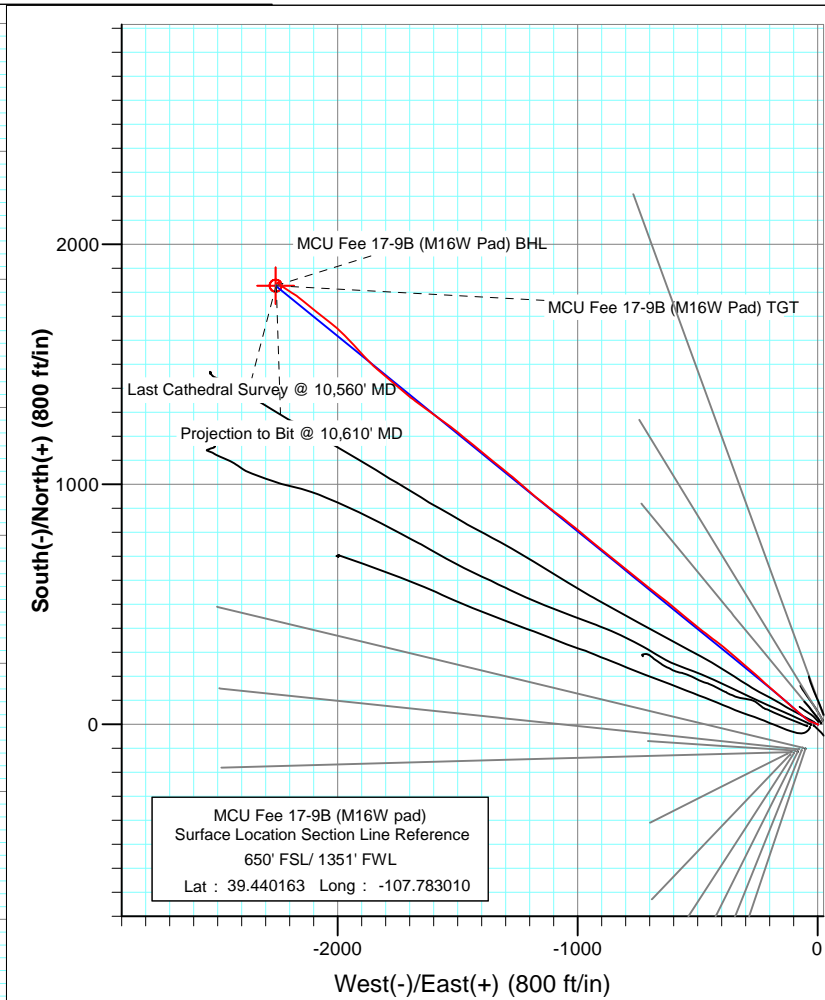
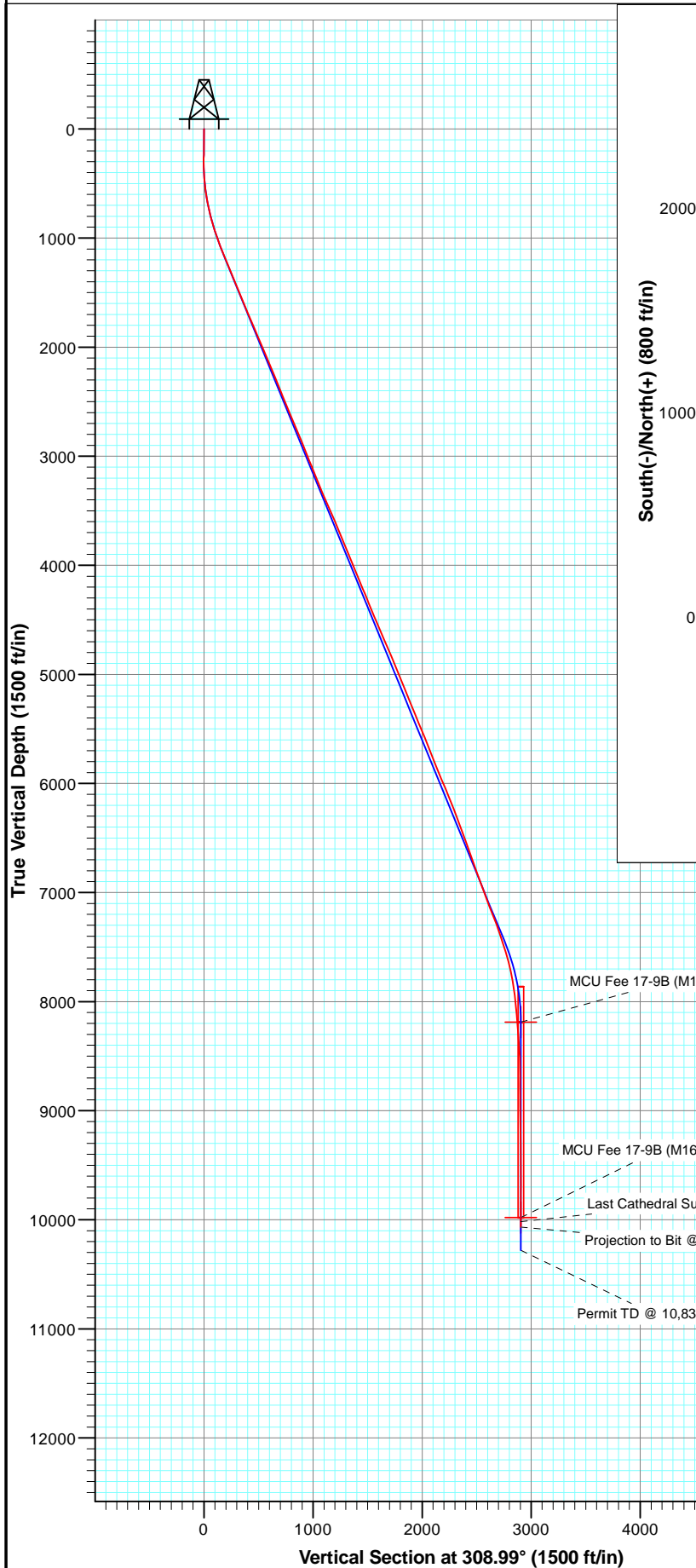




Project: Mamm Creek
Site: M16W Pad (SWSW S16-T7S-R93W)
Well: MCU Fee 17-9B (M16W pad)
Wellbore: DD
Plan: FINAL



FORMATION TOP DETAILS

No formation data is available



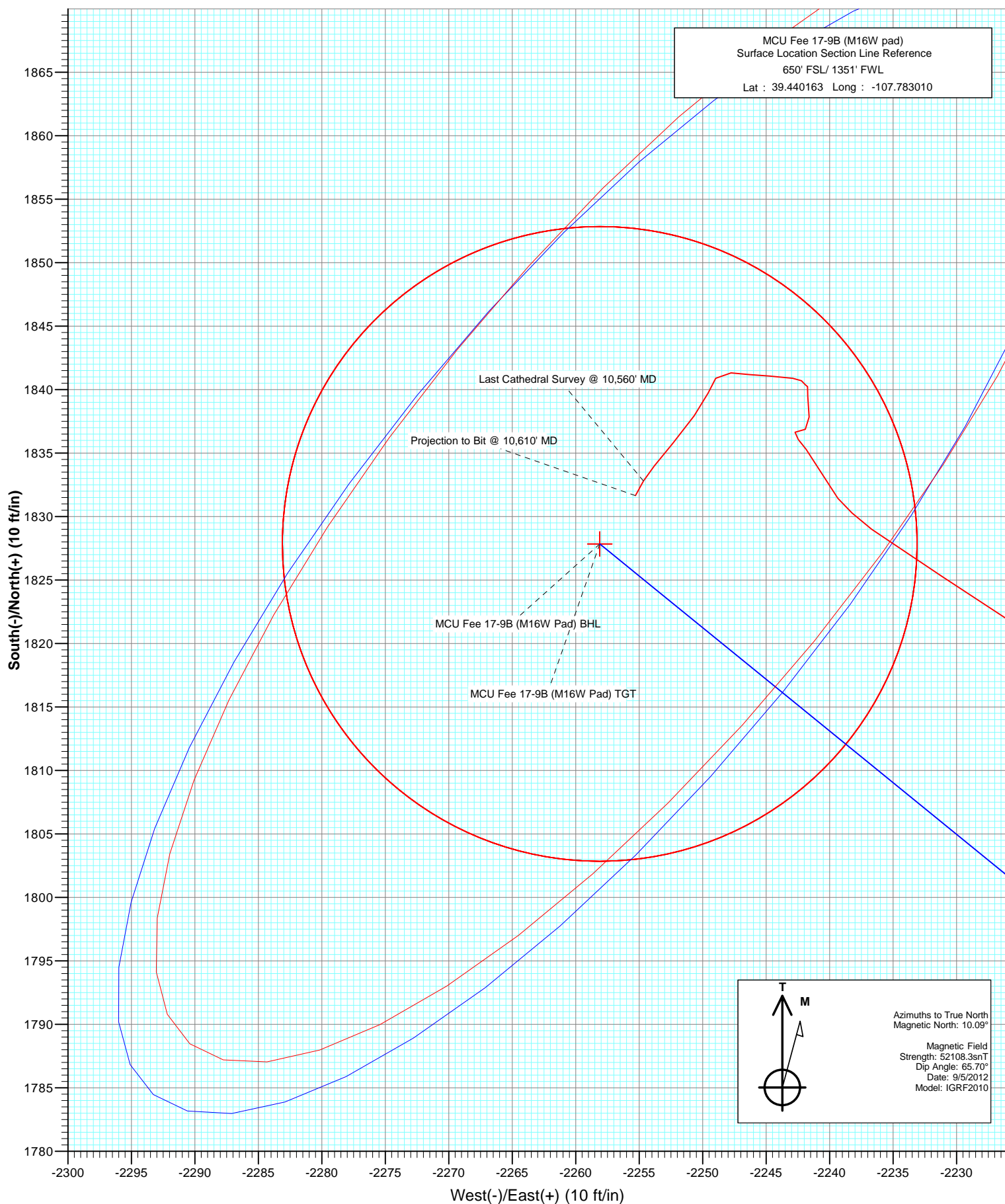
Azimuths to True North
Magnetic North: 10.09°

Magnetic Field
Strength: 52108.3snT
Dip Angle: 65.70°
Date: 9/5/2012
Model: IGRF2010

FINAL							
MCU Fee 17-9B (M16W pad)							
125448/179055 (SH) 125523/182355 (MH); SC							
KBE @ 7903.0ft (Patterson 308)							
GL @ 7881.0							
North American Datum 1983							
Well MCU Fee 17-9B (M16W pad), True North							
Type	Target	Azimuth	Origin	Type	N/S	E/W	From TVD
	MCU Fee 17-9B (M16W Pad) BHL	899	Slot		0.0	0.0	0.0
MCU Fee 17-9B (M16W Pad) TGT		8188.0	1827.8	+N/-S			
MCU Fee 17-9B (M16W Pad) BHL		9979.0	1827.8	+E/-W			
				Latitude			Longitude
					39.445181		-107.791006
							-107.791006



Project: Mamm Creek
Site: M16W Pad (SWSW S16-T7S-R93W)
Well: MCU Fee 17-9B (M16W pad)
Wellbore: DD
Plan: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU Fee 17-9B (M16W pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Patterson 308)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Patterson 308)
Well:	MCU Fee 17-9B (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 Fee 17-9B (M16W pad)			
Well Position	+N/-S	0.0 ft	Northing:	1,593,313.48 ft
	+E/-W	0.0 ft	Easting:	2,355,294.98 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	9/5/2012	10.09	65.70	52,108

Design	FINAL			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	308.99

Survey Program	Date	9/17/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
206.0	1,105.0	Survey #1 (DD)	MWD	Geolink MWD
1,163.0	10,610.0	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	
206.0	1.00	135.00	206.0	-1.3	1.3	-1.8	0.49	0.49	
237.0	1.00	127.50	237.0	-1.6	1.7	-2.3	0.42	0.00	
267.0	0.50	109.90	267.0	-1.8	2.0	-2.7	1.82	-1.67	
298.0	0.20	18.60	298.0	-1.8	2.2	-2.8	1.75	-0.97	
328.0	0.80	339.60	328.0	-1.6	2.1	-2.6	2.19	2.00	
359.0	1.20	314.50	359.0	-1.1	1.8	-2.1	1.88	1.29	
389.0	2.30	295.00	389.0	-0.7	1.0	-1.2	4.12	3.67	
420.0	3.20	296.40	419.9	0.0	-0.3	0.2	2.91	2.90	
450.0	4.40	298.00	449.9	0.9	-2.1	2.2	4.02	4.00	
480.0	5.20	294.60	479.8	2.0	-4.3	4.6	2.83	2.67	
511.0	6.40	291.70	510.6	3.2	-7.2	7.6	3.98	3.87	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU Fee 17-9B (M16W pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Patterson 308)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Patterson 308)
Well:	MCU Fee 17-9B (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
541.0	7.70	289.80	540.4	4.5	-10.7	11.1	4.40	4.33	
571.0	8.70	286.80	570.1	5.9	-14.7	15.1	3.62	3.33	
602.0	9.40	288.70	600.7	7.3	-19.4	19.7	2.45	2.26	
632.0	10.30	293.50	630.2	9.2	-24.2	24.6	4.06	3.00	
663.0	11.00	295.00	660.7	11.6	-29.4	30.1	2.43	2.26	
755.0	12.90	306.80	750.7	21.4	-45.6	48.9	3.35	2.07	
846.0	15.10	310.10	839.0	35.1	-62.8	70.9	2.57	2.42	
937.0	17.70	311.60	926.3	52.0	-82.2	96.6	2.89	2.86	
1,032.0	19.90	312.30	1,016.2	72.4	-104.9	127.1	2.33	2.32	
1,105.0	21.20	311.10	1,084.6	89.5	-124.1	152.7	1.87	1.78	
1,163.0	21.80	308.40	1,138.5	103.1	-140.4	174.0	1.99	1.03	
1,254.0	23.20	311.30	1,222.6	125.4	-167.1	208.8	1.96	1.54	
1,346.0	21.80	311.20	1,307.6	148.6	-193.6	244.0	1.52	-1.52	
1,437.0	22.90	312.40	1,391.8	171.7	-219.4	278.5	1.31	1.21	
1,529.0	22.40	313.40	1,476.7	195.8	-245.3	313.9	0.69	-0.54	
1,620.0	22.90	309.70	1,560.7	219.0	-271.6	348.9	1.66	0.55	
1,712.0	22.10	310.50	1,645.7	241.7	-298.5	384.1	0.93	-0.87	
1,804.0	23.40	310.60	1,730.5	264.8	-325.5	419.6	1.41	1.41	
1,895.0	22.90	311.10	1,814.2	288.2	-352.6	455.4	0.59	-0.55	
1,987.0	23.10	310.50	1,898.9	311.7	-379.8	491.3	0.33	0.22	
2,078.0	22.90	307.20	1,982.6	334.0	-407.5	526.9	1.43	-0.22	
2,170.0	23.60	307.30	2,067.2	356.0	-436.4	563.2	0.76	0.76	
2,261.0	22.90	307.30	2,150.8	377.7	-465.0	599.1	0.77	-0.77	
2,353.0	22.00	309.00	2,235.8	399.4	-492.6	634.2	1.21	-0.98	
2,444.0	22.70	309.00	2,320.0	421.2	-519.5	668.8	0.77	0.77	
2,536.0	21.30	309.60	2,405.3	443.0	-546.2	703.2	1.54	-1.52	
2,627.0	22.80	309.80	2,489.6	464.9	-572.4	737.4	1.65	1.65	
2,719.0	22.50	310.00	2,574.5	487.6	-599.6	772.8	0.34	-0.33	
2,810.0	22.90	308.20	2,658.5	509.7	-626.9	807.9	0.88	0.44	
2,902.0	22.20	307.80	2,743.4	531.4	-654.7	843.2	0.78	-0.76	
2,993.0	23.30	308.30	2,827.3	553.1	-682.4	878.4	1.23	1.21	
3,085.0	22.50	308.20	2,912.1	575.3	-710.5	914.2	0.87	-0.87	
3,176.0	21.00	309.40	2,996.6	596.4	-736.8	947.9	1.72	-1.65	
3,268.0	22.40	308.30	3,082.1	617.7	-763.3	981.9	1.58	1.52	
3,359.0	21.90	310.00	3,166.4	639.4	-789.9	1,016.2	0.89	-0.55	
3,451.0	22.60	307.80	3,251.5	661.3	-817.0	1,051.1	1.18	0.76	
3,543.0	22.00	308.40	3,336.6	682.8	-844.5	1,086.0	0.70	-0.65	
3,634.0	24.80	309.50	3,420.1	705.5	-872.6	1,122.1	3.11	3.08	
3,726.0	23.80	308.90	3,504.0	729.5	-901.9	1,160.0	1.12	-1.09	
3,817.0	23.20	309.90	3,587.4	752.5	-929.9	1,196.3	0.79	-0.66	
3,908.0	21.80	310.50	3,671.5	775.0	-956.5	1,231.1	1.56	-1.54	
4,000.0	22.60	310.10	3,756.7	797.5	-983.0	1,265.8	0.88	0.87	
4,091.0	23.00	308.00	3,840.6	819.7	-1,010.4	1,301.1	1.00	0.44	
4,183.0	22.40	308.10	3,925.5	841.5	-1,038.4	1,336.6	0.65	-0.65	
4,274.0	21.60	307.50	4,009.8	862.4	-1,065.3	1,370.7	0.91	-0.88	
4,365.0	22.90	306.60	4,094.1	883.2	-1,092.8	1,405.1	1.48	1.43	
4,457.0	22.00	308.40	4,179.1	904.6	-1,120.7	1,440.2	1.23	-0.98	
4,548.0	23.30	308.70	4,263.1	926.4	-1,148.1	1,475.3	1.43	1.43	
4,640.0	21.50	308.80	4,348.1	948.3	-1,175.4	1,510.3	1.96	-1.96	
4,731.0	22.30	310.70	4,432.6	970.1	-1,201.5	1,544.2	1.17	0.88	
4,823.0	24.00	310.60	4,517.1	993.6	-1,229.0	1,580.4	1.85	1.85	
4,914.0	23.30	312.00	4,600.5	1,017.7	-1,256.4	1,616.9	0.99	-0.77	
5,006.0	23.50	309.10	4,684.9	1,041.4	-1,284.2	1,653.4	1.27	0.22	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU Fee 17-9B (M16W pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Patterson 308)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Patterson 308)
Well:	MCU Fee 17-9B (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
5,098.0	23.00	308.30	4,769.5	1,064.2	-1,312.5	1,689.7	0.64	-0.54	
5,189.0	22.50	309.20	4,853.4	1,086.2	-1,339.9	1,724.9	0.67	-0.55	
5,281.0	22.70	309.00	4,938.3	1,108.5	-1,367.4	1,760.2	0.23	0.22	
5,372.0	22.30	310.30	5,022.4	1,130.7	-1,394.2	1,795.1	0.70	-0.44	
5,464.0	22.40	308.50	5,107.5	1,152.9	-1,421.2	1,830.0	0.75	0.11	
5,555.0	22.30	309.50	5,191.6	1,174.7	-1,448.1	1,864.6	0.43	-0.11	
5,647.0	22.10	309.50	5,276.8	1,196.8	-1,474.9	1,899.4	0.22	-0.22	
5,738.0	21.90	309.10	5,361.2	1,218.4	-1,501.3	1,933.5	0.27	-0.22	
5,830.0	22.10	306.30	5,446.5	1,239.4	-1,528.6	1,967.9	1.16	0.22	
5,922.0	23.00	305.80	5,531.5	1,260.2	-1,557.1	2,003.2	1.00	0.98	
6,013.0	22.30	305.60	5,615.5	1,280.7	-1,585.6	2,038.2	0.77	-0.77	
6,105.0	21.90	306.40	5,700.7	1,301.0	-1,613.6	2,072.7	0.54	-0.43	
6,196.0	21.10	305.80	5,785.4	1,320.6	-1,640.5	2,106.0	0.91	-0.88	
6,288.0	21.10	307.10	5,871.2	1,340.3	-1,667.2	2,139.1	0.51	0.00	
6,379.0	23.60	308.20	5,955.4	1,361.5	-1,694.5	2,173.7	2.79	2.75	
6,471.0	23.50	309.90	6,039.7	1,384.6	-1,723.1	2,210.5	0.75	-0.11	
6,562.0	21.30	310.40	6,123.8	1,407.0	-1,749.6	2,245.1	2.43	-2.42	
6,654.0	22.20	309.90	6,209.3	1,429.0	-1,775.6	2,279.2	1.00	0.98	
6,746.0	20.80	311.00	6,294.9	1,450.8	-1,801.3	2,312.9	1.58	-1.52	
6,837.0	21.20	310.20	6,379.8	1,472.0	-1,826.1	2,345.5	0.54	0.44	
6,929.0	19.40	313.10	6,466.1	1,493.2	-1,849.9	2,377.4	2.24	-1.96	
7,021.0	19.30	315.60	6,552.9	1,514.5	-1,871.7	2,407.7	0.91	-0.11	
7,112.0	19.20	317.40	6,638.8	1,536.3	-1,892.4	2,437.5	0.66	-0.11	
7,204.0	19.90	318.10	6,725.5	1,559.1	-1,913.1	2,467.9	0.80	0.76	
7,296.0	20.90	317.10	6,811.7	1,582.8	-1,934.7	2,499.6	1.15	1.09	
7,387.0	20.70	315.80	6,896.8	1,606.2	-1,957.0	2,531.6	0.55	-0.22	
7,479.0	20.60	314.60	6,982.9	1,629.2	-1,979.8	2,563.9	0.47	-0.11	
7,571.0	21.00	310.50	7,068.9	1,651.3	-2,003.9	2,596.5	1.64	0.43	
7,662.0	21.40	308.90	7,153.8	1,672.3	-2,029.2	2,629.4	0.77	0.44	
7,753.0	20.90	308.30	7,238.6	1,692.8	-2,054.9	2,662.2	0.60	-0.55	
7,845.0	18.90	308.70	7,325.1	1,712.3	-2,079.4	2,693.5	2.18	-2.17	
7,936.0	18.30	308.30	7,411.4	1,730.3	-2,102.1	2,722.6	0.67	-0.66	
8,028.0	17.50	310.00	7,498.9	1,748.2	-2,124.0	2,750.8	1.04	-0.87	
8,120.0	16.50	308.30	7,586.9	1,765.2	-2,144.9	2,777.7	1.21	-1.09	
8,211.0	13.70	308.50	7,674.7	1,779.9	-2,163.5	2,801.4	3.08	-3.08	
8,303.0	11.90	301.30	7,764.5	1,791.6	-2,180.1	2,821.7	2.61	-1.96	
8,395.0	8.20	299.10	7,855.0	1,799.7	-2,193.9	2,837.6	4.04	-4.02	
8,487.0	6.10	307.30	7,946.3	1,805.9	-2,203.6	2,848.9	2.53	-2.28	
8,578.0	6.10	305.90	8,036.8	1,811.6	-2,211.3	2,858.6	0.16	0.00	
8,670.0	5.10	303.60	8,128.4	1,816.8	-2,218.7	2,867.6	1.11	-1.09	
8,725.0	5.00	306.40	8,183.2	1,819.5	-2,222.6	2,872.4	0.48	-0.18	
8,732.7	4.96	306.23	8,190.8	1,819.9	-2,223.2	2,873.1	0.59	-0.56	MCU Fee 17-9B (M16W Pad) TGT
8,761.0	4.80	305.60	8,219.0	1,821.3	-2,225.1	2,875.5	0.59	-0.56	
8,852.0	4.20	300.60	8,309.7	1,825.3	-2,231.1	2,882.6	0.79	-0.66	
8,944.0	4.20	307.10	8,401.5	1,829.0	-2,236.7	2,889.3	0.52	0.00	
9,035.0	2.00	335.40	8,492.4	1,832.5	-2,240.0	2,894.0	2.88	-2.42	
9,126.0	2.30	319.70	8,583.3	1,835.3	-2,241.8	2,897.2	0.72	0.33	
9,218.0	0.40	100.10	8,675.3	1,836.6	-2,242.7	2,898.8	2.85	-2.07	
9,310.0	0.70	60.00	8,767.3	1,836.9	-2,241.9	2,898.3	0.51	0.33	
9,401.0	0.90	346.10	8,858.3	1,837.8	-2,241.6	2,898.6	1.07	0.22	
9,493.0	1.20	3.50	8,950.2	1,839.5	-2,241.7	2,899.8	0.47	0.33	
9,585.0	0.30	196.70	9,042.2	1,840.2	-2,241.7	2,900.3	1.62	-0.98	
9,676.0	0.50	343.30	9,133.2	1,840.4	-2,241.9	2,900.5	0.84	0.22	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well MCU Fee 17-9B (M16W pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 7903.0ft (Patterson 308)
Site:	M16W Pad (SWSW S16-T7S-R93W)	MD Reference:	KBE @ 7903.0ft (Patterson 308)
Well:	MCU Fee 17-9B (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
9,768.0	1.10	277.90	9,225.2	1,840.9	-2,242.9	2,901.6	1.09	0.65	
9,859.0	1.20	272.80	9,316.2	1,841.1	-2,244.7	2,903.1	0.16	0.11	
9,951.0	0.80	276.60	9,408.2	1,841.2	-2,246.3	2,904.4	0.44	-0.43	
10,043.0	1.00	274.40	9,500.2	1,841.3	-2,247.8	2,905.6	0.22	0.22	
10,134.0	0.80	220.80	9,591.2	1,840.9	-2,249.0	2,906.3	0.91	-0.22	
10,225.0	0.90	195.70	9,682.2	1,839.7	-2,249.6	2,906.0	0.42	0.11	
10,316.0	1.80	219.30	9,773.1	1,837.9	-2,250.7	2,905.8	1.14	0.99	
10,408.0	1.60	215.80	9,865.1	1,835.8	-2,252.3	2,905.7	0.24	-0.22	
10,500.0	1.30	223.90	9,957.1	1,834.0	-2,253.8	2,905.7	0.39	-0.33	
10,522.1	1.36	217.71	9,979.2	1,833.6	-2,254.2	2,905.7	0.71	0.28	MCU Fee 17-9B (M16W Pad) BHL
10,560.0	1.50	208.50	10,017.1	1,832.8	-2,254.7	2,905.6	0.71	0.36	Last Cathedral Survey @ 10,560' MD
10,610.0	1.50	208.50	10,067.0	1,831.7	-2,255.3	2,905.4	0.00	0.00	Projection to Bit @ 10,610' MD

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
MCU Fee 17-9B (M16W - actual wellpath misses target center by 35.9ft at 8732.7ft MD (8190.8 TVD, 1819.9 N, -2223.2 E) - Circle (radius 25.0)	0.00	0.00	8,188.0	1,827.8	-2,258.1	1,595,197.49	2,353,083.51	39.445181	-107.791006
MCU Fee 17-9B (M16W - actual wellpath misses target center by 7.0ft at 10522.1ft MD (9979.2 TVD, 1833.6 N, -2254.2 E) - Circle (radius 25.0)	0.00	0.00	9,979.0	1,827.8	-2,258.1	1,595,197.49	2,353,083.51	39.445181	-107.791006

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
10,560.0	10,017.1	1,832.8	-2,254.7	Last Cathedral Survey @ 10,560' MD
10,610.0	10,067.0	1,831.7	-2,255.3	Projection to Bit @ 10,610' MD

Checked By: _____ Approved By: _____ Date: _____