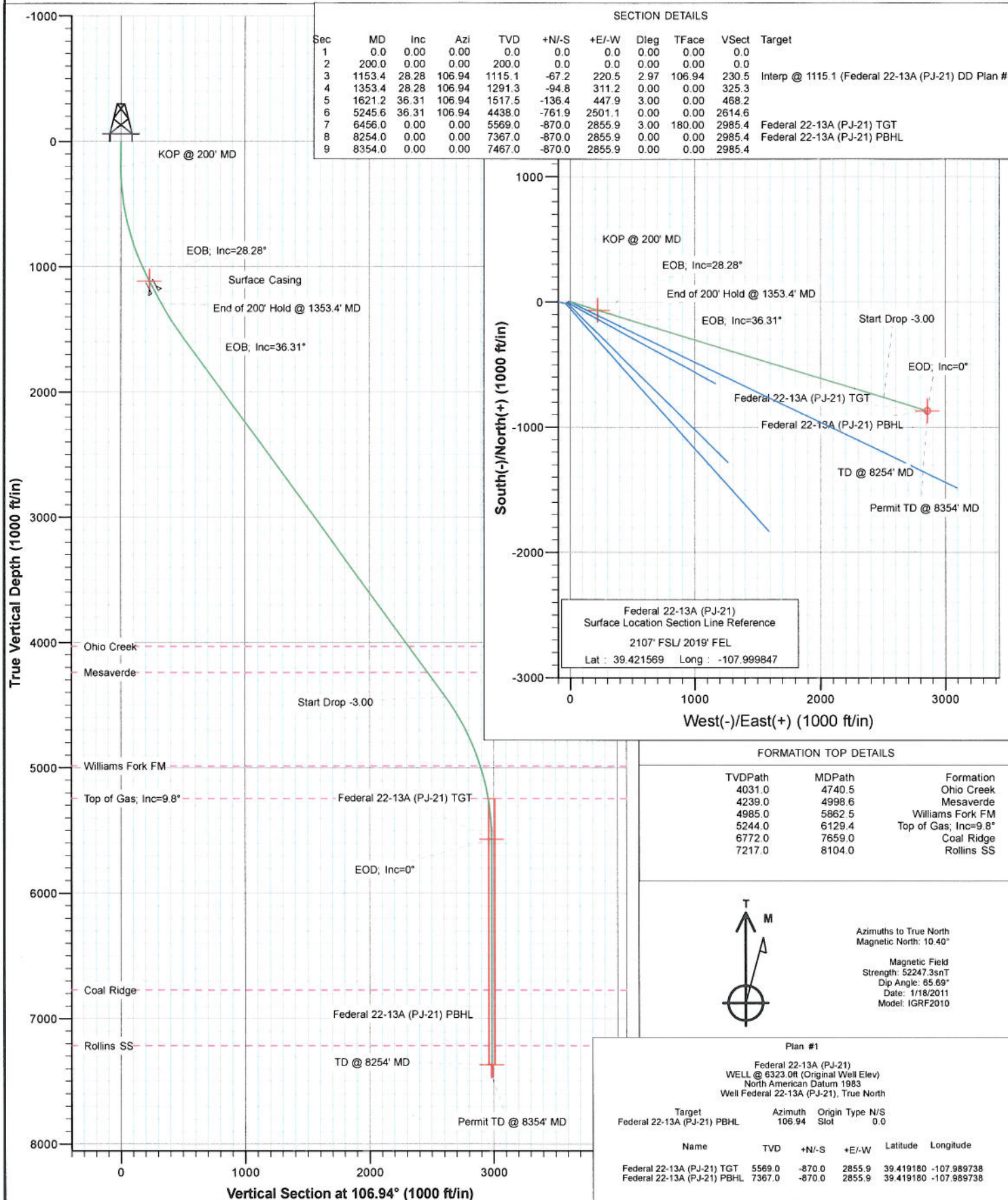




Project: S. Piceance (Parachute)  
Site: NWSE S21-T7S-R95W (PJ-21)  
Well: Federal 22-13A (PJ-21)  
Wellbore: DD  
Plan: Plan #1



# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** NWSE S21-T7S-R95W (PJ-21)  
**Well:** Federal 22-13A (PJ-21)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 22-13A (PJ-21)  
**TVD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**MD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**Project** S. Piceance (Parachute), Garfield County, CO

**Map System:** US State Plane 1983  
**Geo Datum:** North American Datum 1983  
**Map Zone:** Colorado Central Zone  
**System Datum:** Mean Sea Level

**Site** NWSE S21-T7S-R95W (PJ-21)

**Site Position:**  
**From:** Lat/Long  
**Position Uncertainty:** 0.0 ft  
**Northing:** 1,588,155.39 ft  
**Easting:** 2,293,889.70 ft  
**Slot Radius:** 13.200 in  
**Latitude:** 39.421569  
**Longitude:** -107.999847  
**Grid Convergence:** -1.58 °

**Well** Federal 22-13A (PJ-21)

**Well Position**  
**+N/-S** 0.0 ft  
**+E/-W** 0.0 ft  
**Position Uncertainty** 0.0 ft  
**Northing:** 1,588,155.35 ft  
**Easting:** 2,293,889.70 ft  
**Wellhead Elevation:** ft  
**Latitude:** 39.421569  
**Longitude:** -107.999847  
**Ground Level:** 6,301.0 ft

**Wellbore** DD

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/18/2011	10.40	65.69	52,247

**Design** Plan #1

**Audit Notes:**

**Version:**  
**Phase:** PLAN  
**Tie On Depth:** 0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	106.94

**Plan Sections**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,153.4	28.28	106.94	1,115.1	-67.2	220.5	2.97	2.97	11.22	106.94	Interp @ 1115.1 (Fed
1,353.4	28.28	106.94	1,291.3	-94.8	311.2	0.00	0.00	0.00	0.00	
1,621.2	36.31	106.94	1,517.5	-136.4	447.9	3.00	3.00	0.00	0.00	
5,245.6	36.31	106.94	4,438.0	-761.9	2,501.1	0.00	0.00	0.00	0.00	
6,456.0	0.00	0.00	5,569.0	-870.0	2,855.9	3.00	-3.00	0.00	180.00	Federal 22-13A (PJ-2
8,254.0	0.00	0.00	7,367.0	-870.0	2,855.9	0.00	0.00	0.00	0.00	Federal 22-13A (PJ-2
8,354.0	0.00	0.00	7,467.0	-870.0	2,855.9	0.00	0.00	0.00	0.00	



# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** NWSE S21-T7S-R95W (PJ-21)  
**Well:** Federal 22-13A (PJ-21)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 22-13A (PJ-21)  
**TVD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**MD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200' MD
300.0	2.97	106.94	300.0	-0.8	2.5	2.6	2.97	2.97	
400.0	5.93	106.94	399.6	-3.0	9.9	10.3	2.97	2.97	
500.0	8.90	106.94	498.8	-6.8	22.2	23.2	2.97	2.97	
600.0	11.86	106.94	597.1	-12.0	39.5	41.3	2.97	2.97	
700.0	14.83	106.94	694.4	-18.8	61.6	64.4	2.97	2.97	
800.0	17.80	106.94	790.4	-26.9	88.4	92.4	2.97	2.97	
900.0	20.76	106.94	884.8	-36.6	120.0	125.5	2.97	2.97	
1,000.0	23.73	106.94	977.3	-47.6	156.2	163.3	2.97	2.97	
1,100.0	26.70	106.94	1,067.8	-60.0	197.0	205.9	2.97	2.97	
1,153.4	28.28	106.94	1,115.1	-67.2	220.5	230.5	2.97	2.97	EOB; Inc=28.28° - Interp @ 1115.1 (Federal 22
1,200.0	28.28	106.94	1,156.2	-73.6	241.7	252.6	0.00	0.00	
1,252.7	28.28	106.94	1,202.6	-80.9	265.5	277.6	0.00	0.00	Surface Casing
1,300.0	28.28	106.94	1,244.3	-87.4	287.0	300.0	0.00	0.00	
1,353.4	28.28	106.94	1,291.3	-94.8	311.2	325.3	0.00	0.00	End of 200' Hold @ 1353.4' MD
1,400.0	29.68	106.94	1,332.1	-101.4	332.8	347.9	3.00	3.00	
1,500.0	32.68	106.94	1,417.6	-116.5	382.3	399.6	3.00	3.00	
1,600.0	35.68	106.94	1,500.3	-132.8	436.0	455.8	3.00	3.00	
1,621.2	36.31	106.94	1,517.5	-136.4	447.9	468.2	3.00	3.00	EOB; Inc=36.31°
1,700.0	36.31	106.94	1,581.0	-150.0	492.6	514.9	0.00	0.00	
1,800.0	36.31	106.94	1,661.6	-167.3	549.2	574.1	0.00	0.00	
1,900.0	36.31	106.94	1,742.1	-184.6	605.9	633.4	0.00	0.00	
2,000.0	36.31	106.94	1,822.7	-201.8	662.5	692.6	0.00	0.00	
2,100.0	36.31	106.94	1,903.3	-219.1	719.2	751.8	0.00	0.00	
2,200.0	36.31	106.94	1,983.9	-236.3	775.8	811.0	0.00	0.00	
2,300.0	36.31	106.94	2,064.5	-253.6	832.5	870.2	0.00	0.00	
2,400.0	36.31	106.94	2,145.0	-270.8	889.1	929.5	0.00	0.00	
2,500.0	36.31	106.94	2,225.6	-288.1	945.8	988.7	0.00	0.00	
2,600.0	36.31	106.94	2,306.2	-305.4	1,002.4	1,047.9	0.00	0.00	
2,700.0	36.31	106.94	2,386.8	-322.6	1,059.1	1,107.1	0.00	0.00	
2,800.0	36.31	106.94	2,467.4	-339.9	1,115.7	1,166.3	0.00	0.00	
2,900.0	36.31	106.94	2,547.9	-357.1	1,172.4	1,225.5	0.00	0.00	
3,000.0	36.31	106.94	2,628.5	-374.4	1,229.0	1,284.8	0.00	0.00	
3,100.0	36.31	106.94	2,709.1	-391.6	1,285.7	1,344.0	0.00	0.00	
3,200.0	36.31	106.94	2,789.7	-408.9	1,342.3	1,403.2	0.00	0.00	
3,300.0	36.31	106.94	2,870.3	-426.1	1,399.0	1,462.4	0.00	0.00	
3,400.0	36.31	106.94	2,950.8	-443.4	1,455.6	1,521.6	0.00	0.00	
3,500.0	36.31	106.94	3,031.4	-460.7	1,512.2	1,580.9	0.00	0.00	
3,600.0	36.31	106.94	3,112.0	-477.9	1,568.9	1,640.1	0.00	0.00	
3,700.0	36.31	106.94	3,192.6	-495.2	1,625.5	1,699.3	0.00	0.00	
3,800.0	36.31	106.94	3,273.2	-512.4	1,682.2	1,758.5	0.00	0.00	
3,900.0	36.31	106.94	3,353.7	-529.7	1,738.8	1,817.7	0.00	0.00	
4,000.0	36.31	106.94	3,434.3	-546.9	1,795.5	1,876.9	0.00	0.00	
4,100.0	36.31	106.94	3,514.9	-564.2	1,852.1	1,936.2	0.00	0.00	
4,200.0	36.31	106.94	3,595.5	-581.5	1,908.8	1,995.4	0.00	0.00	
4,300.0	36.31	106.94	3,676.1	-598.7	1,965.4	2,054.6	0.00	0.00	
4,400.0	36.31	106.94	3,756.6	-616.0	2,022.1	2,113.8	0.00	0.00	
4,500.0	36.31	106.94	3,837.2	-633.2	2,078.7	2,173.0	0.00	0.00	
4,600.0	36.31	106.94	3,917.8	-650.5	2,135.4	2,232.3	0.00	0.00	
4,700.0	36.31	106.94	3,998.4	-667.7	2,192.0	2,291.5	0.00	0.00	

# Cathedral Energy Services

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** S. Piceance (Parachute)  
**Site:** NWSE S21-T7S-R95W (PJ-21)  
**Well:** Federal 22-13A (PJ-21)  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well Federal 22-13A (PJ-21)  
**TVD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**MD Reference:** WELL @ 6323.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,740.5	36.31	106.94	4,031.0	-674.7	2,215.0	2,315.4	0.00	0.00	Ohio Creek
4,800.0	36.31	106.94	4,079.0	-685.0	2,248.7	2,350.7	0.00	0.00	
4,900.0	36.31	106.94	4,159.5	-702.2	2,305.3	2,409.9	0.00	0.00	
4,998.6	36.31	106.94	4,239.0	-719.3	2,361.2	2,468.3	0.00	0.00	Mesaverde
5,000.0	36.31	106.94	4,240.1	-719.5	2,362.0	2,469.1	0.00	0.00	
5,100.0	36.31	106.94	4,320.7	-736.8	2,418.6	2,528.3	0.00	0.00	
5,200.0	36.31	106.94	4,401.3	-754.0	2,475.3	2,587.6	0.00	0.00	
5,245.6	36.31	106.94	4,438.0	-761.9	2,501.1	2,614.6	0.00	0.00	Start Drop -3.00
5,300.0	34.68	106.94	4,482.3	-771.1	2,531.3	2,646.2	3.00	-3.00	
5,400.0	31.68	106.94	4,566.0	-787.0	2,583.7	2,700.9	3.00	-3.00	
5,500.0	28.68	106.94	4,652.4	-801.7	2,631.7	2,751.1	3.00	-3.00	
5,600.0	25.68	106.94	4,741.4	-815.0	2,675.4	2,796.8	3.00	-3.00	
5,700.0	22.68	106.94	4,832.6	-826.9	2,714.6	2,837.8	3.00	-3.00	
5,800.0	19.68	106.94	4,925.8	-837.4	2,749.2	2,873.9	3.00	-3.00	
5,862.5	17.81	106.94	4,985.0	-843.3	2,768.4	2,894.0	3.00	-3.00	Williams Fork FM
5,900.0	16.68	106.94	5,020.8	-846.5	2,779.0	2,905.1	3.00	-3.00	
6,000.0	13.68	106.94	5,117.3	-854.2	2,804.1	2,931.3	3.00	-3.00	
6,100.0	10.68	106.94	5,215.1	-860.3	2,824.2	2,952.4	3.00	-3.00	
6,129.4	9.80	106.94	5,244.0	-861.8	2,829.2	2,957.6	3.00	-3.00	Top of Gas; Inc=9.8°
6,200.0	7.68	106.94	5,313.8	-865.0	2,839.5	2,968.3	3.00	-3.00	
6,300.0	4.68	106.94	5,413.2	-868.1	2,849.8	2,979.1	3.00	-3.00	
6,400.0	1.68	106.94	5,513.0	-869.7	2,855.1	2,984.6	3.00	-3.00	
6,456.0	0.00	0.00	5,569.0	-870.0	2,855.9	2,985.4	3.00	-3.00	EOD; Inc=0° - Federal 22-13A (PJ-21) TGT
6,500.0	0.00	0.00	5,613.0	-870.0	2,855.9	2,985.4	0.00	0.00	
6,600.0	0.00	0.00	5,713.0	-870.0	2,855.9	2,985.4	0.00	0.00	
6,700.0	0.00	0.00	5,813.0	-870.0	2,855.9	2,985.4	0.00	0.00	
6,800.0	0.00	0.00	5,913.0	-870.0	2,855.9	2,985.4	0.00	0.00	
6,900.0	0.00	0.00	6,013.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,000.0	0.00	0.00	6,113.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,100.0	0.00	0.00	6,213.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,200.0	0.00	0.00	6,313.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,300.0	0.00	0.00	6,413.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,400.0	0.00	0.00	6,513.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,500.0	0.00	0.00	6,613.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,600.0	0.00	0.00	6,713.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,659.0	0.00	0.00	6,772.0	-870.0	2,855.9	2,985.4	0.00	0.00	Coal Ridge
7,700.0	0.00	0.00	6,813.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,800.0	0.00	0.00	6,913.0	-870.0	2,855.9	2,985.4	0.00	0.00	
7,900.0	0.00	0.00	7,013.0	-870.0	2,855.9	2,985.4	0.00	0.00	
8,000.0	0.00	0.00	7,113.0	-870.0	2,855.9	2,985.4	0.00	0.00	
8,100.0	0.00	0.00	7,213.0	-870.0	2,855.9	2,985.4	0.00	0.00	
8,104.0	0.00	0.00	7,217.0	-870.0	2,855.9	2,985.4	0.00	0.00	Rollins SS
8,200.0	0.00	0.00	7,313.0	-870.0	2,855.9	2,985.4	0.00	0.00	
8,254.0	0.00	0.00	7,367.0	-870.0	2,855.9	2,985.4	0.00	0.00	TD @ 8254' MD - Federal 22-13A (PJ-21) PBH1
8,300.0	0.00	0.00	7,413.0	-870.0	2,855.9	2,985.4	0.00	0.00	
8,354.0	0.00	0.00	7,467.0	-870.0	2,855.9	2,985.4	0.00	0.00	Permit TD @ 8354' MD



# Cathedral Energy Services

## Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well Federal 22-13A (PJ-21)
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 6323.0ft (Original Well Elev)
Project:	S. Piceance (Parachute)	MD Reference:	WELL @ 6323.0ft (Original Well Elev)
Site:	NWSE S21-T7S-R95W (PJ-21)	North Reference:	True
Well:	Federal 22-13A (PJ-21)	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

### Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Federal 22-13A (PJ-21) - plan hits target center - Circle (radius 25.0)	0.00	0.00	7,367.0	-870.0	2,855.9	1,587,207.15	2,296,720.57	39.419180	-107.989738
Federal 22-13A (PJ-21) - plan hits target center - Circle (radius 25.0)	0.00	0.00	5,569.0	-870.0	2,855.9	1,587,207.15	2,296,720.57	39.419180	-107.989738
Interp @ 1115.1 (Federal) - plan hits target center - Point	0.00	0.00	1,115.1	-67.2	220.5	1,588,082.14	2,294,108.28	39.421384	-107.999066

### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,252.7	1,202.6	Surface Casing	0.000	0.000

### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,740.5	4,031.0	Ohio Creek		0.00	
4,998.6	4,239.0	Mesaverde		0.00	
5,862.5	4,985.0	Williams Fork FM		0.00	
6,129.4	5,244.0	Top of Gas; Inc=9.8°		0.00	
7,659.0	6,772.0	Coal Ridge		0.00	
8,104.0	7,217.0	Rollins SS		0.00	

### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP @ 200' MD
1,153.4	1,115.1	-67.2	220.5	EOB; Inc=28.28°
1,353.4	1,291.3	-94.8	311.2	End of 200' Hold @ 1353.4' MD
1,621.2	1,517.5	-136.4	447.9	EOB; Inc=36.31°
5,245.6	4,438.0	-761.9	2,501.1	Start Drop -3.00
6,456.0	5,569.0	-870.0	2,855.9	EOD; Inc=0°
8,254.0	7,367.0	-870.0	2,855.9	TD @ 8254' MD
8,354.0	7,467.0	-870.0	2,855.9	Permit TD @ 8354' MD