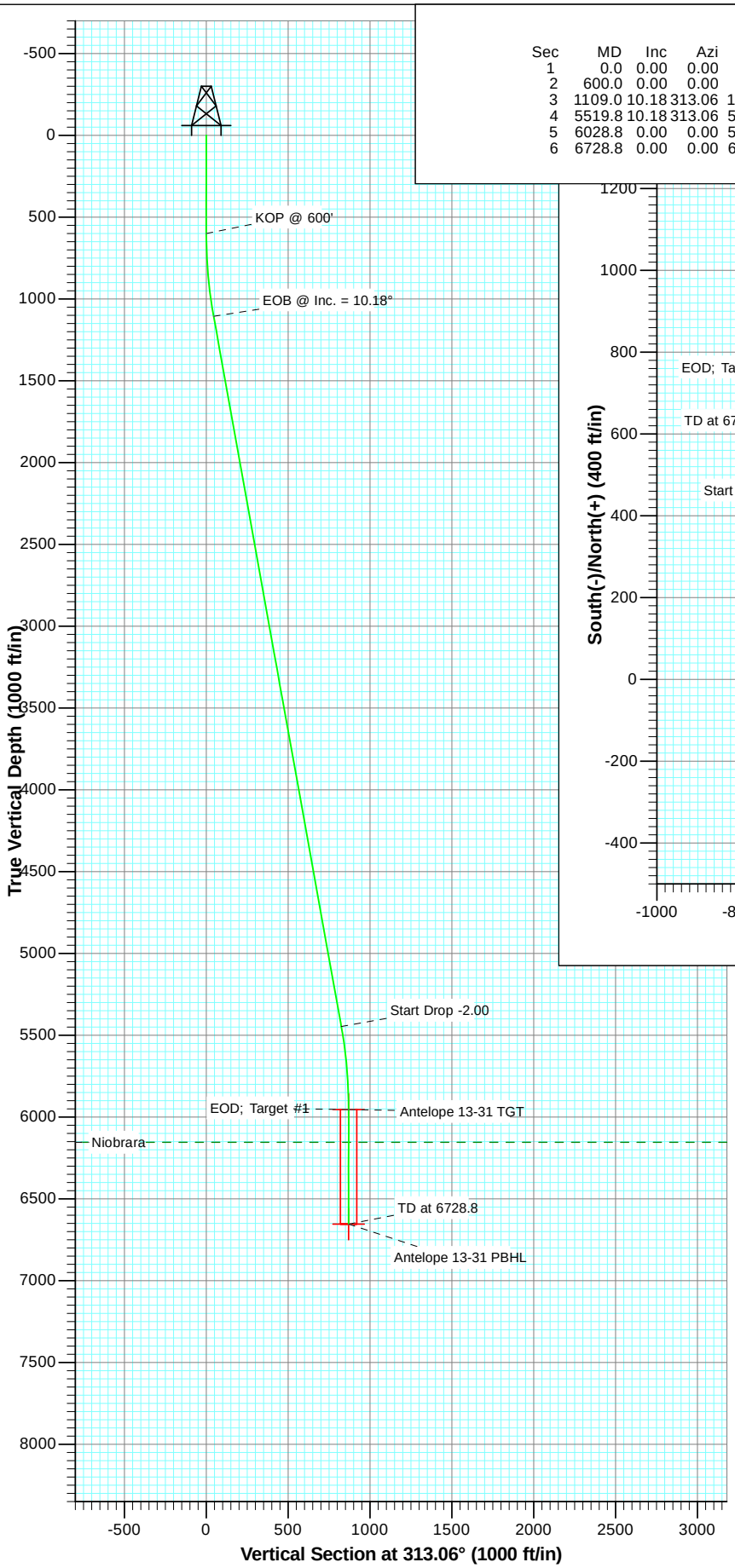
BONANZA CREEK ENERGY COMPANY

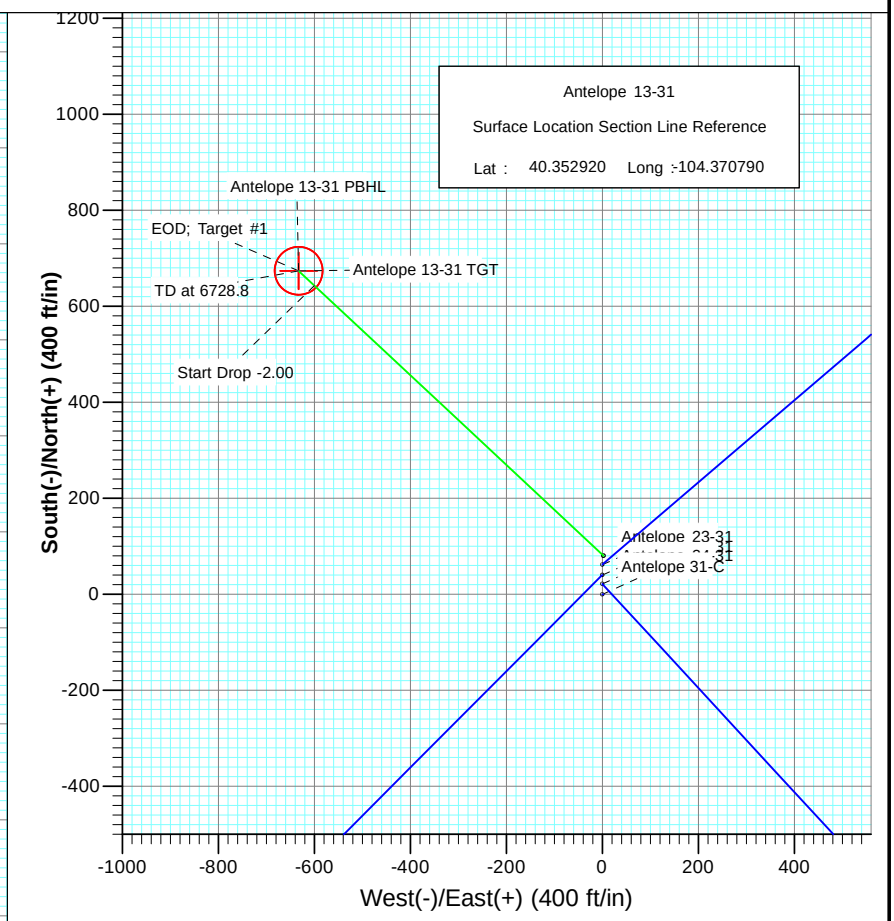
Project: Weld County
Site: Antelope I-31 Pad (was 31 C)
Well: Antelope 13-31
Wellbore: DD
Plan: Plan #1

CATHEDRAL

SECTION DETAILS

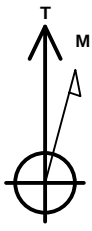
| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 80.1 | 2.8 | 0.00 | 0.00 | 0.0 | |
| 2 | 600.0 | 0.00 | 0.00 | 600.0 | 80.1 | 2.8 | 0.00 | 0.00 | 0.0 | |
| 3 | 1109.0 | 10.18 | 313.06 | 1106.3 | 110.9 | -30.2 | 2.00 | 313.06 | 45.1 | |
| 4 | 5519.8 | 10.18 | 313.06 | 5447.7 | 643.2 | -599.7 | 0.00 | 0.00 | 824.6 | |
| 5 | 6028.8 | 0.00 | 0.00 | 5954.0 | 674.0 | -632.6 | 2.00 | 180.00 | 869.7 | Antelope 13-31 TGT |
| 6 | 6728.8 | 0.00 | 0.00 | 6654.0 | 674.0 | -632.6 | 0.00 | 0.00 | 869.7 | Antelope 13-31 PBHL |




FORMATION TOP DETAILS

| TVDPath | MDPath | Formation |
|---|---|---|
| 6154.0 | 6228.8 | Niobrara |




Azimuths to True North
Magnetic North: 8.72°

Magnetic Field
Strength: 53206.1snT
Dip Angle: 67.10°
Date: 12/8/2010
Model: IGRF2010

Plan #1
Antelope 13-31

WELL @ 4554.0ft (Original Well Elev)
North American Datum 1983
Site Antelope I-31 Pad (was 31 C), True North

| Type | Target | Azimuth | Origin Type | N/S | E/W | From TVD |
|---|---|---|---|---|---|---|
| TD | No Target (Freehand) | 313.06 | Slot | 80.1 | 2.8 | 0.0 |

| Name | TVD | +N/-S | +E/-W | Latitude | Longitude |
|---|---|---|---|---|---|
| Antelope 13-31 TGT | 5954.0 | 674.0 | -632.6 | 40.354550 | -104.373070 |
| Antelope 13-31 PBHL | 6654.0 | 674.0 | -632.6 | 40.354550 | -104.373070 |

# Cathedral Energy

## Planning Report

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 US Multi Users DB | **Local Co-ordinate Reference:** | Site Antelope I-31 Pad (was 31 C) |
| **Company:** | Bonanza Creek Energy Operating Company, LLC | **TVD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Project:** | Weld County | **MD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Site:** | Antelope I-31 Pad (was 31 C) | **North Reference:** | True |
| **Well:** | Antelope 13-31 | **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 I-31 Pad (was 31 C)

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,373,335.76 ft | **Latitude:** | 40.352700 |
| **From:** | Lat/Long | **Easting:** | 3,314,711.44 ft | **Longitude:** | -104.370800 |
| **Position Uncertainty:** | 0.0 ft | **Slot Radius:** | 13.200 in | **Grid Convergence:** | 0.73 ° |

**Well** Antelope 13-31

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 80.1 ft | **Northing:** | 1,373,415.93 ft | **Latitude:** | 40.352920 |
| | **+E/-W** | 2.8 ft | **Easting:** | 3,314,713.21 ft | **Longitude:** | -104.370790 |
| **Position Uncertainty** | | 0.0 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 4,544.0 ft |

**Wellbore** DD

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 12/8/2010 | 8.72 | 67.10 | 53,206 |

**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 | 80.1 | 2.8 | 313.06 |

**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 | 80.1 | 2.8 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 600.0 | 0.00 | 0.00 | 600.0 | 80.1 | 2.8 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,109.0 | 10.18 | 313.06 | 1,106.3 | 110.9 | -30.2 | 2.00 | 2.00 | 0.00 | 313.06 | |
| 5,519.8 | 10.18 | 313.06 | 5,447.7 | 643.2 | -599.7 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6,028.8 | 0.00 | 0.00 | 5,954.0 | 674.0 | -632.6 | 2.00 | -2.00 | 0.00 | 180.00 | Antelope 13-31 TGT |
| 6,728.8 | 0.00 | 0.00 | 6,654.0 | 674.0 | -632.6 | 0.00 | 0.00 | 0.00 | 0.00 | Antelope 13-31 PBHL |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 US Multi Users DB | **Local Co-ordinate Reference:** | Site Antelope I-31 Pad (was 31 C) |
| **Company:** | Bonanza Creek Energy Operating Company, LLC | **TVD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Project:** | Weld County | **MD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Site:** | Antelope I-31 Pad (was 31 C) | **North Reference:** | True |
| **Well:** | Antelope 13-31 | **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 |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 80.1 | 2.8 | 0.0 | 0.00 | 0.00 | |
| 100.0 | 0.00 | 0.00 | 100.0 | 80.1 | 2.8 | 0.0 | 0.00 | 0.00 | |
| 200.0 | 0.00 | 0.00 | 200.0 | 80.1 | 2.8 | 0.0 | 0.00 | 0.00 | |
| 300.0 | 0.00 | 0.00 | 300.0 | 80.1 | 2.8 | 0.0 | 0.00 | 0.00 | |
| 400.0 | 0.00 | 0.00 | 400.0 | 80.1 | 2.8 | 0.0 | 0.00 | 0.00 | |
| 500.0 | 0.00 | 0.00 | 500.0 | 80.1 | 2.8 | 0.0 | 0.00 | 0.00 | |
| 600.0 | 0.00 | 0.00 | 600.0 | 80.1 | 2.8 | 0.0 | 0.00 | 0.00 | KOP @ 600' |
| 700.0 | 2.00 | 313.06 | 700.0 | 81.3 | 1.5 | 1.7 | 2.00 | 2.00 | |
| 800.0 | 4.00 | 313.06 | 799.8 | 84.9 | -2.3 | 7.0 | 2.00 | 2.00 | |
| 900.0 | 6.00 | 313.06 | 899.5 | 90.9 | -8.7 | 15.7 | 2.00 | 2.00 | |
| 1,000.0 | 8.00 | 313.06 | 998.7 | 99.2 | -17.6 | 27.9 | 2.00 | 2.00 | |
| 1,100.0 | 10.00 | 313.06 | 1,097.5 | 109.9 | -29.0 | 43.5 | 2.00 | 2.00 | |
| 1,109.0 | 10.18 | 313.06 | 1,106.3 | 110.9 | -30.2 | 45.1 | 2.00 | 2.00 | EOB @ Inc. = 10.18° |
| 1,200.0 | 10.18 | 313.06 | 1,195.9 | 121.9 | -41.9 | 61.2 | 0.00 | 0.00 | |
| 1,300.0 | 10.18 | 313.06 | 1,294.3 | 134.0 | -54.8 | 78.9 | 0.00 | 0.00 | |
| 1,400.0 | 10.18 | 313.06 | 1,392.7 | 146.0 | -67.7 | 96.5 | 0.00 | 0.00 | |
| 1,500.0 | 10.18 | 313.06 | 1,491.2 | 158.1 | -80.7 | 114.2 | 0.00 | 0.00 | |
| 1,600.0 | 10.18 | 313.06 | 1,589.6 | 170.2 | -93.6 | 131.9 | 0.00 | 0.00 | |
| 1,700.0 | 10.18 | 313.06 | 1,688.0 | 182.2 | -106.5 | 149.5 | 0.00 | 0.00 | |
| 1,800.0 | 10.18 | 313.06 | 1,786.4 | 194.3 | -119.4 | 167.2 | 0.00 | 0.00 | |
| 1,900.0 | 10.18 | 313.06 | 1,884.9 | 206.4 | -132.3 | 184.9 | 0.00 | 0.00 | |
| 2,000.0 | 10.18 | 313.06 | 1,983.3 | 218.4 | -145.2 | 202.6 | 0.00 | 0.00 | |
| 2,100.0 | 10.18 | 313.06 | 2,081.7 | 230.5 | -158.1 | 220.2 | 0.00 | 0.00 | |
| 2,200.0 | 10.18 | 313.06 | 2,180.2 | 242.6 | -171.0 | 237.9 | 0.00 | 0.00 | |
| 2,300.0 | 10.18 | 313.06 | 2,278.6 | 254.6 | -183.9 | 255.6 | 0.00 | 0.00 | |
| 2,400.0 | 10.18 | 313.06 | 2,377.0 | 266.7 | -196.9 | 273.3 | 0.00 | 0.00 | |
| 2,500.0 | 10.18 | 313.06 | 2,475.4 | 278.8 | -209.8 | 290.9 | 0.00 | 0.00 | |
| 2,600.0 | 10.18 | 313.06 | 2,573.9 | 290.8 | -222.7 | 308.6 | 0.00 | 0.00 | |
| 2,700.0 | 10.18 | 313.06 | 2,672.3 | 302.9 | -235.6 | 326.3 | 0.00 | 0.00 | |
| 2,800.0 | 10.18 | 313.06 | 2,770.7 | 315.0 | -248.5 | 343.9 | 0.00 | 0.00 | |
| 2,900.0 | 10.18 | 313.06 | 2,869.1 | 327.0 | -261.4 | 361.6 | 0.00 | 0.00 | |
| 3,000.0 | 10.18 | 313.06 | 2,967.6 | 339.1 | -274.3 | 379.3 | 0.00 | 0.00 | |
| 3,100.0 | 10.18 | 313.06 | 3,066.0 | 351.2 | -287.2 | 397.0 | 0.00 | 0.00 | |
| 3,200.0 | 10.18 | 313.06 | 3,164.4 | 363.2 | -300.2 | 414.6 | 0.00 | 0.00 | |
| 3,300.0 | 10.18 | 313.06 | 3,262.8 | 375.3 | -313.1 | 432.3 | 0.00 | 0.00 | |
| 3,400.0 | 10.18 | 313.06 | 3,361.3 | 387.4 | -326.0 | 450.0 | 0.00 | 0.00 | |
| 3,500.0 | 10.18 | 313.06 | 3,459.7 | 399.4 | -338.9 | 467.7 | 0.00 | 0.00 | |
| 3,600.0 | 10.18 | 313.06 | 3,558.1 | 411.5 | -351.8 | 485.3 | 0.00 | 0.00 | |
| 3,700.0 | 10.18 | 313.06 | 3,656.5 | 423.6 | -364.7 | 503.0 | 0.00 | 0.00 | |
| 3,800.0 | 10.18 | 313.06 | 3,755.0 | 435.6 | -377.6 | 520.7 | 0.00 | 0.00 | |
| 3,900.0 | 10.18 | 313.06 | 3,853.4 | 447.7 | -390.5 | 538.3 | 0.00 | 0.00 | |
| 4,000.0 | 10.18 | 313.06 | 3,951.8 | 459.8 | -403.5 | 556.0 | 0.00 | 0.00 | |
| 4,100.0 | 10.18 | 313.06 | 4,050.2 | 471.8 | -416.4 | 573.7 | 0.00 | 0.00 | |
| 4,200.0 | 10.18 | 313.06 | 4,148.7 | 483.9 | -429.3 | 591.4 | 0.00 | 0.00 | |
| 4,300.0 | 10.18 | 313.06 | 4,247.1 | 496.0 | -442.2 | 609.0 | 0.00 | 0.00 | |
| 4,400.0 | 10.18 | 313.06 | 4,345.5 | 508.0 | -455.1 | 626.7 | 0.00 | 0.00 | |
| 4,500.0 | 10.18 | 313.06 | 4,444.0 | 520.1 | -468.0 | 644.4 | 0.00 | 0.00 | |
| 4,600.0 | 10.18 | 313.06 | 4,542.4 | 532.2 | -480.9 | 662.1 | 0.00 | 0.00 | |
| 4,700.0 | 10.18 | 313.06 | 4,640.8 | 544.2 | -493.8 | 679.7 | 0.00 | 0.00 | |
| 4,800.0 | 10.18 | 313.06 | 4,739.2 | 556.3 | -506.8 | 697.4 | 0.00 | 0.00 | |
| 4,900.0 | 10.18 | 313.06 | 4,837.7 | 568.4 | -519.7 | 715.1 | 0.00 | 0.00 | |
| 5,000.0 | 10.18 | 313.06 | 4,936.1 | 580.4 | -532.6 | 732.7 | 0.00 | 0.00 | |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 US Multi Users DB | **Local Co-ordinate Reference:** | Site Antelope I-31 Pad (was 31 C) |
| **Company:** | Bonanza Creek Energy Operating Company, LLC | **TVD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Project:** | Weld County | **MD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Site:** | Antelope I-31 Pad (was 31 C) | **North Reference:** | True |
| **Well:** | Antelope 13-31 | **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 | 10.18 | 313.06 | 5,034.5 | 592.5 | -545.5 | 750.4 | 0.00 | 0.00 | |
| 5,200.0 | 10.18 | 313.06 | 5,132.9 | 604.6 | -558.4 | 768.1 | 0.00 | 0.00 | |
| 5,300.0 | 10.18 | 313.06 | 5,231.4 | 616.6 | -571.3 | 785.8 | 0.00 | 0.00 | |
| 5,400.0 | 10.18 | 313.06 | 5,329.8 | 628.7 | -584.2 | 803.4 | 0.00 | 0.00 | |
| 5,500.0 | 10.18 | 313.06 | 5,428.2 | 640.8 | -597.1 | 821.1 | 0.00 | 0.00 | |
| 5,519.8 | 10.18 | 313.06 | 5,447.7 | 643.2 | -599.7 | 824.6 | 0.00 | 0.00 | Start Drop -2.00 |
| 5,600.0 | 8.58 | 313.06 | 5,526.8 | 652.1 | -609.2 | 837.7 | 2.00 | -2.00 | |
| 5,700.0 | 6.58 | 313.06 | 5,625.9 | 661.1 | -618.9 | 850.9 | 2.00 | -2.00 | |
| 5,800.0 | 4.58 | 313.06 | 5,725.5 | 667.7 | -626.0 | 860.6 | 2.00 | -2.00 | |
| 5,900.0 | 2.58 | 313.06 | 5,825.3 | 672.0 | -630.5 | 866.8 | 2.00 | -2.00 | |
| 6,000.0 | 0.58 | 313.06 | 5,925.2 | 673.9 | -632.5 | 869.6 | 2.00 | -2.00 | |
| 6,028.8 | 0.00 | 0.00 | 5,954.0 | 674.0 | -632.6 | 869.7 | 2.00 | -2.00 | EOD; Target #1 - Antelope 13-31 TGT |
| 6,100.0 | 0.00 | 0.00 | 6,025.2 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | |
| 6,200.0 | 0.00 | 0.00 | 6,125.2 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | |
| 6,228.8 | 0.00 | 0.00 | 6,154.0 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | Niobrara |
| 6,300.0 | 0.00 | 0.00 | 6,225.2 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | |
| 6,400.0 | 0.00 | 0.00 | 6,325.2 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | |
| 6,500.0 | 0.00 | 0.00 | 6,425.2 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | |
| 6,600.0 | 0.00 | 0.00 | 6,525.2 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | |
| 6,700.0 | 0.00 | 0.00 | 6,625.2 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | |
| 6,728.8 | 0.00 | 0.00 | 6,654.0 | 674.0 | -632.6 | 869.7 | 0.00 | 0.00 | TD at 6728.8 - Antelope 13-31 PBHL |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| Antelope 13-31 TGT<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 5,954.0 | 674.0 | -632.6 | 1,374,001.60 | 3,314,070.27 | 40.354550 | -104.373070 |
| Antelope 13-31 PBHL<br>- plan hits target center<br>- Circle (radius 50.0) | 0.00 | 0.00 | 6,654.0 | 674.0 | -632.6 | 1,374,001.60 | 3,314,070.27 | 40.354550 | -104.373070 |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 6,228.8 | 6,154.0 | Niobrara | | 0.00 | |

| | | | |
|---|---|---|---|
| **Database:** | EDM 5000.1 US Multi Users DB | **Local Co-ordinate Reference:** | Site Antelope I-31 Pad (was 31 C) |
| **Company:** | Bonanza Creek Energy Operating Company, LLC | **TVD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Project:** | Weld County | **MD Reference:** | WELL @ 4554.0ft (Original Well Elev) |
| **Site:** | Antelope I-31 Pad (was 31 C) | **North Reference:** | True |
| **Well:** | Antelope 13-31 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | DD | | |
| **Design:** | Plan #1 | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 600.0 | 600.0 | 80.1 | 2.8 | KOP @ 600' |
| 1,109.0 | 1,106.3 | 110.9 | -30.2 | EOB @ Inc. = 10.18° |
| 5,519.8 | 5,447.7 | 643.2 | -599.7 | Start Drop -2.00 |
| 6,028.8 | 5,954.0 | 674.0 | -632.6 | EOD; Target #1 |
| 6,728.8 | 6,654.0 | 674.0 | -632.6 | TD at 6728.8 |