



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC D**

**BMC D 21B-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 21B-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC D 21B-18-07-95 @ 5285.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 21B-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 21B-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 21B-18-07-95, SHL 39.441507025 -108.040853449					
Well Position	+N/-S	-23.9 usft	Northing:	1,595,732.80 usft	Latitude:	39.441507025
	+E/-W	-32.0 usft	Easting:	2,282,508.38 usft	Longitude:	-108.040853449
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	329.58

<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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
658.9	12.56	329.58	656.0	33.8	-19.8	3.50	3.50	0.00	329.58	
3,805.2	12.56	329.58	3,727.0	623.8	-366.3	0.00	0.00	0.00	0.00	
4,164.0	0.00	0.00	4,083.0	657.6	-386.2	3.50	-3.50	0.00	180.00	21B-18-07-95 TGT
6,700.0	0.00	0.00	6,619.0	657.6	-386.2	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 21B-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 21B-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 21B-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 39.441507025 -108.040853449</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
<b>Start Build 3.50</b>									
400.0	3.50	329.58	399.9	2.6	-1.5	3.1	3.50	3.50	0.00
500.0	7.00	329.58	499.5	10.5	-6.2	12.2	3.50	3.50	0.00
600.0	10.50	329.58	598.3	23.6	-13.9	27.4	3.50	3.50	0.00
658.9	12.56	329.58	656.0	33.8	-19.8	39.2	3.50	3.50	0.00
<b>Start 3146.3 hold at 658.9 MD</b>									
700.0	12.56	329.58	696.1	41.5	-24.4	48.1	0.00	0.00	0.00
800.0	12.56	329.58	793.8	60.2	-35.4	69.9	0.00	0.00	0.00
900.0	12.56	329.58	891.4	79.0	-46.4	91.6	0.00	0.00	0.00
1,000.0	12.56	329.58	989.0	97.8	-57.4	113.4	0.00	0.00	0.00
1,100.0	12.56	329.58	1,086.6	116.5	-68.4	135.1	0.00	0.00	0.00
1,200.0	12.56	329.58	1,184.2	135.3	-79.4	156.9	0.00	0.00	0.00
1,300.0	12.56	329.58	1,281.8	154.0	-90.4	178.6	0.00	0.00	0.00
1,400.0	12.56	329.58	1,379.4	172.8	-101.5	200.4	0.00	0.00	0.00
1,500.0	12.56	329.58	1,477.0	191.5	-112.5	222.1	0.00	0.00	0.00
1,600.0	12.56	329.58	1,574.6	210.3	-123.5	243.8	0.00	0.00	0.00
1,700.0	12.56	329.58	1,672.2	229.0	-134.5	265.6	0.00	0.00	0.00
1,728.5	12.56	329.58	1,700.0	234.4	-137.6	271.8	0.00	0.00	0.00
<b>Surface Casing</b>									
1,800.0	12.56	329.58	1,769.8	247.8	-145.5	287.3	0.00	0.00	0.00
1,900.0	12.56	329.58	1,867.4	266.5	-156.5	309.1	0.00	0.00	0.00
2,000.0	12.56	329.58	1,965.0	285.3	-167.5	330.8	0.00	0.00	0.00
2,100.0	12.56	329.58	2,062.6	304.0	-178.5	352.6	0.00	0.00	0.00
2,200.0	12.56	329.58	2,160.2	322.8	-189.6	374.3	0.00	0.00	0.00
2,300.0	12.56	329.58	2,257.9	341.5	-200.6	396.1	0.00	0.00	0.00
2,400.0	12.56	329.58	2,355.5	360.3	-211.6	417.8	0.00	0.00	0.00
2,500.0	12.56	329.58	2,453.1	379.0	-222.6	439.6	0.00	0.00	0.00
2,600.0	12.56	329.58	2,550.7	397.8	-233.6	461.3	0.00	0.00	0.00
2,700.0	12.56	329.58	2,648.3	416.5	-244.6	483.1	0.00	0.00	0.00
2,800.0	12.56	329.58	2,745.9	435.3	-255.6	504.8	0.00	0.00	0.00
2,900.0	12.56	329.58	2,843.5	454.1	-266.7	526.6	0.00	0.00	0.00
3,000.0	12.56	329.58	2,941.1	472.8	-277.7	548.3	0.00	0.00	0.00
3,100.0	12.56	329.58	3,038.7	491.6	-288.7	570.1	0.00	0.00	0.00
3,200.0	12.56	329.58	3,136.3	510.3	-299.7	591.8	0.00	0.00	0.00
3,300.0	12.56	329.58	3,233.9	529.1	-310.7	613.5	0.00	0.00	0.00
3,380.0	12.56	329.58	3,312.0	544.1	-319.5	630.9	0.00	0.00	0.00
<b>Williams Fork</b>									
3,400.0	12.56	329.58	3,331.5	547.8	-321.7	635.3	0.00	0.00	0.00
3,500.0	12.56	329.58	3,429.1	566.6	-332.7	657.0	0.00	0.00	0.00
3,600.0	12.56	329.58	3,526.7	585.3	-343.7	678.8	0.00	0.00	0.00
3,700.0	12.56	329.58	3,624.3	604.1	-354.8	700.5	0.00	0.00	0.00
3,805.2	12.56	329.58	3,727.0	623.8	-366.3	723.4	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,900.0	9.24	329.58	3,820.1	639.3	-375.4	741.3	3.50	-3.50	0.00
4,000.0	5.74	329.58	3,919.2	650.5	-382.0	754.4	3.50	-3.50	0.00
4,100.0	2.24	329.58	4,019.0	656.5	-385.5	761.3	3.50	-3.50	0.00
4,164.0	0.00	0.00	4,083.0	657.6	-386.2	762.6	3.50	-3.50	0.00

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<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 21B-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 4164 MD - Top of Gas - 21B-18-07-95 TGT									
4,200.0	0.00	0.00	4,119.0	657.6	-386.2	762.6	0.00	0.00	0.00
4,300.0	0.00	0.00	4,219.0	657.6	-386.2	762.6	0.00	0.00	0.00
4,400.0	0.00	0.00	4,319.0	657.6	-386.2	762.6	0.00	0.00	0.00
4,500.0	0.00	0.00	4,419.0	657.6	-386.2	762.6	0.00	0.00	0.00
4,600.0	0.00	0.00	4,519.0	657.6	-386.2	762.6	0.00	0.00	0.00
4,700.0	0.00	0.00	4,619.0	657.6	-386.2	762.6	0.00	0.00	0.00
4,800.0	0.00	0.00	4,719.0	657.6	-386.2	762.6	0.00	0.00	0.00
4,900.0	0.00	0.00	4,819.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,000.0	0.00	0.00	4,919.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,100.0	0.00	0.00	5,019.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,200.0	0.00	0.00	5,119.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,300.0	0.00	0.00	5,219.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,400.0	0.00	0.00	5,319.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,500.0	0.00	0.00	5,419.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,519.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,619.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,782.0	0.00	0.00	5,701.0	657.6	-386.2	762.6	0.00	0.00	0.00
Cameo									
5,800.0	0.00	0.00	5,719.0	657.6	-386.2	762.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,819.0	657.6	-386.2	762.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,919.0	657.6	-386.2	762.6	0.00	0.00	0.00
6,100.0	0.00	0.00	6,019.0	657.6	-386.2	762.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,119.0	657.6	-386.2	762.6	0.00	0.00	0.00
Rollins									
6,300.0	0.00	0.00	6,219.0	657.6	-386.2	762.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,319.0	657.6	-386.2	762.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,419.0	657.6	-386.2	762.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,519.0	657.6	-386.2	762.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,619.0	657.6	-386.2	762.6	0.00	0.00	0.00
TD at 6700.0 - BHL 39.4433123 -108.0422208									

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									
21B-18-07-95 TGT	0.00	0.00	4,083.0	657.6	-386.2	1,596,400.89	2,282,140.76	39.443312300	-108.042220800
- 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 (°)	
3,380.0	3,312.0	Williams Fork		0.00		
4,164.0	4,083.0	Top of Gas		0.00		
5,782.0	5,701.0	Cameo		0.00		
6,200.0	6,119.0	Rollins		0.00		

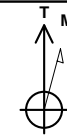
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 21B-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 21B-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #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 39.441507025 -108.040853449
300.0	300.0	0.0	0.0	Start Build 3.50
658.9	656.0	33.8	-19.8	Start 3146.3 hold at 658.9 MD
1,728.5	1,700.0	234.4	-137.6	Surface Casing
3,805.2	3,727.0	623.8	-366.3	Start Drop -3.50
4,164.0	4,083.0	657.6	-386.2	Back to Vertical
4,164.0	4,083.0	657.6	-386.2	Start 2536.0 hold at 4164 MD
6,700.0	6,619.0	657.6	-386.2	TD at 6700.0
6,700.0	6,619.0	657.6	-386.2	BHL 39.4433123 -108.0422208



Well Name: BMC D 21B-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 1595732.81 2282508.38 39.441507025 -108.040853449  
Est KB BMC D 21B-18-07-95 @ 5285.0usft (Est KB)

Slot



Azimuths to True North  
Magnetic North: 9.77°  
Magnetic Field  
Strength: 51562.2snT  
Dip Angle: 65.54°  
Date: 11/23/2016  
Model: IGRF2015

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

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
21B-18-07-95 TGT	4083.0	657.6	-386.2	1596400.90	2282140.76	39.443312300	-108.042220800	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	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	
3	658.9	12.56	329.58	656.0	33.8	-19.8	3.50	329.58	39.2	
4	3805.2	12.56	329.58	3727.0	623.8	-366.3	0.00	0.00	723.4	
5	4164.0	0.00	0.00	4083.0	657.6	-386.2	3.50	180.00	762.6	21B-18-07-95 TGT
6	6700.0	0.00	0.00	6619.0	657.6	-386.2	0.00	0.00	762.6	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.441507025 -108.040853449
300.0	300.0	Start Build 3.50
656.0	658.9	Start 3146.3 hold at 658.9 MD
1700.0	1728.5	Surface Casing
3727.0	3805.2	Start Drop -3.50
4083.0	4164.0	Back to Vertical
4083.0	4164.0	Start 2536.0 hold at 4164 MD
6619.0	6700.0	TD at 6700.0
6619.0	6700.0	BHL 39.4433123 -108.0422208

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3312.0	3380.0	Williams Fork	0.00	
4083.0	4164.0	Top of Gas	0.00	
5701.0	5782.0	Cameo	0.00	
6119.0	6200.0	Rollins	0.00	

