)	MWD	Geolink MWD	
1,703.0	10,105.0	Survey #2 (DD)	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	
175.0	0.20	182.90	175.0	-0.3	0.0	-0.1	0.11	0.11	
237.0	0.70	290.00	237.0	-0.3	-0.4	0.2	1.26	0.81	
328.0	4.30	286.70	327.9	0.9	-4.2	4.2	3.96	3.96	
420.0	5.70	293.90	419.5	3.7	-11.6	12.2	1.66	1.52	
511.0	5.80	290.90	510.1	7.2	-20.1	21.3	0.35	0.11	
602.0	6.20	290.50	600.6	10.6	-29.0	30.8	0.44	0.44	
694.0	6.50	290.80	692.0	14.2	-38.5	41.0	0.33	0.33	
785.0	6.60	294.60	782.4	18.2	-48.1	51.3	0.49	0.11	
876.0	6.50	291.30	872.8	22.2	-57.6	61.7	0.43	-0.11	
968.0	6.60	290.40	964.2	25.9	-67.4	72.2	0.16	0.11	
1,063.0	6.90	292.70	1,058.6	30.0	-77.8	83.4	0.43	0.32	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13B (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Well:	MCU 16-13B (M16W Pad)	North Reference:	True
Wellbore:	DD	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
1,154.0	6.90	295.70	1,148.9	34.5	-87.8	94.3	0.40	0.00	
1,246.0	6.90	292.60	1,240.3	39.0	-97.9	105.3	0.40	0.00	
1,337.0	5.30	286.20	1,330.7	42.3	-106.9	115.0	1.91	-1.76	
1,429.0	5.10	290.00	1,422.4	44.9	-114.9	123.3	0.43	-0.22	
1,520.0	5.30	292.60	1,513.0	47.9	-122.5	131.5	0.34	0.22	
1,703.0	4.90	298.70	1,695.3	54.9	-137.2	147.7	0.37	-0.22	
1,794.0	4.80	292.90	1,785.9	58.3	-144.1	155.4	0.55	-0.11	
1,886.0	4.70	297.30	1,877.6	61.5	-151.0	163.0	0.41	-0.11	
1,977.0	5.80	293.50	1,968.2	65.0	-158.5	171.3	1.27	1.21	
2,069.0	5.70	287.30	2,059.8	68.2	-167.2	180.5	0.68	-0.11	
2,160.0	5.10	290.70	2,150.4	71.0	-175.3	189.1	0.75	-0.66	
2,252.0	6.90	308.90	2,241.9	75.9	-183.4	198.5	2.82	1.96	
2,343.0	6.60	307.30	2,332.2	82.5	-191.8	208.8	0.39	-0.33	
2,435.0	6.20	305.60	2,423.7	88.6	-200.1	218.8	0.48	-0.43	
2,526.0	8.70	309.90	2,513.9	95.9	-209.3	230.2	2.81	2.75	
2,618.0	9.70	293.70	2,604.7	103.5	-221.8	244.6	3.01	1.09	
2,709.0	8.10	285.20	2,694.6	108.2	-235.0	258.6	2.27	-1.76	
2,801.0	8.00	282.20	2,785.7	111.3	-247.5	271.3	0.47	-0.11	
2,893.0	7.70	278.90	2,876.9	113.6	-259.8	283.6	0.59	-0.33	
2,984.0	6.30	276.90	2,967.2	115.1	-270.8	294.3	1.56	-1.54	
3,075.0	6.00	280.10	3,057.7	116.6	-280.5	303.7	0.50	-0.33	
3,167.0	5.40	287.80	3,149.2	118.7	-289.3	312.7	1.06	-0.65	
3,259.0	4.40	294.10	3,240.9	121.5	-296.7	320.5	1.23	-1.09	
3,350.0	4.30	289.90	3,331.6	124.1	-303.0	327.4	0.37	-0.11	
3,442.0	4.10	294.20	3,423.4	126.6	-309.3	334.2	0.41	-0.22	
3,533.0	4.00	289.10	3,514.1	129.0	-315.3	340.6	0.41	-0.11	
3,625.0	4.00	285.90	3,605.9	130.9	-321.4	347.0	0.24	0.00	
3,716.0	5.20	305.00	3,696.6	134.2	-327.8	354.2	2.12	1.32	
3,807.0	5.00	298.50	3,787.3	138.4	-334.7	362.1	0.67	-0.22	
3,899.0	4.00	293.40	3,879.0	141.6	-341.1	369.3	1.17	-1.09	
3,990.0	5.00	294.50	3,969.7	144.5	-347.7	376.5	1.10	1.10	
4,082.0	6.50	300.00	4,061.2	148.8	-355.8	385.7	1.74	1.63	
4,173.0	6.50	297.10	4,151.6	153.7	-364.9	395.9	0.36	0.00	
4,265.0	5.80	297.20	4,243.1	158.2	-373.6	405.7	0.76	-0.76	
4,356.0	5.50	294.00	4,333.7	162.1	-381.7	414.7	0.48	-0.33	
4,448.0	5.20	297.80	4,425.3	165.8	-389.4	423.3	0.50	-0.33	
4,539.0	5.10	294.80	4,515.9	169.4	-396.7	431.4	0.32	-0.11	
4,630.0	4.90	292.30	4,606.6	172.6	-404.0	439.3	0.32	-0.22	
4,722.0	4.60	297.00	4,698.2	175.8	-410.9	446.9	0.53	-0.33	
4,814.0	5.10	285.80	4,789.9	178.5	-418.2	454.7	1.16	0.54	
4,905.0	4.80	285.10	4,880.6	180.6	-425.7	462.5	0.34	-0.33	
4,997.0	5.20	286.20	4,972.2	182.8	-433.4	470.4	0.45	0.43	
5,088.0	5.50	292.90	5,062.8	185.7	-441.4	478.9	0.76	0.33	
5,180.0	5.00	293.80	5,154.4	189.0	-449.2	487.3	0.55	-0.54	
5,272.0	5.10	297.20	5,246.1	192.5	-456.5	495.4	0.34	0.11	
5,363.0	5.40	302.00	5,336.7	196.6	-463.7	503.6	0.58	0.33	
5,455.0	7.50	293.70	5,428.1	201.3	-472.9	513.9	2.49	2.28	
5,546.0	6.70	294.10	5,518.4	205.9	-483.1	525.2	0.88	-0.88	
5,637.0	6.60	293.60	5,608.8	210.1	-492.8	535.7	0.13	-0.11	
5,729.0	6.30	289.30	5,700.2	213.9	-502.4	546.0	0.62	-0.33	
5,821.0	6.00	292.50	5,791.7	217.4	-511.6	555.9	0.50	-0.33	
5,912.0	6.80	281.70	5,882.1	220.3	-521.3	565.9	1.58	0.88	
6,004.0	6.20	282.00	5,973.5	222.5	-531.5	576.1	0.65	-0.65	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13B (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Well:	MCU 16-13B (M16W Pad)	North Reference:	True
Wellbore:	DD	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
6,095.0	5.40	286.80	6,064.1	224.7	-540.4	585.2	1.03	-0.88	
6,187.0	4.20	290.50	6,155.7	227.1	-547.7	592.9	1.35	-1.30	
6,278.0	3.80	291.60	6,246.5	229.4	-553.6	599.2	0.45	-0.44	
6,370.0	3.80	294.40	6,338.3	231.8	-559.2	605.3	0.20	0.00	
6,461.0	4.40	298.50	6,429.1	234.7	-565.0	611.8	0.73	0.66	
6,553.0	5.40	300.60	6,520.8	238.6	-571.8	619.6	1.10	1.09	
6,645.0	4.70	290.80	6,612.4	242.1	-579.1	627.7	1.20	-0.76	
6,736.0	6.10	295.90	6,703.0	245.6	-586.9	636.2	1.62	1.54	
6,828.0	6.20	300.80	6,794.5	250.3	-595.6	646.0	0.58	0.11	
6,920.0	5.40	304.50	6,886.0	255.3	-603.4	655.2	0.96	-0.87	
7,011.0	4.60	306.70	6,976.6	259.9	-609.9	662.9	0.90	-0.88	
7,103.0	4.60	303.10	7,068.3	264.1	-615.9	670.2	0.31	0.00	
7,195.0	6.20	303.20	7,159.9	268.8	-623.2	678.7	1.74	1.74	
7,286.0	5.90	306.50	7,250.4	274.3	-631.0	688.1	0.50	-0.33	
7,378.0	5.80	308.20	7,342.0	280.0	-638.5	697.1	0.22	-0.11	
7,470.0	5.10	308.40	7,433.5	285.4	-645.4	705.6	0.76	-0.76	
7,561.0	4.80	310.30	7,524.2	290.4	-651.4	713.1	0.38	-0.33	
7,653.0	4.50	299.40	7,615.9	294.6	-657.5	720.4	1.01	-0.33	
7,745.0	2.60	288.50	7,707.7	297.1	-662.6	726.0	2.18	-2.07	
7,837.0	1.20	275.50	7,799.7	297.8	-665.6	729.0	1.58	-1.52	
7,905.4	0.81	312.01	7,868.0	298.2	-666.6	730.2	1.07	-0.56	MCU 16-13B (M16W Pad) TGT
7,928.0	0.80	329.20	7,890.6	298.5	-666.8	730.5	1.07	-0.06	
8,020.0	0.20	280.10	7,982.6	299.0	-667.3	731.1	0.75	-0.65	
8,111.0	0.50	299.40	8,073.6	299.3	-667.8	731.7	0.35	0.33	
8,203.0	0.80	271.20	8,165.6	299.5	-668.8	732.7	0.47	0.33	
8,294.0	0.80	296.20	8,256.6	299.8	-670.0	733.9	0.38	0.00	
8,386.0	0.70	246.20	8,348.6	299.8	-671.1	734.9	0.70	-0.11	
8,477.0	0.90	278.50	8,439.6	299.7	-672.3	736.0	0.53	0.22	
8,569.0	0.70	253.00	8,531.6	299.6	-673.6	737.1	0.44	-0.22	
8,660.0	0.80	275.80	8,622.6	299.5	-674.8	738.2	0.34	0.11	
8,752.0	0.60	289.30	8,714.6	299.8	-675.8	739.3	0.28	-0.22	
8,843.0	0.70	257.20	8,805.6	299.8	-676.8	740.2	0.41	0.11	
8,935.0	0.70	222.20	8,897.6	299.3	-677.8	740.8	0.46	0.00	
9,026.0	1.10	264.60	8,988.6	298.8	-679.0	741.8	0.82	0.44	
9,118.0	1.10	263.10	9,080.6	298.6	-680.8	743.3	0.03	0.00	
9,209.0	1.70	240.20	9,171.5	297.8	-682.8	744.9	0.89	0.66	
9,300.0	0.90	266.50	9,262.5	297.1	-684.7	746.3	1.07	-0.88	
9,392.0	1.20	271.80	9,354.5	297.1	-686.4	747.9	0.34	0.33	
9,479.0	1.20	217.20	9,441.5	296.4	-687.8	749.0	1.27	0.00	
9,491.0	1.00	221.00	9,453.5	296.2	-688.0	749.0	1.77	-1.67	
9,582.0	0.40	68.80	9,544.5	295.7	-688.2	749.0	1.50	-0.66	
9,674.0	0.40	137.50	9,636.5	295.6	-687.7	748.5	0.49	0.00	
9,766.0	0.90	152.00	9,728.5	294.7	-687.1	747.7	0.57	0.54	
9,857.0	0.90	160.30	9,819.4	293.4	-686.6	746.6	0.14	0.00	
9,949.0	0.90	144.50	9,911.4	292.1	-685.9	745.5	0.27	0.00	
10,021.8	0.98	138.30	9,984.2	291.2	-685.1	744.5	0.18	0.11	MCU 16-13B (M16W Pad) BHL
10,040.0	1.00	136.90	10,002.4	291.0	-684.9	744.2	0.18	0.12	
10,055.0	0.90	132.80	10,017.4	290.8	-684.8	744.0	0.81	-0.67	Last Cathedral Survey @ 10,055' MD
10,105.0	0.90	132.80	10,067.4	290.3	-684.2	743.2	0.00	0.00	Projection to Bit @ 10,105' MD

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU 16-13B (M16W Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Original Well Elev)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Original Well Elev)
Well:	MCU 16-13B (M16W Pad)	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
MCU 16-13B (M16W Pa	0.00	0.00	9,984.0	286.3	-673.6	1,593,611.16	2,354,585.45	39.440931	-107.785548
- actual wellpath misses target center by 12.6ft at 10021.8ft MD (9984.2 TVD, 291.2 N, -685.1 E)									
- Circle (radius 25.0)									
MCU 16-13B (M16W Pa	0.00	0.00	7,868.0	286.3	-673.6	1,593,611.16	2,354,585.45	39.440931	-107.785548
- actual wellpath misses target center by 13.8ft at 7905.4ft MD (7868.0 TVD, 298.2 N, -666.6 E)									
- Circle (radius 25.0)									

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
10,055.0	10,017.4	290.8	-684.8	Last Cathedral Survey @ 10,055' MD
10,105.0	10,067.4	290.3	-684.2	Projection to Bit @ 10,105' MD

Checked By: _____ Approved By: _____ Date: _____