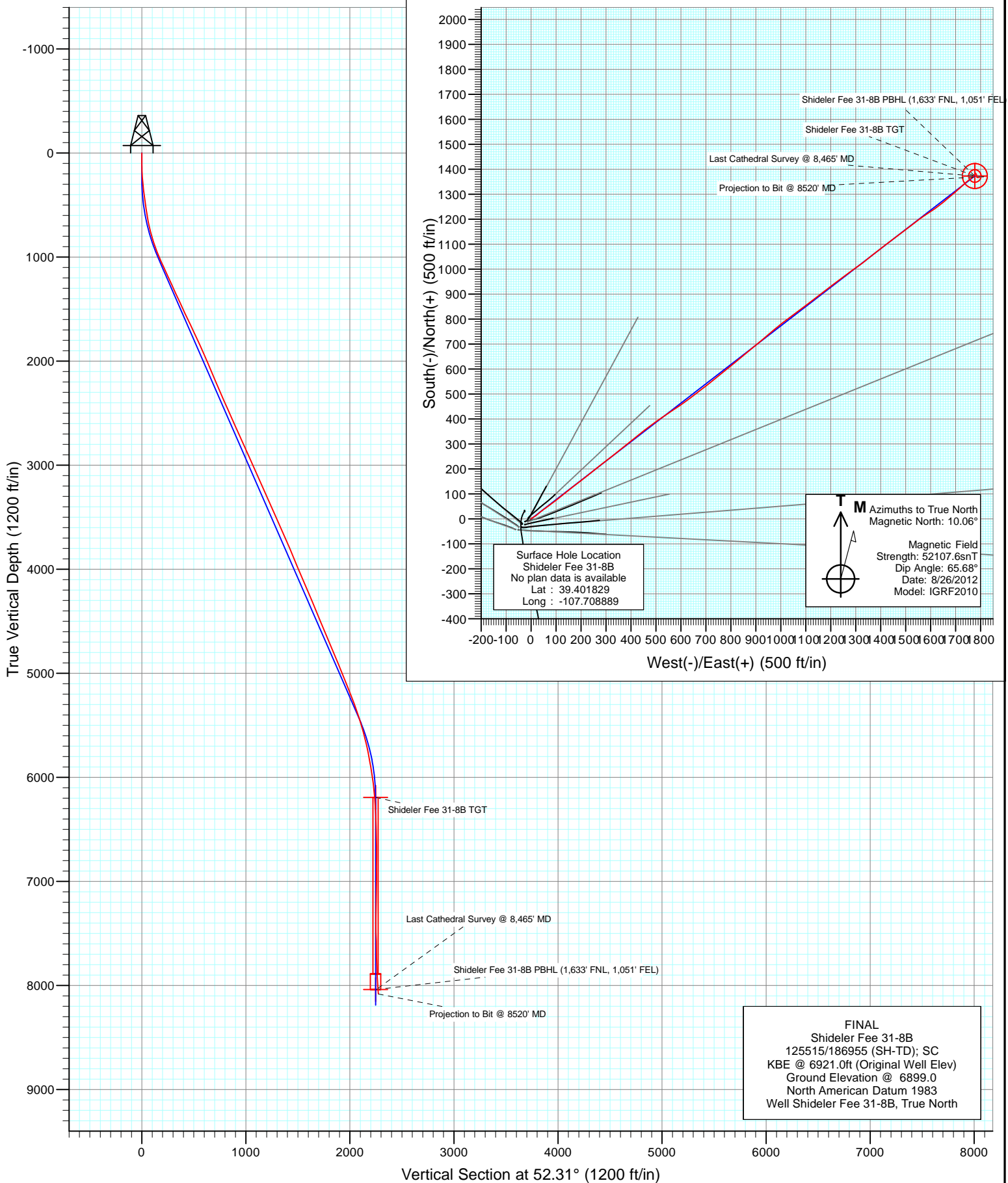
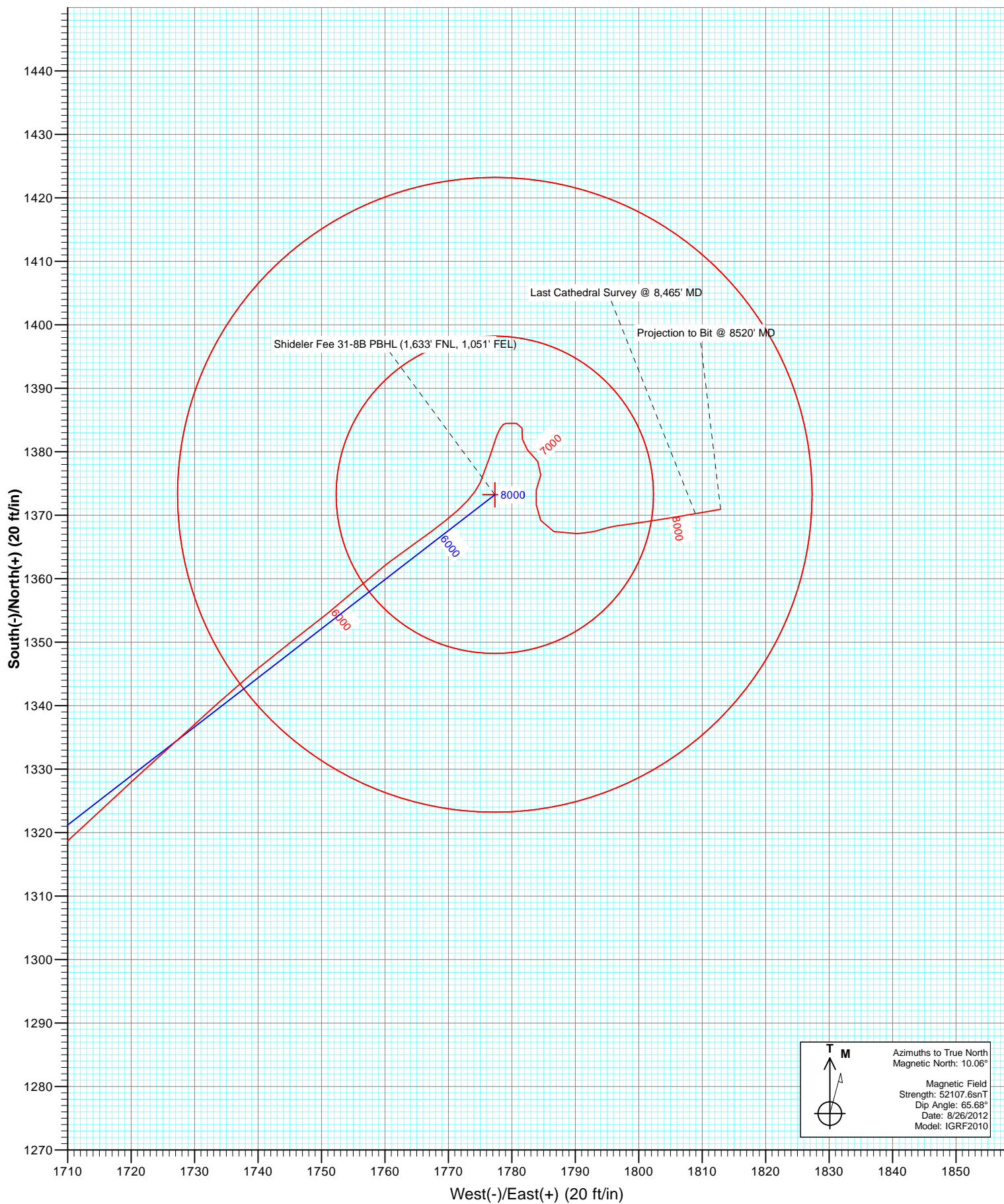





Project: Mamm Creek  
Site: K31E Pad  
Well: Shideler Fee 31-8B  
Wellbore: OH  
Design: FINAL






 Azimuths to True North  
 Magnetic North: 10.06°  
 Magnetic Field  
 Strength: 52107.6nT  
 Dip Angle: 65.68°  
 Date: 8/26/2012  
 Model: IGRF2010

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Shideler Fee 31-8B
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Site:</b>	K31E Pad	<b>MD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Well:</b>	Shideler Fee 31-8B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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		K31E Pad			
Site Position:		Northing:	1,578,791.89 ft	Latitude:	39.401699
From:	Lat/Long	Easting:	2,375,816.61 ft	Longitude:	-107.709119
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.39 °

Well	Shideler Fee 31-8B					
Well Position	+N/-S	0.0 ft	Northing:	1,578,837.63 ft	Latitude:	39.401829
	+E/-W	0.0 ft	Easting:	2,375,882.74 ft	Longitude:	-107.708889
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,899.0 ft

Wellbore		OH			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/26/2012	10.06	65.68	52,108

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	52.31

Survey Program		Date	9/3/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
79.0	8,520.0	Survey #1 (OH)	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	
79.0	0.40	6.60	79.0	0.3	0.0	0.2	0.51	0.51	
110.0	0.80	37.60	110.0	0.6	0.2	0.5	1.62	1.29	
141.0	1.40	52.20	141.0	1.0	0.6	1.1	2.12	1.94	
171.0	2.00	55.30	171.0	1.5	1.3	2.0	2.02	2.00	
202.0	2.70	60.20	202.0	2.1	2.4	3.2	2.35	2.26	
232.0	4.00	55.20	231.9	3.1	3.9	5.0	4.44	4.33	
294.0	5.30	58.60	293.7	5.8	8.1	10.0	2.14	2.10	
386.0	6.90	57.60	385.2	11.0	16.4	19.7	1.74	1.74	
479.0	8.60	47.70	477.3	18.7	26.3	32.2	2.32	1.83	
570.0	8.80	52.50	567.3	27.5	36.8	45.9	0.83	0.22	
663.0	10.90	53.40	658.9	37.1	49.5	61.8	2.26	2.26	
755.0	13.90	54.20	748.7	48.7	65.5	81.6	3.27	3.26	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Shideler Fee 31-8B
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Site:</b>	K31E Pad	<b>MD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Well:</b>	Shideler Fee 31-8B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
847.0	17.40	53.20	837.3	63.4	85.4	106.4	3.82	3.80	
939.0	20.50	51.60	924.3	81.7	109.1	136.3	3.42	3.37	
1,031.0	23.70	51.60	1,009.6	103.2	136.2	170.9	3.48	3.48	
1,124.0	24.30	52.20	1,094.5	126.5	166.0	208.7	0.70	0.65	
1,216.0	24.90	52.10	1,178.2	150.0	196.2	247.0	0.65	0.65	
1,308.0	24.40	51.40	1,261.8	173.8	226.4	285.4	0.63	-0.54	
1,400.0	24.70	51.60	1,345.5	197.6	256.3	323.6	0.34	0.33	
1,492.0	25.10	52.00	1,428.9	221.5	286.7	362.3	0.47	0.43	
1,615.0	25.20	52.10	1,540.3	253.7	327.9	414.6	0.09	0.08	
1,707.0	25.40	51.40	1,623.4	278.0	358.8	453.9	0.39	0.22	
1,798.0	25.70	50.00	1,705.5	302.9	389.2	493.1	0.74	0.33	
1,890.0	24.80	51.70	1,788.7	327.6	419.6	532.4	1.26	-0.98	
1,982.0	24.20	52.60	1,872.5	351.1	449.7	570.5	0.77	-0.65	
2,073.0	24.00	51.90	1,955.5	373.8	479.1	607.7	0.38	-0.22	
2,164.0	22.70	56.30	2,039.1	395.0	508.3	643.7	2.39	-1.43	
2,256.0	22.70	56.00	2,124.0	414.7	537.8	679.1	0.13	0.00	
2,347.0	23.40	55.80	2,207.7	434.7	567.3	714.7	0.77	0.77	
2,439.0	23.50	55.80	2,292.1	455.3	597.5	751.2	0.11	0.11	
2,530.0	23.40	53.10	2,375.6	476.3	627.0	787.4	1.19	-0.11	
2,622.0	23.60	53.30	2,459.9	498.3	656.4	824.1	0.23	0.22	
2,714.0	24.10	51.70	2,544.1	521.0	685.9	861.3	0.89	0.54	
2,805.0	24.30	51.60	2,627.1	544.1	715.1	898.6	0.22	0.22	
2,897.0	24.50	51.40	2,710.9	567.8	744.9	936.6	0.24	0.22	
2,989.0	24.50	50.60	2,794.6	591.8	774.5	974.7	0.36	0.00	
3,081.0	24.40	50.60	2,878.3	616.0	804.0	1,012.8	0.11	-0.11	
3,172.0	24.20	50.60	2,961.3	639.7	832.9	1,050.2	0.22	-0.22	
3,264.0	24.30	50.20	3,045.2	663.8	862.0	1,088.0	0.21	0.11	
3,355.0	23.60	49.80	3,128.3	687.5	890.3	1,124.9	0.79	-0.77	
3,447.0	23.90	49.90	3,212.5	711.4	918.6	1,161.9	0.33	0.33	
3,539.0	23.80	49.80	3,296.7	735.4	947.1	1,199.1	0.12	-0.11	
3,630.0	23.30	50.00	3,380.1	758.8	974.9	1,235.4	0.56	-0.55	
3,722.0	24.40	52.70	3,464.2	782.1	1,003.9	1,272.6	1.68	1.20	
3,813.0	24.40	52.30	3,547.1	804.9	1,033.8	1,310.2	0.18	0.00	
3,904.0	24.20	53.00	3,630.0	827.7	1,063.5	1,347.6	0.39	-0.22	
3,996.0	23.30	53.30	3,714.3	849.9	1,093.2	1,384.7	0.99	-0.98	
4,087.0	23.00	52.80	3,797.9	871.4	1,121.8	1,420.4	0.39	-0.33	
4,179.0	22.20	53.50	3,882.9	892.6	1,150.0	1,455.8	0.92	-0.87	
4,271.0	22.90	52.20	3,967.8	913.9	1,178.2	1,491.1	0.93	0.76	
4,362.0	22.90	51.90	4,051.7	935.7	1,206.1	1,526.5	0.13	0.00	
4,454.0	23.40	53.10	4,136.2	957.7	1,234.8	1,562.6	0.75	0.54	
4,545.0	23.10	54.10	4,219.9	979.0	1,263.7	1,598.6	0.54	-0.33	
4,637.0	22.60	54.10	4,304.6	1,000.0	1,292.6	1,634.3	0.54	-0.54	
4,729.0	22.60	54.90	4,389.6	1,020.5	1,321.4	1,669.6	0.33	0.00	
4,820.0	22.40	49.10	4,473.7	1,041.9	1,348.8	1,704.4	2.45	-0.22	
4,912.0	23.70	52.50	4,558.3	1,064.6	1,376.7	1,740.4	2.02	1.41	
5,003.0	23.70	52.90	4,641.6	1,086.8	1,405.8	1,776.9	0.18	0.00	
5,095.0	22.20	53.60	4,726.4	1,108.3	1,434.6	1,812.8	1.66	-1.63	
5,186.0	21.40	51.80	4,810.8	1,128.7	1,461.5	1,846.6	1.15	-0.88	
5,277.0	22.90	52.60	4,895.1	1,149.8	1,488.6	1,880.9	1.68	1.65	
5,369.0	21.90	51.80	4,980.2	1,171.2	1,516.3	1,916.0	1.14	-1.09	
5,461.0	22.50	53.60	5,065.4	1,192.3	1,543.9	1,950.7	0.99	0.65	
5,552.0	21.30	55.80	5,149.8	1,211.9	1,571.6	1,984.6	1.60	-1.32	
5,644.0	21.80	57.30	5,235.4	1,230.5	1,599.8	2,018.3	0.81	0.54	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Shideler Fee 31-8B
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Site:</b>	K31E Pad	<b>MD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Well:</b>	Shideler Fee 31-8B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
5,735.0	20.60	53.00	5,320.2	1,249.3	1,626.8	2,051.2	2.16	-1.32	
5,827.0	17.40	49.70	5,407.2	1,268.0	1,650.3	2,081.1	3.67	-3.48	
5,918.0	16.30	49.60	5,494.3	1,285.0	1,670.4	2,107.5	1.21	-1.21	
6,010.0	15.60	51.10	5,582.7	1,301.2	1,689.8	2,132.7	0.88	-0.76	
6,102.0	13.10	47.10	5,671.9	1,316.0	1,707.1	2,155.5	2.92	-2.72	
6,194.0	10.80	47.60	5,761.9	1,328.9	1,721.1	2,174.5	2.50	-2.50	
6,286.0	10.50	47.90	5,852.3	1,340.4	1,733.7	2,191.4	0.33	-0.33	
6,378.0	8.90	52.70	5,943.0	1,350.3	1,745.6	2,206.9	1.95	-1.74	
6,469.0	7.70	49.10	6,033.0	1,358.6	1,755.8	2,220.0	1.44	-1.32	
6,561.0	6.40	55.40	6,124.3	1,365.5	1,764.6	2,231.3	1.64	-1.41	
6,631.3	4.86	50.22	6,194.2	1,369.6	1,770.2	2,238.2	2.30	-2.19	Shideler Fee 31-8B TGT
6,653.0	4.40	47.90	6,215.9	1,370.8	1,771.5	2,239.9	2.30	-2.13	
6,744.0	2.80	25.50	6,306.7	1,375.1	1,775.0	2,245.4	2.31	-1.76	
6,836.0	2.20	13.80	6,398.6	1,378.9	1,776.4	2,248.8	0.85	-0.65	
6,926.0	2.70	21.90	6,488.6	1,382.5	1,777.6	2,251.9	0.67	0.56	
7,018.0	0.80	96.70	6,580.5	1,384.5	1,779.1	2,254.3	2.83	-2.07	
7,109.0	1.30	84.20	6,671.5	1,384.5	1,780.7	2,255.6	0.60	0.55	
7,201.0	1.10	190.30	6,763.5	1,383.7	1,781.6	2,255.8	2.09	-0.22	
7,293.0	1.10	165.30	6,855.5	1,382.0	1,781.7	2,254.8	0.52	0.00	
7,384.0	1.30	146.50	6,946.5	1,380.3	1,782.5	2,254.4	0.48	0.22	
7,476.0	1.80	132.80	7,038.4	1,378.5	1,784.1	2,254.6	0.67	0.54	
7,568.0	1.60	207.10	7,130.4	1,376.3	1,784.6	2,253.7	2.24	-0.22	
7,660.0	1.50	185.90	7,222.4	1,374.0	1,783.9	2,251.7	0.63	-0.11	
7,751.0	1.50	174.10	7,313.3	1,371.6	1,783.9	2,250.2	0.34	0.00	
7,842.0	1.70	155.50	7,404.3	1,369.2	1,784.5	2,249.3	0.61	0.22	
7,934.0	2.00	109.60	7,496.2	1,367.4	1,786.6	2,249.8	1.60	0.33	
8,025.0	2.80	84.40	7,587.2	1,367.1	1,790.3	2,252.6	1.44	0.88	
8,117.0	0.80	72.60	7,679.1	1,367.5	1,793.2	2,255.1	2.20	-2.17	
8,208.0	1.50	75.50	7,770.1	1,368.0	1,794.9	2,256.8	0.77	0.77	
8,299.0	2.90	82.70	7,861.0	1,368.6	1,798.4	2,259.9	1.57	1.54	
8,391.0	3.90	81.00	7,952.9	1,369.4	1,803.8	2,264.6	1.09	1.09	
8,465.0	4.20	80.10	8,026.7	1,370.2	1,808.9	2,269.2	0.41	0.41	Last Cathedral Survey @ 8,465' MD - Shideler F
8,520.0	4.20	80.10	8,081.5	1,370.9	1,812.9	2,272.8	0.00	0.00	Projection to Bit @ 8520' MD

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Shideler Fee 31-8B
<b>Project:</b>	Mamm Creek	<b>TVD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Site:</b>	K31E Pad	<b>MD Reference:</b>	KBE @ 6921.0ft (Original Well Elev)
<b>Well:</b>	Shideler Fee 31-8B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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									
Shideler Fee 31-8B TGT	0.00	0.00	6,193.5	1,373.2	1,777.3	1,580,167.24	2,377,692.92	39.405599	-107.702599
- survey misses target center by 8.0ft at 6631.3ft MD (6194.2 TVD, 1369.6 N, 1770.2 E)									
- Circle (radius 25.0)									
Shideler Fee 31-8B PBI-	0.00	0.00	8,038.0	1,373.2	1,777.3	1,580,167.24	2,377,692.92	39.405599	-107.702599
- survey misses target center by 33.7ft at 8465.0ft MD (8026.7 TVD, 1370.2 N, 1808.9 E)									
- Circle (radius 50.0)									

Survey Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W	Comment	
(ft)	(ft)	(ft)	(ft)		
8,465.0	8,026.7	1,370.2	1,808.9	Last Cathedral Survey @ 8,465' MD	
8,520.0	8,081.5	1,370.9	1,812.9	Projection to Bit @ 8520' MD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_