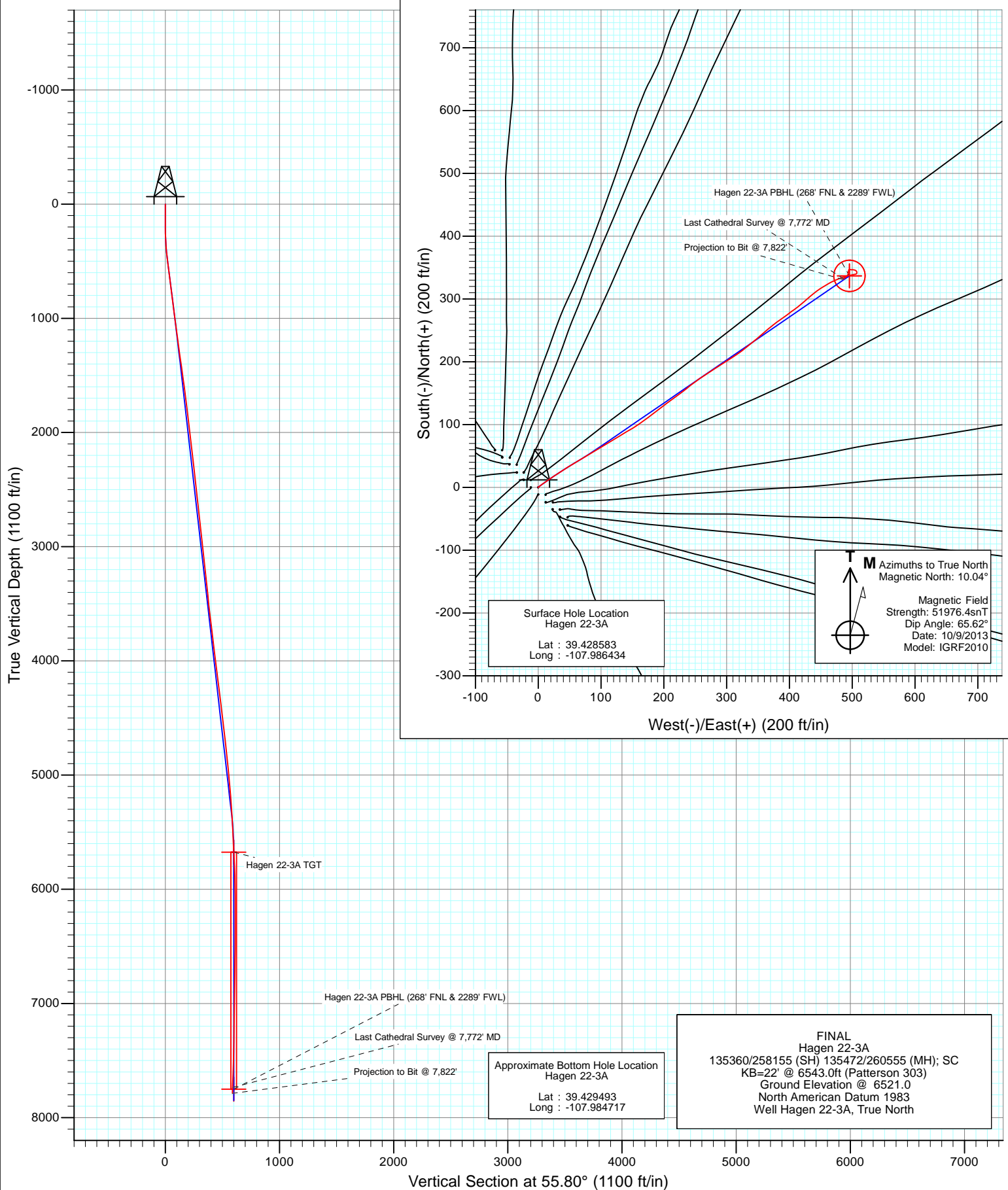


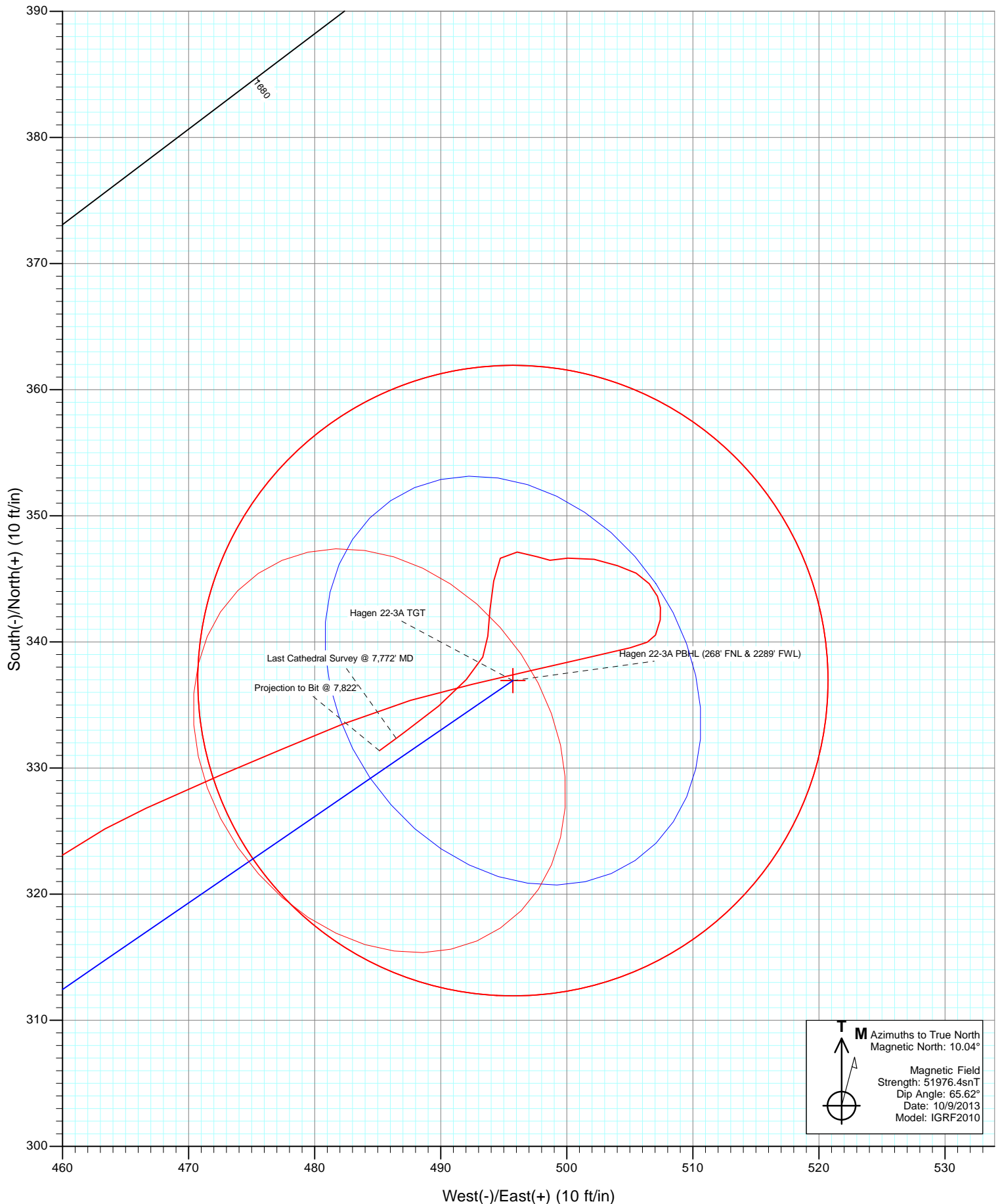


Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen 22-3A
Wellbore: OH
Design: FINAL



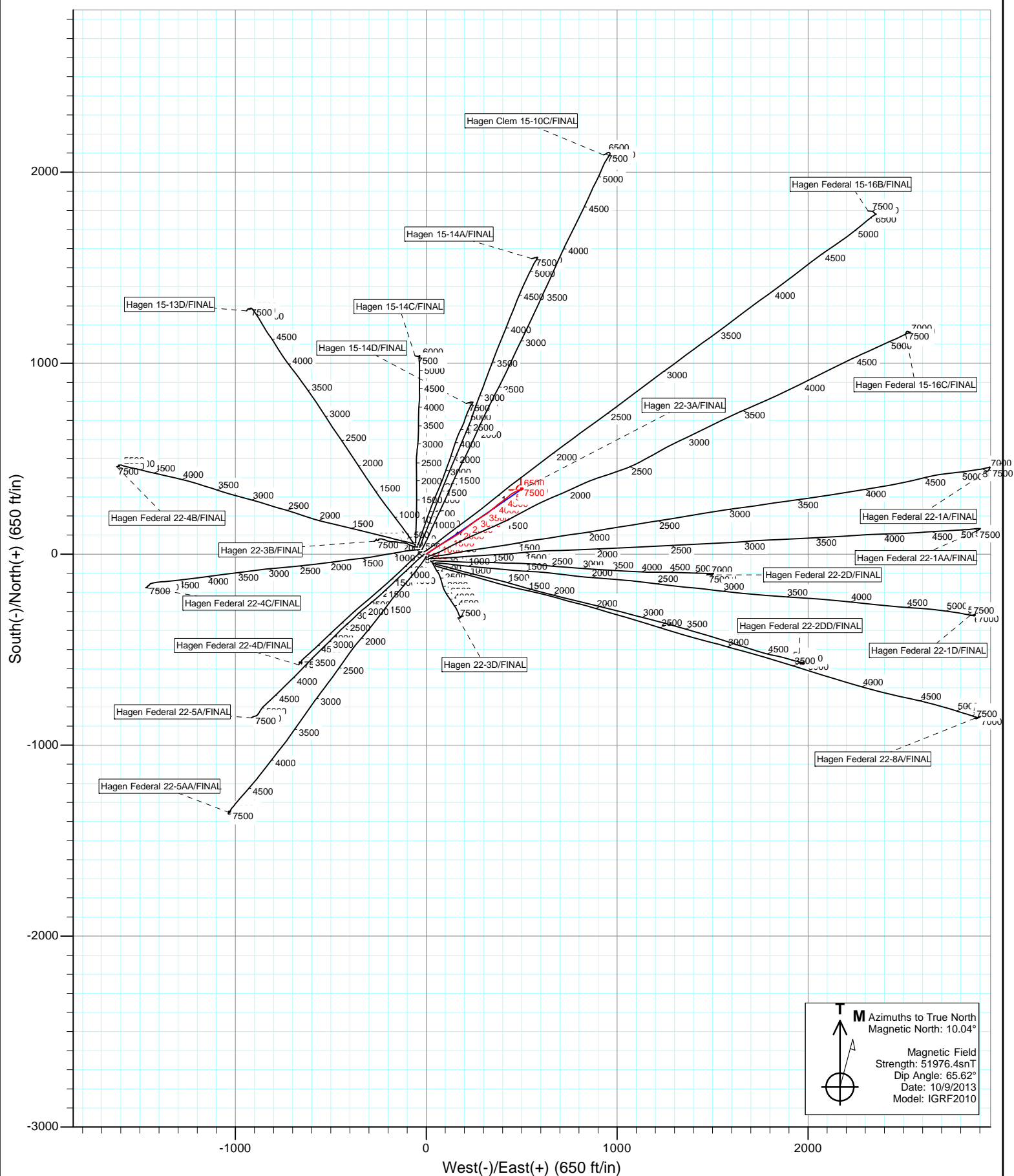


Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen 22-3A
Wellbore: OH
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Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen 22-3A
Wellbore: OH
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Hagen 22-3A
Project:	S. Piceance (Parachute)	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Well:	Hagen 22-3A	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	S. Piceance (Parachute), Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	PC-22 Pad NENW 2 7S 95W			
Site Position:		Northing:	1,590,596.09 ft	Latitude: 39.428560
From:	Lat/Long	Easting:	2,297,773.66 ft	Longitude: -107.986340
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: -1.57 °

Well	Hagen 22-3A			
Well Position	+N/-S	0.0 ft	Northing:	1,590,605.18 ft
	+E/-W	0.0 ft	Easting:	2,297,747.35 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level: 6,521.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/9/2013	10.04	65.62	51,976

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	55.80

Survey Program	Date	10/14/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
115.0	7,822.0	Survey #1 (OH)	Geolink 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	
115.0	0.30	318.50	115.0	0.2	-0.2	0.0	0.26	0.26	
145.0	0.40	49.90	145.0	0.4	-0.2	0.1	1.69	0.33	
176.0	0.10	95.90	176.0	0.4	-0.1	0.2	1.09	-0.97	
207.0	0.40	66.20	207.0	0.5	0.1	0.3	1.02	0.97	
237.0	0.90	58.80	237.0	0.6	0.4	0.6	1.69	1.67	
267.0	1.70	52.90	267.0	1.0	0.9	1.3	2.70	2.67	
298.0	2.30	49.90	298.0	1.7	1.8	2.4	1.96	1.94	
328.0	2.90	51.80	327.9	2.5	2.8	3.8	2.02	2.00	
359.0	3.80	56.60	358.9	3.6	4.3	5.6	3.04	2.90	
390.0	4.90	57.50	389.8	4.9	6.3	7.9	3.56	3.55	
420.0	5.40	53.50	419.7	6.4	8.5	10.6	2.05	1.67	
512.0	7.10	55.60	511.1	12.2	16.7	20.6	1.86	1.85	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Hagen 22-3A
Project:	S. Piceance (Parachute)	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Well:	Hagen 22-3A	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
603.0	7.90	56.60	601.3	18.8	26.5	32.5	0.89	0.88	
695.0	7.50	55.40	692.5	25.7	36.7	44.8	0.47	-0.43	
787.0	7.20	59.40	783.8	32.0	46.6	56.6	0.64	-0.33	
877.0	7.20	59.80	873.1	37.8	56.4	67.8	0.06	0.00	
969.0	7.10	56.50	964.3	43.8	66.1	79.3	0.46	-0.11	
1,005.0	7.00	58.80	1,000.1	46.2	69.8	83.7	0.83	-0.28	
1,155.0	7.70	60.30	1,148.8	55.9	86.4	102.8	0.48	0.47	
1,247.0	7.90	58.60	1,240.0	62.2	97.1	115.3	0.33	0.22	
1,339.0	8.00	58.90	1,331.1	68.8	108.0	128.0	0.12	0.11	
1,431.0	8.10	58.60	1,422.2	75.5	119.0	140.9	0.12	0.11	
1,522.0	8.00	58.40	1,512.3	82.2	129.9	153.6	0.11	-0.11	
1,613.0	7.70	60.00	1,602.4	88.5	140.6	166.0	0.41	-0.33	
1,705.0	7.20	59.40	1,693.7	94.5	150.9	177.9	0.55	-0.54	
1,797.0	6.60	55.40	1,785.0	100.5	160.2	189.0	0.84	-0.65	
1,889.0	6.90	53.30	1,876.4	106.8	169.0	199.8	0.42	0.33	
1,981.0	6.90	52.40	1,967.7	113.5	177.8	210.8	0.12	0.00	
2,072.0	6.60	54.00	2,058.1	119.9	186.3	221.5	0.39	-0.33	
2,164.0	6.60	51.70	2,149.5	126.3	194.7	232.0	0.29	0.00	
2,255.0	6.70	52.80	2,239.8	132.7	203.1	242.6	0.18	0.11	
2,347.0	6.60	53.70	2,331.2	139.1	211.6	253.2	0.16	-0.11	
2,438.0	6.60	54.30	2,421.6	145.2	220.1	263.7	0.08	0.00	
2,530.0	6.30	52.70	2,513.0	151.4	228.4	274.0	0.38	-0.33	
2,621.0	6.00	51.30	2,603.5	157.4	236.1	283.7	0.37	-0.33	
2,712.0	5.80	52.00	2,694.0	163.2	243.4	293.0	0.23	-0.22	
2,804.0	5.50	53.90	2,785.6	168.6	250.6	302.1	0.38	-0.33	
2,895.0	6.60	56.00	2,876.1	174.1	258.5	311.7	1.23	1.21	
2,987.0	6.80	56.20	2,967.4	180.1	267.4	322.4	0.22	0.22	
3,079.0	6.50	57.70	3,058.8	185.9	276.3	333.1	0.38	-0.33	
3,171.0	6.40	57.60	3,150.2	191.5	285.1	343.4	0.11	-0.11	
3,262.0	6.00	56.50	3,240.7	196.8	293.3	353.2	0.46	-0.44	
3,353.0	5.80	57.60	3,331.2	201.9	301.2	362.6	0.25	-0.22	
3,444.0	5.70	57.00	3,421.8	206.8	308.8	371.7	0.13	-0.11	
3,536.0	5.80	57.30	3,513.3	211.8	316.6	380.9	0.11	0.11	
3,627.0	7.60	51.20	3,603.7	218.1	325.1	391.5	2.12	1.98	
3,718.0	7.40	51.80	3,693.9	225.5	334.4	403.3	0.24	-0.22	
3,810.0	7.30	49.20	3,785.2	232.9	343.5	415.0	0.38	-0.11	
3,901.0	7.00	49.90	3,875.4	240.3	352.1	426.3	0.34	-0.33	
3,993.0	6.60	49.80	3,966.8	247.3	360.5	437.1	0.43	-0.43	
4,084.0	6.20	49.70	4,057.2	253.9	368.2	447.2	0.44	-0.44	
4,176.0	7.50	53.10	4,148.6	260.7	376.8	458.2	1.48	1.41	
4,267.0	7.30	55.30	4,238.8	267.6	386.3	469.9	0.38	-0.22	
4,359.0	6.70	53.70	4,330.1	274.1	395.4	481.1	0.69	-0.65	
4,451.0	6.60	52.90	4,421.5	280.4	404.0	491.7	0.15	-0.11	
4,542.0	6.50	52.20	4,511.9	286.7	412.2	502.1	0.14	-0.11	
4,634.0	6.50	51.50	4,603.3	293.2	420.4	512.5	0.09	0.00	
4,725.0	6.90	48.50	4,693.7	300.0	428.5	523.0	0.58	0.44	
4,816.0	6.50	47.70	4,784.1	307.1	436.4	533.6	0.45	-0.44	
4,908.0	6.20	57.00	4,875.5	313.3	444.4	543.7	1.16	-0.33	
5,000.0	5.80	58.70	4,967.0	318.4	452.6	553.3	0.48	-0.43	
5,091.0	5.20	56.50	5,057.6	323.1	459.9	562.0	0.70	-0.66	
5,183.0	4.40	66.00	5,149.3	326.8	466.6	569.7	1.22	-0.87	
5,274.0	3.70	66.20	5,240.0	329.4	472.5	576.0	0.77	-0.77	
5,366.0	2.90	68.10	5,331.9	331.5	477.4	581.2	0.88	-0.87	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Hagen 22-3A
Project:	S. Piceance (Parachute)	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Well:	Hagen 22-3A	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
5,457.0	3.70	67.10	5,422.7	333.5	482.2	586.3	0.88	0.88	
5,549.0	3.40	74.60	5,514.6	335.4	487.6	591.8	0.60	-0.33	
5,640.0	3.00	76.30	5,605.4	336.6	492.5	596.6	0.45	-0.44	
5,732.0	2.90	77.60	5,697.3	337.7	497.1	601.0	0.13	-0.11	
5,824.0	2.50	76.50	5,789.2	338.7	501.4	605.0	0.44	-0.43	
5,916.0	2.20	77.70	5,881.1	339.5	505.0	608.5	0.33	-0.33	
6,007.0	0.90	25.90	5,972.1	340.5	507.0	610.8	1.97	-1.43	
6,099.0	0.70	5.00	6,064.1	341.8	507.4	611.8	0.38	-0.22	
6,191.0	0.50	356.80	6,156.1	342.7	507.4	612.3	0.24	-0.22	
6,282.0	0.70	336.70	6,247.1	343.6	507.2	612.6	0.32	0.22	
6,374.0	0.80	318.00	6,339.1	344.6	506.5	612.7	0.29	0.11	
6,465.0	0.90	301.00	6,430.1	345.5	505.5	612.3	0.30	0.11	
6,557.0	1.10	284.30	6,522.0	346.0	504.0	611.4	0.38	0.22	
6,649.0	1.30	286.30	6,614.0	346.6	502.2	610.1	0.22	0.22	
6,740.0	1.40	259.70	6,705.0	346.6	500.1	608.5	0.69	0.11	
6,832.0	0.40	275.20	6,797.0	346.5	498.7	607.2	1.11	-1.09	
6,924.0	0.90	290.50	6,889.0	346.8	497.7	606.5	0.57	0.54	
7,014.0	1.20	277.20	6,979.0	347.1	496.1	605.4	0.43	0.33	
7,106.0	0.90	211.80	7,070.9	346.6	494.7	604.0	1.26	-0.33	
7,198.0	1.50	187.10	7,162.9	344.8	494.2	602.6	0.85	0.65	
7,290.0	1.40	187.90	7,254.9	342.5	493.9	601.0	0.11	-0.11	
7,381.0	1.20	180.10	7,345.9	340.5	493.7	599.7	0.29	-0.22	
7,473.0	1.00	210.10	7,437.9	338.8	493.3	598.5	0.65	-0.22	
7,564.0	1.80	219.60	7,528.8	337.0	492.0	596.4	0.91	0.88	
7,656.0	2.00	232.30	7,620.8	334.9	489.8	593.4	0.51	0.22	
7,748.0	2.20	232.70	7,712.7	332.9	487.2	590.0	0.22	0.22	
7,772.0	1.90	233.80	7,736.7	332.4	486.5	589.2	1.26	-1.25	Last Cathedral Survey @ 7,772' MD
7,822.0	1.90	233.80	7,786.7	331.4	485.1	587.5	0.00	0.00	Projection to Bit @ 7,822'

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
Hagen 22-3A PBHL (26E)		0.00	0.00	7,751.0	336.9	495.7	1,590,928.42	2,298,252.12	39.429508 -107.984679
- actual wellpath misses target center by 17.6ft at 7772.0ft MD (7736.7 TVD, 332.4 N, 486.5 E)									
- Circle (radius 25.0)									
Hagen 22-3A TGT		0.00	0.00	5,675.0	336.9	495.7	1,590,928.42	2,298,252.12	39.429508 -107.984679
- actual wellpath misses target center by 0.6ft at 5709.7ft MD (5675.0 TVD, 337.5 N, 496.0 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
7,772.0	7,736.7	332.4	486.5	Last Cathedral Survey @ 7,772' MD	
7,822.0	7,786.7	331.4	485.1	Projection to Bit @ 7,822'	

Checked By: _____ Approved By: _____ Date: _____