



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 41B-13-07-96

Wellbore #1

Plan: Design #1

Standard Planning Report

22 November, 2016



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 41B-13-07-96
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 41B-13-07-96 @ 5117.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC B 41B-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 41B-13-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Rockies Region		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	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 41B-13-07-96, SHL 39.438868010 -108.046466066					
Well Position	+N/-S	0.3 usft	Northing:	1,594,816.34 usft	Latitude:	39.438868010
	+E/-W	10.0 usft	Easting:	2,280,896.95 usft	Longitude:	-108.046466066
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,117.0 usft	Ground Level:	5,100.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/18/2016	9.78	65.54	51,563

Design	Design #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	320.26

Plan Sections										
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	
1,419.2	35.67	320.26	1,354.7	236.2	-196.4	3.50	3.50	0.00	320.26	
4,013.8	35.67	320.26	3,462.3	1,399.6	-1,163.7	0.00	0.00	0.00	0.00	
5,033.0	0.00	0.00	4,417.0	1,635.8	-1,360.1	3.50	-3.50	0.00	180.00	
7,009.0	0.00	0.00	6,393.0	1,635.8	-1,360.1	0.00	0.00	0.00	0.00	

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Project:	Rockies Region	MD Reference:	BMC B 41B-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 41B-13-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
SHL 39.438868010 -108.046466066									
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
Start Build 3.50									
500.0	3.50	320.26	499.9	2.3	-2.0	3.1	3.50	3.50	0.00
600.0	7.00	320.26	599.5	9.4	-7.8	12.2	3.50	3.50	0.00
700.0	10.50	320.26	698.3	21.1	-17.5	27.4	3.50	3.50	0.00
800.0	14.00	320.26	796.0	37.4	-31.1	48.6	3.50	3.50	0.00
900.0	17.50	320.26	892.3	58.3	-48.4	75.8	3.50	3.50	0.00
1,000.0	21.00	320.26	986.7	83.6	-69.5	108.7	3.50	3.50	0.00
1,100.0	24.50	320.26	1,078.9	113.3	-94.2	147.4	3.50	3.50	0.00
1,200.0	28.00	320.26	1,168.5	147.3	-122.5	191.6	3.50	3.50	0.00
1,300.0	31.50	320.26	1,255.3	185.5	-154.2	241.2	3.50	3.50	0.00
1,400.0	35.00	320.26	1,339.0	227.6	-189.3	296.1	3.50	3.50	0.00
1,419.2	35.67	320.26	1,354.7	236.2	-196.4	307.2	3.50	3.50	0.00
Start 2594.5 hold at 1419.2 MD									
1,500.0	35.67	320.26	1,420.3	272.4	-226.5	354.3	0.00	0.00	0.00
1,600.0	35.67	320.26	1,501.5	317.3	-263.8	412.6	0.00	0.00	0.00
1,700.0	35.67	320.26	1,582.7	362.1	-301.1	470.9	0.00	0.00	0.00
1,800.0	35.67	320.26	1,664.0	406.9	-338.3	529.2	0.00	0.00	0.00
1,844.4	35.67	320.26	1,700.0	426.8	-354.9	555.1	0.00	0.00	0.00
Surface Casing									
1,900.0	35.67	320.26	1,745.2	451.8	-375.6	587.5	0.00	0.00	0.00
2,000.0	35.67	320.26	1,826.4	496.6	-412.9	645.9	0.00	0.00	0.00
2,100.0	35.67	320.26	1,907.7	541.5	-450.2	704.2	0.00	0.00	0.00
2,200.0	35.67	320.26	1,988.9	586.3	-487.5	762.5	0.00	0.00	0.00
2,300.0	35.67	320.26	2,070.1	631.2	-524.8	820.8	0.00	0.00	0.00
2,400.0	35.67	320.26	2,151.4	676.0	-562.0	879.1	0.00	0.00	0.00
2,500.0	35.67	320.26	2,232.6	720.8	-599.3	937.4	0.00	0.00	0.00
2,600.0	35.67	320.26	2,313.8	765.7	-636.6	995.8	0.00	0.00	0.00
2,700.0	35.67	320.26	2,395.1	810.5	-673.9	1,054.1	0.00	0.00	0.00
2,800.0	35.67	320.26	2,476.3	855.4	-711.2	1,112.4	0.00	0.00	0.00
2,900.0	35.67	320.26	2,557.6	900.2	-748.5	1,170.7	0.00	0.00	0.00
3,000.0	35.67	320.26	2,638.8	945.0	-785.7	1,229.0	0.00	0.00	0.00
3,100.0	35.67	320.26	2,720.0	989.9	-823.0	1,287.3	0.00	0.00	0.00
3,200.0	35.67	320.26	2,801.3	1,034.7	-860.3	1,345.7	0.00	0.00	0.00
3,300.0	35.67	320.26	2,882.5	1,079.6	-897.6	1,404.0	0.00	0.00	0.00
3,400.0	35.67	320.26	2,963.7	1,124.4	-934.9	1,462.3	0.00	0.00	0.00
3,500.0	35.67	320.26	3,045.0	1,169.3	-972.2	1,520.6	0.00	0.00	0.00
3,550.5	35.67	320.26	3,086.0	1,191.9	-991.0	1,550.1	0.00	0.00	0.00
Williams Fork									
3,600.0	35.67	320.26	3,126.2	1,214.1	-1,009.4	1,578.9	0.00	0.00	0.00
3,700.0	35.67	320.26	3,207.4	1,258.9	-1,046.7	1,637.2	0.00	0.00	0.00
3,800.0	35.67	320.26	3,288.7	1,303.8	-1,084.0	1,695.6	0.00	0.00	0.00
3,900.0	35.67	320.26	3,369.9	1,348.6	-1,121.3	1,753.9	0.00	0.00	0.00
4,000.0	35.67	320.26	3,451.1	1,393.5	-1,158.6	1,812.2	0.00	0.00	0.00
4,013.8	35.67	320.26	3,462.3	1,399.6	-1,163.7	1,820.2	0.00	0.00	0.00
Start Drop -3.50									
4,100.0	32.66	320.26	3,533.7	1,436.9	-1,194.7	1,868.6	3.50	-3.50	0.00

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Well:	BMC B 41B-13-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
4,200.0	29.16	320.26	3,619.5	1,476.4	-1,227.5	1,920.0	3.50	-3.50	0.00
4,300.0	25.66	320.26	3,708.2	1,511.7	-1,256.9	1,966.0	3.50	-3.50	0.00
4,400.0	22.16	320.26	3,799.6	1,542.9	-1,282.8	2,006.5	3.50	-3.50	0.00
4,461.5	20.00	320.26	3,857.0	1,559.9	-1,297.0	2,028.7	3.50	-3.50	0.00
Top of Gas									
4,494.2	18.86	320.26	3,887.8	1,568.3	-1,303.9	2,039.5	3.50	-3.50	0.00
41B-13-07-96 TGT									
4,500.0	18.66	320.26	3,893.3	1,569.7	-1,305.1	2,041.4	3.50	-3.50	0.00
4,600.0	15.16	320.26	3,989.0	1,592.1	-1,323.7	2,070.5	3.50	-3.50	0.00
4,700.0	11.66	320.26	4,086.3	1,609.9	-1,338.5	2,093.7	3.50	-3.50	0.00
4,800.0	8.16	320.26	4,184.8	1,623.1	-1,349.5	2,110.9	3.50	-3.50	0.00
4,900.0	4.66	320.26	4,284.1	1,631.7	-1,356.7	2,122.0	3.50	-3.50	0.00
5,000.0	1.16	320.26	4,384.0	1,635.6	-1,359.9	2,127.1	3.50	-3.50	0.00
5,033.0	0.00	0.00	4,417.0	1,635.8	-1,360.1	2,127.4	3.50	-3.50	0.00
Back to Vertical - Start 1976.0 hold at 5033.0 MD									
5,100.0	0.00	0.00	4,484.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,200.0	0.00	0.00	4,584.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,300.0	0.00	0.00	4,684.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,400.0	0.00	0.00	4,784.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,500.0	0.00	0.00	4,884.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,600.0	0.00	0.00	4,984.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,700.0	0.00	0.00	5,084.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,800.0	0.00	0.00	5,184.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
5,900.0	0.00	0.00	5,284.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,000.0	0.00	0.00	5,384.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,091.0	0.00	0.00	5,475.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
Cameo									
6,100.0	0.00	0.00	5,484.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,200.0	0.00	0.00	5,584.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,300.0	0.00	0.00	5,684.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,400.0	0.00	0.00	5,784.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,500.0	0.00	0.00	5,884.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,509.0	0.00	0.00	5,893.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
Rollins									
6,600.0	0.00	0.00	5,984.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,700.0	0.00	0.00	6,084.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,184.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
6,900.0	0.00	0.00	6,284.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
7,009.0	0.00	0.00	6,393.0	1,635.8	-1,360.1	2,127.4	0.00	0.00	0.00
TD at 7009.0 - BHL 39.4433589 -108.0512819									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
41B-13-07-96 TGT	0.00	0.00	3,857.0	1,635.8	-1,360.1	1,596,489.59	2,279,583.28	39.443358900	-108.051281900
- hit/miss target									
- Shape									
- plan misses target center by 93.1usft at 4494.2usft MD (3887.8 TVD, 1568.3 N, -1303.9 E) - Rectangle (sides W100.0 H40.0 D2,536.0)									

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Project:	Rockies Region	MD Reference:	BMC B 41B-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 41B-13-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,550.5	3,086.0	Williams Fork		0.00	
4,461.5	3,857.0	Top of Gas		0.00	
6,091.0	5,475.0	Cameo		0.00	
6,509.0	5,893.0	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 39.438868010 -108.046466066
400.0	400.0	0.0	0.0	Start Build 3.50
1,419.2	1,354.7	236.2	-196.4	Start 2594.5 hold at 1419.2 MD
1,844.4	1,700.0	426.8	-354.9	Surface Casing
4,013.8	3,462.3	1,399.6	-1,163.7	Start Drop -3.50
5,033.0	4,417.0	1,635.8	-1,360.1	Back to Vertical
5,033.0	4,417.0	1,635.8	-1,360.1	Start 1976.0 hold at 5033.0 MD
7,009.0	6,393.0	1,635.8	-1,360.1	TD at 7009.0
7,009.0	6,393.0	1,635.8	-1,360.1	BHL 39.4433589 -108.0512819

