



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC D**

**BMC D 31B-18-07-95**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**30 October, 2015**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 31B-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC D 31B-18-07-95 @ 5282.0usft (PLAN KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31B-18-07-95 @ 5282.0usft (PLAN KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31B-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Rockies Region		
<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 Central Zone		

Site		BMC D			
Site Position:		Northing:	1,595,755.80 usft	Latitude:	39° 26' 29.662 N
From:	Lat/Long	Easting:	2,282,541.08 usft	Longitude:	108° 2' 26.664 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.60 °

Well	BMC D 31B-18-07-95, SHL: 39.441547766 -108.040649809					
Well Position	+N/-S	-9.1 usft	Northing:	1,595,746.01 usft	Latitude:	39° 26' 29.572 N
	+E/-W	25.5 usft	Easting:	2,282,566.28 usft	Longitude:	108° 2' 26.339 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,282.0 usft	Ground Level:	5,265.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	10/29/2015	9.80	65.57	51,780

<b>Design</b>	Design #1				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE		<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	46.41	

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,124.7	21.86	46.41	1,109.6	81.2	85.3	3.50	3.50	0.00	46.41	
3,732.0	21.86	46.41	3,529.4	750.7	788.5	0.00	0.00	0.00	0.00	
4,356.6	0.00	0.00	4,139.0	831.9	873.8	3.50	-3.50	0.00	180.00	BMC D 31B-18-07-95
6,892.6	0.00	0.00	6,675.0	831.9	873.8	0.00	0.00	0.00	0.00	

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 31B-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31B-18-07-95 @ 5282.0usft (PLAN KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31B-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
0.1	0.00	0.00	0.1	0.0	0.0	0.0	0.00	0.00	0.00
<b>SHL: 39.441605462 -108.040683232</b>									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Start Build 3.50</b>									
600.0	3.50	46.41	599.9	2.1	2.2	3.1	3.50	3.50	0.00
700.0	7.00	46.41	699.5	8.4	8.8	12.2	3.50	3.50	0.00
800.0	10.50	46.41	798.3	18.9	19.9	27.4	3.50	3.50	0.00
900.0	14.00	46.41	896.0	33.5	35.2	48.6	3.50	3.50	0.00
1,000.0	17.50	46.41	992.3	52.2	54.9	75.8	3.50	3.50	0.00
1,100.0	21.00	46.41	1,086.7	75.0	78.7	108.7	3.50	3.50	0.00
1,124.7	21.86	46.41	1,109.6	81.2	85.3	117.7	3.50	3.50	0.00
<b>Start 2607.3 hold at 1124.7 MD</b>									
1,200.0	21.86	46.41	1,179.5	100.5	105.6	145.8	0.00	0.00	0.00
1,300.0	21.86	46.41	1,272.3	126.2	132.6	183.0	0.00	0.00	0.00
1,400.0	21.86	46.41	1,365.1	151.9	159.5	220.3	0.00	0.00	0.00
1,500.0	21.86	46.41	1,458.0	177.6	186.5	257.5	0.00	0.00	0.00
1,600.0	21.86	46.41	1,550.8	203.2	213.5	294.8	0.00	0.00	0.00
1,700.0	21.86	46.41	1,643.6	228.9	240.5	332.0	0.00	0.00	0.00
1,760.8	21.86	46.41	1,700.0	244.5	256.9	354.6	0.00	0.00	0.00
<b>Surface Casing</b>									
1,800.0	21.86	46.41	1,736.4	254.6	267.4	369.2	0.00	0.00	0.00
1,900.0	21.86	46.41	1,829.2	280.3	294.4	406.5	0.00	0.00	0.00
2,000.0	21.86	46.41	1,922.0	306.0	321.4	443.7	0.00	0.00	0.00
2,100.0	21.86	46.41	2,014.8	331.6	348.3	481.0	0.00	0.00	0.00
2,200.0	21.86	46.41	2,107.6	357.3	375.3	518.2	0.00	0.00	0.00
2,300.0	21.86	46.41	2,200.4	383.0	402.3	555.4	0.00	0.00	0.00
2,400.0	21.86	46.41	2,293.2	408.7	429.3	592.7	0.00	0.00	0.00
2,500.0	21.86	46.41	2,386.0	434.3	456.2	629.9	0.00	0.00	0.00
2,600.0	21.86	46.41	2,478.8	460.0	483.2	667.2	0.00	0.00	0.00
2,700.0	21.86	46.41	2,571.6	485.7	510.2	704.4	0.00	0.00	0.00
2,800.0	21.86	46.41	2,664.4	511.4	537.1	741.6	0.00	0.00	0.00
2,900.0	21.86	46.41	2,757.3	537.1	564.1	778.9	0.00	0.00	0.00
3,000.0	21.86	46.41	2,850.1	562.7	591.1	816.1	0.00	0.00	0.00
3,100.0	21.86	46.41	2,942.9	588.4	618.1	853.4	0.00	0.00	0.00
3,200.0	21.86	46.41	3,035.7	614.1	645.0	890.6	0.00	0.00	0.00
3,300.0	21.86	46.41	3,128.5	639.8	672.0	927.8	0.00	0.00	0.00
3,400.0	21.86	46.41	3,221.3	665.5	699.0	965.1	0.00	0.00	0.00
3,500.0	21.86	46.41	3,314.1	691.1	725.9	1,002.3	0.00	0.00	0.00
3,558.1	21.86	46.41	3,368.0	706.0	741.6	1,023.9	0.00	0.00	0.00
<b>Williams Fork</b>									
3,600.0	21.86	46.41	3,406.9	716.8	752.9	1,039.6	0.00	0.00	0.00
3,700.0	21.86	46.41	3,499.7	742.5	779.9	1,076.8	0.00	0.00	0.00
3,732.0	21.86	46.41	3,529.4	750.7	788.5	1,088.7	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,800.0	19.48	46.41	3,593.0	767.3	805.9	1,112.7	3.50	-3.50	0.00
3,900.0	15.98	46.41	3,688.3	788.3	827.9	1,143.2	3.50	-3.50	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31B-18-07-95 @ 5282.0usft (PLAN KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31B-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,000.0	12.48	46.41	3,785.2	805.2	845.8	1,167.8	3.50	-3.50	0.00
4,100.0	8.98	46.41	3,883.4	818.0	859.2	1,186.4	3.50	-3.50	0.00
4,200.0	5.48	46.41	3,982.6	826.7	868.4	1,199.0	3.50	-3.50	0.00
4,300.0	1.98	46.41	4,082.4	831.2	873.1	1,205.5	3.50	-3.50	0.00
4,356.6	0.00	0.00	4,139.0	831.9	873.8	1,206.4	3.50	-3.50	0.00
Back to Vertical - Start 2536.0 hold at 4356.6 MD - Top of gas									
4,400.0	0.00	0.00	4,182.4	831.9	873.8	1,206.4	0.00	0.00	0.00
4,500.0	0.00	0.00	4,282.4	831.9	873.8	1,206.4	0.00	0.00	0.00
4,600.0	0.00	0.00	4,382.4	831.9	873.8	1,206.4	0.00	0.00	0.00
4,700.0	0.00	0.00	4,482.4	831.9	873.8	1,206.4	0.00	0.00	0.00
4,800.0	0.00	0.00	4,582.4	831.9	873.8	1,206.4	0.00	0.00	0.00
4,900.0	0.00	0.00	4,682.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,000.0	0.00	0.00	4,782.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,100.0	0.00	0.00	4,882.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,200.0	0.00	0.00	4,982.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,300.0	0.00	0.00	5,082.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,400.0	0.00	0.00	5,182.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,500.0	0.00	0.00	5,282.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,600.0	0.00	0.00	5,382.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,700.0	0.00	0.00	5,482.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,800.0	0.00	0.00	5,582.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,900.0	0.00	0.00	5,682.4	831.9	873.8	1,206.4	0.00	0.00	0.00
5,974.6	0.00	0.00	5,757.0	831.9	873.8	1,206.4	0.00	0.00	0.00
Cameo									
6,000.0	0.00	0.00	5,782.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,100.0	0.00	0.00	5,882.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,200.0	0.00	0.00	5,982.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,300.0	0.00	0.00	6,082.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,392.6	0.00	0.00	6,175.0	831.9	873.8	1,206.4	0.00	0.00	0.00
Rollins									
6,400.0	0.00	0.00	6,182.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,500.0	0.00	0.00	6,282.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,600.0	0.00	0.00	6,382.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,700.0	0.00	0.00	6,482.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,582.4	831.9	873.8	1,206.4	0.00	0.00	0.00
6,892.5	0.00	0.00	6,674.9	831.9	873.8	1,206.4	0.00	0.00	0.00
BHL: 39.4438316 -108.0375558									
6,892.6	0.00	0.00	6,675.0	831.9	873.8	1,206.4	0.00	0.00	0.00
TD at 6892.6 - TD									

## Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BMC D 31B-18-07-95 T(	0.00	0.00	4,139.0	831.9	873.8	1,596,553.13	2,283,462.98	39° 26' 37.794 N	108° 2' 15.201 W
- hit/miss target									
- Shape									
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 31B-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31B-18-07-95 @ 5282.0usft (PLAN KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31B-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

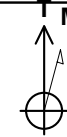
Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,558.1	3,368.0	Williams Fork		0.00		
4,356.6	4,139.0	Top of gas		0.00		
5,974.6	5,757.0	Cameo		0.00		
6,392.6	6,175.0	Rollins		0.00		
6,892.6	6,675.0	TD		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
0.1	0.1	0.0	0.0	SHL: 39.441605462 -108.040683232	
500.0	500.0	0.0	0.0	Start Build 3.50	
1,124.7	1,109.6	81.2	85.3	Start 2607.3 hold at 1124.7 MD	
1,760.8	1,700.0	244.5	256.9	Surface Casing	
3,732.0	3,529.4	750.7	788.5	Start Drop -3.50	
4,356.6	4,139.0	831.9	873.8	Back to Vertical	
4,356.6	4,139.0	831.9	873.8	Start 2536.0 hold at 4356.6 MD	
6,892.5	6,674.9	831.9	873.8	BHL: 39.4438316 -108.0375558	
6,892.6	6,675.0	831.9	873.8	TD at 6892.6	



Well Name: BMC D 31B-18-07-95  
Surface Location: BMC D  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5265.0  
+N/-S +E/-W Northing Easting Latitude Longitude  
0.0 0.0 1595746.01 2282566.28 39° 26' 29.572 N 108° 2' 26.339 W  
PLAN KB BMC D 31B-18-07-95 @ 5282.0usft (PLAN KB)

Slot



Azimuths to True North  
Magnetic North: 9.80°  
Magnetic Field  
Strength: 51779.7nT  
Dip Angle: 65.57°  
Date: 10/29/2015  
Model: IGRF2010

BMC D  
BMC D 31B-18-07-95  
Design #1  
9:24, October 30 2015

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
BMC D 31B-18-07-95 TGT4139.0		831.9	873.8	1596553.14	2283462.98	39° 26' 37.794 N	108° 2' 15.201 W	Rectangle (Sides: L40.0 W100.0)

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1124.7	21.86	46.41	1109.6	81.2	85.3	3.50	46.41	117.7	
4	3732.0	21.86	46.41	3529.4	750.7	788.5	0.00	0.00	1088.7	
5	4356.6	0.00	0.00	4139.0	831.9	873.8	3.50	180.00	1206.4	BMC D 31B-18-07-95 TGT
6	6892.6	0.00	0.00	6675.0	831.9	873.8	0.00	0.00	1206.4	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.441605462 -108.040683232
500.0	500.0	Start Build 3.50
1109.6	1124.7	Start 2607.3 hold at 1124.7 MD
1700.0	1760.8	Surface Casing
3529.4	3732.0	Start Drop -3.50
4139.0	4356.6	Back to Vertical
4139.0	4356.6	Start 2536.0 hold at 4356.6 MD
6674.9	6892.5	BHL: 39.4438316 -108.0375558
6675.0	6892.6	TD at 6892.6

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3368.0	3558.1	Williams Fork	0.00	
4139.0	4356.6	Top of gas	0.00	
5757.0	5974.6	Cameo	0.00	
6175.0	6392.6	Rollins	0.00	
6675.0	6892.6	TD	0.00	

