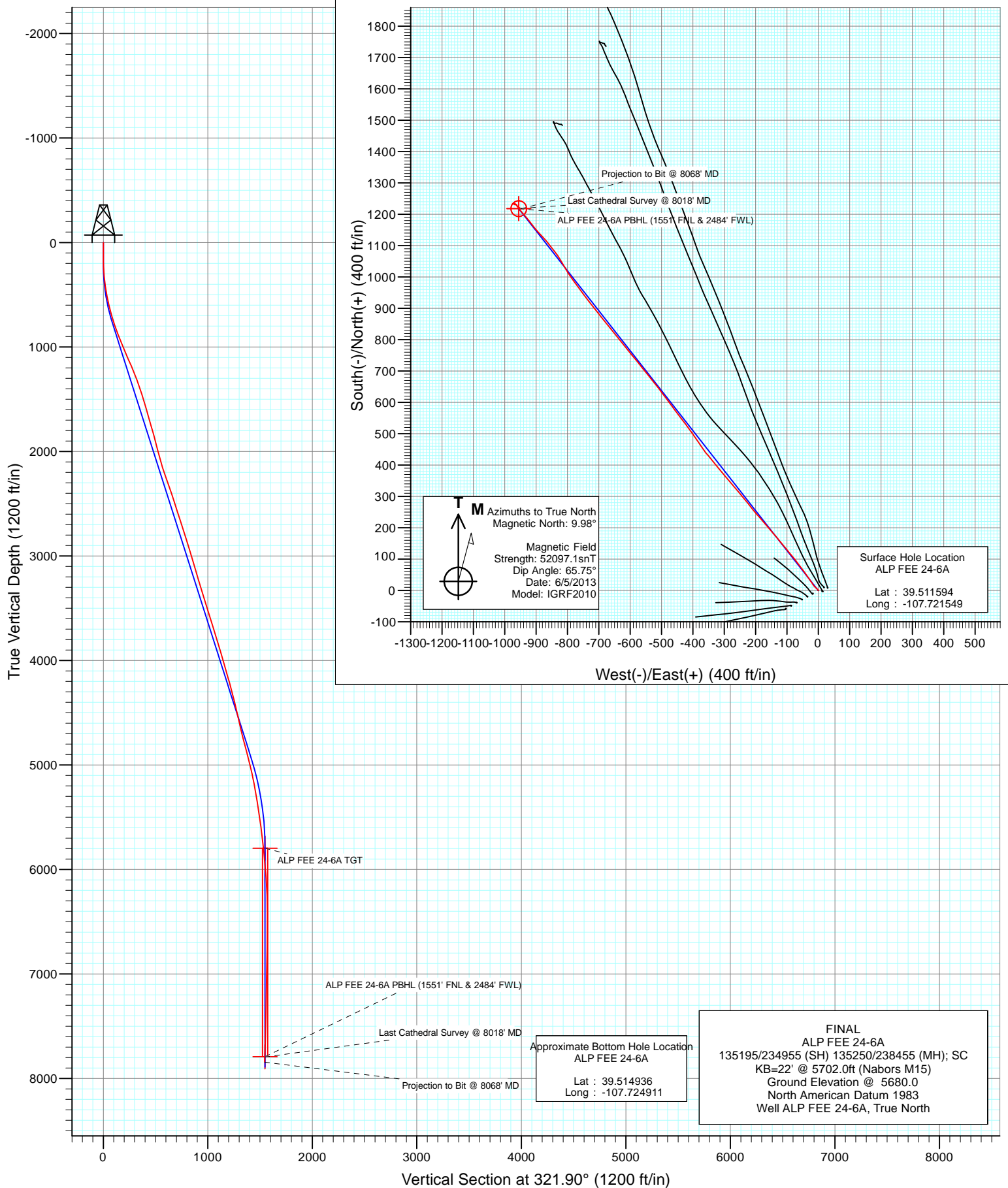
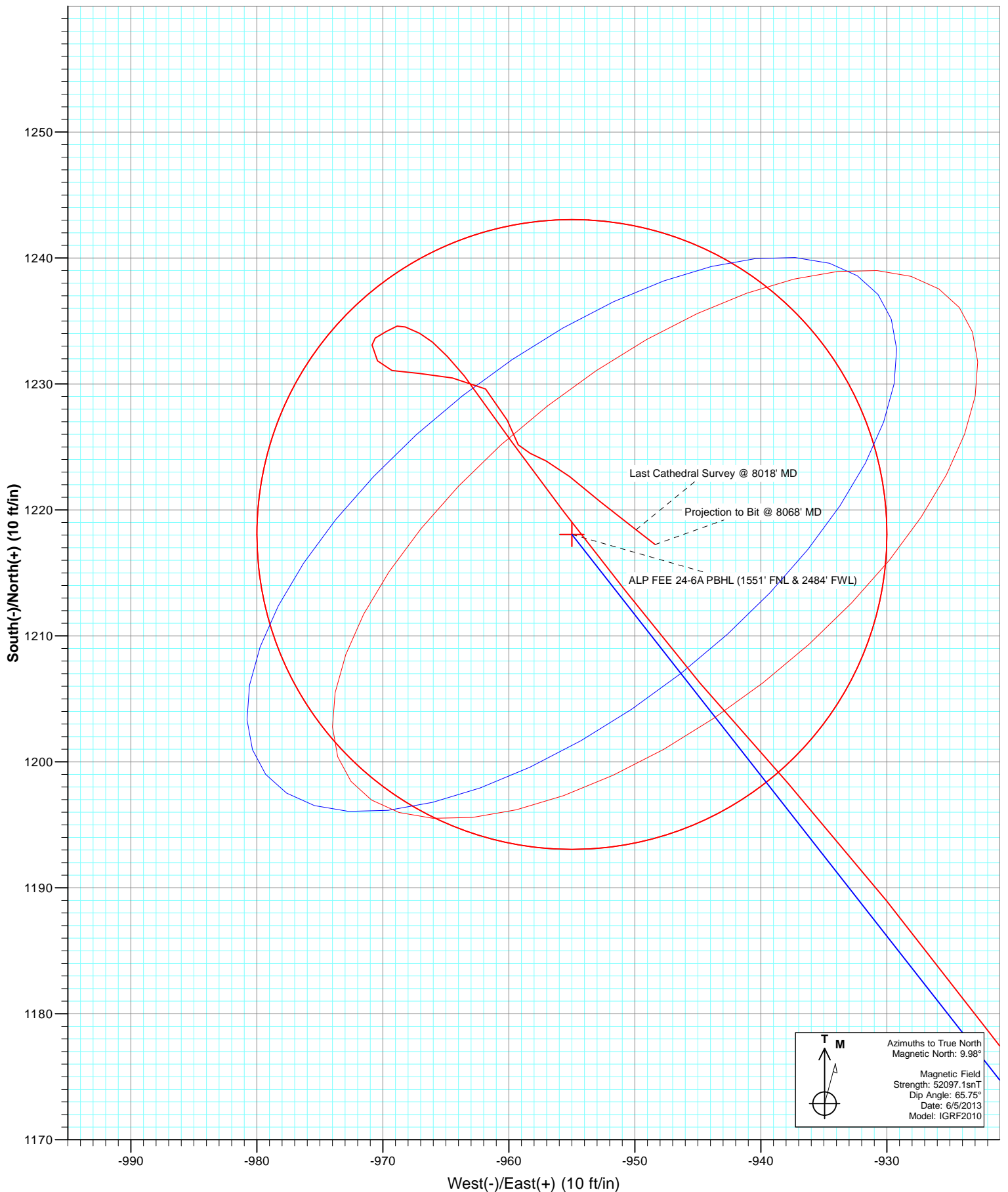
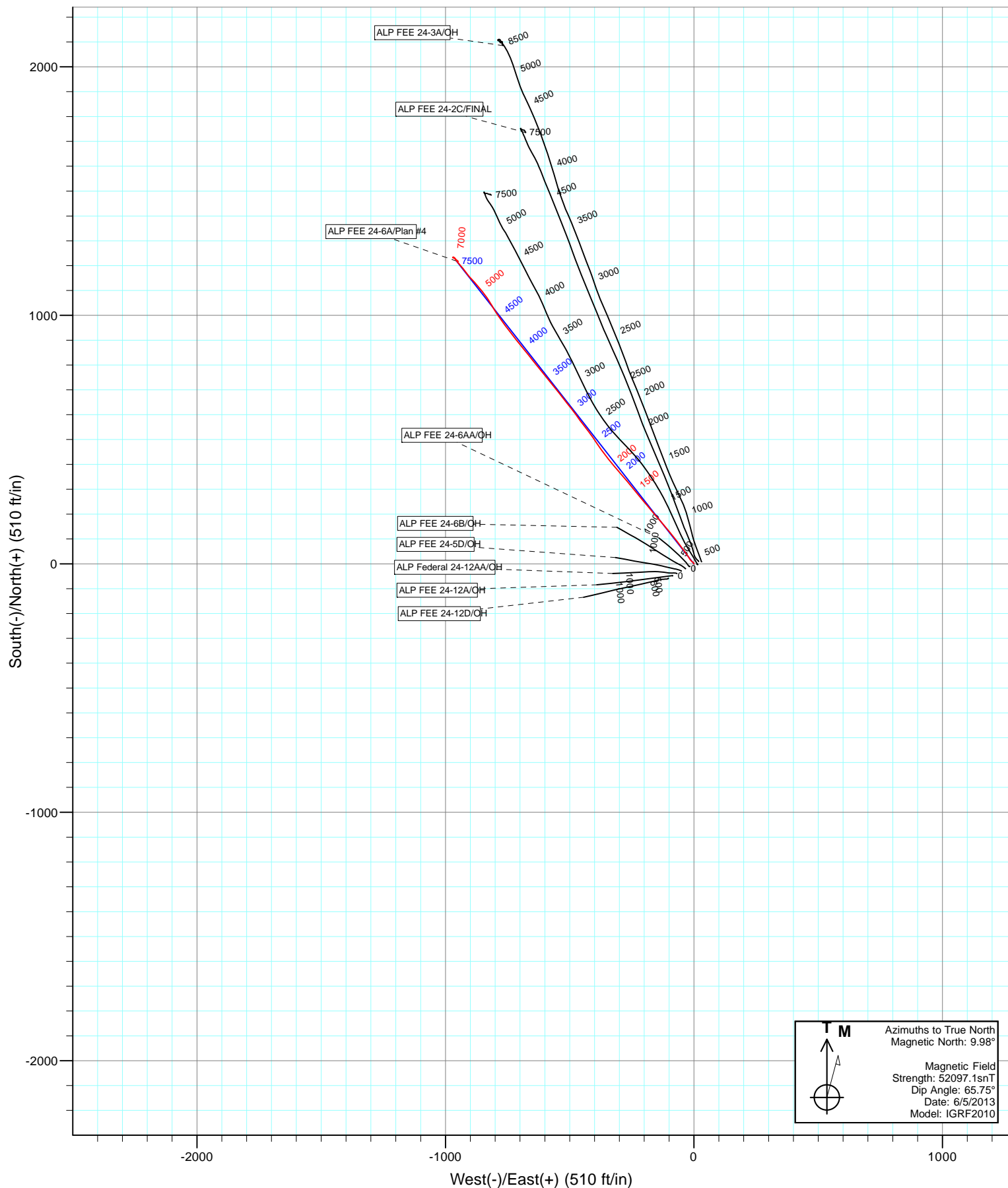




Project: Mamm Creek
Site: J24NW Pad
Well: ALP FEE 24-6A
Wellbore: OH
Design: FINAL







Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well ALP FEE 24-6A
Project:	Mamm Creek	TVD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Site:	J24NW Pad	MD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Well:	ALP FEE 24-6A	North Reference:	True
Wellbore:	OH	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		J24NW Pad			
Site Position:		Northing:	1,618,899.86 ft	Latitude:	39.511614
From:	Lat/Long	Easting:	2,373,314.58 ft	Longitude:	-107.721441
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.40 °

Well	ALP FEE 24-6A					
Well Position	+N/-S	0.0 ft	Northing:	1,618,893.31 ft	Latitude:	39.511594
	+E/-W	0.0 ft	Easting:	2,373,283.94 ft	Longitude:	-107.721549
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,680.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/5/2013	9.98	65.75	52,097

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	321.90	

Survey Program	Date	6/14/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
121.0	8,068.0	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		
121.0	0.20	341.10	121.0	0.2	-0.1	0.2	0.17	0.17		
151.0	0.40	351.00	151.0	0.4	-0.1	0.3	0.69	0.67		
182.0	1.10	340.80	182.0	0.7	-0.2	0.7	2.29	2.26		
213.0	1.80	334.00	213.0	1.5	-0.5	1.5	2.32	2.26		
244.0	2.90	328.90	244.0	2.6	-1.1	2.7	3.61	3.55		
274.0	3.70	311.00	273.9	3.9	-2.3	4.4	4.32	2.67		
305.0	4.70	310.50	304.8	5.3	-4.0	6.7	3.23	3.23		
335.0	5.80	309.90	334.7	7.1	-6.1	9.3	3.67	3.67		
365.0	6.90	312.20	364.5	9.3	-8.6	12.6	3.76	3.67		
396.0	7.70	316.20	395.3	12.0	-11.4	16.5	3.06	2.58		
426.0	8.50	321.60	425.0	15.2	-14.2	20.7	3.68	2.67		
457.0	9.40	328.00	455.6	19.2	-16.9	25.5	4.33	2.90		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well ALP FEE 24-6A
Project:	Mamm Creek	TVD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Site:	J24NW Pad	MD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Well:	ALP FEE 24-6A	North Reference:	True
Wellbore:	OH	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
488.0	10.30	327.50	486.1	23.7	-19.8	30.8	2.92	2.90	
518.0	11.40	326.10	515.6	28.4	-22.9	36.4	3.77	3.67	
549.0	11.50	324.10	546.0	33.4	-26.4	42.6	1.32	0.32	
579.0	11.90	324.40	575.4	38.4	-29.9	48.7	1.35	1.33	
671.0	15.20	324.40	664.8	55.9	-42.5	70.2	3.59	3.59	
764.0	18.00	323.50	753.9	77.4	-58.1	96.7	3.02	3.01	
855.0	20.10	321.40	839.9	100.9	-76.2	126.4	2.43	2.31	
948.0	21.80	321.00	926.8	126.8	-97.1	159.7	1.83	1.83	
1,009.0	22.40	319.80	983.3	144.5	-111.7	182.6	1.23	0.98	
1,155.0	23.90	319.40	1,117.5	188.2	-148.9	240.0	1.03	1.03	
1,249.0	22.80	320.30	1,203.8	216.6	-172.9	277.2	1.23	-1.17	
1,345.0	20.60	318.30	1,293.0	243.6	-196.1	312.7	2.42	-2.29	
1,441.0	19.20	321.20	1,383.3	268.5	-217.2	345.3	1.78	-1.46	
1,536.0	17.80	321.90	1,473.4	292.1	-235.9	375.4	1.49	-1.47	
1,631.0	15.80	319.40	1,564.3	313.3	-253.3	402.9	2.24	-2.11	
1,727.0	16.20	320.10	1,656.6	333.5	-270.4	429.3	0.46	0.42	
1,822.0	16.00	319.90	1,747.9	353.7	-287.4	455.7	0.22	-0.21	
1,918.0	15.00	318.80	1,840.4	373.2	-304.1	481.3	1.09	-1.04	
2,013.0	15.00	320.60	1,932.1	391.9	-320.0	505.9	0.49	0.00	
2,109.0	14.80	322.30	2,024.9	411.2	-335.3	530.5	0.50	-0.21	
2,203.0	15.90	318.70	2,115.6	430.4	-351.2	555.4	1.55	1.17	
2,298.0	19.40	325.70	2,206.1	453.2	-368.7	584.1	4.30	3.68	
2,394.0	19.70	325.90	2,296.5	479.8	-386.7	616.2	0.32	0.31	
2,489.0	18.80	324.80	2,386.2	505.6	-404.5	647.5	1.02	-0.95	
2,584.0	18.00	323.10	2,476.4	529.8	-422.2	677.4	1.01	-0.84	
2,680.0	17.60	321.90	2,567.8	553.1	-440.0	706.8	0.57	-0.42	
2,775.0	18.10	323.80	2,658.2	576.3	-457.6	735.9	0.81	0.53	
2,871.0	17.80	323.00	2,749.5	600.1	-475.2	765.5	0.40	-0.31	
2,967.0	16.90	322.70	2,841.2	622.9	-492.5	794.1	0.94	-0.94	
3,063.0	17.10	322.70	2,933.0	645.2	-509.5	822.1	0.21	0.21	
3,158.0	16.60	320.90	3,023.9	666.8	-526.6	849.7	0.76	-0.53	
3,253.0	16.60	321.60	3,114.9	688.0	-543.6	876.8	0.21	0.00	
3,348.0	16.70	321.60	3,205.9	709.3	-560.5	904.0	0.11	0.11	
3,443.0	16.40	321.40	3,297.0	730.5	-577.3	931.1	0.32	-0.32	
3,538.0	16.80	320.30	3,388.1	751.6	-594.4	958.2	0.54	0.42	
3,634.0	17.80	321.40	3,479.7	773.7	-612.5	986.8	1.10	1.04	
3,728.0	18.00	321.10	3,569.2	796.2	-630.5	1,015.7	0.23	0.21	
3,824.0	17.60	321.20	3,660.6	819.1	-649.0	1,045.0	0.42	-0.42	
3,919.0	15.70	321.10	3,751.6	840.3	-666.0	1,072.2	2.00	-2.00	
4,015.0	17.20	321.50	3,843.6	861.5	-683.0	1,099.4	1.57	1.56	
4,110.0	16.10	320.10	3,934.7	882.6	-700.2	1,126.6	1.23	-1.16	
4,206.0	16.50	322.40	4,026.8	903.6	-717.1	1,153.5	0.79	0.42	
4,302.0	16.40	322.50	4,118.9	925.2	-733.6	1,180.7	0.11	-0.10	
4,397.0	15.10	322.90	4,210.3	945.7	-749.3	1,206.5	1.37	-1.37	
4,492.0	14.70	323.30	4,302.1	965.2	-763.9	1,230.9	0.43	-0.42	
4,587.0	14.20	324.20	4,394.1	984.3	-778.0	1,254.6	0.58	-0.53	
4,683.0	13.30	325.50	4,487.4	1,003.0	-791.1	1,277.4	0.99	-0.94	
4,778.0	12.30	329.70	4,580.0	1,020.7	-802.4	1,298.4	1.44	-1.05	
4,872.0	13.10	329.60	4,671.7	1,038.6	-812.8	1,318.8	0.85	0.85	
4,967.0	15.50	328.30	4,763.7	1,058.7	-825.0	1,342.1	2.55	2.53	
5,063.0	14.80	321.80	4,856.4	1,079.2	-839.3	1,367.1	1.91	-0.73	
5,158.0	13.90	323.00	4,948.4	1,097.9	-853.6	1,390.7	1.00	-0.95	
5,253.0	13.10	319.10	5,040.8	1,115.1	-867.6	1,412.8	1.28	-0.84	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well ALP FEE 24-6A
Project:	Mamm Creek	TVD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Site:	J24NW Pad	MD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Well:	ALP FEE 24-6A	North Reference:	True
Wellbore:	OH	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
5,349.0	11.50	317.30	5,134.6	1,130.4	-881.2	1,433.2	1.71	-1.67	
5,444.0	10.30	317.50	5,227.9	1,143.6	-893.3	1,451.1	1.26	-1.26	
5,540.0	9.80	321.10	5,322.4	1,156.3	-904.3	1,467.9	0.84	-0.52	
5,635.0	8.00	321.20	5,416.3	1,167.7	-913.5	1,482.6	1.89	-1.89	
5,730.0	8.50	323.10	5,510.3	1,178.5	-921.8	1,496.2	0.60	0.53	
5,825.0	7.60	320.90	5,604.4	1,189.0	-930.0	1,509.5	1.00	-0.95	
5,920.0	7.10	319.10	5,698.6	1,198.3	-937.8	1,521.6	0.58	-0.53	
6,015.0	5.80	318.30	5,793.0	1,206.3	-944.9	1,532.3	1.37	-1.37	
6,111.0	5.30	324.10	5,888.5	1,213.5	-950.7	1,541.6	0.78	-0.52	
6,206.0	4.40	319.60	5,983.2	1,219.8	-955.6	1,549.6	1.03	-0.95	
6,302.0	3.80	327.70	6,078.9	1,225.3	-959.7	1,556.4	0.87	-0.62	
6,397.0	4.10	321.00	6,173.7	1,230.6	-963.5	1,563.0	0.58	0.32	
6,492.0	1.90	297.70	6,268.6	1,234.0	-967.1	1,567.8	2.60	-2.32	
6,588.0	0.50	247.70	6,364.6	1,234.6	-968.9	1,569.4	1.69	-1.46	
6,683.0	0.70	240.70	6,459.6	1,234.2	-969.8	1,569.6	0.22	0.21	
6,778.0	0.50	237.10	6,554.6	1,233.6	-970.6	1,569.7	0.21	-0.21	
6,874.0	0.40	162.50	6,650.5	1,233.1	-970.9	1,569.4	0.57	-0.10	
6,970.0	1.20	160.00	6,746.5	1,231.8	-970.4	1,568.2	0.83	0.83	
7,065.0	1.00	78.20	6,841.5	1,231.1	-969.3	1,566.8	1.52	-0.21	
7,160.0	1.70	106.50	6,936.5	1,230.8	-967.1	1,565.3	1.00	0.74	
7,256.0	1.50	88.10	7,032.5	1,230.5	-964.5	1,563.4	0.57	-0.21	
7,351.0	2.00	123.40	7,127.4	1,229.6	-961.8	1,561.1	1.22	0.53	
7,447.0	1.90	168.00	7,223.4	1,227.1	-960.1	1,558.1	1.54	-0.10	
7,543.0	0.80	127.00	7,319.3	1,225.2	-959.3	1,556.0	1.46	-1.15	
7,638.0	0.60	122.10	7,414.3	1,224.5	-958.3	1,554.9	0.22	-0.21	
7,733.0	1.10	112.60	7,509.3	1,223.9	-957.0	1,553.6	0.55	0.53	
7,829.0	1.60	130.70	7,605.3	1,222.7	-955.2	1,551.5	0.68	0.52	
7,925.0	2.20	128.70	7,701.2	1,220.6	-952.7	1,548.4	0.63	0.62	
8,018.0	2.20	127.50	7,794.2	1,218.4	-949.9	1,545.0	0.05	0.00	Last Cathedral Survey @ 8018' MD
8,068.0	2.20	127.50	7,844.1	1,217.3	-948.4	1,543.1	0.00	0.00	Projection to Bit @ 8068' MD

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well ALP FEE 24-6A
Project:	Mamm Creek	TVD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Site:	J24NW Pad	MD Reference:	KB=22' @ 5702.0ft (Nabors M15)
Well:	ALP FEE 24-6A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	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									
ALP FEE 24-6A TGT	0.00	0.00	5,796.0	1,218.1	-955.0	1,620,134.35	2,372,359.01	39.514938	-107.724934
- actual wellpath misses target center by 15.1ft at 6019.5ft MD (5797.5 TVD, 1206.6 N, -945.2 E)									
- Point									
ALP FEE 24-6A PBHL (1	0.00	0.00	7,792.0	1,218.1	-955.0	1,620,134.35	2,372,359.01	39.514938	-107.724934
- actual wellpath misses target center by 5.0ft at 8015.7ft MD (7791.9 TVD, 1218.5 N, -950.0 E)									
- Circle (radius 25.0)									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
		(ft)	(ft)	Comment	
8,018.0	7,794.2	1,218.4	-949.9	Last Cathedral Survey @ 8018' MD	
8,068.0	7,844.1	1,217.3	-948.4	Projection to Bit @ 8068' MD	

Checked By: _____ Approved By: _____ Date: _____