



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

**BMC B 32C-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 32C-13-07-96
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 32C-13-07-96 @ 5117.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 32C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 32C-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 32C-13-07-96, SHL 39.438861859 -108.046749072					
Well Position	+N/-S	-2.0 usft	Northing:	1,594,816.34 usft	Latitude:	39.438861859
	+E/-W	-69.9 usft	Easting:	2,280,816.99 usft	Longitude:	-108.046749072
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	273.17

<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	
1,522.3	39.28	273.17	1,436.4	20.5	-369.3	3.50	3.50	0.00	273.17	
4,528.7	39.28	273.17	3,763.6	125.8	-2,269.8	0.00	0.00	0.00	0.00	
5,651.0	0.00	0.00	4,800.0	146.3	-2,639.1	3.50	-3.50	0.00	180.00	
7,146.0	0.00	0.00	6,295.0	146.3	-2,639.1	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 B 32C-13-07-96
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 32C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 32C-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 39.438861859 -108.046749072</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	273.17	499.9	0.2	-3.0	3.1	3.50	3.50	0.00
600.0	7.00	273.17	599.5	0.7	-12.2	12.2	3.50	3.50	0.00
700.0	10.50	273.17	698.3	1.5	-27.4	27.4	3.50	3.50	0.00
800.0	14.00	273.17	796.0	2.7	-48.6	48.6	3.50	3.50	0.00
900.0	17.50	273.17	892.3	4.2	-75.7	75.8	3.50	3.50	0.00
1,000.0	21.00	273.17	986.7	6.0	-108.6	108.7	3.50	3.50	0.00
1,100.0	24.50	273.17	1,078.9	8.2	-147.2	147.4	3.50	3.50	0.00
1,200.0	28.00	273.17	1,168.5	10.6	-191.3	191.6	3.50	3.50	0.00
1,300.0	31.50	273.17	1,255.3	13.3	-240.9	241.2	3.50	3.50	0.00
1,400.0	35.00	273.17	1,339.0	16.4	-295.6	296.1	3.50	3.50	0.00
1,500.0	38.50	273.17	1,419.1	19.7	-355.3	355.9	3.50	3.50	0.00
1,522.3	39.28	273.17	1,436.4	20.5	-369.3	369.9	3.50	3.50	0.00
<b>Start 3006.4 hold at 1522.3 MD</b>									
1,600.0	39.28	273.17	1,496.6	23.2	-418.4	419.1	0.00	0.00	0.00
1,700.0	39.28	273.17	1,574.0	26.7	-481.6	482.4	0.00	0.00	0.00
1,800.0	39.28	273.17	1,651.4	30.2	-544.9	545.7	0.00	0.00	0.00
1,862.8	39.28	273.17	1,700.0	32.4	-584.6	585.4	0.00	0.00	0.00
<b>Surface Casing</b>									
1,900.0	39.28	273.17	1,728.8	33.7	-608.1	609.0	0.00	0.00	0.00
2,000.0	39.28	273.17	1,806.2	37.2	-671.3	672.3	0.00	0.00	0.00
2,100.0	39.28	273.17	1,883.6	40.7	-734.5	735.6	0.00	0.00	0.00
2,200.0	39.28	273.17	1,961.0	44.2	-797.7	798.9	0.00	0.00	0.00
2,300.0	39.28	273.17	2,038.4	47.7	-860.9	862.2	0.00	0.00	0.00
2,400.0	39.28	273.17	2,115.8	51.2	-924.1	925.6	0.00	0.00	0.00
2,500.0	39.28	273.17	2,193.2	54.7	-987.3	988.9	0.00	0.00	0.00
2,600.0	39.28	273.17	2,270.6	58.2	-1,050.6	1,052.2	0.00	0.00	0.00
2,700.0	39.28	273.17	2,348.0	61.7	-1,113.8	1,115.5	0.00	0.00	0.00
2,800.0	39.28	273.17	2,425.5	65.2	-1,177.0	1,178.8	0.00	0.00	0.00
2,900.0	39.28	273.17	2,502.9	68.7	-1,240.2	1,242.1	0.00	0.00	0.00
3,000.0	39.28	273.17	2,580.3	72.2	-1,303.4	1,305.4	0.00	0.00	0.00
3,100.0	39.28	273.17	2,657.7	75.7	-1,366.6	1,368.7	0.00	0.00	0.00
3,200.0	39.28	273.17	2,735.1	79.2	-1,429.8	1,432.0	0.00	0.00	0.00
3,300.0	39.28	273.17	2,812.5	82.7	-1,493.1	1,495.3	0.00	0.00	0.00
3,400.0	39.28	273.17	2,889.9	86.2	-1,556.3	1,558.7	0.00	0.00	0.00
3,500.0	39.28	273.17	2,967.3	89.7	-1,619.5	1,622.0	0.00	0.00	0.00
3,526.7	39.28	273.17	2,988.0	90.7	-1,636.4	1,638.9	0.00	0.00	0.00
<b>Williams Fork</b>									
3,600.0	39.28	273.17	3,044.7	93.3	-1,682.7	1,685.3	0.00	0.00	0.00
3,700.0	39.28	273.17	3,122.1	96.8	-1,745.9	1,748.6	0.00	0.00	0.00
3,800.0	39.28	273.17	3,199.5	100.3	-1,809.1	1,811.9	0.00	0.00	0.00
3,900.0	39.28	273.17	3,276.9	103.8	-1,872.3	1,875.2	0.00	0.00	0.00
4,000.0	39.28	273.17	3,354.3	107.3	-1,935.5	1,938.5	0.00	0.00	0.00
4,100.0	39.28	273.17	3,431.7	110.8	-1,998.8	2,001.8	0.00	0.00	0.00
4,200.0	39.28	273.17	3,509.1	114.3	-2,062.0	2,065.1	0.00	0.00	0.00
4,300.0	39.28	273.17	3,586.6	117.8	-2,125.2	2,128.4	0.00	0.00	0.00
4,400.0	39.28	273.17	3,664.0	121.3	-2,188.4	2,191.8	0.00	0.00	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 32C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 32C-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)
4,500.0	39.28	273.17	3,741.4	124.8	-2,251.6	2,255.1	0.00	0.00	0.00
4,522.8	39.28	273.17	3,759.0	125.6	-2,266.0	2,269.5	0.00	0.00	0.00
Top of Gas									
4,528.7	39.28	273.17	3,763.6	125.8	-2,269.8	2,273.2	0.00	0.00	0.00
Start Drop -3.50									
4,600.0	36.78	273.17	3,819.7	128.2	-2,313.6	2,317.2	3.50	-3.50	0.00
4,700.0	33.28	273.17	3,901.6	131.4	-2,370.9	2,374.6	3.50	-3.50	0.00
4,718.9	32.62	273.17	3,917.5	132.0	-2,381.2	2,384.8	3.50	-3.50	0.00
32C-13-07-96 TGT									
4,800.0	29.78	273.17	3,986.8	134.3	-2,423.1	2,426.9	3.50	-3.50	0.00
4,900.0	26.28	273.17	4,075.1	136.9	-2,470.1	2,473.8	3.50	-3.50	0.00
5,000.0	22.78	273.17	4,166.0	139.2	-2,511.5	2,515.4	3.50	-3.50	0.00
5,100.0	19.28	273.17	4,259.4	141.2	-2,547.3	2,551.3	3.50	-3.50	0.00
5,200.0	15.78	273.17	4,354.7	142.8	-2,577.4	2,581.4	3.50	-3.50	0.00
5,300.0	12.28	273.17	4,451.7	144.2	-2,601.6	2,605.6	3.50	-3.50	0.00
5,400.0	8.78	273.17	4,550.0	145.2	-2,619.9	2,623.9	3.50	-3.50	0.00
5,500.0	5.28	273.17	4,649.2	145.9	-2,632.1	2,636.1	3.50	-3.50	0.00
5,600.0	1.78	273.17	4,749.0	146.2	-2,638.3	2,642.3	3.50	-3.50	0.00
5,651.0	0.00	0.00	4,800.0	146.3	-2,639.1	2,643.1	3.50	-3.50	0.00
Back to Vertical - Start 1495.0 hold at 5651.0 MD									
5,700.0	0.00	0.00	4,849.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
5,800.0	0.00	0.00	4,949.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
5,900.0	0.00	0.00	5,049.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,149.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,100.0	0.00	0.00	5,249.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,200.0	0.00	0.00	5,349.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,228.0	0.00	0.00	5,377.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
Cameo									
6,300.0	0.00	0.00	5,449.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,400.0	0.00	0.00	5,549.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,500.0	0.00	0.00	5,649.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,600.0	0.00	0.00	5,749.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,646.0	0.00	0.00	5,795.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
Rollins									
6,700.0	0.00	0.00	5,849.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,800.0	0.00	0.00	5,949.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
6,900.0	0.00	0.00	6,049.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
7,000.0	0.00	0.00	6,149.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
7,100.0	0.00	0.00	6,249.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
7,146.0	0.00	0.00	6,295.0	146.3	-2,639.1	2,643.1	0.00	0.00	0.00
TD at 7146.0 - BHL 39.4392630 -108.0560928									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
32C-13-07-96 TGT	0.00	0.00	3,759.0	146.3	-2,639.1	1,595,036.50	2,278,183.20	39.439263000	-108.056092800
- hit/miss target									
- Shape									
- plan misses target center by 303.0usft at 4718.9usft MD (3917.5 TVD, 132.0 N, -2381.2 E)									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 32C-13-07-96 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 32C-13-07-96	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

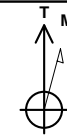
Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,526.7	2,988.0	Williams Fork		0.00	
4,522.8	3,759.0	Top of Gas		0.00	
6,228.0	5,377.0	Cameo		0.00	
6,646.0	5,795.0	Rollins		0.00	

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 39.438861859 -108.046749072
400.0	400.0	0.0	0.0	Start Build 3.50
1,522.3	1,436.4	20.5	-369.3	Start 3006.4 hold at 1522.3 MD
1,862.8	1,700.0	32.4	-584.6	Surface Casing
4,528.7	3,763.6	125.8	-2,269.8	Start Drop -3.50
5,651.0	4,800.0	146.3	-2,639.1	Back to Vertical
5,651.0	4,800.0	146.3	-2,639.1	Start 1495.0 hold at 5651.0 MD
7,146.0	6,295.0	146.3	-2,639.1	TD at 7146.0
7,146.0	6,295.0	146.3	-2,639.1	BHL 39.4392630 -108.0560928



Well Name: BMC B 32C-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 2280816.99 39.438861859 -108.046749072  
Est KB BMC B 32C-13-07-96 @ 5117.0usft (Est KB)

Slot



Azimuths to True North  
Magnetic North: 9.78°  
Magnetic Field  
Strength: 51562.8nT  
Dip Angle: 65.54°  
Date: 11/18/2016  
Model: IGRF2015

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

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
32C-13-07-96 TGT	3759.0	146.3	-2639.1	1595036.50	2278183.20	39.439263000	-108.056092800	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	1522.3	39.28	273.17	1436.4	20.5	-369.3	3.50	273.17	369.9	
4	4528.7	39.28	273.17	3763.6	125.8	-2269.8	0.00	0.00	2273.2	
5	5651.0	0.00	0.00	4800.0	146.3	-2639.1	3.50	180.00	2643.1	
6	7146.0	0.00	0.00	6295.0	146.3	-2639.1	0.00	0.00	2643.1	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.438861859 -108.046749072
400.0	400.0	Start Build 3.50
1436.4	1522.3	Start 3006.4 hold at 1522.3 MD
1700.0	1862.8	Surface Casing
3763.6	4528.7	Start Drop -3.50
4800.0	5651.0	Back to Vertical
4800.0	5651.0	Start 1495.0 hold at 5651.0 MD
6295.0	7146.0	TD at 7146.0
6295.0	7146.0	BHL 39.4392630 -108.0560928

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
2988.0	3526.7	Williams Fork	0.00	
3759.0	4522.8	Top of Gas	0.00	
5377.0	6228.0	Cameo	0.00	
5795.0	6646.0	Rollins	0.00	

