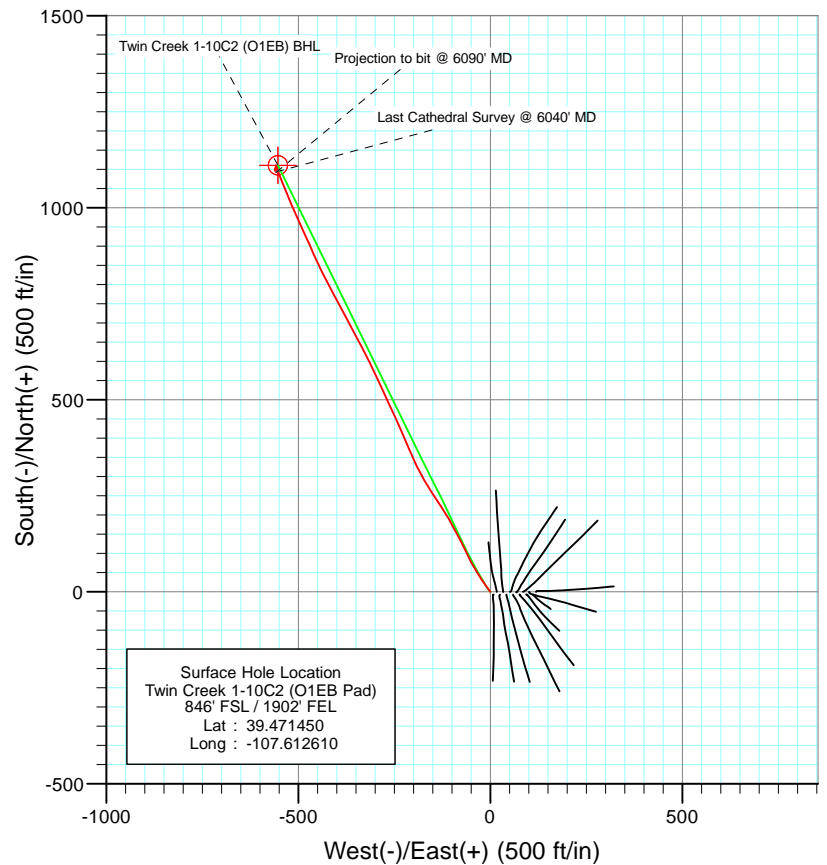
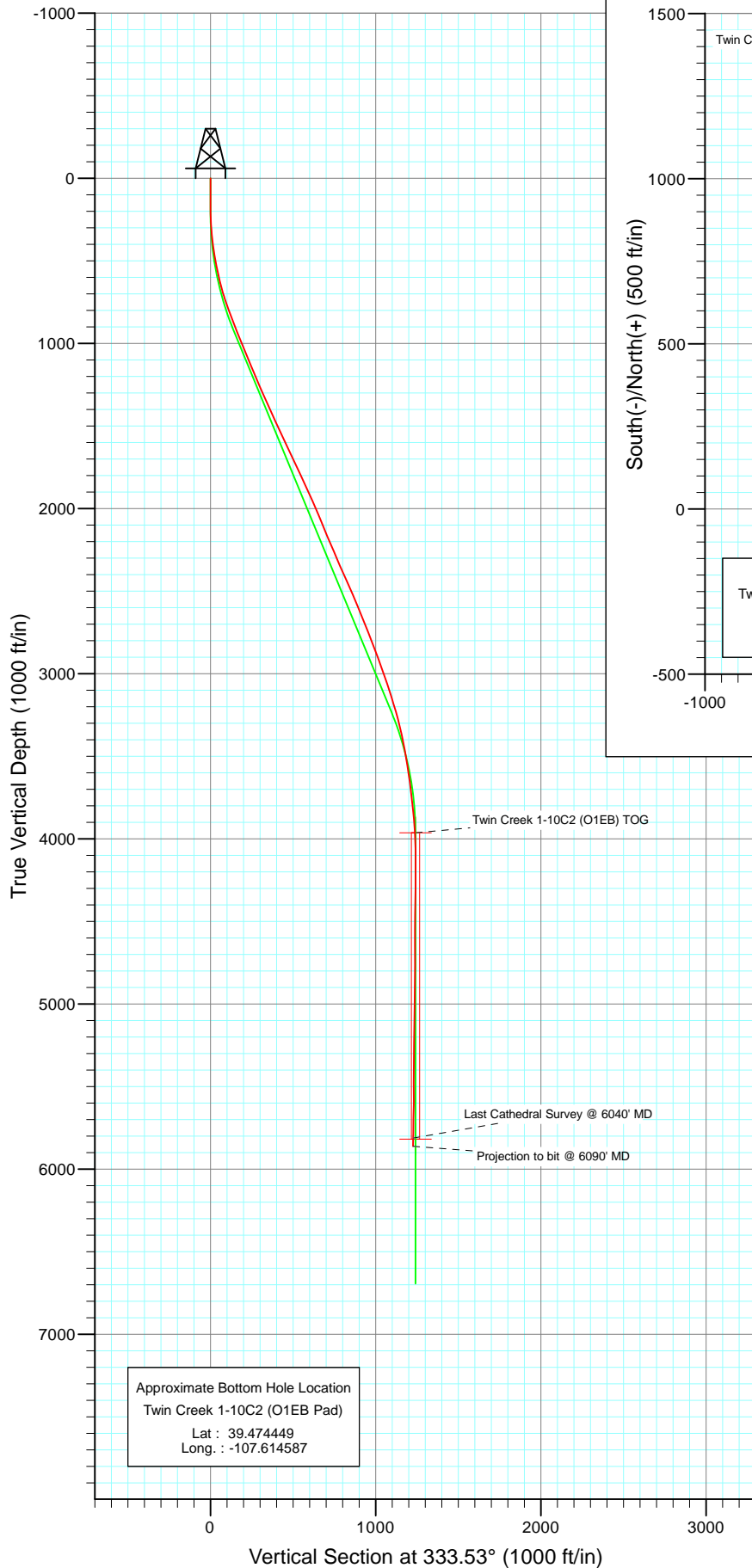




Project: Mamm Creek
 Site: SWSE S1-T7S-R92W (O1EB Pad)
 Well: Twin Creek 1-10C2 (O1EB Pad)
 Wellbore: Final
 Design: Plan #1



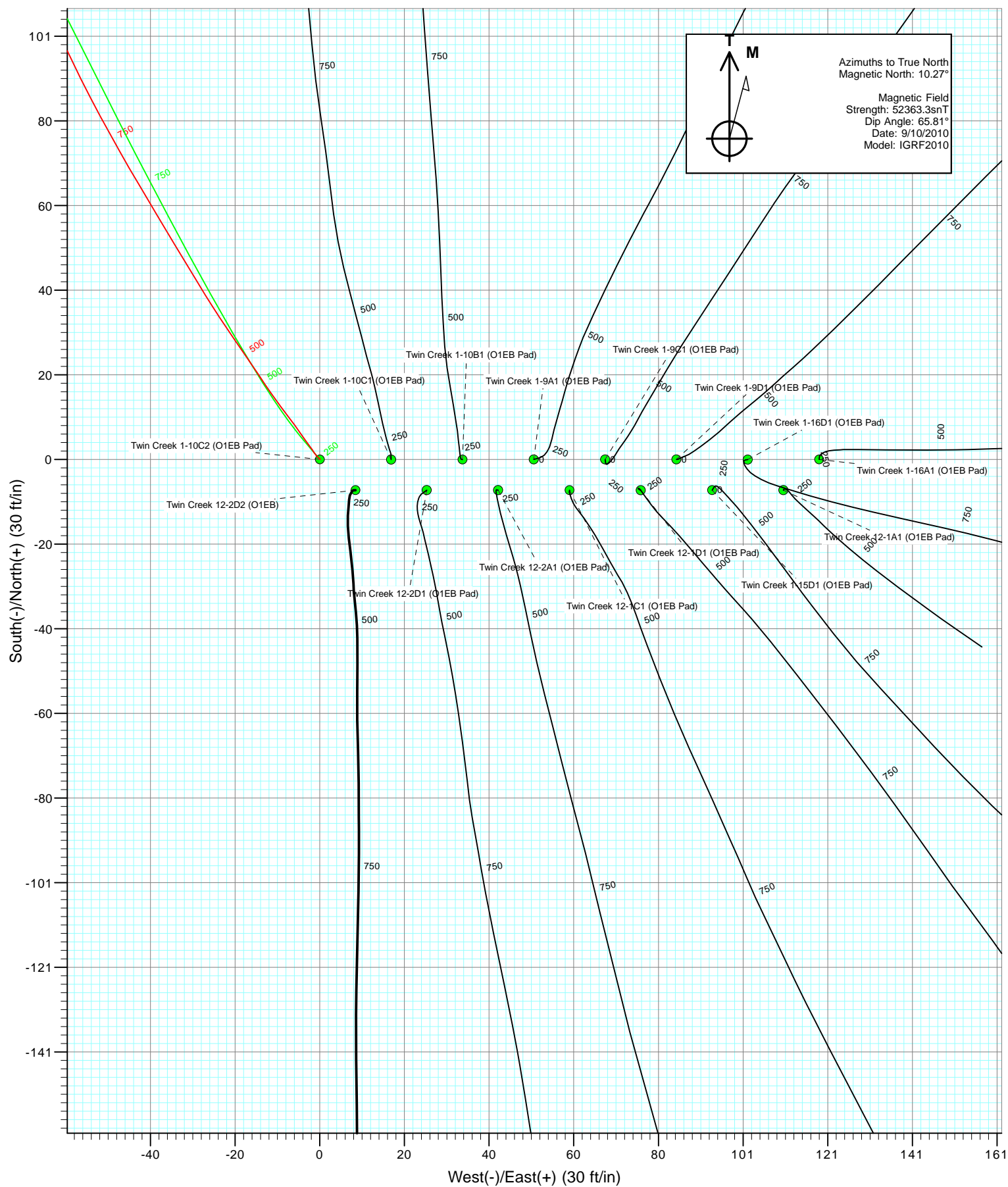
Azimuths to True North
 Magnetic North: 10.27°

Magnetic Field
 Strength: 52363.3snT
 Dip Angle: 65.81°
 Date: 9/10/2010
 Model: IGRF2010

DESIGN DETAILS: DD

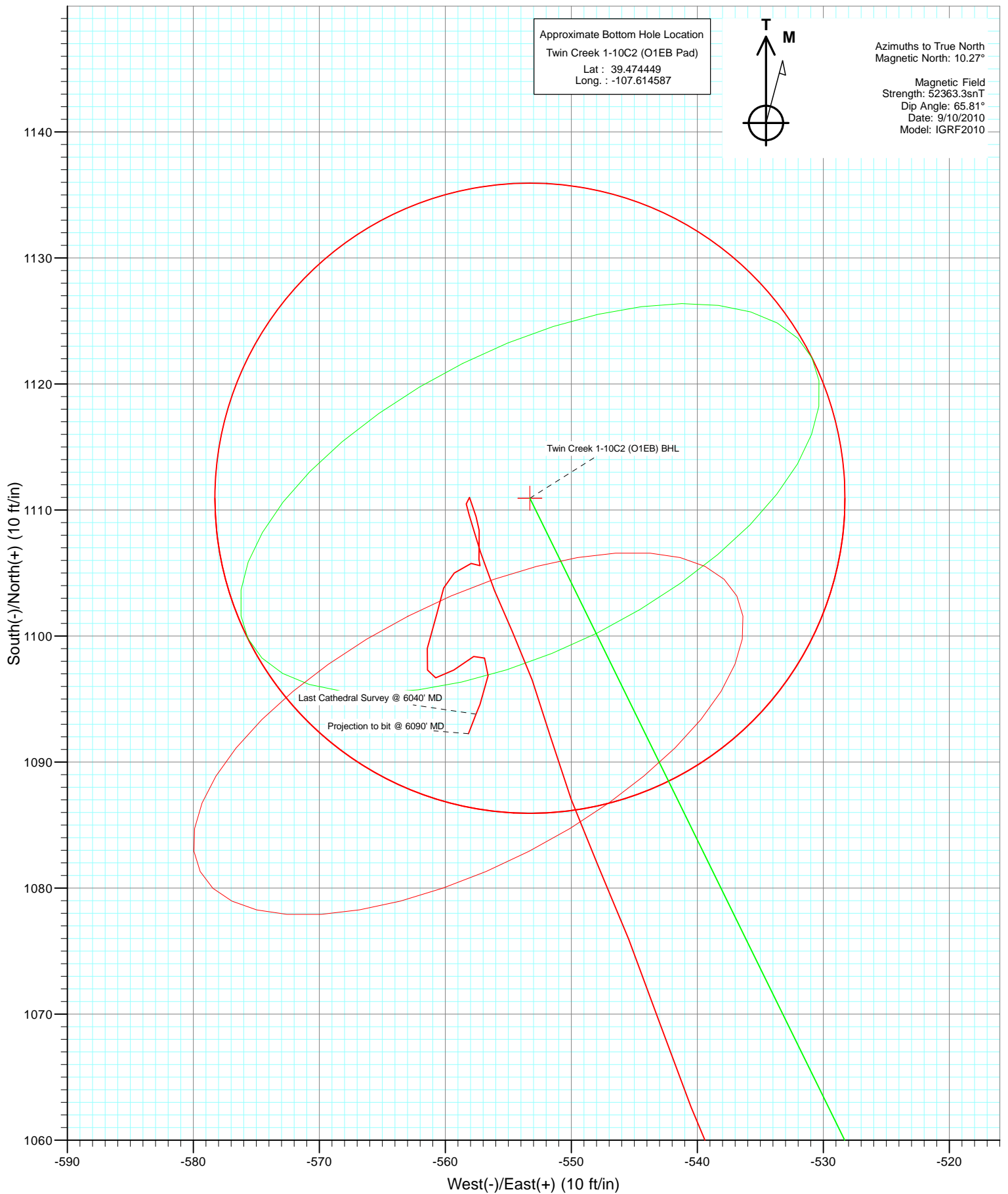
105390: KR
 KBE @ 6084.0ft (Original Well Elev)

Target	Azimuth	Origin	N/S	E/W	From TVD
Twin Creek 1-10C2 (O1EB) BHL	333.53	Slot	0.0	0.0	0.0





Project: Mamm Creek
Site: SWSE S1-T7S-R92W (O1EB Pad)
Well: Twin Creek 1-10C2 (O1EB Pad)
Wellbore: Final
Design: DD



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Twin Creek 1-10C2 (O1EB Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 6084.0ft (Original Well Elev)
Site:	SWSE S1-T7S-R92W (O1EB Pad)	MD Reference:	KBE @ 6084.0ft (Original Well Elev)
Well:	Twin Creek 1-10C2 (O1EB Pad)	North Reference:	True
Wellbore:	DD	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 1-10C2 (O1EB Pad)			
Well Position	+N/-S	0.0 ft	Northing:	1,603,542.10 ft
	+E/-W	0.0 ft	Easting:	2,403,671.08 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level: 6,062.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/10/2010	10.27	65.81	52,363

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	333.53

Survey Program	Date	9/19/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
124.0	6,090.0	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	
124.0	0.10	58.50	124.0	0.1	0.1	0.0	0.08	0.08	
154.0	0.60	304.70	154.0	0.2	0.0	0.1	2.16	1.67	
185.0	0.90	314.50	185.0	0.4	-0.3	0.5	1.05	0.97	
216.0	1.50	313.50	216.0	0.9	-0.8	1.1	1.94	1.94	
247.0	2.30	329.90	247.0	1.7	-1.4	2.1	3.10	2.58	
277.0	3.60	322.60	276.9	3.0	-2.3	3.7	4.50	4.33	
308.0	4.30	325.30	307.9	4.7	-3.5	5.8	2.34	2.26	
339.0	5.30	324.50	338.7	6.8	-5.0	8.3	3.23	3.23	
370.0	6.60	322.90	369.6	9.4	-6.9	11.5	4.23	4.19	
401.0	7.40	323.40	400.4	12.4	-9.2	15.2	2.59	2.58	
431.0	8.40	324.90	430.1	15.8	-11.6	19.3	3.40	3.33	
462.0	9.80	326.70	460.7	19.8	-14.3	24.1	4.61	4.52	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Twin Creek 1-10C2 (O1EB Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 6084.0ft (Original Well Elev)
Site:	SWSE S1-T7S-R92W (O1EB Pad)	MD Reference:	KBE @ 6084.0ft (Original Well Elev)
Well:	Twin Creek 1-10C2 (O1EB Pad)	North Reference:	True
Wellbore:	DD	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	10.30	325.00	490.2	24.2	-17.3	29.3	1.94	1.67	
523.0	10.70	325.70	520.7	28.8	-20.5	34.9	1.35	1.29	
554.0	11.30	326.40	551.1	33.7	-23.8	40.8	1.98	1.94	
585.0	12.20	328.70	581.5	39.0	-27.2	47.1	3.27	2.90	
615.0	13.50	328.80	610.7	44.7	-30.6	53.7	4.33	4.33	
646.0	14.30	328.70	640.8	51.1	-34.5	61.1	2.58	2.58	
677.0	15.60	329.40	670.8	58.0	-38.6	69.1	4.23	4.19	
708.0	16.80	329.10	700.5	65.4	-43.0	77.7	3.88	3.87	
738.0	18.00	330.60	729.2	73.2	-47.5	86.7	4.27	4.00	
768.0	18.50	331.60	757.7	81.4	-52.1	96.1	1.97	1.67	
799.0	19.80	333.40	786.9	90.4	-56.8	106.2	4.61	4.19	
830.0	20.60	334.50	816.0	100.0	-61.5	116.9	2.86	2.58	
861.0	21.60	335.20	845.0	110.1	-66.2	128.1	3.33	3.23	
953.0	21.50	332.50	930.5	140.4	-81.1	161.9	1.08	-0.11	
1,046.0	22.30	330.90	1,016.8	171.0	-97.6	196.5	1.07	0.86	
1,120.0	22.80	328.90	1,085.2	195.5	-111.8	224.9	1.24	0.68	
1,265.0	22.70	325.90	1,218.9	242.8	-142.0	280.6	0.80	-0.07	
1,360.0	24.30	328.70	1,306.0	274.6	-162.4	318.2	2.05	1.68	
1,455.0	24.50	331.60	1,392.5	308.7	-181.9	357.4	1.28	0.21	
1,550.0	24.50	335.60	1,479.0	343.9	-199.5	396.8	1.75	0.00	
1,645.0	24.80	337.50	1,565.3	380.3	-215.2	436.3	0.89	0.32	
1,740.0	25.60	336.10	1,651.3	417.5	-231.2	476.7	1.05	0.84	
1,834.0	25.80	335.50	1,736.0	454.6	-247.9	517.5	0.35	0.21	
1,929.0	24.10	335.40	1,822.1	491.1	-264.5	557.5	1.79	-1.79	
2,024.0	24.80	335.00	1,908.6	526.8	-281.0	596.8	0.76	0.74	
2,119.0	23.50	335.30	1,995.3	562.0	-297.3	635.7	1.37	-1.37	
2,214.0	22.20	333.20	2,082.8	595.3	-313.4	672.5	1.62	-1.37	
2,404.0	23.30	332.10	2,258.0	660.5	-347.1	746.0	0.62	0.58	
2,499.0	23.70	332.30	2,345.1	694.0	-364.8	783.9	0.43	0.42	
2,594.0	24.00	331.20	2,432.0	727.9	-383.0	822.3	0.56	0.32	
2,689.0	23.30	332.70	2,519.1	761.5	-400.9	860.4	0.97	-0.74	
2,784.0	22.80	331.10	2,606.5	794.3	-418.4	897.5	0.84	-0.53	
2,878.0	21.10	333.50	2,693.7	825.4	-434.8	932.7	2.04	-1.81	
2,974.0	21.10	335.90	2,783.2	856.6	-449.5	967.2	0.90	0.00	
3,068.0	21.20	336.30	2,870.9	887.6	-463.3	1,001.1	0.19	0.11	
3,163.0	20.10	334.90	2,959.8	918.2	-477.1	1,034.6	1.27	-1.16	
3,259.0	18.50	335.60	3,050.4	947.0	-490.4	1,066.3	1.68	-1.67	
3,354.0	17.70	336.00	3,140.7	973.9	-502.5	1,095.8	0.85	-0.84	
3,449.0	15.80	335.70	3,231.7	998.9	-513.7	1,123.1	2.00	-2.00	
3,544.0	13.80	337.80	3,323.5	1,021.2	-523.3	1,147.3	2.18	-2.11	
3,639.0	10.90	337.80	3,416.3	1,040.0	-531.0	1,167.6	3.05	-3.05	
3,734.0	9.60	336.40	3,509.8	1,055.5	-537.5	1,184.5	1.39	-1.37	
3,829.0	8.50	340.70	3,603.6	1,069.4	-543.0	1,199.4	1.36	-1.16	
3,927.0	7.10	336.10	3,700.7	1,081.8	-547.9	1,212.6	1.56	-1.43	
4,022.0	6.10	343.90	3,795.1	1,092.0	-551.7	1,223.4	1.41	-1.05	
4,117.0	4.60	335.00	3,889.6	1,100.3	-554.7	1,232.2	1.80	-1.58	
4,212.0	3.60	342.20	3,984.4	1,106.6	-557.2	1,239.0	1.18	-1.05	
4,307.0	1.30	346.90	4,079.3	1,110.5	-558.3	1,243.0	2.43	-2.42	
4,402.0	0.90	137.30	4,174.3	1,111.0	-558.1	1,243.3	2.24	-0.42	
4,495.0	1.20	179.20	4,267.3	1,109.5	-557.6	1,241.7	0.86	0.32	
4,591.0	0.30	110.10	4,363.3	1,108.4	-557.3	1,240.6	1.18	-0.94	
4,685.0	0.90	197.60	4,457.3	1,107.6	-557.3	1,239.9	1.00	0.64	
4,780.0	1.00	165.10	4,552.3	1,106.1	-557.3	1,238.6	0.57	0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Twin Creek 1-10C2 (O1EB Pad)
Project:	Mamm Creek	TVD Reference:	KBE @ 6084.0ft (Original Well Elev)
Site:	SWSE S1-T7S-R92W (O1EB Pad)	MD Reference:	KBE @ 6084.0ft (Original Well Elev)
Well:	Twin Creek 1-10C2 (O1EB Pad)	North Reference:	True
Wellbore:	DD	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
4,875.0	0.40	336.00	4,647.2	1,105.6	-557.2	1,238.1	1.47	-0.63	
4,970.0	0.70	256.00	4,742.2	1,105.8	-557.9	1,238.5	0.78	0.32	
5,065.0	1.20	231.80	4,837.2	1,105.0	-559.3	1,238.5	0.66	0.53	
5,160.0	0.70	185.50	4,932.2	1,103.8	-560.1	1,237.8	0.92	-0.53	
5,255.0	1.90	198.40	5,027.2	1,101.7	-560.7	1,236.2	1.29	1.26	
5,350.0	1.50	191.50	5,122.2	1,099.0	-561.4	1,234.1	0.47	-0.42	
5,444.0	0.70	153.70	5,216.1	1,097.3	-561.4	1,232.5	1.11	-0.85	
5,538.0	0.50	104.30	5,310.1	1,096.7	-560.8	1,231.7	0.57	-0.21	
5,634.0	1.50	55.10	5,406.1	1,097.3	-559.3	1,231.6	1.28	1.04	
5,729.0	0.80	56.90	5,501.1	1,098.4	-557.7	1,231.8	0.74	-0.74	
5,824.0	0.70	147.60	5,596.1	1,098.3	-556.9	1,231.3	1.13	-0.11	
5,919.0	1.10	182.00	5,691.1	1,096.9	-556.6	1,230.0	0.69	0.42	
6,014.0	1.80	204.20	5,786.1	1,094.6	-557.2	1,228.2	0.93	0.74	
6,040.0	1.90	200.90	5,812.0	1,093.8	-557.6	1,227.7	0.56	0.38	
6,090.0	1.90	200.90	5,862.0	1,092.3	-558.2	1,226.5	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 1-10C2 (O1E	0.00	0.00	3,964.0	1,110.9	-553.3	1,604,665.61	2,403,143.78	39.474500	-107.614570
- actual wellpath misses target center by 6.6ft at 4191.8ft MD (3964.3 TVD, 1105.4 N, -556.8 E)									
- Point									
Twin Creek 1-10C2 (O1E	0.00	0.00	5,819.0	1,110.9	-553.3	1,604,665.61	2,403,143.78	39.474500	-107.614570
- actual wellpath misses target center by 19.0ft at 6040.0ft MD (5812.0 TVD, 1093.8 N, -557.6 E)									
- Circle (radius 25.0)									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
6,040.0	5,812.0	1,093.8	-557.6	Last Cathedral Survey @ 6040' MD
6,090.0	5,862.0	1,092.3	-558.2	Projection to bit @ 6090' MD

Checked By: _____ Approved By: _____ Date: _____