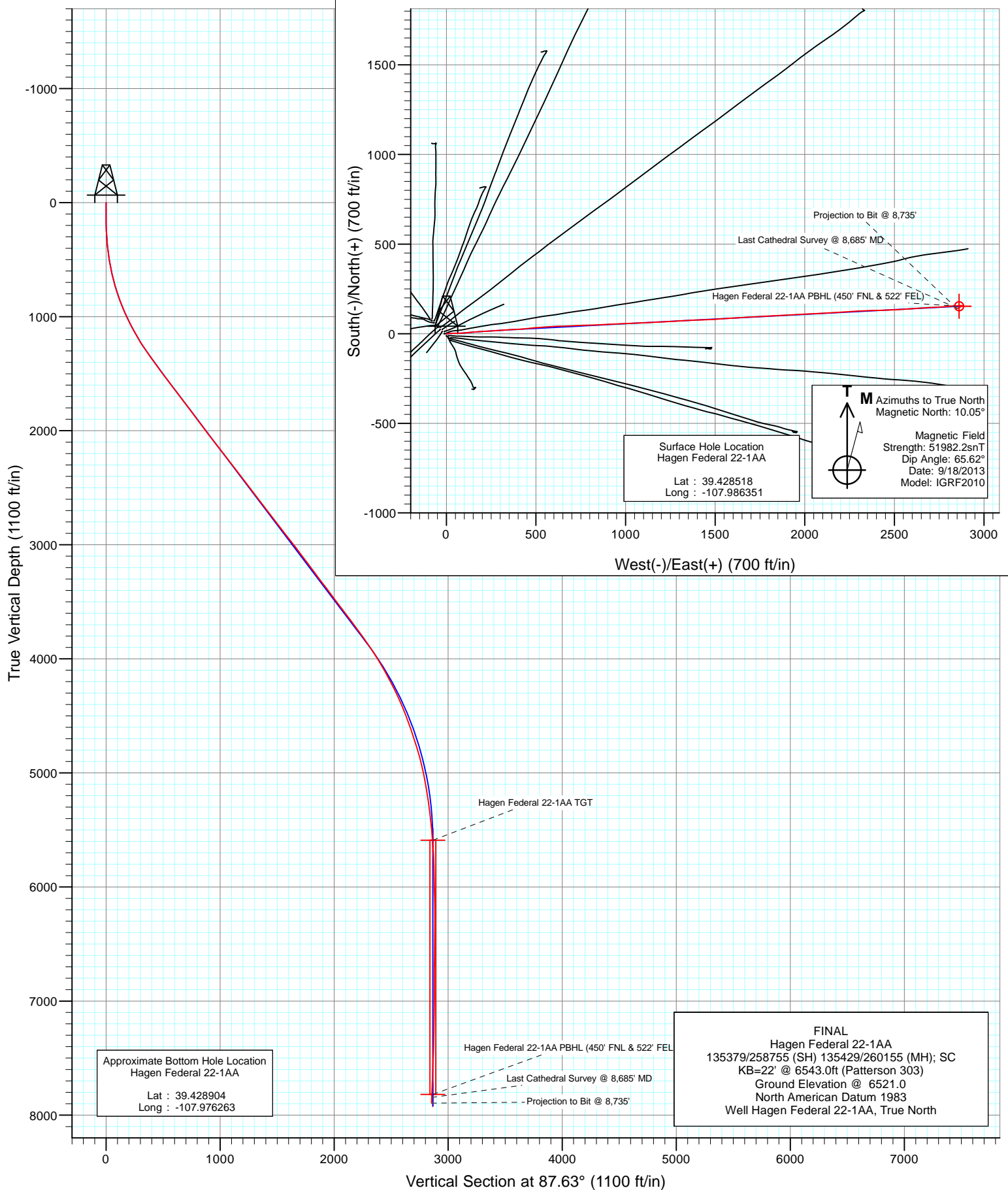


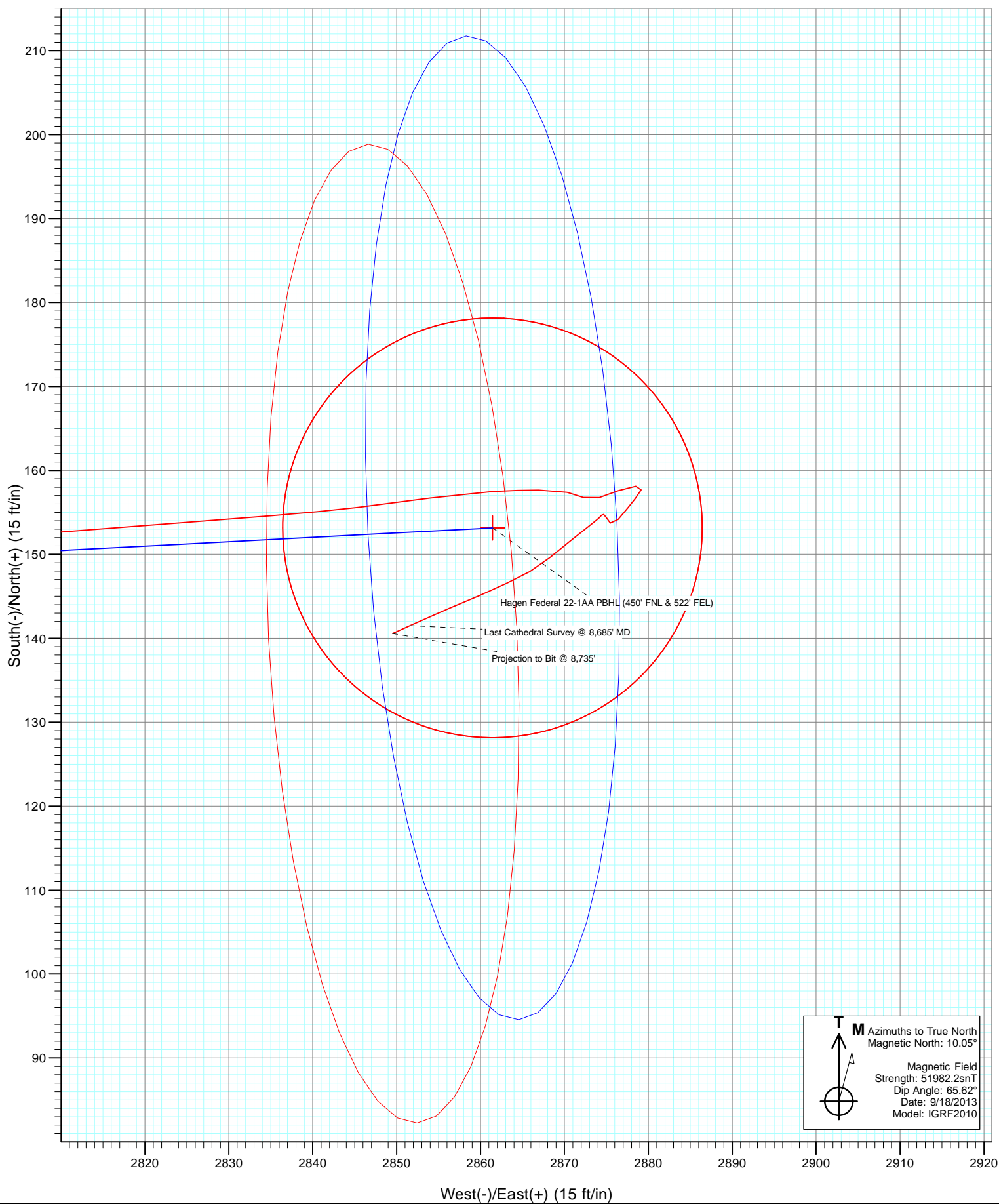


Project: S. Piceance (Parachute)  
Site: PC-22 Pad NENW 2 7S 95W  
Well: Hagen Federal 22-1AA  
Wellbore: OH  
Design: FINAL



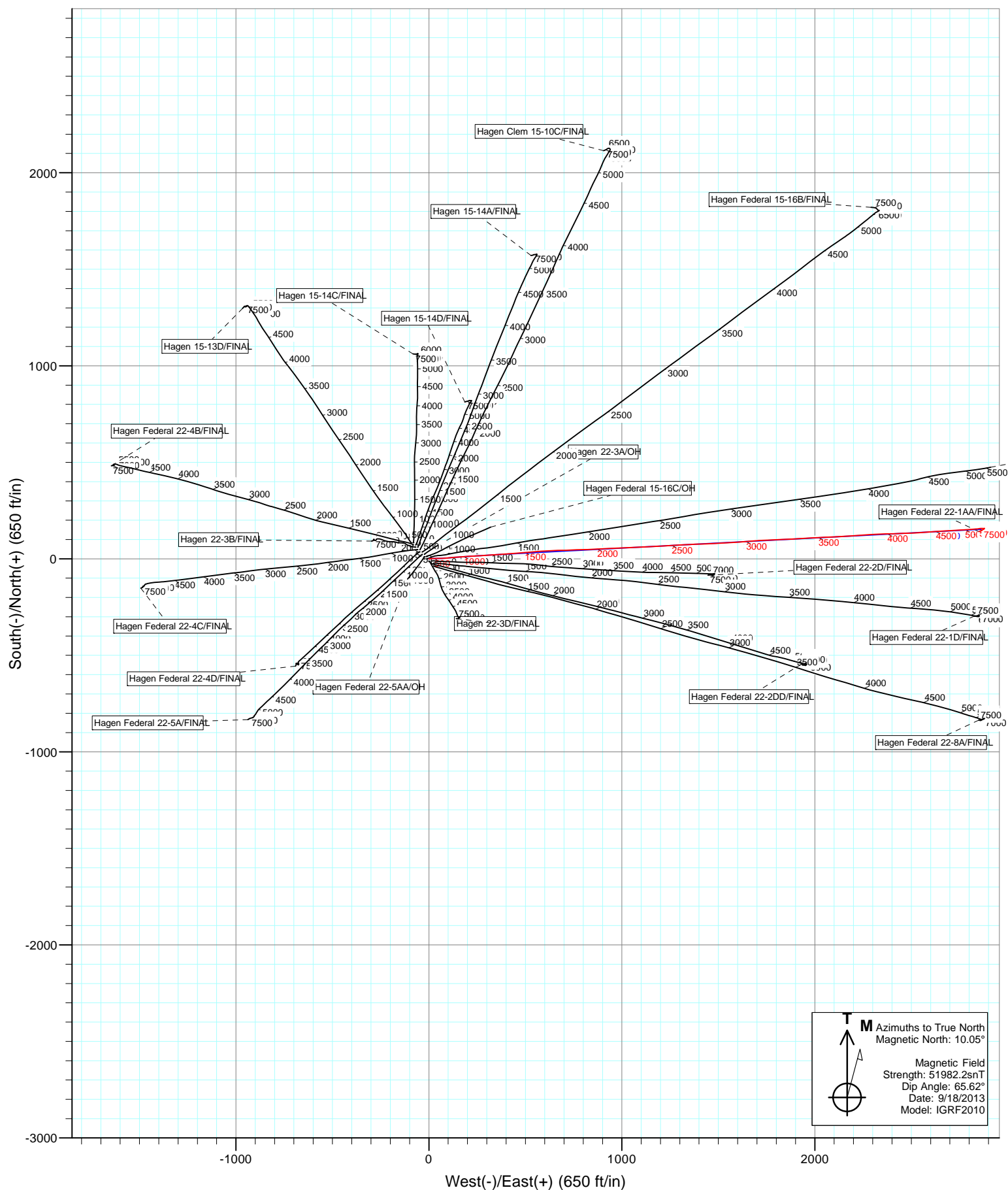


Project: S. Piceance (Parachute)  
Site: PC-22 Pad NENW 2 7S 95W  
Well: Hagen Federal 22-1AA  
Wellbore: OH  
Design: FINAL





Project: S. Piceance (Parachute)  
Site: PC-22 Pad NENW 2 7S 95W  
Well: Hagen Federal 22-1AA  
Wellbore: OH  
Design: FINAL



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Hagen Federal 22-1AA
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Site:</b>	PC-22 Pad NENW 2 7S 95W	<b>MD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Well:</b>	Hagen Federal 22-1AA	<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

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

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

<b>Well</b>	Hagen Federal 22-1AA			
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	1,590,580.87 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	2,297,770.14 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b> 6,521.0 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	9/18/2013	10.05	65.62	51,982

<b>Design</b>	FINAL			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b> 0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	87.63

<b>Survey Program</b>	<b>Date</b>	9/28/2013		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
117.0	8,735.0	Survey #1 (OH)	Geolink MWD	Geolink MWD

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
117.0	0.50	183.30	117.0	-0.5	0.0	-0.1	0.43	0.43	
148.0	0.10	145.50	148.0	-0.7	0.0	0.0	1.37	-1.29	
179.0	0.90	93.80	179.0	-0.7	0.2	0.2	2.72	2.58	
209.0	1.50	88.30	209.0	-0.7	0.9	0.8	2.03	2.00	
270.0	3.30	81.20	269.9	-0.4	3.4	3.4	2.99	2.95	
301.0	3.80	73.40	300.9	0.0	5.3	5.3	2.24	1.61	
331.0	4.40	76.70	330.8	0.6	7.3	7.4	2.15	2.00	
362.0	5.60	88.70	361.7	0.9	10.0	10.0	5.11	3.87	
392.0	6.30	89.50	391.5	0.9	13.1	13.1	2.35	2.33	
484.0	8.40	83.40	482.8	1.7	24.8	24.9	2.43	2.28	
576.0	10.90	91.80	573.5	2.2	40.2	40.3	3.11	2.72	
667.0	14.00	88.50	662.3	2.3	59.8	59.9	3.49	3.41	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Hagen Federal 22-1AA
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Site:</b>	PC-22 Pad NENW 2 7S 95W	<b>MD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Well:</b>	Hagen Federal 22-1AA	<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
759.0	17.30	86.00	750.9	3.5	84.6	84.7	3.66	3.59	
850.0	19.60	84.10	837.2	6.0	113.3	113.4	2.61	2.53	
941.0	22.40	86.30	922.1	8.7	145.8	146.0	3.20	3.08	
1,032.0	25.10	85.60	1,005.4	11.3	182.3	182.6	2.98	2.97	
1,124.0	27.80	87.10	1,087.8	13.9	223.2	223.6	3.02	2.93	
1,215.0	30.20	85.90	1,167.4	16.6	267.2	267.7	2.71	2.64	
1,306.0	32.30	86.30	1,245.2	19.8	314.3	314.9	2.32	2.31	
1,397.0	35.70	87.10	1,320.6	22.7	365.1	365.8	3.77	3.74	
1,439.0	36.00	87.10	1,354.7	24.0	389.7	390.4	0.71	0.71	
1,521.0	35.60	84.50	1,421.2	27.5	437.5	438.3	1.92	-0.49	
1,612.0	36.70	84.20	1,494.6	32.7	491.0	491.9	1.22	1.21	
1,704.0	37.00	86.30	1,568.3	37.3	545.9	547.0	1.41	0.33	
1,795.0	37.30	86.80	1,640.8	40.6	600.8	601.9	0.47	0.33	
1,887.0	37.50	88.70	1,713.9	42.8	656.6	657.8	1.27	0.22	
1,978.0	36.50	87.60	1,786.6	44.6	711.3	712.6	1.32	-1.10	
2,070.0	36.60	88.10	1,860.5	46.6	766.1	767.4	0.34	0.11	
2,162.0	37.60	88.10	1,933.8	48.5	821.6	822.9	1.09	1.09	
2,254.0	36.80	86.30	2,007.1	51.2	877.1	878.5	1.47	-0.87	
2,345.0	38.30	88.60	2,079.3	53.6	932.5	933.9	2.26	1.65	
2,437.0	38.00	87.70	2,151.6	55.5	989.3	990.8	0.69	-0.33	
2,529.0	37.50	86.40	2,224.4	58.4	1,045.6	1,047.1	1.02	-0.54	
2,620.0	38.30	88.00	2,296.2	61.1	1,101.4	1,103.0	1.39	0.88	
2,712.0	37.70	87.00	2,368.7	63.5	1,158.0	1,159.6	0.93	-0.65	
2,804.0	36.90	86.70	2,441.9	66.6	1,213.6	1,215.4	0.89	-0.87	
2,895.0	37.70	87.10	2,514.2	69.6	1,268.7	1,270.5	0.92	0.88	
2,987.0	36.50	86.30	2,587.6	72.8	1,324.1	1,326.0	1.41	-1.30	
3,078.0	36.90	87.90	2,660.6	75.5	1,378.4	1,380.4	1.14	0.44	
3,170.0	38.80	87.90	2,733.2	77.6	1,434.8	1,436.8	2.07	2.07	
3,262.0	38.40	87.20	2,805.1	80.0	1,492.2	1,494.2	0.64	-0.43	
3,354.0	37.90	86.80	2,877.5	83.0	1,548.9	1,551.0	0.61	-0.54	
3,445.0	37.50	86.20	2,949.5	86.4	1,604.5	1,606.7	0.60	-0.44	
3,536.0	37.10	84.70	3,021.9	90.8	1,659.4	1,661.8	1.09	-0.44	
3,628.0	37.20	86.50	3,095.2	95.0	1,714.8	1,717.3	1.19	0.11	
3,720.0	36.60	87.80	3,168.8	97.8	1,770.0	1,772.5	1.07	-0.65	
3,811.0	36.20	87.80	3,242.0	99.9	1,823.9	1,826.5	0.44	-0.44	
3,903.0	37.90	87.20	3,315.4	102.3	1,879.3	1,881.9	1.89	1.85	
3,995.0	37.20	86.60	3,388.4	105.3	1,935.3	1,938.0	0.86	-0.76	
4,086.0	36.20	86.60	3,461.3	108.5	1,989.6	1,992.4	1.10	-1.10	
4,178.0	37.10	87.60	3,535.1	111.3	2,044.4	2,047.3	1.17	0.98	
4,270.0	37.50	87.30	3,608.3	113.8	2,100.1	2,103.0	0.48	0.43	
4,362.0	37.00	86.70	3,681.6	116.7	2,155.7	2,158.7	0.67	-0.54	
4,453.0	36.30	85.70	3,754.6	120.3	2,209.9	2,213.0	1.01	-0.77	
4,545.0	35.30	85.70	3,829.2	124.3	2,263.6	2,266.8	1.09	-1.09	
4,636.0	33.90	87.70	3,904.1	127.3	2,315.2	2,318.5	1.98	-1.54	
4,728.0	31.80	89.10	3,981.4	128.7	2,365.1	2,368.4	2.43	-2.28	
4,819.0	29.80	87.80	4,059.6	130.0	2,411.7	2,415.0	2.32	-2.20	
4,911.0	29.30	87.50	4,139.6	131.9	2,457.0	2,460.3	0.57	-0.54	
5,002.0	26.80	88.00	4,219.9	133.5	2,499.7	2,503.1	2.76	-2.75	
5,094.0	26.10	86.40	4,302.3	135.5	2,540.7	2,544.1	1.09	-0.76	
5,185.0	23.70	85.40	4,384.8	138.3	2,578.9	2,582.4	2.68	-2.64	
5,277.0	21.60	86.50	4,469.7	140.8	2,614.2	2,617.8	2.33	-2.28	
5,368.0	19.50	86.60	4,554.9	142.7	2,646.1	2,649.7	2.31	-2.31	
5,460.0	19.50	85.20	4,641.6	144.9	2,676.7	2,680.4	0.51	0.00	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Hagen Federal 22-1AA
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Site:</b>	PC-22 Pad NENW 2 7S 95W	<b>MD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Well:</b>	Hagen Federal 22-1AA	<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
5,551.0	17.80	88.10	4,727.8	146.6	2,705.8	2,709.5	2.13	-1.87	
5,643.0	15.90	86.40	4,815.9	147.9	2,732.4	2,736.2	2.13	-2.07	
5,734.0	14.20	86.90	4,903.8	149.3	2,756.0	2,759.8	1.87	-1.87	
5,826.0	12.00	86.60	4,993.4	150.4	2,776.8	2,780.7	2.39	-2.39	
5,918.0	10.50	86.20	5,083.6	151.6	2,794.7	2,798.6	1.63	-1.63	
6,009.0	9.00	85.60	5,173.3	152.7	2,810.1	2,814.0	1.65	-1.65	
6,101.0	7.90	85.60	5,264.3	153.7	2,823.6	2,827.5	1.20	-1.20	
6,192.0	6.90	85.40	5,354.5	154.6	2,835.3	2,839.2	1.10	-1.10	
6,284.0	5.80	83.40	5,446.0	155.6	2,845.4	2,849.4	1.22	-1.20	
6,375.0	5.10	81.80	5,536.5	156.7	2,854.0	2,858.0	0.79	-0.77	
6,467.0	4.20	86.60	5,628.2	157.5	2,861.4	2,865.4	1.06	-0.98	
6,558.0	2.80	91.00	5,719.1	157.6	2,866.9	2,871.0	1.57	-1.54	
6,649.0	1.50	100.10	5,810.0	157.4	2,870.3	2,874.4	1.47	-1.43	
6,740.0	1.10	118.20	5,901.0	156.8	2,872.2	2,876.3	0.62	-0.44	
6,832.0	1.50	70.30	5,992.9	156.8	2,874.2	2,878.2	1.21	0.43	
6,923.0	1.50	70.30	6,083.9	157.6	2,876.4	2,880.5	0.00	0.00	
7,015.0	1.20	82.00	6,175.9	158.1	2,878.5	2,882.6	0.44	-0.33	
7,107.0	0.80	208.20	6,267.9	157.7	2,879.1	2,883.2	1.95	-0.43	
7,198.0	0.80	220.60	6,358.9	156.6	2,878.4	2,882.4	0.19	0.00	
7,289.0	1.00	217.50	6,449.9	155.5	2,877.5	2,881.5	0.23	0.22	
7,381.0	1.20	222.20	6,541.8	154.2	2,876.4	2,880.3	0.24	0.22	
7,472.0	0.50	312.60	6,632.8	153.7	2,875.5	2,879.4	1.43	-0.77	
7,564.0	0.50	334.70	6,724.8	154.4	2,875.0	2,878.9	0.21	0.00	
7,656.0	0.20	280.10	6,816.8	154.8	2,874.7	2,878.6	0.45	-0.33	
7,747.0	0.20	212.20	6,907.8	154.7	2,874.4	2,878.4	0.25	0.00	
7,838.0	0.40	230.50	6,998.8	154.3	2,874.1	2,878.0	0.24	0.22	
7,930.0	0.80	231.20	7,090.8	153.7	2,873.3	2,877.2	0.43	0.43	
8,022.0	1.00	231.30	7,182.8	152.8	2,872.2	2,876.1	0.22	0.22	
8,113.0	1.60	231.70	7,273.8	151.5	2,870.6	2,874.4	0.66	0.66	
8,204.0	2.10	230.40	7,364.7	149.7	2,868.3	2,872.1	0.55	0.55	
8,296.0	1.70	240.90	7,456.7	147.9	2,865.8	2,869.5	0.57	-0.43	
8,387.0	2.10	244.70	7,547.6	146.6	2,863.1	2,866.8	0.46	0.44	
8,479.0	2.40	246.60	7,639.6	145.1	2,859.9	2,863.4	0.34	0.33	
8,570.0	2.50	247.40	7,730.5	143.6	2,856.3	2,859.8	0.12	0.11	
8,685.0	2.60	245.30	7,845.4	141.5	2,851.6	2,855.0	0.12	0.09	Last Cathedral Survey @ 8,685' MD
8,735.0	2.60	245.30	7,895.3	140.6	2,849.5	2,852.9	0.00	0.00	Projection to Bit @ 8,735'

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well Hagen Federal 22-1AA
<b>Project:</b>	S. Piceance (Parachute)	<b>TVD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Site:</b>	PC-22 Pad NENW 2 7S 95W	<b>MD Reference:</b>	KB=22' @ 6543.0ft (Patterson 303)
<b>Well:</b>	Hagen Federal 22-1AA	<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									
Hagen Federal 22-1AA F	0.00	0.00	7,819.0	153.2	2,861.4	1,590,655.66	2,300,634.68	39.428938	-107.976221
- actual wellpath misses target center by 14.2ft at 8658.0ft MD (7818.4 TVD, 142.0 N, 2852.7 E)									
- Circle (radius 25.0)									
Hagen Federal 22-1AA 1	0.00	0.00	5,590.0	153.2	2,861.4	1,590,655.66	2,300,634.68	39.428938	-107.976221
- actual wellpath misses target center by 5.1ft at 6428.9ft MD (5590.2 TVD, 157.3 N, 2858.5 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
		(ft)	(ft)	Comment	
8,685.0	7,845.4	141.5	2,851.6	Last Cathedral Survey @ 8,685' MD	
8,735.0	7,895.3	140.6	2,849.5	Projection to Bit @ 8,735'	

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