

Cathedral Energy

Planning Report

Database:	EDM 5000.1 US Multi Users DB	Local Co-ordinate Reference:	Well Antelope 33-31
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	WELL @ 4566.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	WELL @ 4566.0ft (Original Well Elev)
Site:	Antelope S-31 Pad (was 31 I)	North Reference:	True
Well:	Antelope 33-31	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 33-31			
Well Position	+N/-S	0.0 ft	Northing:	1,373,396.93 ft
	+E/-W	0.0 ft	Easting:	3,317,216.42 ft
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft
			Ground Level:	4,556.0 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	314.56

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	
1,129.2	10.58	314.56	1,126.2	34.2	-34.7	2.00	2.00	0.00	314.56	
5,517.5	10.58	314.56	5,439.8	599.7	-609.1	0.00	0.00	0.00	0.00	
6,046.7	0.00	0.00	5,966.0	633.9	-643.8	2.00	-2.00	0.00	180.00	Antelope 33-31 TGT
6,746.7	0.00	0.00	6,666.0	633.9	-643.8	0.00	0.00	0.00	0.00	Antelope 33-31 PBHL

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Local Co-ordinate Reference: Well Antelope 33-31
TVD Reference: WELL @ 4566.0ft (Original Well Elev)
MD Reference: WELL @ 4566.0ft (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	314.56	700.0	1.2	-1.2	1.7	2.00	2.00	
800.0	4.00	314.56	799.8	4.9	-5.0	7.0	2.00	2.00	
900.0	6.00	314.56	899.5	11.0	-11.2	15.7	2.00	2.00	
1,000.0	8.00	314.56	998.7	19.6	-19.9	27.9	2.00	2.00	
1,100.0	10.00	314.56	1,097.5	30.5	-31.0	43.5	2.00	2.00	
1,129.2	10.58	314.56	1,126.2	34.2	-34.7	48.7	2.00	2.00	EOB @ Inc. = 10.58°
1,200.0	10.58	314.56	1,195.8	43.3	-44.0	61.7	0.00	0.00	
1,300.0	10.58	314.56	1,294.1	56.2	-57.1	80.1	0.00	0.00	
1,400.0	10.58	314.56	1,392.4	69.1	-70.2	98.5	0.00	0.00	
1,500.0	10.58	314.56	1,490.7	82.0	-83.3	116.8	0.00	0.00	
1,600.0	10.58	314.56	1,589.0	94.9	-96.3	135.2	0.00	0.00	
1,700.0	10.58	314.56	1,687.3	107.8	-109.4	153.6	0.00	0.00	
1,800.0	10.58	314.56	1,785.6	120.6	-122.5	171.9	0.00	0.00	
1,900.0	10.58	314.56	1,883.9	133.5	-135.6	190.3	0.00	0.00	
2,000.0	10.58	314.56	1,982.2	146.4	-148.7	208.7	0.00	0.00	
2,100.0	10.58	314.56	2,080.5	159.3	-161.8	227.0	0.00	0.00	
2,200.0	10.58	314.56	2,178.8	172.2	-174.9	245.4	0.00	0.00	
2,300.0	10.58	314.56	2,277.1	185.1	-188.0	263.8	0.00	0.00	
2,400.0	10.58	314.56	2,375.4	198.0	-201.1	282.2	0.00	0.00	
2,500.0	10.58	314.56	2,473.7	210.8	-214.1	300.5	0.00	0.00	
2,600.0	10.58	314.56	2,572.0	223.7	-227.2	318.9	0.00	0.00	
2,700.0	10.58	314.56	2,670.3	236.6	-240.3	337.3	0.00	0.00	
2,800.0	10.58	314.56	2,768.6	249.5	-253.4	355.6	0.00	0.00	
2,900.0	10.58	314.56	2,866.9	262.4	-266.5	374.0	0.00	0.00	
3,000.0	10.58	314.56	2,965.2	275.3	-279.6	392.4	0.00	0.00	
3,100.0	10.58	314.56	3,063.5	288.2	-292.7	410.7	0.00	0.00	
3,200.0	10.58	314.56	3,161.8	301.1	-305.8	429.1	0.00	0.00	
3,300.0	10.58	314.56	3,260.1	313.9	-318.8	447.5	0.00	0.00	
3,400.0	10.58	314.56	3,358.4	326.8	-331.9	465.8	0.00	0.00	
3,500.0	10.58	314.56	3,456.7	339.7	-345.0	484.2	0.00	0.00	
3,600.0	10.58	314.56	3,555.0	352.6	-358.1	502.6	0.00	0.00	
3,700.0	10.58	314.56	3,653.3	365.5	-371.2	520.9	0.00	0.00	
3,800.0	10.58	314.56	3,751.6	378.4	-384.3	539.3	0.00	0.00	
3,900.0	10.58	314.56	3,849.9	391.3	-397.4	557.7	0.00	0.00	
4,000.0	10.58	314.56	3,948.2	404.1	-410.5	576.0	0.00	0.00	
4,100.0	10.58	314.56	4,046.5	417.0	-423.5	594.4	0.00	0.00	
4,200.0	10.58	314.56	4,144.8	429.9	-436.6	612.8	0.00	0.00	
4,300.0	10.58	314.56	4,243.1	442.8	-449.7	631.1	0.00	0.00	
4,400.0	10.58	314.56	4,341.4	455.7	-462.8	649.5	0.00	0.00	
4,500.0	10.58	314.56	4,439.6	468.6	-475.9	667.9	0.00	0.00	
4,600.0	10.58	314.56	4,537.9	481.5	-489.0	686.2	0.00	0.00	
4,700.0	10.58	314.56	4,636.2	494.3	-502.1	704.6	0.00	0.00	
4,800.0	10.58	314.56	4,734.5	507.2	-515.2	723.0	0.00	0.00	
4,900.0	10.58	314.56	4,832.8	520.1	-528.2	741.3	0.00	0.00	
5,000.0	10.58	314.56	4,931.1	533.0	-541.3	759.7	0.00	0.00	

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Project:	Weld County	MD Reference:	WELL @ 4566.0ft (Original Well Elev)
Site:	Antelope S-31 Pad (was 31 I)	North Reference:	True
Well:	Antelope 33-31	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	10.58	314.56	5,029.4	545.9	-554.4	778.1	0.00	0.00	
5,200.0	10.58	314.56	5,127.7	558.8	-567.5	796.4	0.00	0.00	
5,300.0	10.58	314.56	5,226.0	571.7	-580.6	814.8	0.00	0.00	
5,400.0	10.58	314.56	5,324.3	584.6	-593.7	833.2	0.00	0.00	
5,500.0	10.58	314.56	5,422.6	597.4	-606.8	851.5	0.00	0.00	
5,517.5	10.58	314.56	5,439.8	599.7	-609.1	854.7	0.00	0.00	Start Drop -2.00
5,600.0	8.93	314.56	5,521.1	609.5	-619.0	868.7	2.00	-2.00	
5,700.0	6.93	314.56	5,620.2	619.2	-628.9	882.5	2.00	-2.00	
5,800.0	4.93	314.56	5,719.6	626.4	-636.2	892.9	2.00	-2.00	
5,900.0	2.93	314.56	5,819.4	631.3	-641.1	899.7	2.00	-2.00	
6,000.0	0.93	314.56	5,919.3	633.6	-643.5	903.1	2.00	-2.00	
6,046.7	0.00	0.00	5,966.0	633.9	-643.8	903.5	2.00	-2.00	EOD; Target #1 - Antelope 33-31 TGT
6,100.0	0.00	0.00	6,019.3	633.9	-643.8	903.5	0.00	0.00	
6,200.0	0.00	0.00	6,119.3	633.9	-643.8	903.5	0.00	0.00	
6,246.7	0.00	0.00	6,166.0	633.9	-643.8	903.5	0.00	0.00	Niobrara
6,300.0	0.00	0.00	6,219.3	633.9	-643.8	903.5	0.00	0.00	
6,400.0	0.00	0.00	6,319.3	633.9	-643.8	903.5	0.00	0.00	
6,500.0	0.00	0.00	6,419.3	633.9	-643.8	903.5	0.00	0.00	
6,600.0	0.00	0.00	6,519.3	633.9	-643.8	903.5	0.00	0.00	
6,700.0	0.00	0.00	6,619.3	633.9	-643.8	903.5	0.00	0.00	
6,746.7	0.00	0.00	6,666.0	633.9	-643.8	903.5	0.00	0.00	TD at 6746.7 - Antelope 33-31 PBHL

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									
Antelope 33-31 PBHL	0.00	0.00	6,666.0	633.9	-643.8	1,374,022.50	3,316,564.55	40.354520	-104.364120
- plan hits target center									
- Circle (radius 50.0)									
Antelope 33-31 TGT	0.00	0.00	5,966.0	633.9	-643.8	1,374,022.50	3,316,564.55	40.354520	-104.364120
- plan hits target center									
- Point									

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,246.7	6,166.0	Niobrara		0.00		

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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'
1,129.2	1,126.2	34.2	-34.7	EOB @ Inc. = 10.58°
5,517.5	5,439.8	599.7	-609.1	Start Drop -2.00
6,046.7	5,966.0	633.9	-643.8	EOD; Target #1
6,746.7	6,666.0	633.9	-643.8	TD at 6746.7