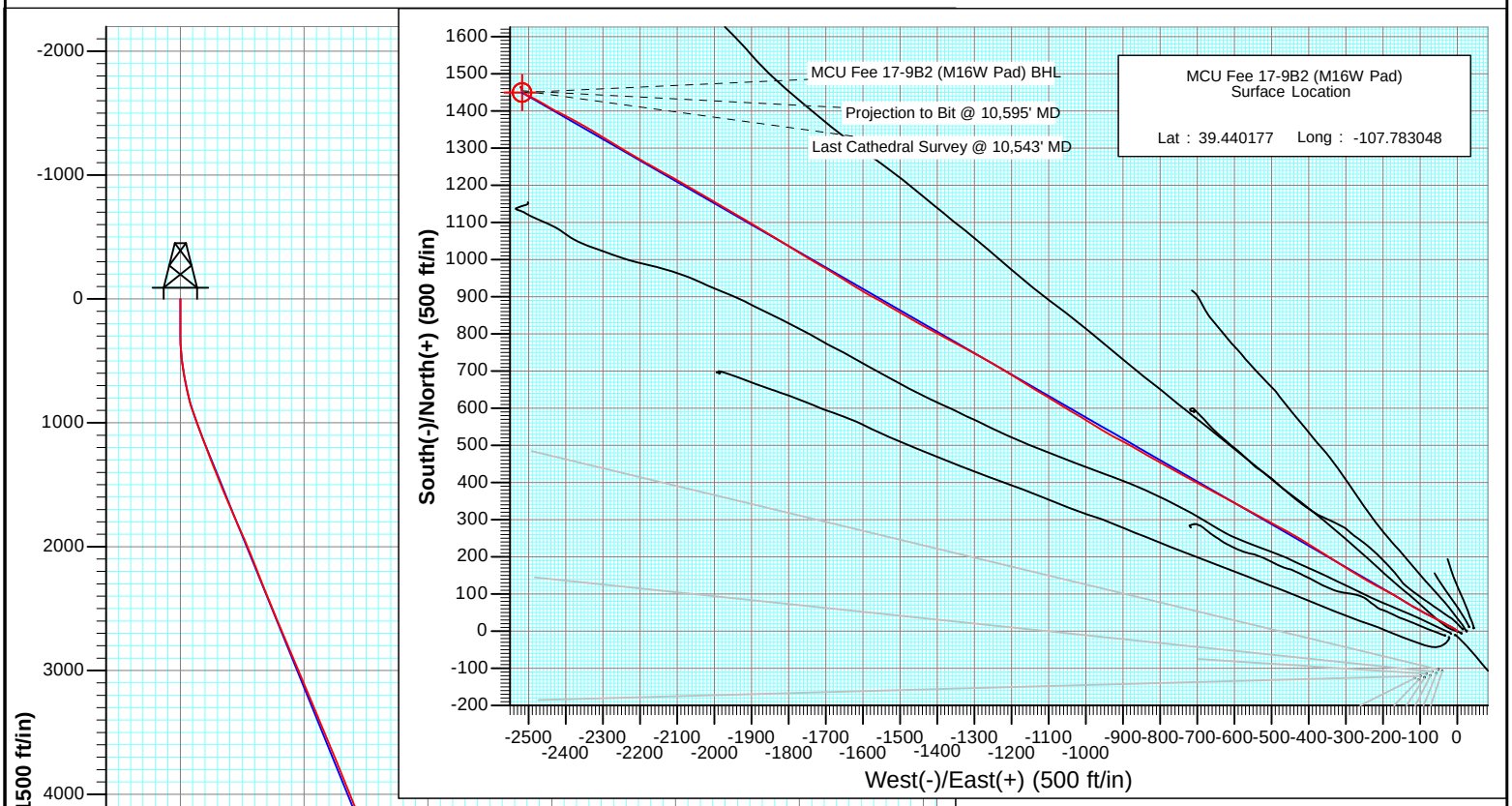
Project: Mamm Creek
Site: M16W Pad (SWSW S16-T7S-R93W
Well: MCU Fee 17-9B2 (M16W Pad)
Wellbore: DD
Plan: FINAL



Azimuths to True North
Magnetic North: 10.09°

Magnetic Field
Strength: 52110.5snT
Dip Angle: 65.70°
Date: 8/28/2012
Model: IGRF2010

FINAL
MCU Fee 17-9B2 (M16W Pad)
125447/178955 (SH) 125518/182255 (MH); SC

KBE @ 7903.0ft (Patterson 308)
North American Datum 1983
Well MCU Fee 17-9B2 (M16W Pad), True North

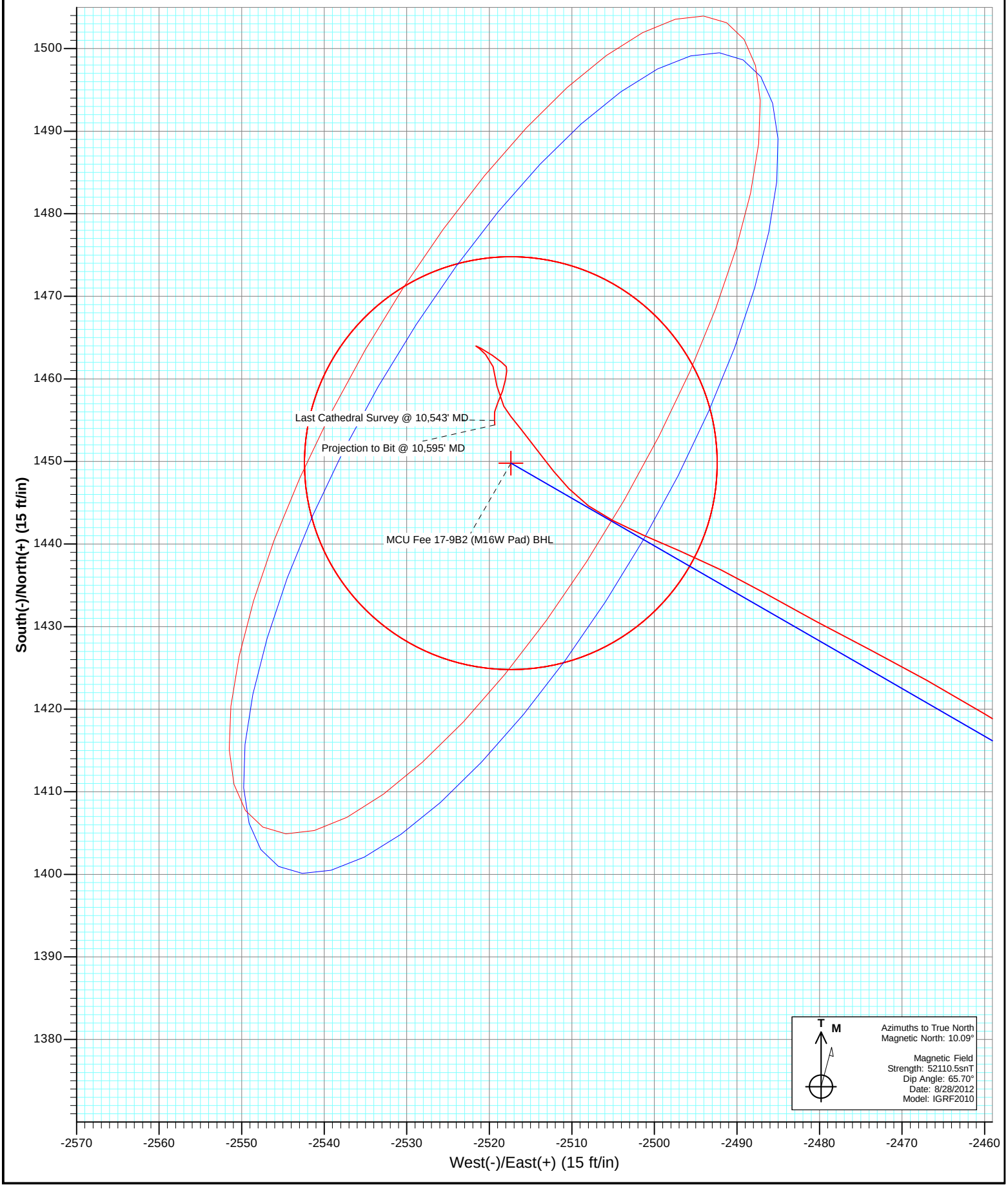
Target	Azimuth	Origin Type	N/S
MCU Fee 17-9B2 (M16W Pad) BHL	299.94	Slot	0.0

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
MCU Fee 17-9B2 (M16W Pad) TGT	8188.0	1449.8	-2517.4	39.444157	-107.791962
MCU Fee 17-9B2 (M16W Pad) BHL	9979.0	1449.8	-2517.4	39.444157	-107.791962

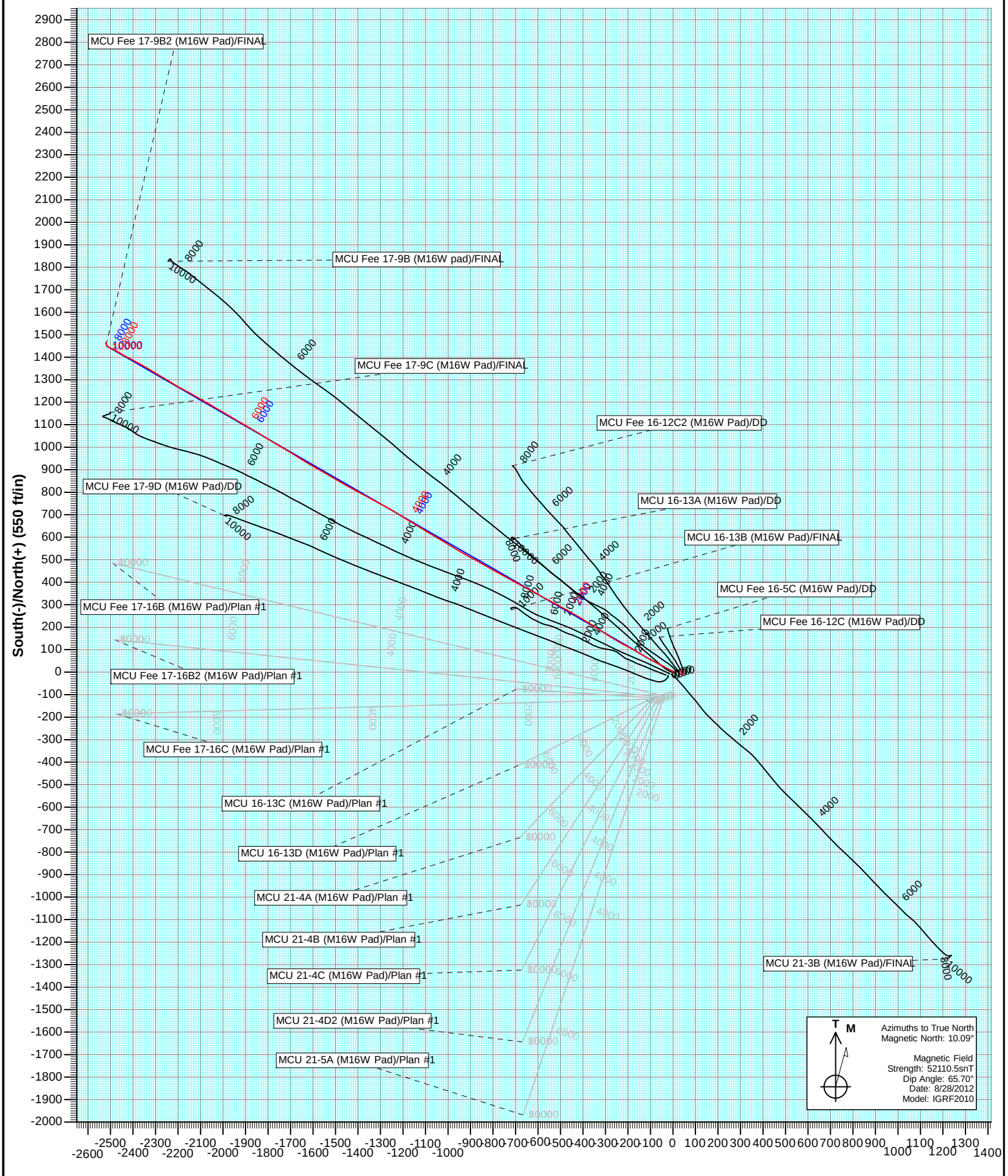
encana natural gas

Project: Mamm Creek
Site: M16W Pad (SWSW S16-T7S-R93W)
Well: MCU Fee 17-9B2 (M16W Pad)
Wellbore: DD
Plan: FINAL

CATHEDRAL



Project: Mamm Creek
Site: M16W Pad (SWSW S16-T7S-R93W
Well: MCU Fee 17-9B2 (M16W Pad)
Wellbore: DD
Plan: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well MCU Fee 17-9B2 (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 17-9B2 (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 17-9B2 (M16W Pad)

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,593,318.84 ft	**Latitude:**	39.440177
	+E/-W	0.0 ft	**Easting:**	2,355,284.38 ft	**Longitude:**	-107.783048
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	8/28/2012	10.09	65.70	52,111

Design FINAL

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	299.94

Survey Program **Date** 10/3/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
206.0	10,595.0	Survey #1 (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	0.10	230.40	206.0	-0.1	-0.1	0.1	0.05	0.05	
237.0	0.10	54.90	237.0	-0.1	-0.1	0.1	0.64	0.00	
267.0	0.40	343.20	267.0	0.0	-0.1	0.1	1.27	1.00	
298.0	1.00	320.20	298.0	0.3	-0.4	0.5	2.10	1.94	
328.0	1.90	319.30	328.0	0.9	-0.8	1.2	3.00	3.00	
359.0	2.80	321.80	359.0	1.9	-1.6	2.4	2.92	2.90	
389.0	3.50	307.80	388.9	3.0	-2.8	3.9	3.45	2.33	
480.0	6.40	301.70	479.6	7.4	-9.3	11.8	3.23	3.19	
571.0	8.60	297.90	569.8	13.2	-19.7	23.6	2.48	2.42	
663.0	11.10	299.00	660.4	20.7	-33.5	39.4	2.72	2.72	
755.0	13.00	298.10	750.4	29.9	-50.4	58.6	2.08	2.07	
846.0	15.50	296.10	838.6	40.1	-70.3	80.9	2.80	2.75	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well MCU Fee 17-9B2 (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 17-9B2 (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
937.0	18.10	298.60	925.7	52.2	-93.7	107.2	2.96	2.86	
1,032.0	20.90	300.10	1,015.2	67.8	-121.3	138.9	2.99	2.95	
1,123.0	21.70	301.70	1,100.0	84.7	-149.6	172.0	1.09	0.88	
1,135.0	21.50	301.20	1,111.2	87.1	-153.4	176.4	2.27	-1.67	
1,256.0	20.50	297.70	1,224.1	108.4	-191.1	219.7	1.33	-0.83	
1,347.0	21.10	297.70	1,309.2	123.4	-219.7	252.0	0.66	0.66	
1,439.0	21.20	300.40	1,395.0	139.5	-248.7	285.2	1.06	0.11	
1,530.0	21.90	302.00	1,479.7	156.8	-277.3	318.6	1.00	0.77	
1,622.0	22.90	302.30	1,564.7	175.5	-307.0	353.6	1.09	1.09	
1,714.0	23.40	302.80	1,649.3	195.0	-337.5	389.8	0.58	0.54	
1,805.0	24.00	301.50	1,732.6	214.4	-368.5	426.3	0.87	0.66	
1,897.0	24.00	302.70	1,816.7	234.3	-400.2	463.7	0.53	0.00	
1,988.0	23.30	299.60	1,900.0	253.2	-431.4	500.2	1.57	-0.77	
2,080.0	22.30	299.70	1,984.8	270.8	-462.4	535.8	1.09	-1.09	
2,171.0	23.00	297.30	2,068.8	287.5	-493.2	570.9	1.27	0.77	
2,263.0	21.70	299.00	2,153.9	304.0	-524.0	605.8	1.58	-1.41	
2,354.0	21.20	297.50	2,238.6	319.8	-553.3	639.1	0.82	-0.55	
2,446.0	21.70	298.60	2,324.2	335.6	-583.0	672.7	0.70	0.54	
2,537.0	21.60	299.20	2,408.8	351.8	-612.4	706.3	0.27	-0.11	
2,629.0	22.00	298.20	2,494.2	368.2	-642.4	740.4	0.59	0.43	
2,720.0	22.90	298.80	2,578.3	384.8	-672.9	775.2	1.02	0.99	
2,812.0	24.10	298.80	2,662.7	402.5	-705.1	811.9	1.30	1.30	
2,904.0	23.10	297.50	2,747.0	419.9	-737.5	848.7	1.23	-1.09	
2,995.0	22.30	297.90	2,831.0	436.2	-768.6	883.8	0.90	-0.88	
3,086.0	22.20	299.50	2,915.2	452.7	-798.8	918.2	0.67	-0.11	
3,178.0	22.50	301.00	3,000.3	470.4	-829.1	953.2	0.70	0.33	
3,270.0	23.10	300.10	3,085.1	488.5	-859.8	988.8	0.75	0.65	
3,361.0	23.30	297.30	3,168.7	505.7	-891.2	1,024.7	1.23	0.22	
3,453.0	22.20	298.60	3,253.6	522.4	-922.6	1,060.2	1.31	-1.20	
3,544.0	23.40	301.20	3,337.5	540.0	-953.2	1,095.5	1.72	1.32	
3,636.0	22.10	301.60	3,422.3	558.5	-983.6	1,131.0	1.42	-1.41	
3,727.0	23.10	300.60	3,506.3	576.5	-1,013.5	1,166.0	1.18	1.10	
3,818.0	22.30	300.70	3,590.3	594.4	-1,043.7	1,201.1	0.88	-0.88	
3,910.0	22.70	301.10	3,675.3	612.5	-1,073.9	1,236.3	0.47	0.43	
4,001.0	23.30	301.90	3,759.0	631.1	-1,104.2	1,271.9	0.74	0.66	
4,093.0	21.40	300.40	3,844.1	649.2	-1,134.2	1,306.8	2.16	-2.07	
4,184.0	22.30	302.30	3,928.6	666.8	-1,163.1	1,340.7	1.26	0.99	
4,276.0	23.00	301.70	4,013.5	685.6	-1,193.1	1,376.1	0.80	0.76	
4,367.0	21.60	301.50	4,097.7	703.7	-1,222.5	1,410.6	1.54	-1.54	
4,459.0	21.40	299.80	4,183.3	720.9	-1,251.5	1,444.3	0.71	-0.22	
4,550.0	22.50	299.40	4,267.7	737.7	-1,281.1	1,478.3	1.22	1.21	
4,641.0	22.80	297.20	4,351.7	754.3	-1,312.0	1,513.3	0.99	0.33	
4,733.0	23.20	298.50	4,436.4	771.1	-1,343.7	1,549.3	0.70	0.43	
4,825.0	24.00	298.10	4,520.7	788.6	-1,376.2	1,586.1	0.89	0.87	
4,916.0	22.60	299.10	4,604.2	805.8	-1,407.8	1,622.1	1.60	-1.54	
5,008.0	22.90	297.50	4,689.1	822.6	-1,439.1	1,657.6	0.75	0.33	
5,099.0	24.60	301.20	4,772.4	840.6	-1,471.0	1,694.3	2.48	1.87	
5,191.0	22.70	300.10	4,856.6	859.5	-1,502.8	1,731.2	2.12	-2.07	
5,283.0	22.90	300.30	4,941.5	877.4	-1,533.6	1,766.8	0.23	0.22	
5,374.0	21.30	298.50	5,025.8	894.2	-1,563.4	1,801.0	1.91	-1.76	
5,466.0	22.00	299.60	5,111.3	910.7	-1,593.0	1,835.0	0.88	0.76	
5,557.0	23.30	302.30	5,195.3	928.7	-1,623.1	1,870.0	1.83	1.43	
5,648.0	22.60	302.70	5,279.1	947.8	-1,653.0	1,905.5	0.79	-0.77	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well MCU Fee 17-9B2 (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 17-9B2 (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
5,740.0	22.40	300.50	5,364.1	966.2	-1,683.0	1,940.6	0.94	-0.22	
5,832.0	22.40	300.30	5,449.1	984.0	-1,713.2	1,975.7	0.08	0.00	
5,923.0	22.00	300.80	5,533.4	1,001.5	-1,742.8	2,010.1	0.49	-0.44	
6,015.0	20.90	300.90	5,619.0	1,018.7	-1,771.7	2,043.7	1.20	-1.20	
6,106.0	21.40	302.70	5,703.9	1,036.0	-1,799.6	2,076.5	0.90	0.55	
6,198.0	22.50	302.30	5,789.2	1,054.5	-1,828.6	2,110.9	1.21	1.20	
6,289.0	21.80	300.20	5,873.5	1,072.3	-1,857.9	2,145.2	1.16	-0.77	
6,381.0	20.70	300.60	5,959.2	1,089.2	-1,886.7	2,178.5	1.21	-1.20	
6,472.0	21.20	299.90	6,044.2	1,105.6	-1,914.8	2,211.1	0.61	0.55	
6,564.0	21.10	300.80	6,130.0	1,122.3	-1,943.5	2,244.2	0.37	-0.11	
6,656.0	22.10	299.70	6,215.5	1,139.4	-1,972.7	2,278.1	1.17	1.09	
6,747.0	20.80	301.80	6,300.2	1,156.4	-2,001.3	2,311.4	1.66	-1.43	
6,839.0	22.20	300.40	6,385.8	1,173.8	-2,030.2	2,345.1	1.62	1.52	
6,931.0	21.00	300.10	6,471.4	1,190.8	-2,059.5	2,379.0	1.31	-1.30	
7,022.0	20.00	300.10	6,556.6	1,206.8	-2,087.0	2,410.8	1.10	-1.10	
7,114.0	20.40	298.60	6,643.0	1,222.4	-2,114.7	2,442.6	0.71	0.43	
7,206.0	20.80	298.90	6,729.1	1,238.0	-2,143.1	2,475.0	0.45	0.43	
7,297.0	20.10	298.90	6,814.3	1,253.3	-2,170.9	2,506.7	0.77	-0.77	
7,338.0	18.70	297.50	6,853.0	1,259.8	-2,182.9	2,520.4	3.60	-3.41	
7,430.0	19.80	300.80	6,939.9	1,274.6	-2,209.4	2,550.7	1.68	1.20	
7,522.0	21.40	300.10	7,026.0	1,291.0	-2,237.3	2,583.0	1.76	1.74	
7,613.0	21.60	303.80	7,110.7	1,308.6	-2,265.6	2,616.4	1.51	0.22	
7,704.0	20.00	301.70	7,195.7	1,326.1	-2,292.7	2,648.6	1.94	-1.76	
7,796.0	18.20	299.80	7,282.7	1,341.5	-2,318.6	2,678.7	2.07	-1.96	
7,887.0	17.10	299.60	7,369.4	1,355.2	-2,342.6	2,706.3	1.21	-1.21	
7,979.0	15.70	298.70	7,457.6	1,367.8	-2,365.2	2,732.3	1.55	-1.52	
8,070.0	15.30	298.60	7,545.3	1,379.5	-2,386.6	2,756.6	0.44	-0.44	
8,162.0	14.30	297.20	7,634.3	1,390.5	-2,407.4	2,780.1	1.15	-1.09	
8,254.0	13.30	296.70	7,723.6	1,400.4	-2,426.9	2,802.0	1.09	-1.09	
8,345.0	12.10	301.10	7,812.4	1,410.1	-2,444.4	2,822.0	1.69	-1.32	
8,437.0	10.60	300.90	7,902.6	1,419.4	-2,459.9	2,840.1	1.63	-1.63	
8,528.0	9.60	297.30	7,992.2	1,427.2	-2,473.9	2,856.0	1.30	-1.10	
8,620.0	8.30	299.40	8,083.0	1,434.0	-2,486.5	2,870.3	1.46	-1.41	
8,711.0	6.50	292.70	8,173.3	1,439.2	-2,497.0	2,882.0	2.19	-1.98	
8,803.0	4.60	296.80	8,264.8	1,442.8	-2,505.0	2,890.9	2.11	-2.07	
8,894.0	3.80	317.10	8,355.6	1,446.7	-2,510.4	2,897.4	1.84	-0.88	
8,985.0	2.60	324.70	8,446.5	1,450.6	-2,513.6	2,902.1	1.40	-1.32	
9,077.0	2.70	319.90	8,538.4	1,454.0	-2,516.2	2,906.1	0.26	0.11	
9,168.0	1.60	329.10	8,629.3	1,456.7	-2,518.2	2,909.2	1.26	-1.21	
9,260.0	1.70	352.00	8,721.3	1,459.1	-2,519.1	2,911.2	0.72	0.11	
9,351.0	1.30	344.50	8,812.3	1,461.5	-2,519.6	2,912.7	0.49	-0.44	
9,443.0	1.00	307.50	8,904.2	1,463.0	-2,520.5	2,914.3	0.85	-0.33	
9,534.0	0.30	334.10	8,995.2	1,463.7	-2,521.2	2,915.2	0.82	-0.77	
9,628.0	0.40	288.50	9,089.2	1,464.0	-2,521.6	2,915.8	0.30	0.11	
9,719.0	1.20	113.60	9,180.2	1,463.7	-2,521.0	2,915.1	1.76	0.88	
9,811.0	0.90	131.70	9,272.2	1,462.8	-2,519.6	2,913.5	0.48	-0.33	
9,903.0	0.80	120.50	9,364.2	1,462.0	-2,518.5	2,912.1	0.21	-0.11	
9,994.0	0.30	170.60	9,455.2	1,461.5	-2,517.9	2,911.3	0.71	-0.55	
10,086.0	0.40	178.80	9,547.2	1,460.9	-2,517.9	2,911.0	0.12	0.11	
10,177.0	0.90	192.70	9,638.2	1,459.9	-2,518.1	2,910.6	0.57	0.55	
10,269.0	0.90	196.00	9,730.2	1,458.5	-2,518.4	2,910.3	0.06	0.00	
10,360.0	0.90	208.60	9,821.2	1,457.2	-2,518.9	2,910.1	0.22	0.00	
10,452.0	0.70	185.40	9,913.1	1,456.0	-2,519.3	2,909.8	0.41	-0.22	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well MCU Fee 17-9B2 (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 17-9B2 (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
10,543.0	0.60	176.70	10,004.1	1,455.0	-2,519.4	2,909.3	0.15	-0.11	**Last Cathedral Survey @ 10,543' MD**
10,595.0	0.60	176.70	10,056.1	1,454.4	-2,519.3	2,909.0	0.00	0.00	**Projection to Bit @ 10,595' 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 17-9B2 (M16V	0.00	0.00	8,188.0	1,449.8	-2,517.4	1,594,831.44	2,352,804.21	39.444157	-107.791962
- actual wellpath misses target center by 21.3ft at 8727.9ft MD (8190.1 TVD, 1439.9 N, -2498.7 E)									
- Circle (radius 25.0)									
MCU Fee 17-9B2 (M16V	0.00	0.00	9,979.0	1,449.8	-2,517.4	1,594,831.44	2,352,804.21	39.444157	-107.791962
- actual wellpath misses target center by 5.8ft at 10517.9ft MD (9979.1 TVD, 1455.2 N, -2519.4 E)									
- Circle (radius 25.0)									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
10,543.0	10,004.1	1,455.0	-2,519.4	Last Cathedral Survey @ 10,543' MD
10,595.0	10,056.1	1,454.4	-2,519.3	Projection to Bit @ 10,595' MD

Checked By: _____ Approved By: _____ Date: _____