

# Cathedral Energy

## Planning Report

<b>Database:</b>	EDM 5000.1 US Multi Users DB	<b>Local Co-ordinate Reference:</b>	Site Antelope I-31 Pad (was 31 C)
<b>Company:</b>	Bonanza Creek Energy Operating Company, LLC	<b>TVD Reference:</b>	WELL @ 4552.0ft (Original Well Elev)
<b>Project:</b>	Weld County	<b>MD Reference:</b>	WELL @ 4552.0ft (Original Well Elev)
<b>Site:</b>	Antelope I-31 Pad (was 31 C)	<b>North Reference:</b>	True
<b>Well:</b>	Antelope 23-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

<b>Project</b>	Weld County		
<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 Northern Zone		

<b>Site</b>	Antelope I-31 Pad (was 31 C)			
<b>Site Position:</b>		<b>Northing:</b>	1,373,335.76 ft	<b>Latitude:</b> 40.352700
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,314,711.44 ft	<b>Longitude:</b> -104.370800
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> 0.73 °

<b>Well</b>	Antelope 23-31			
<b>Well Position</b>	<b>+N/-S</b>	61.9 ft	<b>Northing:</b>	1,373,397.68 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	3,314,710.65 ft
<b>Position Uncertainty</b>	0.0 ft		<b>Wellhead Elevation:</b>	ft
			<b>Ground Level:</b>	4,542.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/8/2010	8.72	67.10	53,206

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<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	61.9	0.0	49.45

<b>Plan Sections</b>										
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	61.9	0.0	0.00	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	61.9	0.0	0.00	0.00	0.00	0.00	
1,130.1	10.60	49.45	1,127.1	93.7	37.2	2.00	2.00	0.00	49.45	
5,502.6	10.60	49.45	5,424.9	616.7	648.4	0.00	0.00	0.00	0.00	
6,032.7	0.00	0.00	5,952.0	648.5	685.6	2.00	-2.00	0.00	180.00	Antelope 23-31 TGT
6,732.7	0.00	0.00	6,652.0	648.5	685.6	0.00	0.00	0.00	0.00	Antelope 23-31 PBHL

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<b>Site:</b>	Antelope I-31 Pad (was 31 C)	<b>North Reference:</b>	True
<b>Well:</b>	Antelope 23-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	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
0.0	0.00	0.00	0.0	61.9	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	61.9	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	61.9	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	61.9	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	61.9	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	61.9	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	61.9	0.0	0.0	0.00	0.00	KOP @ 600'
700.0	2.00	49.45	700.0	63.1	1.3	1.7	2.00	2.00	
800.0	4.00	49.45	799.8	66.5	5.3	7.0	2.00	2.00	
900.0	6.00	49.45	899.5	72.1	11.9	15.7	2.00	2.00	
1,000.0	8.00	49.45	998.7	80.0	21.2	27.9	2.00	2.00	
1,100.0	10.00	49.45	1,097.5	90.2	33.1	43.5	2.00	2.00	
1,130.1	10.60	49.45	1,127.1	93.7	37.2	48.9	2.00	2.00	EOB @ Inc. = 10.6°
1,200.0	10.60	49.45	1,195.8	102.1	46.9	61.8	0.00	0.00	
1,300.0	10.60	49.45	1,294.1	114.0	60.9	80.2	0.00	0.00	
1,400.0	10.60	49.45	1,392.4	126.0	74.9	98.6	0.00	0.00	
1,500.0	10.60	49.45	1,490.7	138.0	88.9	117.0	0.00	0.00	
1,600.0	10.60	49.45	1,589.0	149.9	102.9	135.4	0.00	0.00	
1,700.0	10.60	49.45	1,687.3	161.9	116.8	153.8	0.00	0.00	
1,800.0	10.60	49.45	1,785.5	173.8	130.8	172.2	0.00	0.00	
1,900.0	10.60	49.45	1,883.8	185.8	144.8	190.5	0.00	0.00	
2,000.0	10.60	49.45	1,982.1	197.8	158.8	208.9	0.00	0.00	
2,100.0	10.60	49.45	2,080.4	209.7	172.8	227.3	0.00	0.00	
2,200.0	10.60	49.45	2,178.7	221.7	186.7	245.7	0.00	0.00	
2,300.0	10.60	49.45	2,277.0	233.6	200.7	264.1	0.00	0.00	
2,400.0	10.60	49.45	2,375.3	245.6	214.7	282.5	0.00	0.00	
2,500.0	10.60	49.45	2,473.6	257.6	228.7	300.9	0.00	0.00	
2,600.0	10.60	49.45	2,571.9	269.5	242.7	319.3	0.00	0.00	
2,700.0	10.60	49.45	2,670.2	281.5	256.6	337.7	0.00	0.00	
2,800.0	10.60	49.45	2,768.5	293.4	270.6	356.1	0.00	0.00	
2,900.0	10.60	49.45	2,866.8	305.4	284.6	374.5	0.00	0.00	
3,000.0	10.60	49.45	2,965.1	317.4	298.6	392.9	0.00	0.00	
3,100.0	10.60	49.45	3,063.4	329.3	312.6	411.3	0.00	0.00	
3,200.0	10.60	49.45	3,161.6	341.3	326.5	429.7	0.00	0.00	
3,300.0	10.60	49.45	3,259.9	353.2	340.5	448.1	0.00	0.00	
3,400.0	10.60	49.45	3,358.2	365.2	354.5	466.5	0.00	0.00	
3,500.0	10.60	49.45	3,456.5	377.2	368.5	484.9	0.00	0.00	
3,600.0	10.60	49.45	3,554.8	389.1	382.5	503.3	0.00	0.00	
3,700.0	10.60	49.45	3,653.1	401.1	396.4	521.7	0.00	0.00	
3,800.0	10.60	49.45	3,751.4	413.0	410.4	540.1	0.00	0.00	
3,900.0	10.60	49.45	3,849.7	425.0	424.4	558.5	0.00	0.00	
4,000.0	10.60	49.45	3,948.0	437.0	438.4	576.9	0.00	0.00	
4,100.0	10.60	49.45	4,046.3	448.9	452.4	595.3	0.00	0.00	
4,200.0	10.60	49.45	4,144.6	460.9	466.3	613.7	0.00	0.00	
4,300.0	10.60	49.45	4,242.9	472.8	480.3	632.1	0.00	0.00	
4,400.0	10.60	49.45	4,341.2	484.8	494.3	650.5	0.00	0.00	
4,500.0	10.60	49.45	4,439.5	496.8	508.3	668.9	0.00	0.00	
4,600.0	10.60	49.45	4,537.7	508.7	522.3	687.3	0.00	0.00	
4,700.0	10.60	49.45	4,636.0	520.7	536.2	705.7	0.00	0.00	
4,800.0	10.60	49.45	4,734.3	532.6	550.2	724.1	0.00	0.00	
4,900.0	10.60	49.45	4,832.6	544.6	564.2	742.5	0.00	0.00	
5,000.0	10.60	49.45	4,930.9	556.6	578.2	760.9	0.00	0.00	

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<b>Project:</b>	Weld County	<b>MD Reference:</b>	WELL @ 4552.0ft (Original Well Elev)
<b>Site:</b>	Antelope I-31 Pad (was 31 C)	<b>North Reference:</b>	True
<b>Well:</b>	Antelope 23-31	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	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	10.60	49.45	5,029.2	568.5	592.2	779.3	0.00	0.00	
5,200.0	10.60	49.45	5,127.5	580.5	606.1	797.7	0.00	0.00	
5,300.0	10.60	49.45	5,225.8	592.4	620.1	816.1	0.00	0.00	
5,400.0	10.60	49.45	5,324.1	604.4	634.1	834.5	0.00	0.00	
5,500.0	10.60	49.45	5,422.4	616.4	648.1	852.9	0.00	0.00	
5,502.6	10.60	49.45	5,424.9	616.7	648.4	853.3	0.00	0.00	Start Drop -2.00
5,600.0	8.65	49.45	5,521.0	627.3	660.8	869.6	2.00	-2.00	
5,700.0	6.65	49.45	5,620.1	635.9	670.9	883.0	2.00	-2.00	
5,800.0	4.65	49.45	5,719.6	642.3	678.4	892.8	2.00	-2.00	
5,900.0	2.65	49.45	5,819.4	646.5	683.3	899.2	2.00	-2.00	
6,000.0	0.65	49.45	5,919.3	648.3	685.5	902.1	2.00	-2.00	
6,032.7	0.00	0.00	5,952.0	648.5	685.6	902.3	2.00	-2.00	EOD; Target #1 - Antelope 23-31 TGT
6,100.0	0.00	0.00	6,019.3	648.5	685.6	902.3	0.00	0.00	
6,200.0	0.00	0.00	6,119.3	648.5	685.6	902.3	0.00	0.00	
6,232.7	0.00	0.00	6,152.0	648.5	685.6	902.3	0.00	0.00	Niobrara
6,300.0	0.00	0.00	6,219.3	648.5	685.6	902.3	0.00	0.00	
6,400.0	0.00	0.00	6,319.3	648.5	685.6	902.3	0.00	0.00	
6,500.0	0.00	0.00	6,419.3	648.5	685.6	902.3	0.00	0.00	
6,600.0	0.00	0.00	6,519.3	648.5	685.6	902.3	0.00	0.00	
6,700.0	0.00	0.00	6,619.3	648.5	685.6	902.3	0.00	0.00	
6,732.7	0.00	0.00	6,652.0	648.5	685.6	902.3	0.00	0.00	TD at 6732.7 - Antelope 23-31 PBHL

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Antelope 23-31 TGT - hit/miss target - Shape	0.00	0.00	5,952.0	648.5	685.6	1,373,992.89	3,315,388.73	40.354480	-104.368340
Antelope 23-31 PBHL - plan hits target center - Circle (radius 50.0)	0.00	0.00	6,652.0	648.5	685.6	1,373,992.89	3,315,388.73	40.354480	-104.368340

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,232.7	6,152.0	Niobrara		0.00		

# Cathedral Energy

## Planning Report

**Database:** EDM 5000.1 US Multi Users DB  
**Company:** Bonanza Creek Energy Operating Company, LLC  
**Project:** Weld County  
**Site:** Antelope I-31 Pad (was 31 C)  
**Well:** Antelope 23-31  
**Wellbore:** DD  
**Design:** Plan #1

**Local Co-ordinate Reference:** Site Antelope I-31 Pad (was 31 C)  
**TVD Reference:** WELL @ 4552.0ft (Original Well Elev)  
**MD Reference:** WELL @ 4552.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
600.0	600.0	61.9	0.0	KOP @ 600'
1,130.1	1,127.1	93.7	37.2	EOB @ Inc. = 10.6°
5,502.6	5,424.9	616.7	648.4	Start Drop -2.00
6,032.7	5,952.0	648.5	685.6	EOD; Target #1
6,732.7	6,652.0	648.5	685.6	TD at 6732.7