

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: S. Piceance (Parachute)
Site: S29-T7S-R95W (PF-29 Pad)
Well: Federal 29-11A
Wellbore: DD
Design: Plan #2

Local Co-ordinate Reference: Well Federal 29-11A
TVD Reference: WELL @ 6058.0ft (Original Well Elev)
MD Reference: WELL @ 6058.0ft (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 S29-T7S-R95W (PF-29 Pad)

Site Position: Northing: 1,584,347.66 ft Latitude: 39.410580
From: Lat/Long Easting: 2,286,791.27 ft Longitude: -108.024590
Position Uncertainty: 0.0 ft Slot Radius: 13.200 in Grid Convergence: -1.59 °

Well Federal 29-11A

Well Position +N/-S 0.0 ft Northing: 1,584,337.27 ft Latitude: 39.410550
+E/-W 0.0 ft Easting: 2,286,771.20 ft Longitude: -108.024660
Position Uncertainty 0.0 ft Wellhead Elevation: ft Ground Level: 6,036.0 ft

Wellbore DD

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	9/27/2010	10.42	65.69	52,302

Design Plan #2

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	139.77

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	
883.8	20.51	139.77	869.2	-92.5	78.2	3.00	3.00	0.00	139.77	
3,940.5	20.51	139.77	3,732.1	-910.3	769.9	0.00	0.00	0.00	0.00	
4,966.1	0.00	0.00	4,736.0	-1,049.0	887.2	2.00	-2.00	0.00	180.00	Federal 29-11A ToG
6,934.1	0.00	0.00	6,704.0	-1,049.0	887.2	0.00	0.00	0.00	0.00	Federal 29-11A BHL
7,034.1	0.00	0.00	6,804.0	-1,049.0	887.2	0.00	0.00	0.00	0.00	

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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'
300.0	3.00	139.77	300.0	-2.0	1.7	2.6	3.00	3.00	
400.0	6.00	139.77	399.6	-8.0	6.8	10.5	3.00	3.00	
500.0	9.00	139.77	498.8	-18.0	15.2	23.5	3.00	3.00	
600.0	12.00	139.77	597.1	-31.9	27.0	41.7	3.00	3.00	
700.0	15.00	139.77	694.3	-49.7	42.0	65.1	3.00	3.00	
800.0	18.00	139.77	790.2	-71.4	60.4	93.5	3.00	3.00	
883.8	20.51	139.77	869.2	-92.5	78.2	121.1	3.00	3.00	EOB @ Inc. = 20.51°
900.0	20.51	139.77	884.5	-96.8	81.9	126.8	0.00	0.00	
1,000.0	20.51	139.77	978.1	-123.6	104.5	161.8	0.00	0.00	
1,054.0	20.51	139.77	1,028.7	-138.0	116.7	180.8	0.00	0.00	Surface Casing
1,100.0	20.51	139.77	1,071.8	-150.3	127.1	196.9	0.00	0.00	
1,200.0	20.51	139.77	1,165.4	-177.1	149.8	231.9	0.00	0.00	
1,300.0	20.51	139.77	1,259.1	-203.8	172.4	267.0	0.00	0.00	
1,400.0	20.51	139.77	1,352.8	-230.6	195.0	302.0	0.00	0.00	
1,500.0	20.51	139.77	1,446.4	-257.3	217.7	337.0	0.00	0.00	
1,600.0	20.51	139.77	1,540.1	-284.1	240.3	372.1	0.00	0.00	
1,700.0	20.51	139.77	1,633.7	-310.8	262.9	407.1	0.00	0.00	
1,800.0	20.51	139.77	1,727.4	-337.6	285.5	442.2	0.00	0.00	
1,900.0	20.51	139.77	1,821.1	-364.3	308.2	477.2	0.00	0.00	
2,000.0	20.51	139.77	1,914.7	-391.1	330.8	512.2	0.00	0.00	
2,100.0	20.51	139.77	2,008.4	-417.9	353.4	547.3	0.00	0.00	
2,200.0	20.51	139.77	2,102.0	-444.6	376.1	582.3	0.00	0.00	
2,300.0	20.51	139.77	2,195.7	-471.4	398.7	617.4	0.00	0.00	
2,400.0	20.51	139.77	2,289.3	-498.1	421.3	652.4	0.00	0.00	
2,500.0	20.51	139.77	2,383.0	-524.9	444.0	687.5	0.00	0.00	
2,600.0	20.51	139.77	2,476.7	-551.6	466.6	722.5	0.00	0.00	
2,700.0	20.51	139.77	2,570.3	-578.4	489.2	757.5	0.00	0.00	
2,800.0	20.51	139.77	2,664.0	-605.1	511.8	792.6	0.00	0.00	
2,900.0	20.51	139.77	2,757.6	-631.9	534.5	827.6	0.00	0.00	
3,000.0	20.51	139.77	2,851.3	-658.7	557.1	862.7	0.00	0.00	
3,100.0	20.51	139.77	2,945.0	-685.4	579.7	897.7	0.00	0.00	
3,200.0	20.51	139.77	3,038.6	-712.2	602.4	932.7	0.00	0.00	
3,300.0	20.51	139.77	3,132.3	-738.9	625.0	967.8	0.00	0.00	
3,400.0	20.51	139.77	3,225.9	-765.7	647.6	1,002.8	0.00	0.00	
3,500.0	20.51	139.77	3,319.6	-792.4	670.2	1,037.9	0.00	0.00	
3,600.0	20.51	139.77	3,413.3	-819.2	692.9	1,072.9	0.00	0.00	
3,662.7	20.51	139.77	3,472.0	-836.0	707.1	1,094.9	0.00	0.00	Ohio Creek
3,700.0	20.51	139.77	3,506.9	-845.9	715.5	1,107.9	0.00	0.00	
3,800.0	20.51	139.77	3,600.6	-872.7	738.1	1,143.0	0.00	0.00	
3,900.0	20.51	139.77	3,694.2	-899.4	760.8	1,178.0	0.00	0.00	
3,925.4	20.51	139.77	3,718.0	-906.2	766.5	1,186.9	0.00	0.00	Mesaverde Fm
3,940.5	20.51	139.77	3,732.1	-910.3	769.9	1,192.2	0.00	0.00	Start 2° Drop
4,000.0	19.32	139.77	3,788.1	-925.8	783.0	1,212.5	2.00	-2.00	
4,100.0	17.32	139.77	3,883.0	-949.8	803.3	1,243.9	2.00	-2.00	
4,200.0	15.32	139.77	3,979.0	-971.2	821.5	1,272.0	2.00	-2.00	
4,300.0	13.32	139.77	4,075.9	-990.1	837.4	1,296.8	2.00	-2.00	
4,400.0	11.32	139.77	4,173.6	-1,006.4	851.2	1,318.1	2.00	-2.00	
4,500.0	9.32	139.77	4,272.0	-1,020.1	862.8	1,336.0	2.00	-2.00	
4,600.0	7.32	139.77	4,370.9	-1,031.1	872.1	1,350.5	2.00	-2.00	

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 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
4,628.3	6.76	139.77	4,399.0	-1,033.8	874.4	1,354.0	2.00	-2.00	WILLIAMS FORK FM
4,700.0	5.32	139.77	4,470.3	-1,039.5	879.2	1,361.5	2.00	-2.00	
4,800.0	3.32	139.77	4,570.0	-1,045.3	884.1	1,369.0	2.00	-2.00	
4,900.0	1.32	139.77	4,669.9	-1,048.4	886.7	1,373.1	2.00	-2.00	
4,966.1	0.00	0.00	4,736.0	-1,049.0	887.2	1,373.9	2.00	-2.00	EOD @ Inc. = 0° - TOP GAS
5,000.0	0.00	0.00	4,769.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,100.0	0.00	0.00	4,869.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,200.0	0.00	0.00	4,969.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,300.0	0.00	0.00	5,069.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,400.0	0.00	0.00	5,169.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,500.0	0.00	0.00	5,269.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,600.0	0.00	0.00	5,369.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,700.0	0.00	0.00	5,469.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,800.0	0.00	0.00	5,569.9	-1,049.0	887.2	1,373.9	0.00	0.00	
5,900.0	0.00	0.00	5,669.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,000.0	0.00	0.00	5,769.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,100.0	0.00	0.00	5,869.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,200.0	0.00	0.00	5,969.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,300.0	0.00	0.00	6,069.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,400.0	0.00	0.00	6,169.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,412.1	0.00	0.00	6,182.0	-1,049.0	887.2	1,373.9	0.00	0.00	COAL RIDGE (Paludal)
6,500.0	0.00	0.00	6,269.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,600.0	0.00	0.00	6,369.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,700.0	0.00	0.00	6,469.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,784.1	0.00	0.00	6,554.0	-1,049.0	887.2	1,373.9	0.00	0.00	ROLLINS SS (Iles Fm)
6,800.0	0.00	0.00	6,569.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,900.0	0.00	0.00	6,669.9	-1,049.0	887.2	1,373.9	0.00	0.00	
6,934.1	0.00	0.00	6,704.0	-1,049.0	887.2	1,373.9	0.00	0.00	Drillers TD @ 6,934.1' MD
7,000.0	0.00	0.00	6,769.9	-1,049.0	887.2	1,373.9	0.00	0.00	
7,034.1	0.00	0.00	6,804.0	-1,049.0	887.2	1,373.9	0.00	0.00	Permit TD @ 7,034.1' MD

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									
Federal 29-11A ToG	0.00	0.00	4,736.0	-1,049.0	887.2	1,583,264.07	2,287,628.93	39.407670	-108.021520
- plan hits target center									
- Point									
Federal 29-11A BHL	0.00	0.00	6,704.0	-1,049.0	887.2	1,583,264.07	2,287,628.93	39.407670	-108.021520
- plan hits target center									
- Circle (radius 25.0)									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,054.0	1,028.7	Surface Casing	5.500	6.000

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TVD Reference: WELL @ 6058.0ft (Original Well Elev)
MD Reference: WELL @ 6058.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,662.7	3,472.0	Ohio Creek			
3,925.4	3,718.0	Mesaverde Fm			
4,628.3	4,399.0	WILLIAMS FORK FM			
4,966.1	4,736.0	TOP GAS			
6,412.1	6,182.0	COAL RIDGE (Paludal)			
6,784.1	6,554.0	ROLLINS SS (Iles Fm)			

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'
883.8	869.2	-92.5	78.2	EOB @ Inc. = 20.51°
3,940.5	3,732.1	-910.3	769.9	Start 2° Drop
4,966.1	4,736.0	-1,049.0	887.2	EOD @ Inc. = 0°
6,934.1	6,704.0	-1,049.0	887.2	Drillers TD @ 6,934.1' MD
7,034.1	6,804.0	-1,049.0	887.2	Permit TD @ 7,034.1' MD