



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC D**

**BMC D 21D-18-07-95**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**28 November, 2016**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 21D-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC D 21D-18-07-95 @ 5285.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 21D-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 21D-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		Using geodetic scale factor

Site	BMC D				
Site Position:		Northing:	1,595,755.80 usft	Latitude:	39.441572650
From:	Lat/Long	Easting:	2,282,541.08 usft	Longitude:	-108.040739971
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.60 °

Well	BMC D 21D-18-07-95, SHL 39.441629797 -108.040507962					
Well Position	+N/-S	20.8 usft	Northing:	1,595,774.78 usft	Latitude:	39.441629797
	+E/-W	65.5 usft	Easting:	2,282,607.16 usft	Longitude:	-108.040507962
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	5,268.0 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>
	IGRF2015	11/23/2016	9.77	65.54	51,562

<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	264.41

<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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
626.8	7.94	264.41	626.1	-1.5	-15.6	3.50	3.50	0.00	264.41	
3,877.8	7.94	264.41	3,845.9	-45.3	-462.5	0.00	0.00	0.00	0.00	
4,104.6	0.00	0.00	4,072.0	-46.8	-478.1	3.50	-3.50	0.00	180.00	21D-18-07-95 TGT
6,640.6	0.00	0.00	6,608.0	-46.8	-478.1	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 21D-18-07-95
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<b>Well:</b>	BMC D 21D-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 39.441629797 -108.040507962</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
<b>Start Build 3.50</b>									
500.0	3.50	264.41	499.9	-0.3	-3.0	3.1	3.50	3.50	0.00
600.0	7.00	264.41	599.5	-1.2	-12.1	12.2	3.50	3.50	0.00
626.8	7.94	264.41	626.1	-1.5	-15.6	15.7	3.50	3.50	0.00
<b>Start 3250.9 hold at 626.8 MD</b>									
700.0	7.94	264.41	698.6	-2.5	-25.7	25.8	0.00	0.00	0.00
800.0	7.94	264.41	797.6	-3.9	-39.4	39.6	0.00	0.00	0.00
900.0	7.94	264.41	896.7	-5.2	-53.2	53.4	0.00	0.00	0.00
1,000.0	7.94	264.41	995.7	-6.6	-66.9	67.2	0.00	0.00	0.00
1,100.0	7.94	264.41	1,094.7	-7.9	-80.7	81.0	0.00	0.00	0.00
1,200.0	7.94	264.41	1,193.8	-9.2	-94.4	94.9	0.00	0.00	0.00
1,300.0	7.94	264.41	1,292.8	-10.6	-108.2	108.7	0.00	0.00	0.00
1,400.0	7.94	264.41	1,391.9	-11.9	-121.9	122.5	0.00	0.00	0.00
1,500.0	7.94	264.41	1,490.9	-13.3	-135.6	136.3	0.00	0.00	0.00
1,600.0	7.94	264.41	1,589.9	-14.6	-149.4	150.1	0.00	0.00	0.00
1,700.0	7.94	264.41	1,689.0	-16.0	-163.1	163.9	0.00	0.00	0.00
1,711.1	7.94	264.41	1,700.0	-16.1	-164.7	165.5	0.00	0.00	0.00
<b>Surface Casing</b>									
1,800.0	7.94	264.41	1,788.0	-17.3	-176.9	177.7	0.00	0.00	0.00
1,900.0	7.94	264.41	1,887.1	-18.7	-190.6	191.5	0.00	0.00	0.00
2,000.0	7.94	264.41	1,986.1	-20.0	-204.4	205.4	0.00	0.00	0.00
2,100.0	7.94	264.41	2,085.2	-21.4	-218.1	219.2	0.00	0.00	0.00
2,200.0	7.94	264.41	2,184.2	-22.7	-231.9	233.0	0.00	0.00	0.00
2,300.0	7.94	264.41	2,283.2	-24.1	-245.6	246.8	0.00	0.00	0.00
2,400.0	7.94	264.41	2,382.3	-25.4	-259.4	260.6	0.00	0.00	0.00
2,500.0	7.94	264.41	2,481.3	-26.8	-273.1	274.4	0.00	0.00	0.00
2,600.0	7.94	264.41	2,580.4	-28.1	-286.9	288.2	0.00	0.00	0.00
2,700.0	7.94	264.41	2,679.4	-29.4	-300.6	302.0	0.00	0.00	0.00
2,800.0	7.94	264.41	2,778.4	-30.8	-314.3	315.8	0.00	0.00	0.00
2,900.0	7.94	264.41	2,877.5	-32.1	-328.1	329.7	0.00	0.00	0.00
3,000.0	7.94	264.41	2,976.5	-33.5	-341.8	343.5	0.00	0.00	0.00
3,100.0	7.94	264.41	3,075.6	-34.8	-355.6	357.3	0.00	0.00	0.00
3,200.0	7.94	264.41	3,174.6	-36.2	-369.3	371.1	0.00	0.00	0.00
3,300.0	7.94	264.41	3,273.7	-37.5	-383.1	384.9	0.00	0.00	0.00
3,327.6	7.94	264.41	3,301.0	-37.9	-386.9	388.7	0.00	0.00	0.00
<b>Williams Fork</b>									
3,400.0	7.94	264.41	3,372.7	-38.9	-396.8	398.7	0.00	0.00	0.00
3,500.0	7.94	264.41	3,471.7	-40.2	-410.6	412.5	0.00	0.00	0.00
3,600.0	7.94	264.41	3,570.8	-41.6	-424.3	426.3	0.00	0.00	0.00
3,700.0	7.94	264.41	3,669.8	-42.9	-438.1	440.2	0.00	0.00	0.00
3,800.0	7.94	264.41	3,768.9	-44.3	-451.8	454.0	0.00	0.00	0.00
3,877.8	7.94	264.41	3,845.9	-45.3	-462.5	464.7	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,900.0	7.16	264.41	3,867.9	-45.6	-465.4	467.6	3.50	-3.50	0.00
4,000.0	3.66	264.41	3,967.5	-46.5	-474.8	477.1	3.50	-3.50	0.00
4,104.6	0.00	0.00	4,072.0	-46.8	-478.1	480.4	3.50	-3.50	91.38

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<b>Well:</b>	BMC D 21D-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)
Back to Vertical - Start 2536.0 hold at 4104.6 MD - Top of Gas - 21D-18-07-95 TGT									
4,200.0	0.00	0.00	4,167.4	-46.8	-478.1	480.4	0.00	0.00	0.00
4,300.0	0.00	0.00	4,267.4	-46.8	-478.1	480.4	0.00	0.00	0.00
4,400.0	0.00	0.00	4,367.4	-46.8	-478.1	480.4	0.00	0.00	0.00
4,500.0	0.00	0.00	4,467.4	-46.8	-478.1	480.4	0.00	0.00	0.00
4,600.0	0.00	0.00	4,567.4	-46.8	-478.1	480.4	0.00	0.00	0.00
4,700.0	0.00	0.00	4,667.4	-46.8	-478.1	480.4	0.00	0.00	0.00
4,800.0	0.00	0.00	4,767.4	-46.8	-478.1	480.4	0.00	0.00	0.00
4,900.0	0.00	0.00	4,867.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,000.0	0.00	0.00	4,967.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,100.0	0.00	0.00	5,067.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,200.0	0.00	0.00	5,167.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,300.0	0.00	0.00	5,267.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,400.0	0.00	0.00	5,367.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,500.0	0.00	0.00	5,467.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,600.0	0.00	0.00	5,567.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,700.0	0.00	0.00	5,667.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,722.6	0.00	0.00	5,690.0	-46.8	-478.1	480.4	0.00	0.00	0.00
Cameo									
5,800.0	0.00	0.00	5,767.4	-46.8	-478.1	480.4	0.00	0.00	0.00
5,900.0	0.00	0.00	5,867.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,000.0	0.00	0.00	5,967.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,100.0	0.00	0.00	6,067.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,140.6	0.00	0.00	6,108.0	-46.8	-478.1	480.4	0.00	0.00	0.00
Rollins									
6,200.0	0.00	0.00	6,167.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,300.0	0.00	0.00	6,267.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,400.0	0.00	0.00	6,367.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,500.0	0.00	0.00	6,467.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,600.0	0.00	0.00	6,567.4	-46.8	-478.1	480.4	0.00	0.00	0.00
6,640.6	0.00	0.00	6,608.0	-46.8	-478.1	480.4	0.00	0.00	0.00
TD at 6640.6 - BHL 39.4415012 -108.0422008									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
21D-18-07-95 TGT	0.00	0.00	4,072.0	-46.8	-478.1	1,595,741.33	2,282,127.95	39.441501200	-108.042200800
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,327.6	3,301.0	Williams Fork		0.00		
4,104.6	4,072.0	Top of Gas		0.00		
5,722.6	5,690.0	Cameo		0.00		
6,140.6	6,108.0	Rollins		0.00		

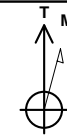
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<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC D 21D-18-07-95 @ 5285.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 21D-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 21D-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.1	0.1	0.0	0.0	SHL 39.441629797 -108.040507962
400.0	400.0	0.0	0.0	Start Build 3.50
626.8	626.1	-1.5	-15.6	Start 3250.9 hold at 626.8 MD
1,711.1	1,700.0	-16.1	-164.7	Surface Casing
3,877.8	3,845.9	-45.3	-462.5	Start Drop -3.50
4,104.6	4,072.0	-46.8	-478.1	Back to Vertical
4,104.6	4,072.0	-46.8	-478.1	Start 2536.0 hold at 4104.6 MD
6,640.6	6,608.0	-46.8	-478.1	TD at 6640.6
6,640.6	6,608.0	-46.8	-478.1	BHL 39.4415012 -108.0422008



Well Name: BMC D 21D-18-07-95  
Surface Location: BMC D  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5268.0  
+N/-S +E/-W Northing Easting Latitude Longitude  
0.0 0.0 1595774.78 2282607.16 39.441629797 -108.040507962  
Est KB BMC D 21D-18-07-95 @ 5285.0usft (Est KB)

Slot



Azimuths to True North  
Magnetic North: 9.77°  
Magnetic Field  
Strength: 51562.3snT  
Dip Angle: 65.54°  
Date: 11/23/2016  
Model: IGRF2015

BMC D  
BMC D 21D-18-07-95  
Design #1  
13:49, November 28 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
21D-18-07-95 TGT	4072.0	-46.8	-478.1	1595774.33	2282127.95	39.441501200	-108.042200800	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	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	626.8	7.94	264.41	626.1	-1.5	-15.6	3.50	264.41	15.7	
4	3877.8	7.94	264.41	3845.9	-45.3	-462.5	0.00	0.00	464.7	
5	4104.6	0.00	0.00	4072.0	-46.8	-478.1	3.50	180.00	480.4	21D-18-07-95 TGT
6	6640.6	0.00	0.00	6608.0	-46.8	-478.1	0.00	0.00	480.4	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.441629797 -108.040507962
400.0	400.0	Start Build 3.50
626.1	626.8	Start 3250.9 hold at 626.8 MD
1700.0	1711.1	Surface Casing
3845.9	3877.8	Start Drop -3.50
4072.0	4104.6	Back to Vertical
4072.0	4104.6	Start 2536.0 hold at 4104.6 MD
6608.0	6640.6	TD at 6640.6
6608.0	6640.6	BHL 39.4415012 -108.0422008

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3301.0	3327.6	Williams Fork	0.00	
4072.0	4104.6	Top of Gas	0.00	
5690.0	5722.6	Cameo	0.00	
6108.0	6140.6	Rollins	0.00	

