



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

**BMC B 41C-13-07-96**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**22 November, 2016**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC B 41C-13-07-96
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 41C-13-07-96 @ 5117.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 41C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 41C-13-07-96	<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 B				
Site Position:		Northing:	1,594,816.33 usft	Latitude:	39.438867241
From:	Lat/Long	Easting:	2,280,886.96 usft	Longitude:	-108.046501442
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.61 °

Well	BMC B 41C-13-07-96, SHL 39.438867241 -108.046501442					
Well Position	+N/-S	0.0 usft	Northing:	1,594,816.34 usft	Latitude:	39.438867241
	+E/-W	0.0 usft	Easting:	2,280,886.96 usft	Longitude:	-108.046501442
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,117.0 usft	Ground Level:	5,100.0 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	11/18/2016	9.78	65.54	51,563

<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	314.13

<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	
1,528.4	39.49	314.13	1,441.2	260.3	-268.3	3.50	3.50	0.00	314.13	
3,304.6	39.49	314.13	2,811.8	1,046.9	-1,079.1	0.00	0.00	0.00	0.00	
4,433.1	0.00	0.00	3,853.0	1,307.2	-1,347.3	3.50	-3.50	0.00	180.00	41C-13-07-96 TGT
6,969.1	0.00	0.00	6,389.0	1,307.2	-1,347.3	0.00	0.00	0.00	0.00	

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 41C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 41C-13-07-96	<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 39.438867241 -108.046501442</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	314.13	499.9	2.1	-2.2	3.1	3.50	3.50	0.00
600.0	7.00	314.13	599.5	8.5	-8.8	12.2	3.50	3.50	0.00
700.0	10.50	314.13	698.3	19.1	-19.7	27.4	3.50	3.50	0.00
800.0	14.00	314.13	796.0	33.9	-34.9	48.6	3.50	3.50	0.00
900.0	17.50	314.13	892.3	52.8	-54.4	75.8	3.50	3.50	0.00
1,000.0	21.00	314.13	986.7	75.7	-78.0	108.7	3.50	3.50	0.00
1,100.0	24.50	314.13	1,078.9	102.6	-105.8	147.4	3.50	3.50	0.00
1,200.0	28.00	314.13	1,168.5	133.4	-137.5	191.6	3.50	3.50	0.00
1,300.0	31.50	314.13	1,255.3	168.0	-173.1	241.2	3.50	3.50	0.00
1,400.0	35.00	314.13	1,339.0	206.2	-212.5	296.1	3.50	3.50	0.00
1,500.0	38.50	314.13	1,419.1	247.8	-255.4	355.9	3.50	3.50	0.00
1,528.4	39.49	314.13	1,441.2	260.3	-268.3	373.8	3.50	3.50	0.00
<b>Start 1776.2 hold at 1528.4 MD</b>									
1,600.0	39.49	314.13	1,496.4	292.0	-300.9	419.3	0.00	0.00	0.00
1,700.0	39.49	314.13	1,573.6	336.2	-346.6	482.9	0.00	0.00	0.00
1,800.0	39.49	314.13	1,650.7	380.5	-392.2	546.5	0.00	0.00	0.00
1,863.8	39.49	314.13	1,700.0	408.8	-421.4	587.1	0.00	0.00	0.00
<b>Surface Casing</b>									
1,900.0	39.49	314.13	1,727.9	424.8	-437.9	610.1	0.00	0.00	0.00
2,000.0	39.49	314.13	1,805.1	469.1	-483.5	673.7	0.00	0.00	0.00
2,100.0	39.49	314.13	1,882.2	513.4	-529.2	737.3	0.00	0.00	0.00
2,200.0	39.49	314.13	1,959.4	557.7	-574.8	800.9	0.00	0.00	0.00
2,300.0	39.49	314.13	2,036.6	602.0	-620.5	864.5	0.00	0.00	0.00
2,400.0	39.49	314.13	2,113.7	646.3	-666.1	928.1	0.00	0.00	0.00
2,500.0	39.49	314.13	2,190.9	690.6	-711.8	991.7	0.00	0.00	0.00
2,600.0	39.49	314.13	2,268.1	734.8	-757.4	1,055.3	0.00	0.00	0.00
2,700.0	39.49	314.13	2,345.2	779.1	-803.1	1,118.9	0.00	0.00	0.00
2,800.0	39.49	314.13	2,422.4	823.4	-848.7	1,182.5	0.00	0.00	0.00
2,900.0	39.49	314.13	2,499.6	867.7	-894.3	1,246.1	0.00	0.00	0.00
3,000.0	39.49	314.13	2,576.7	912.0	-940.0	1,309.7	0.00	0.00	0.00
3,100.0	39.49	314.13	2,653.9	956.3	-985.6	1,373.3	0.00	0.00	0.00
3,200.0	39.49	314.13	2,731.1	1,000.6	-1,031.3	1,436.9	0.00	0.00	0.00
3,304.6	39.49	314.13	2,811.8	1,046.9	-1,079.1	1,503.5	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,400.0	36.16	314.13	2,887.1	1,087.6	-1,121.0	1,561.9	3.50	-3.50	0.00
3,500.0	32.66	314.13	2,969.6	1,127.0	-1,161.6	1,618.4	3.50	-3.50	0.00
3,600.0	29.16	314.13	3,055.4	1,162.7	-1,198.4	1,669.8	3.50	-3.50	0.00
3,630.3	28.10	314.13	3,082.0	1,172.8	-1,208.8	1,684.3	3.50	-3.50	0.00
<b>Williams Fork</b>									
3,700.0	25.66	314.13	3,144.2	1,194.8	-1,231.5	1,715.8	3.50	-3.50	0.00
3,800.0	22.16	314.13	3,235.6	1,223.0	-1,260.5	1,756.3	3.50	-3.50	0.00
3,900.0	18.66	314.13	3,329.3	1,247.3	-1,285.6	1,791.2	3.50	-3.50	0.00
4,000.0	15.16	314.13	3,425.0	1,267.5	-1,306.4	1,820.3	3.50	-3.50	0.00
4,100.0	11.66	314.13	3,522.2	1,283.7	-1,323.1	1,843.5	3.50	-3.50	0.00
4,200.0	8.16	314.13	3,620.7	1,295.6	-1,335.4	1,860.7	3.50	-3.50	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 41C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 41C-13-07-96	<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)
4,300.0	4.66	314.13	3,720.1	1,303.4	-1,343.4	1,871.8	3.50	-3.50	0.00
4,400.0	1.16	314.13	3,819.9	1,306.9	-1,347.1	1,876.9	3.50	-3.50	0.00
4,433.1	0.00	0.00	3,853.0	1,307.2	-1,347.3	1,877.2	3.50	-3.50	0.00
Back to Vertical - Start 2536.0 hold at 4433.1 MD - Top of Gas - 41C-13-07-96 TGT									
4,500.0	0.00	0.00	3,919.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
4,600.0	0.00	0.00	4,019.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
4,700.0	0.00	0.00	4,119.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
4,800.0	0.00	0.00	4,219.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
4,900.0	0.00	0.00	4,319.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,000.0	0.00	0.00	4,419.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,100.0	0.00	0.00	4,519.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,200.0	0.00	0.00	4,619.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,300.0	0.00	0.00	4,719.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,400.0	0.00	0.00	4,819.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,500.0	0.00	0.00	4,919.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,600.0	0.00	0.00	5,019.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,700.0	0.00	0.00	5,119.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,800.0	0.00	0.00	5,219.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
5,900.0	0.00	0.00	5,319.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,000.0	0.00	0.00	5,419.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,051.1	0.00	0.00	5,471.0	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
Cameo									
6,100.0	0.00	0.00	5,519.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,200.0	0.00	0.00	5,619.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,300.0	0.00	0.00	5,719.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,400.0	0.00	0.00	5,819.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,469.1	0.00	0.00	5,889.0	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
Rollins									
6,500.0	0.00	0.00	5,919.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,600.0	0.00	0.00	6,019.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,700.0	0.00	0.00	6,119.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,800.0	0.00	0.00	6,219.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,900.0	0.00	0.00	6,319.9	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
6,969.1	0.00	0.00	6,389.0	1,307.2	-1,347.3	1,877.2	0.00	0.00	0.00
BHL 39.4424558 -108.0512719 - TD at 6969.1									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
41C-13-07-96 TGT	0.00	0.00	3,853.0	1,307.2	-1,347.3	1,596,160.70	2,279,576.87	39.442455800	-108.051271900
- hit/miss target									
- Shape									
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 41C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 41C-13-07-96	<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 (°)
3,630.3	3,082.0	Williams Fork		0.00	
4,433.1	3,853.0	Top of Gas		0.00	
6,051.1	5,471.0	Cameo		0.00	
6,469.1	5,889.0	Rollins		0.00	

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 39.438867241 -108.046501442
400.0	400.0	0.0	0.0	Start Build 3.50
1,528.4	1,441.2	260.3	-268.3	Start 1776.2 hold at 1528.4 MD
1,863.8	1,700.0	408.8	-421.4	Surface Casing
3,304.6	2,811.8	1,046.9	-1,079.1	Start Drop -3.50
4,433.1	3,853.0	1,307.2	-1,347.3	Back to Vertical
4,433.1	3,853.0	1,307.2	-1,347.3	Start 2536.0 hold at 4433.1 MD
6,969.1	6,389.0	1,307.2	-1,347.3	BHL 39.4424558 -108.0512719
6,969.1	6,389.0	1,307.2	-1,347.3	TD at 6969.1



Well Name: BMC B 41C-13-07-96  
Surface Location: BMC B  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5100.0  
+N/-S +E/-W Northing Easting Latitude Longitude  
0.0 0.0 1594816.34 2280886.96 39.438867241 -108.046501442  
Est KB BMC B 41C-13-07-96 @ 5117.0usft (Est KB)

Slot



Azimuths to True North  
Magnetic North: 9.78°  
Magnetic Field  
Strength: 51562.9nT  
Dip Angle: 65.54°  
Date: 11/18/2016  
Model: IGRF2015

BMC B  
BMC B 41C-13-07-96  
Design #1  
14:32, November 22 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
41C-13-07-96 TGT	3853.0	1307.2	-1347.3	1596160.70	2279576.87	39.442455800	-108.051271900	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	1528.4	39.49	314.13	1441.2	260.3	-268.3	3.50	314.13	373.8	
4	3304.6	39.49	314.13	2811.8	1046.9	-1079.1	0.00	0.00	1503.5	
5	4433.1	0.00	0.00	3853.0	1307.2	-1347.3	3.50	180.00	1877.2	41C-13-07-96 TGT
6	6969.1	0.00	0.00	6389.0	1307.2	-1347.3	0.00	0.00	1877.2	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.438867241 -108.046501442
400.0	400.0	Start Build 3.50
1441.2	1528.4	Start 1776.2 hold at 1528.4 MD
1700.0	1863.8	Surface Casing
2811.8	3304.6	Start Drop -3.50
3853.0	4433.1	Start 2536.0 hold at 4433.1 MD
3853.0	4433.1	Back to Vertical
6389.0	6969.1	TD at 6969.1
6389.0	6969.1	BHL 39.4424558 -108.0512719

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3082.0	3630.3	Williams Fork	0.00	
3853.0	4433.1	Top of Gas	0.00	
5471.0	6051.1	Cameo	0.00	
5889.0	6469.1	Rollins	0.00	

