

Cathedral Energy

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well Antelope 34-31
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	WELL @ 4562.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	WELL @ 4562.0ft (Original Well Elev)
Site:	Antelope S-31 Pad (was 31 I)	North Reference:	True
Well:	Antelope 34-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project	Weld County		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Antelope S-31 Pad (was 31 I)			
Site Position:		Northing:	1,373,356.87 ft	Latitude: 40.352670
From:	Lat/Long	Easting:	3,317,216.94 ft	Longitude: -104.361810
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: 0.74 °

Well	Antelope 34-31			
Well Position	+N/-S	0.0 ft	Northing:	1,373,335.00 ft
	+E/-W	0.0 ft	Easting:	3,317,217.22 ft
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft
			Ground Level:	4,552.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/8/2010	8.71	67.10	53,207

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	227.39

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	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,140.4	10.81	227.39	1,137.2	-34.4	-37.4	2.00	2.00	0.00	227.39	
5,505.4	10.81	227.39	5,424.8	-588.5	-639.9	0.00	0.00	0.00	0.00	
6,045.8	0.00	0.00	5,962.0	-622.9	-677.3	2.00	-2.00	0.00	180.00	Antelope 34-31 TGT
6,745.8	0.00	0.00	6,662.0	-622.9	-677.3	0.00	0.00	0.00	0.00	Antelope 34-31 PBHL

Cathedral Energy

Planning Report

Database: EDM 5000.1 US Multi Users DB
Company: Bonanza Creek Energy Operating Company, LLC
Project: Weld County
Site: Antelope S-31 Pad (was 31 I)
Well: Antelope 34-31
Wellbore: DD
Design: Plan #1

Local Co-ordinate Reference: Well Antelope 34-31
TVD Reference: WELL @ 4562.0ft (Original Well Elev)
MD Reference: WELL @ 4562.0ft (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	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	KOP @ 600'
700.0	2.00	227.39	700.0	-1.2	-1.3	1.7	2.00	2.00	
800.0	4.00	227.39	799.8	-4.7	-5.1	7.0	2.00	2.00	
900.0	6.00	227.39	899.5	-10.6	-11.6	15.7	2.00	2.00	
1,000.0	8.00	227.39	998.7	-18.9	-20.5	27.9	2.00	2.00	
1,100.0	10.00	227.39	1,097.5	-29.5	-32.0	43.5	2.00	2.00	
1,140.4	10.81	227.39	1,137.2	-34.4	-37.4	50.8	2.00	2.00	EOB @ Inc. = 10.81°
1,200.0	10.81	227.39	1,195.7	-42.0	-45.6	62.0	0.00	0.00	
1,300.0	10.81	227.39	1,294.0	-54.7	-59.4	80.7	0.00	0.00	
1,400.0	10.81	227.39	1,392.2	-67.4	-73.2	99.5	0.00	0.00	
1,500.0	10.81	227.39	1,490.4	-80.1	-87.0	118.3	0.00	0.00	
1,600.0	10.81	227.39	1,588.6	-92.7	-100.8	137.0	0.00	0.00	
1,700.0	10.81	227.39	1,686.9	-105.4	-114.6	155.8	0.00	0.00	
1,800.0	10.81	227.39	1,785.1	-118.1	-128.4	174.5	0.00	0.00	
1,900.0	10.81	227.39	1,883.3	-130.8	-142.2	193.3	0.00	0.00	
2,000.0	10.81	227.39	1,981.6	-143.5	-156.0	212.0	0.00	0.00	
2,100.0	10.81	227.39	2,079.8	-156.2	-169.8	230.8	0.00	0.00	
2,200.0	10.81	227.39	2,178.0	-168.9	-183.7	249.5	0.00	0.00	
2,300.0	10.81	227.39	2,276.2	-181.6	-197.5	268.3	0.00	0.00	
2,400.0	10.81	227.39	2,374.5	-194.3	-211.3	287.0	0.00	0.00	
2,500.0	10.81	227.39	2,472.7	-207.0	-225.1	305.8	0.00	0.00	
2,600.0	10.81	227.39	2,570.9	-219.7	-238.9	324.5	0.00	0.00	
2,700.0	10.81	227.39	2,669.1	-232.4	-252.7	343.3	0.00	0.00	
2,800.0	10.81	227.39	2,767.4	-245.1	-266.5	362.0	0.00	0.00	
2,900.0	10.81	227.39	2,865.6	-257.8	-280.3	380.8	0.00	0.00	
3,000.0	10.81	227.39	2,963.8	-270.5	-294.1	399.5	0.00	0.00	
3,100.0	10.81	227.39	3,062.0	-283.2	-307.9	418.3	0.00	0.00	
3,200.0	10.81	227.39	3,160.3	-295.9	-321.7	437.0	0.00	0.00	
3,300.0	10.81	227.39	3,258.5	-308.6	-335.5	455.8	0.00	0.00	
3,400.0	10.81	227.39	3,356.7	-321.2	-349.3	474.5	0.00	0.00	
3,500.0	10.81	227.39	3,454.9	-333.9	-363.1	493.3	0.00	0.00	
3,600.0	10.81	227.39	3,553.2	-346.6	-376.9	512.0	0.00	0.00	
3,700.0	10.81	227.39	3,651.4	-359.3	-390.7	530.8	0.00	0.00	
3,800.0	10.81	227.39	3,749.6	-372.0	-404.5	549.6	0.00	0.00	
3,900.0	10.81	227.39	3,847.8	-384.7	-418.3	568.3	0.00	0.00	
4,000.0	10.81	227.39	3,946.1	-397.4	-432.1	587.1	0.00	0.00	
4,100.0	10.81	227.39	4,044.3	-410.1	-445.9	605.8	0.00	0.00	
4,200.0	10.81	227.39	4,142.5	-422.8	-459.7	624.6	0.00	0.00	
4,300.0	10.81	227.39	4,240.8	-435.5	-473.5	643.3	0.00	0.00	
4,400.0	10.81	227.39	4,339.0	-448.2	-487.3	662.1	0.00	0.00	
4,500.0	10.81	227.39	4,437.2	-460.9	-501.1	680.8	0.00	0.00	
4,600.0	10.81	227.39	4,535.4	-473.6	-514.9	699.6	0.00	0.00	
4,700.0	10.81	227.39	4,633.7	-486.3	-528.7	718.3	0.00	0.00	
4,800.0	10.81	227.39	4,731.9	-499.0	-542.5	737.1	0.00	0.00	
4,900.0	10.81	227.39	4,830.1	-511.7	-556.3	755.8	0.00	0.00	
5,000.0	10.81	227.39	4,928.3	-524.4	-570.1	774.6	0.00	0.00	

Cathedral Energy

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well Antelope 34-31
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	WELL @ 4562.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	WELL @ 4562.0ft (Original Well Elev)
Site:	Antelope S-31 Pad (was 31 I)	North Reference:	True
Well:	Antelope 34-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

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
5,100.0	10.81	227.39	5,026.6	-537.1	-583.9	793.3	0.00	0.00	
5,200.0	10.81	227.39	5,124.8	-549.7	-597.7	812.1	0.00	0.00	
5,300.0	10.81	227.39	5,223.0	-562.4	-611.5	830.8	0.00	0.00	
5,400.0	10.81	227.39	5,321.2	-575.1	-625.3	849.6	0.00	0.00	
5,500.0	10.81	227.39	5,419.5	-587.8	-639.1	868.3	0.00	0.00	
5,505.4	10.81	227.39	5,424.8	-588.5	-639.9	869.4	0.00	0.00	Start Drop -2.00
5,600.0	8.92	227.39	5,518.0	-599.5	-651.8	885.6	2.00	-2.00	
5,700.0	6.92	227.39	5,617.0	-608.8	-661.9	899.3	2.00	-2.00	
5,800.0	4.92	227.39	5,716.5	-615.8	-669.5	909.6	2.00	-2.00	
5,900.0	2.92	227.39	5,816.2	-620.4	-674.5	916.5	2.00	-2.00	
6,000.0	0.92	227.39	5,916.2	-622.7	-677.0	919.8	2.00	-2.00	
6,045.8	0.00	0.00	5,962.0	-622.9	-677.3	920.2	2.00	-2.00	EOD; Target #1 - Antelope 34-31 TGT
6,100.0	0.00	0.00	6,016.2	-622.9	-677.3	920.2	0.00	0.00	
6,200.0	0.00	0.00	6,116.2	-622.9	-677.3	920.2	0.00	0.00	
6,245.8	0.00	0.00	6,162.0	-622.9	-677.3	920.2	0.00	0.00	Niobrara
6,300.0	0.00	0.00	6,216.2	-622.9	-677.3	920.2	0.00	0.00	
6,400.0	0.00	0.00	6,316.2	-622.9	-677.3	920.2	0.00	0.00	
6,500.0	0.00	0.00	6,416.2	-622.9	-677.3	920.2	0.00	0.00	
6,600.0	0.00	0.00	6,516.2	-622.9	-677.3	920.2	0.00	0.00	
6,700.0	0.00	0.00	6,616.2	-622.9	-677.3	920.2	0.00	0.00	
6,745.8	0.00	0.00	6,662.0	-622.9	-677.3	920.2	0.00	0.00	Antelope 34-31 PBHL

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Antelope 34-31 PBHL - hit/miss target - Shape	0.00	0.00	6,662.0	-622.9	-677.3	1,372,703.43	3,316,548.00	40.350900	-104.364240
Antelope 34-31 TGT - plan hits target center - Circle (radius 50.0)	0.00	0.00	5,962.0	-622.9	-677.3	1,372,703.43	3,316,548.00	40.350900	-104.364240

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,245.8	6,162.0	Niobrara		0.00		

Cathedral Energy

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well Antelope 34-31
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	WELL @ 4562.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	WELL @ 4562.0ft (Original Well Elev)
Site:	Antelope S-31 Pad (was 31 I)	North Reference:	True
Well:	Antelope 34-31	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
600.0	600.0	0.0	0.0	KOP @ 600'
1,140.4	1,137.2	-34.4	-37.4	EOB @ Inc. = 10.81°
5,505.4	5,424.8	-588.5	-639.9	Start Drop -2.00
6,045.8	5,962.0	-622.9	-677.3	EOD; Target #1
6,745.8	6,662.0	-622.9	-677.3	TD at 6745.8