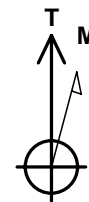
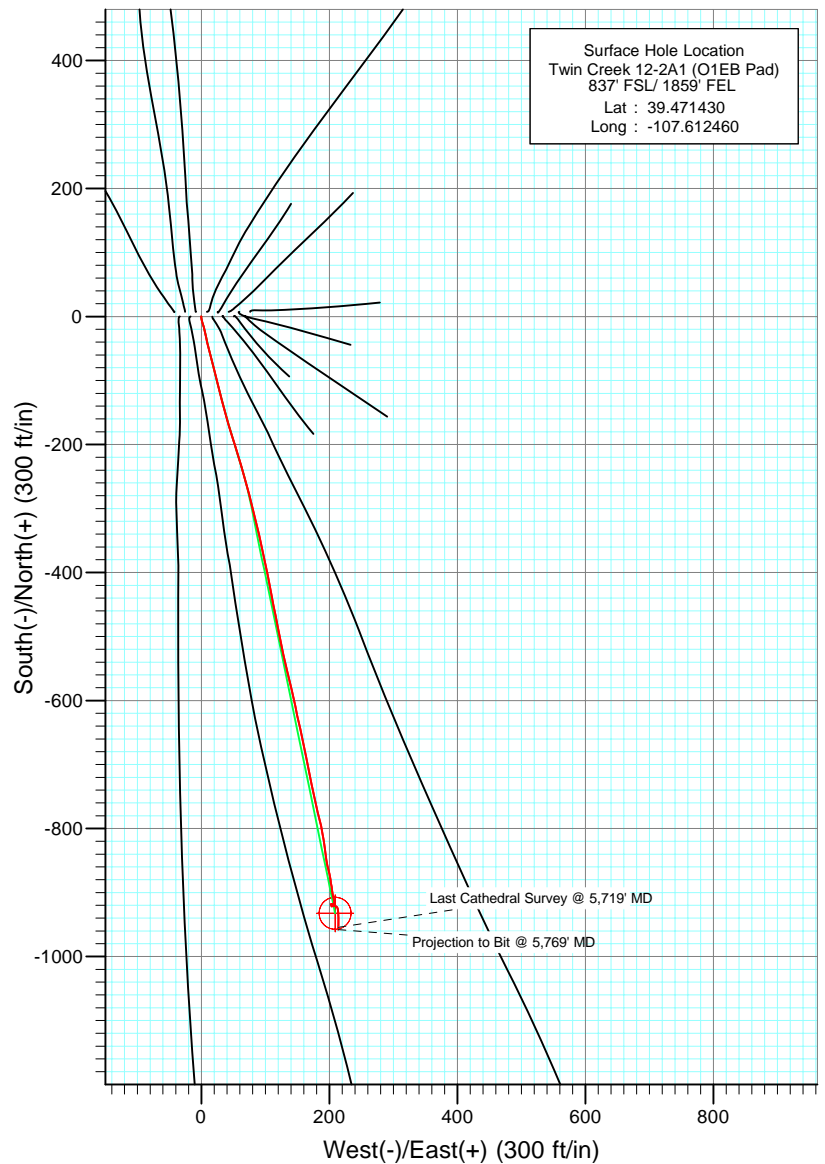
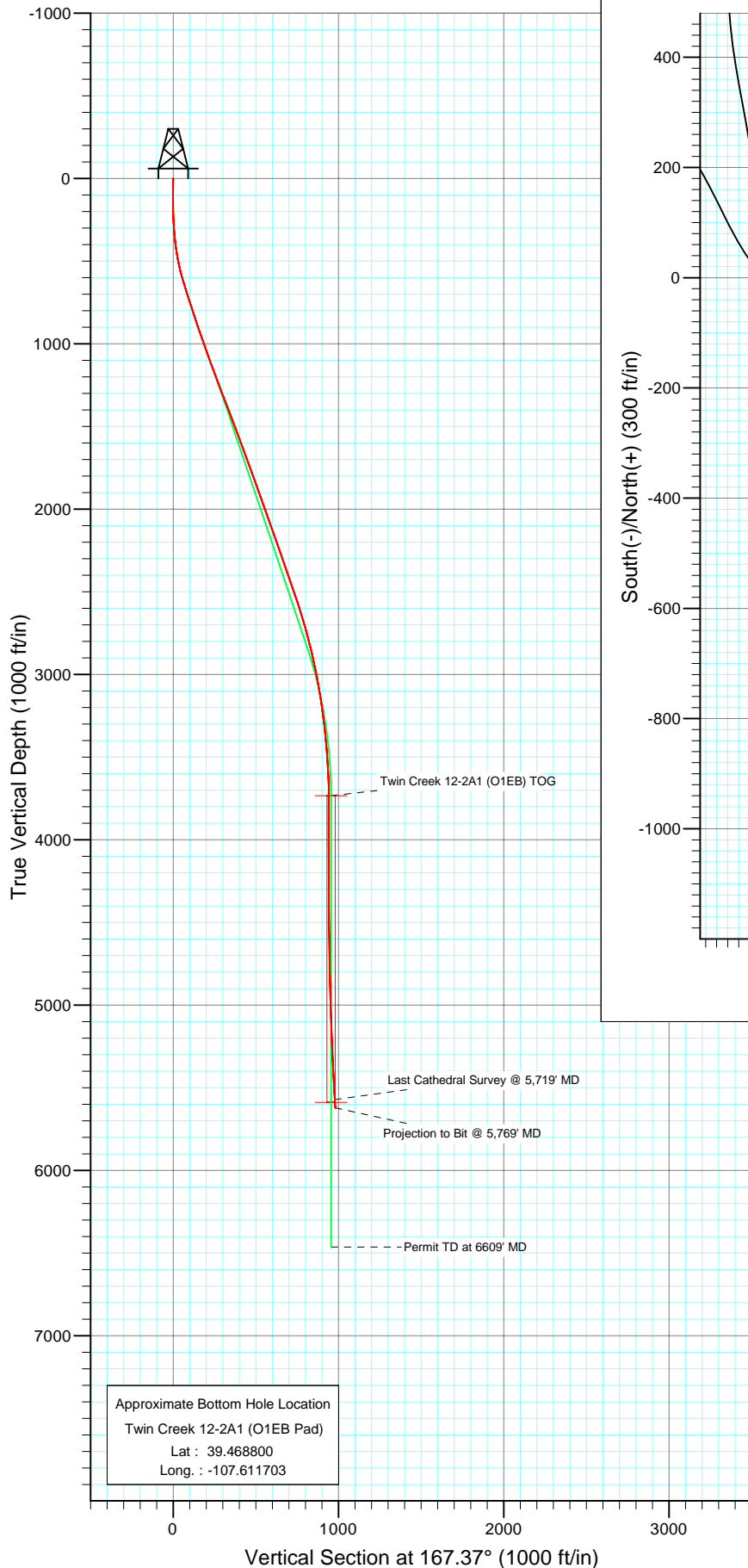




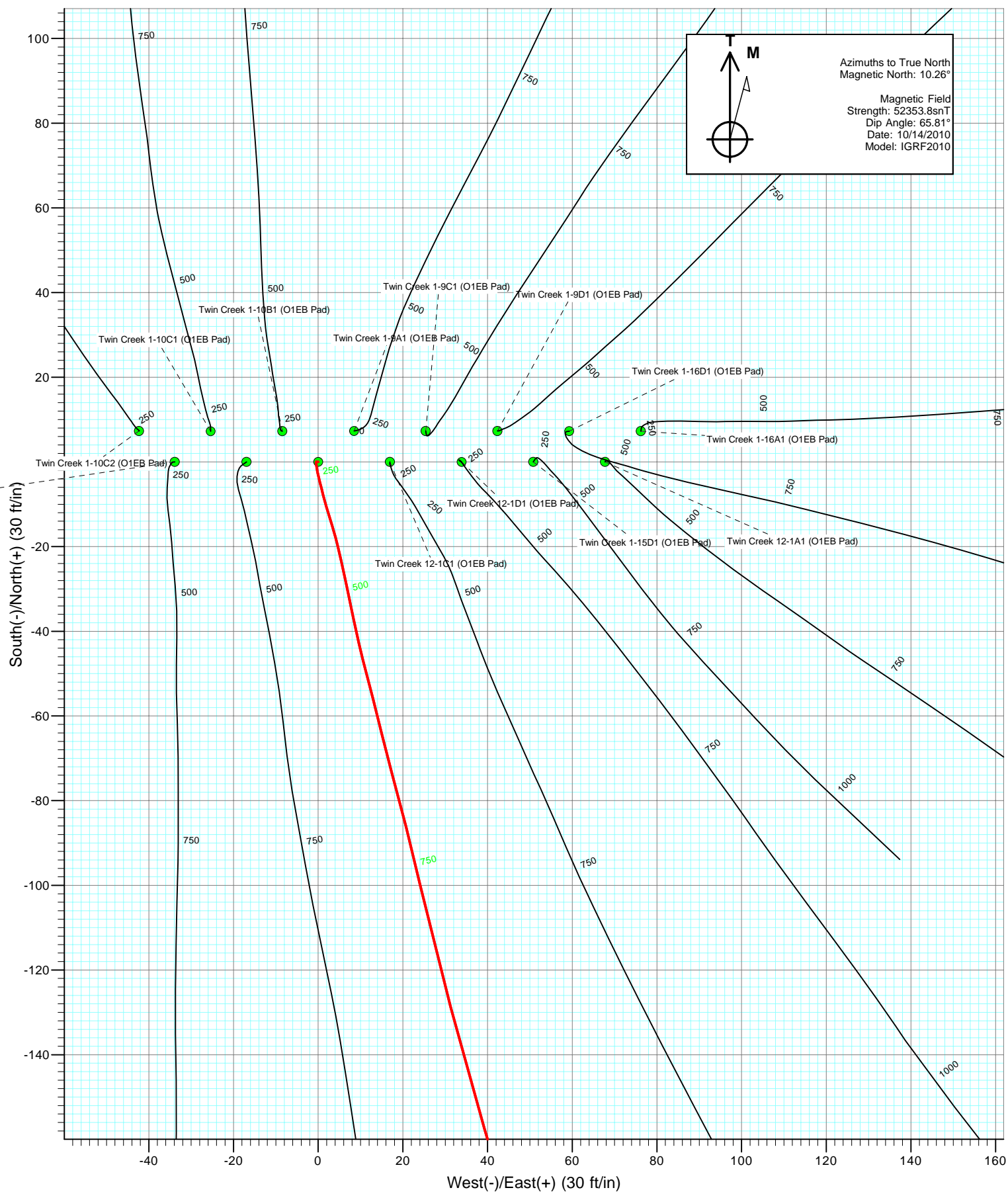
Project: Mamm Creek
 Site: SWSE S1-T7S-R92W (O1EB Pad)
 Well: Twin Creek 12-2A1 (O1EB Pad)
 Wellbore: Final
 Design: DD



Azimuths to True North
 Magnetic North: 10.26°

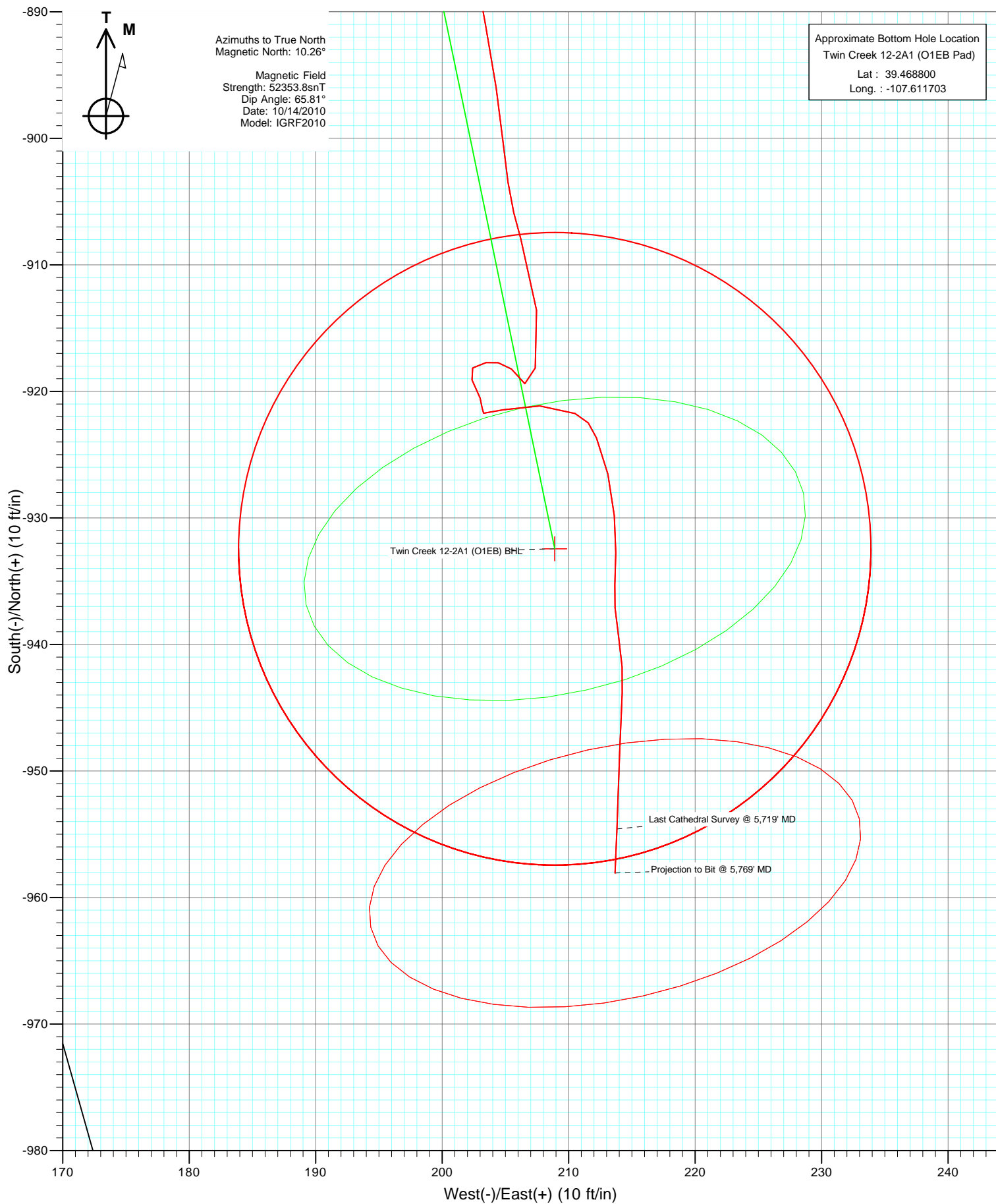
Magnetic Field
 Strength: 52353.8snT
 Dip Angle: 65.81°
 Date: 10/14/2010
 Model: IGRF2010

DESIGN DETAILS: DD				
105381 (SH)105445 (MH): KR				
KBE @ 6084.0ft (Nabors M15)				
Target	Azimuth	Origin	N/S	E/W From TVD
Twin Creek 12-2A1 (O1EB) BHL	167.37	Slot	0.0	0.0





Project: Mamm Creek
Site: SWSE S1-T7S-R92W (O1EB Pad)
Well: Twin Creek 12-2A1 (O1EB Pad)
Wellbore: Final
Design: DD



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Twin Creek 12-2A1 (O1EB Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 6084.0ft (Nabors M15)
Site:	SWSE S1-T7S-R92W (O1EB Pad)	MD Reference:	KBE @ 6084.0ft (Nabors M15)
Well:	Twin Creek 12-2A1 (O1EB Pad)	North Reference:	True
Wellbore:	Final	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US 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	SWSE S1-T7S-R92W (O1EB Pad)			
Site Position:		Northing:	1,603,540.14 ft	Latitude: 39.471450
From:	Lat/Long	Easting:	2,403,755.74 ft	Longitude: -107.612310
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: -1.33 °

Well	Twin Creek 12-2A1 (O1EB Pad)			
Well Position	+N/-S	0.0 ft	Northing:	1,603,533.83 ft
	+E/-W	0.0 ft	Easting:	2,403,713.24 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level: 6,062.0 ft

Wellbore	Final				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/14/2010	10.26	65.81	52,354

Design	DD			
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	167.37

Survey Program	Date	10/23/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
124.0	5,769.0	Survey #1 (Final)	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	
124.0	0.40	280.30	124.0	0.1	-0.4	-0.2	0.32	0.32	
154.0	0.40	160.40	154.0	0.0	-0.5	-0.1	2.31	0.00	
185.0	0.80	193.40	185.0	-0.3	-0.5	0.2	1.66	1.29	
216.0	1.40	162.50	216.0	-0.9	-0.4	0.8	2.66	1.94	
247.0	2.40	172.50	247.0	-1.9	-0.2	1.8	3.39	3.23	
277.0	3.20	167.50	276.9	-3.3	0.0	3.3	2.79	2.67	
308.0	4.00	164.80	307.9	-5.2	0.5	5.2	2.64	2.58	
339.0	5.00	166.00	338.8	-7.6	1.1	7.6	3.24	3.23	
370.0	6.10	163.10	369.6	-10.5	1.9	10.6	3.66	3.55	
401.0	7.30	163.30	400.4	-13.9	2.9	14.2	3.87	3.87	
431.0	8.50	164.70	430.1	-17.9	4.1	18.3	4.05	4.00	
462.0	9.80	167.30	460.7	-22.7	5.3	23.3	4.40	4.19	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Twin Creek 12-2A1 (O1EB Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 6084.0ft (Nabors M15)
Site:	SWSE S1-T7S-R92W (O1EB Pad)	MD Reference:	KBE @ 6084.0ft (Nabors M15)
Well:	Twin Creek 12-2A1 (O1EB Pad)	North Reference:	True
Wellbore:	Final	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US 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
492.0	11.10	168.10	490.2	-28.0	6.4	28.7	4.36	4.33	
523.0	12.40	168.30	520.6	-34.2	7.7	35.0	4.20	4.19	
554.0	13.70	167.30	550.8	-41.0	9.2	42.0	4.26	4.19	
585.0	14.60	165.60	580.9	-48.4	11.0	49.6	3.20	2.90	
615.0	15.80	165.40	609.8	-56.0	12.9	57.5	4.00	4.00	
646.0	16.70	166.50	639.6	-64.4	15.0	66.1	3.07	2.90	
677.0	17.10	164.60	669.2	-73.1	17.3	75.1	2.20	1.29	
768.0	18.30	166.90	755.9	-99.9	24.1	102.8	1.53	1.32	
861.0	18.80	165.10	844.1	-128.6	31.3	132.4	0.82	0.54	
953.0	19.00	163.90	931.1	-157.4	39.2	162.1	0.48	0.22	
1,046.0	19.60	163.30	1,018.9	-186.8	47.9	192.8	0.68	0.65	
1,111.0	19.90	162.80	1,080.1	-207.9	54.3	214.7	0.53	0.46	
1,256.0	20.50	164.20	1,216.2	-255.9	68.5	264.7	0.53	0.41	
1,351.0	21.10	166.20	1,305.0	-288.5	77.1	298.4	0.98	0.63	
1,446.0	21.20	165.70	1,393.6	-321.7	85.4	332.6	0.22	0.11	
1,540.0	20.50	168.00	1,481.4	-354.3	93.1	366.1	1.15	-0.74	
1,635.0	20.40	168.20	1,570.4	-386.8	99.9	399.3	0.13	-0.11	
1,731.0	19.80	168.60	1,660.6	-419.1	106.5	432.2	0.64	-0.62	
1,826.0	20.80	169.60	1,749.7	-451.5	112.8	465.2	1.11	1.05	
1,921.0	19.80	168.40	1,838.8	-483.8	119.0	498.1	1.14	-1.05	
2,016.0	19.10	168.80	1,928.4	-514.8	125.3	529.8	0.75	-0.74	
2,111.0	19.30	166.50	2,018.1	-545.3	132.0	561.0	0.82	0.21	
2,206.0	20.20	166.40	2,107.5	-576.5	139.5	593.1	0.95	0.95	
2,301.0	19.30	169.30	2,196.9	-607.9	146.3	625.2	1.40	-0.95	
2,396.0	19.20	165.70	2,286.6	-638.5	153.1	656.5	1.25	-0.11	
2,491.0	19.40	169.30	2,376.2	-669.1	159.8	687.9	1.27	0.21	
2,586.0	19.20	168.90	2,465.9	-699.9	165.8	719.3	0.25	-0.21	
2,681.0	18.10	168.70	2,555.9	-729.7	171.7	749.6	1.16	-1.16	
2,776.0	17.30	166.10	2,646.4	-757.9	178.0	778.5	1.18	-0.84	
2,872.0	15.30	166.70	2,738.6	-784.1	184.3	805.4	2.09	-2.08	
2,967.0	13.80	170.40	2,830.5	-807.5	189.1	829.3	1.86	-1.58	
3,061.0	12.50	172.10	2,922.0	-828.6	192.3	850.6	1.44	-1.38	
3,156.0	11.10	171.40	3,015.0	-847.8	195.1	870.0	1.48	-1.47	
3,251.0	9.60	165.50	3,108.5	-864.6	198.5	887.0	1.93	-1.58	
3,346.0	8.20	171.70	3,202.3	-878.9	201.4	901.7	1.78	-1.47	
3,441.0	6.50	169.30	3,296.6	-890.9	203.4	913.8	1.82	-1.79	
3,536.0	5.40	174.30	3,391.1	-900.7	204.9	923.7	1.28	-1.16	
3,631.0	3.60	162.10	3,485.8	-907.9	206.2	931.1	2.14	-1.89	
3,726.0	3.40	173.40	3,580.6	-913.6	207.5	936.8	0.75	-0.21	
3,821.0	2.20	193.50	3,675.5	-918.1	207.4	941.3	1.61	-1.26	
3,916.0	0.80	323.70	3,770.4	-919.4	206.5	942.3	2.93	-1.47	
4,011.0	1.10	313.20	3,865.4	-918.2	205.5	940.9	0.36	0.32	
4,105.0	0.50	253.20	3,959.4	-917.7	204.4	940.2	1.01	-0.64	
4,200.0	0.70	283.20	4,054.4	-917.7	203.5	940.0	0.39	0.21	
4,295.0	0.90	221.20	4,149.4	-918.1	202.4	940.2	0.89	0.21	
4,390.0	0.70	130.80	4,244.4	-919.1	202.4	941.1	1.20	-0.21	
4,485.0	1.30	169.10	4,339.4	-920.5	203.0	942.6	0.91	0.63	
4,579.0	0.20	152.80	4,433.4	-921.7	203.3	943.9	1.18	-1.17	
4,679.0	1.80	74.10	4,533.4	-921.4	204.9	943.9	1.77	1.60	
4,769.0	1.90	93.40	4,623.3	-921.1	207.7	944.3	0.70	0.11	
4,864.0	1.60	112.70	4,718.3	-921.7	210.5	945.5	0.69	-0.32	
4,959.0	1.80	162.00	4,813.2	-923.7	212.2	947.7	1.50	0.21	
5,054.0	1.80	162.70	4,908.2	-926.5	213.1	950.7	0.02	0.00	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Twin Creek 12-2A1 (O1EB Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 6084.0ft (Nabors M15)
Site:	SWSE S1-T7S-R92W (O1EB Pad)	MD Reference:	KBE @ 6084.0ft (Nabors M15)
Well:	Twin Creek 12-2A1 (O1EB Pad)	North Reference:	True
Wellbore:	Final	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	EDM 5000.1 US 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
5,148.0	2.30	177.80	5,002.1	-929.8	213.6	954.0	0.78	0.53	
5,244.0	1.20	177.80	5,098.1	-932.7	213.7	956.9	1.15	-1.15	
5,338.0	1.90	184.20	5,192.1	-935.3	213.7	959.4	0.77	0.74	
5,433.0	3.10	170.70	5,287.0	-939.4	214.0	963.4	1.40	1.26	
5,528.0	2.30	183.80	5,381.9	-943.8	214.2	967.8	1.06	-0.84	
5,623.0	3.30	181.60	5,476.7	-948.5	214.0	972.3	1.06	1.05	
5,719.0	4.00	182.40	5,572.5	-954.6	213.8	978.2	0.73	0.73	
5,769.0	4.00	182.40	5,622.4	-958.1	213.7	981.6	0.00	0.00	

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Twin Creek 12-2A1 (O1EB Pad)	0.00	0.00	3,734.0	-932.4	208.9	1,602,596.79	2,403,900.41	39.468870	-107.611720
- actual wellpath misses target center by 13.1ft at 3879.7ft MD (3734.2 TVD, -919.5 N, 206.8 E)									
- Point									
Twin Creek 12-2A1 (O1EB Pad)	0.00	0.00	5,589.0	-932.4	208.9	1,602,596.79	2,403,900.41	39.468870	-107.611720
- actual wellpath misses target center by 28.0ft at 5719.0ft MD (5572.5 TVD, -954.6 N, 213.8 E)									
- Circle (radius 25.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
5,719.0	5,572.5	-954.6	213.8	Last Cathedral Survey @ 5,719' MD	
5,769.0	5,622.4	-958.1	213.7	Projection to Bit @ 5,769' MD	

Checked By: _____ Approved By: _____ Date: _____