



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

**BMC B 23C-18-07-95**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**28 October, 2015**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC B 23C-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 23C-18-07-95 @ 5117.0usft (PLAN KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 23C-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 23C-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 B			
Site Position:		Northing:	1,594,816.33 usft	Latitude:	39° 26' 19.922 N
From:	Lat/Long	Easting:	2,280,886.96 usft	Longitude:	108° 2' 47.405 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.61 °

Well	BMC B 23C-18-07-95, SHL LAT: 39.438802831 LONG: -108.046623026					
Well Position	+N/-S	-23.5 usft	Northing:	1,594,793.84 usft	Latitude:	39° 26' 19.690 N
	+E/-W	-34.3 usft	Easting:	2,280,851.97 usft	Longitude:	108° 2' 47.843 W
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>
	IGRF2010	10/23/2015	9.81	65.56	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	136.27

<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	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,580.9	34.33	136.27	1,523.3	-206.1	197.2	3.50	3.50	0.00	136.27	
3,825.4	34.33	136.27	3,376.7	-1,120.8	1,072.3	0.00	0.00	0.00	0.00	
4,806.4	0.00	0.00	4,300.0	-1,326.8	1,269.5	3.50	-3.50	0.00	180.00	
6,818.4	0.00	0.00	6,312.0	-1,326.8	1,269.5	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 B 23C-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 23C-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 23C-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: 39.438802831 -108.046623026</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
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Start Build 3.50</b>									
700.0	3.50	136.27	699.9	-2.2	2.1	3.1	3.50	3.50	0.00
800.0	7.00	136.27	799.5	-8.8	8.4	12.2	3.50	3.50	0.00
900.0	10.50	136.27	898.3	-19.8	19.0	27.4	3.50	3.50	0.00
1,000.0	14.00	136.27	996.0	-35.1	33.6	48.6	3.50	3.50	0.00
1,100.0	17.50	136.27	1,092.3	-54.7	52.4	75.8	3.50	3.50	0.00
1,200.0	21.00	136.27	1,186.7	-78.6	75.2	108.7	3.50	3.50	0.00
1,300.0	24.50	136.27	1,278.9	-106.5	101.9	147.4	3.50	3.50	0.00
1,400.0	28.00	136.27	1,368.5	-138.5	132.5	191.6	3.50	3.50	0.00
1,500.0	31.50	136.27	1,455.3	-174.3	166.8	241.2	3.50	3.50	0.00
1,580.9	34.33	136.27	1,523.3	-206.1	197.2	285.2	3.50	3.50	0.00
<b>Start 2244.5 hold at 1580.9 MD</b>									
1,600.0	34.33	136.27	1,539.0	-213.8	204.6	296.0	0.00	0.00	0.00
1,700.0	34.33	136.27	1,621.6	-254.6	243.6	352.4	0.00	0.00	0.00
1,794.9	34.33	136.27	1,700.0	-293.3	280.6	405.9	0.00	0.00	0.00
<b>Surface Casing</b>									
1,800.0	34.33	136.27	1,704.2	-295.4	282.6	408.8	0.00	0.00	0.00
1,900.0	34.33	136.27	1,786.8	-336.1	321.6	465.2	0.00	0.00	0.00
2,000.0	34.33	136.27	1,869.3	-376.9	360.6	521.6	0.00	0.00	0.00
2,100.0	34.33	136.27	1,951.9	-417.6	399.6	578.0	0.00	0.00	0.00
2,200.0	34.33	136.27	2,034.5	-458.4	438.5	634.4	0.00	0.00	0.00
2,300.0	34.33	136.27	2,117.1	-499.1	477.5	690.8	0.00	0.00	0.00
2,400.0	34.33	136.27	2,199.6	-539.9	516.5	747.2	0.00	0.00	0.00
2,500.0	34.33	136.27	2,282.2	-580.6	555.5	803.6	0.00	0.00	0.00
2,600.0	34.33	136.27	2,364.8	-621.4	594.5	860.0	0.00	0.00	0.00
2,700.0	34.33	136.27	2,447.4	-662.1	633.5	916.4	0.00	0.00	0.00
2,800.0	34.33	136.27	2,529.9	-702.9	672.5	972.8	0.00	0.00	0.00
2,900.0	34.33	136.27	2,612.5	-743.6	711.5	1,029.2	0.00	0.00	0.00
3,000.0	34.33	136.27	2,695.1	-784.4	750.5	1,085.6	0.00	0.00	0.00
3,100.0	34.33	136.27	2,777.7	-825.1	789.5	1,142.0	0.00	0.00	0.00
3,200.0	34.33	136.27	2,860.3	-865.9	828.5	1,198.4	0.00	0.00	0.00
3,300.0	34.33	136.27	2,942.8	-906.6	867.4	1,254.8	0.00	0.00	0.00
3,375.3	34.33	136.27	3,005.0	-937.3	896.8	1,297.2	0.00	0.00	0.00
<b>Williams Fork</b>									
3,400.0	34.33	136.27	3,025.4	-947.4	906.4	1,311.2	0.00	0.00	0.00
3,500.0	34.33	136.27	3,108.0	-988.1	945.4	1,367.6	0.00	0.00	0.00
3,600.0	34.33	136.27	3,190.6	-1,028.9	984.4	1,424.0	0.00	0.00	0.00
3,700.0	34.33	136.27	3,273.1	-1,069.6	1,023.4	1,480.4	0.00	0.00	0.00
3,800.0	34.33	136.27	3,355.7	-1,110.4	1,062.4	1,536.8	0.00	0.00	0.00
3,825.4	34.33	136.27	3,376.7	-1,120.8	1,072.3	1,551.1	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,900.0	31.72	136.27	3,439.2	-1,150.1	1,100.4	1,591.8	3.50	-3.50	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 23C-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 23C-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	28.22	136.27	3,525.8	-1,186.2	1,134.9	1,641.7	3.50	-3.50	0.00
4,100.0	24.72	136.27	3,615.3	-1,218.4	1,165.8	1,686.3	3.50	-3.50	0.00
4,200.0	21.22	136.27	3,707.4	-1,246.6	1,192.7	1,725.3	3.50	-3.50	0.00
4,273.0	18.67	136.27	3,776.0	-1,264.6	1,209.9	1,750.2	3.50	-3.50	0.00
<b>Top of Gas</b>									
4,300.0	17.72	136.27	3,801.7	-1,270.7	1,215.8	1,758.6	3.50	-3.50	0.00
4,400.0	14.22	136.27	3,897.8	-1,290.6	1,234.8	1,786.1	3.50	-3.50	0.00
4,500.0	10.72	136.27	3,995.4	-1,306.2	1,249.7	1,807.7	3.50	-3.50	0.00
4,600.0	7.22	136.27	4,094.2	-1,317.5	1,260.5	1,823.3	3.50	-3.50	0.00
4,700.0	3.72	136.27	4,193.7	-1,324.3	1,267.1	1,832.9	3.50	-3.50	0.00
4,806.4	0.00	0.00	4,300.0	-1,326.8	1,269.5	1,836.3	3.50	-3.50	-128.10
<b>Back to Vertical - Start 2012.0 hold at 4806.4 MD</b>									
4,900.0	0.00	0.00	4,393.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,000.0	0.00	0.00	4,493.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,100.0	0.00	0.00	4,593.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,200.0	0.00	0.00	4,693.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,300.0	0.00	0.00	4,793.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,400.0	0.00	0.00	4,893.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,500.0	0.00	0.00	4,993.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,600.0	0.00	0.00	5,093.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,700.0	0.00	0.00	5,193.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,800.0	0.00	0.00	5,293.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,900.0	0.00	0.00	5,393.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
5,900.4	0.00	0.00	5,394.0	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
<b>Cameo</b>									
6,000.0	0.00	0.00	5,493.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,100.0	0.00	0.00	5,593.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,200.0	0.00	0.00	5,693.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,300.0	0.00	0.00	5,793.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,318.4	0.00	0.00	5,812.0	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
<b>Rollins</b>									
6,400.0	0.00	0.00	5,893.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,500.0	0.00	0.00	5,993.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,600.0	0.00	0.00	6,093.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,700.0	0.00	0.00	6,193.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,800.0	0.00	0.00	6,293.6	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
6,818.3	0.00	0.00	6,311.9	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
<b>BHL: 39.4351599 -108.0421284</b>									
6,818.4	0.00	0.00	6,312.0	-1,326.8	1,269.5	1,836.3	0.00	0.00	0.00
<b>TD at 6818.4</b>									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
23C-18-07-95 TGT	0.00	0.00	3,776.0	-1,326.8	1,269.5	1,593,431.94	2,282,083.77	39° 26' 6.576 N	108° 2' 31.662 W
- hit/miss target									
- Shape									
- plan misses target center by 81.8usft at 4299.9usft MD (3801.6 TVD, -1270.7 N, 1215.7 E)									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

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<b>Well:</b>	BMC B 23C-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

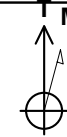
Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,375.3	3,005.0	Williams Fork		0.00	
4,273.0	3,776.0	Top of Gas		0.00	
5,900.4	5,394.0	Cameo		0.00	
6,318.4	5,812.0	Rollins		0.00	

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: 39.438802831 -108.046623026
600.0	600.0	0.0	0.0	Start Build 3.50
1,580.9	1,523.3	-206.1	197.2	Start 2244.5 hold at 1580.9 MD
1,794.9	1,700.0	-293.3	280.6	Surface Casing
3,825.4	3,376.7	-1,120.8	1,072.3	Start Drop -3.50
4,806.4	4,300.0	-1,326.8	1,269.5	Back to Vertical
4,806.4	4,300.0	-1,326.8	1,269.5	Start 2012.0 hold at 4806.4 MD
6,818.3	6,311.9	-1,326.8	1,269.5	BHL: 39.4351599 -108.0421284
6,818.4	6,312.0	-1,326.8	1,269.5	TD at 6818.4



Well Name: BMC B 23C-18-07-95  
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 1594793.85 2280851.97 39° 26' 19.690 N 108° 2' 47.843 W  
PLAN KB BMC B 23C-18-07-95 @ 5117.0usft (PLAN KB)

Slot



Azimuths to True North  
Magnetic North: 9.81°  
Magnetic Field  
Strength: 51780.4snT  
Dip Angle: 65.56°  
Date: 10/23/2015  
Model: IGRF2010

BMC B  
BMC B 23C-18-07-95  
Design #1  
10:50, October 28 2015

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
23C-18-07-95 TGT	3776.0	-1326.8	1269.5	1593431.94	2282083.77	39° 26' 6.576 N	108° 2' 31.662 W	Rectangle (Sides: L40.0 W100.0)

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1580.9	34.33	136.27	1523.3	-206.1	197.2	3.50	136.27	285.2	
4	3825.4	34.33	136.27	3376.7	-1120.8	1072.3	0.00	0.00	1551.1	
5	4806.4	0.00	0.00	4300.0	-1326.8	1269.5	3.50	180.00	1836.3	
6	6818.4	0.00	0.00	6312.0	-1326.8	1269.5	0.00	0.00	1836.3	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.438802831 -108.046623026
600.0	600.0	Start Build 3.50
1523.3	1580.9	Start 2244.5 hold at 1580.9 MD
1700.0	1794.9	Surface Casing
3376.7	3825.4	Start Drop -3.50
4300.0	4806.4	Back to Vertical
4300.0	4806.4	Start 2012.0 hold at 4806.4 MD
6311.9	6818.3	BHL: 39.4351599 -108.0421284
6312.0	6818.4	TD at 6818.4

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3005.0	3375.3	Williams Fork	0.00	
3776.0	4273.0	Top of Gas	0.00	
5394.0	5900.4	Cameo	0.00	
5812.0	6318.4	Rollins	0.00	

