



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 32A-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 32A-13-07-96
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 32A-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 32A-13-07-96, SHL 39.438864934 -108.046607569					
Well Position	+N/-S	-0.8 usft	Northing:	1,594,816.34 usft	Latitude:	39.438864934
	+E/-W	-30.0 usft	Easting:	2,280,856.97 usft	Longitude:	-108.046607569
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	285.29

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	
1,514.8	39.02	285.29	1,430.6	96.3	-352.2	3.50	3.50	0.00	285.29	
4,782.5	39.02	285.29	3,969.4	638.6	-2,336.7	0.00	0.00	0.00	0.00	
5,897.3	0.00	0.00	5,000.0	734.9	-2,689.0	3.50	-3.50	0.00	180.00	
7,246.3	0.00	0.00	6,349.0	734.9	-2,689.0	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 32A-13-07-96
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 32A-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 39.438864934 -108.046607569									
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	285.29	499.9	0.8	-2.9	3.1	3.50	3.50	0.00
600.0	7.00	285.29	599.5	3.2	-11.8	12.2	3.50	3.50	0.00
700.0	10.50	285.29	698.3	7.2	-26.4	27.4	3.50	3.50	0.00
800.0	14.00	285.29	796.0	12.8	-46.9	48.6	3.50	3.50	0.00
900.0	17.50	285.29	892.3	20.0	-73.1	75.8	3.50	3.50	0.00
1,000.0	21.00	285.29	986.7	28.7	-104.9	108.7	3.50	3.50	0.00
1,100.0	24.50	285.29	1,078.9	38.9	-142.2	147.4	3.50	3.50	0.00
1,200.0	28.00	285.29	1,168.5	50.5	-184.8	191.6	3.50	3.50	0.00
1,300.0	31.50	285.29	1,255.3	63.6	-232.7	241.2	3.50	3.50	0.00
1,400.0	35.00	285.29	1,339.0	78.0	-285.6	296.1	3.50	3.50	0.00
1,500.0	38.50	285.29	1,419.1	93.8	-343.3	355.9	3.50	3.50	0.00
1,514.8	39.02	285.29	1,430.6	96.3	-352.2	365.1	3.50	3.50	0.00
Start 3406.9 hold at 1384.3 MD									
1,514.8	39.02	285.29	1,430.6	96.3	-352.2	365.2	3.50	3.50	0.00
1,600.0	39.02	285.29	1,496.8	110.4	-404.0	418.8	0.00	0.00	0.00
1,700.0	39.02	285.29	1,574.5	127.0	-464.7	481.7	0.00	0.00	0.00
1,800.0	39.02	285.29	1,652.2	143.6	-525.4	544.7	0.00	0.00	0.00
1,861.5	39.02	285.29	1,700.0	153.8	-562.8	583.4	0.00	0.00	0.00
Surface Casing									
1,900.0	39.02	285.29	1,729.9	160.2	-586.2	607.7	0.00	0.00	0.00
2,000.0	39.02	285.29	1,807.6	176.8	-646.9	670.6	0.00	0.00	0.00
2,100.0	39.02	285.29	1,885.3	193.4	-707.6	733.6	0.00	0.00	0.00
2,200.0	39.02	285.29	1,963.0	210.0	-768.4	796.5	0.00	0.00	0.00
2,300.0	39.02	285.29	2,040.7	226.6	-829.1	859.5	0.00	0.00	0.00
2,400.0	39.02	285.29	2,118.4	243.2	-889.8	922.4	0.00	0.00	0.00
2,500.0	39.02	285.29	2,196.0	259.8	-950.5	985.4	0.00	0.00	0.00
2,600.0	39.02	285.29	2,273.7	276.4	-1,011.3	1,048.4	0.00	0.00	0.00
2,700.0	39.02	285.29	2,351.4	293.0	-1,072.0	1,111.3	0.00	0.00	0.00
2,800.0	39.02	285.29	2,429.1	309.6	-1,132.7	1,174.3	0.00	0.00	0.00
2,900.0	39.02	285.29	2,506.8	326.2	-1,193.5	1,237.2	0.00	0.00	0.00
3,000.0	39.02	285.29	2,584.5	342.8	-1,254.2	1,300.2	0.00	0.00	0.00
3,100.0	39.02	285.29	2,662.2	359.4	-1,314.9	1,363.2	0.00	0.00	0.00
3,200.0	39.02	285.29	2,739.9	376.0	-1,375.7	1,426.1	0.00	0.00	0.00
3,300.0	39.02	285.29	2,817.6	392.6	-1,436.4	1,489.1	0.00	0.00	0.00
3,400.0	39.02	285.29	2,895.3	409.1	-1,497.1	1,552.0	0.00	0.00	0.00
3,500.0	39.02	285.29	2,973.0	425.7	-1,557.9	1,615.0	0.00	0.00	0.00
3,588.8	39.02	285.29	3,042.0	440.5	-1,611.8	1,670.9	0.00	0.00	0.00
Williams Fork									
3,600.0	39.02	285.29	3,050.7	442.3	-1,618.6	1,677.9	0.00	0.00	0.00
3,700.0	39.02	285.29	3,128.4	458.9	-1,679.3	1,740.9	0.00	0.00	0.00
3,800.0	39.02	285.29	3,206.1	475.5	-1,740.1	1,803.9	0.00	0.00	0.00
3,900.0	39.02	285.29	3,283.8	492.1	-1,800.8	1,866.8	0.00	0.00	0.00
4,000.0	39.02	285.29	3,361.4	508.7	-1,861.5	1,929.8	0.00	0.00	0.00
4,100.0	39.02	285.29	3,439.1	525.3	-1,922.2	1,992.7	0.00	0.00	0.00
4,200.0	39.02	285.29	3,516.8	541.9	-1,983.0	2,055.7	0.00	0.00	0.00
4,300.0	39.02	285.29	3,594.5	558.5	-2,043.7	2,118.7	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 32A-13-07-96
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 32A-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)
4,400.0	39.02	285.29	3,672.2	575.1	-2,104.4	2,181.6	0.00	0.00	0.00
4,500.0	39.02	285.29	3,749.9	591.7	-2,165.2	2,244.6	0.00	0.00	0.00
4,581.2	39.02	285.29	3,813.0	605.2	-2,214.5	2,295.7	0.00	0.00	0.00
Top of Gas									
4,600.0	39.02	285.29	3,827.6	608.3	-2,225.9	2,307.5	0.00	0.00	0.00
4,700.0	39.02	285.29	3,905.3	624.9	-2,286.6	2,370.5	0.00	0.00	0.00
4,782.5	39.02	285.29	3,969.4	638.6	-2,336.7	2,422.4	0.00	0.00	0.00
4,782.5	39.02	285.29	3,969.4	638.6	-2,336.7	2,422.4	0.00	0.00	0.00
Start Drop -3.50									
4,800.0	38.41	285.29	3,983.1	641.5	-2,347.3	2,433.4	3.51	-3.51	0.00
4,875.0	35.78	285.29	4,042.9	653.4	-2,390.9	2,478.6	3.50	-3.50	0.00
32A-13-07-96 TGT									
4,900.0	34.91	285.29	4,063.3	657.2	-2,404.9	2,493.1	3.50	-3.50	0.00
5,000.0	31.41	285.29	4,147.0	671.6	-2,457.6	2,547.7	3.50	-3.50	0.00
5,100.0	27.91	285.29	4,233.9	684.7	-2,505.3	2,597.2	3.50	-3.50	0.00
5,200.0	24.41	285.29	4,323.6	696.3	-2,547.9	2,641.3	3.50	-3.50	0.00
5,300.0	20.91	285.29	4,415.9	706.5	-2,585.0	2,679.8	3.50	-3.50	0.00
5,400.0	17.41	285.29	4,510.3	715.1	-2,616.7	2,712.6	3.50	-3.50	0.00
5,500.0	13.91	285.29	4,606.6	722.2	-2,642.7	2,739.6	3.50	-3.50	0.00
5,600.0	10.41	285.29	4,704.3	727.8	-2,663.0	2,760.6	3.50	-3.50	0.00
5,700.0	6.91	285.29	4,803.2	731.7	-2,677.5	2,775.7	3.50	-3.50	0.00
5,800.0	3.41	285.29	4,902.8	734.1	-2,686.2	2,784.7	3.50	-3.50	0.00
5,897.3	0.00	0.00	5,000.0	734.9	-2,689.0	2,787.6	3.50	-3.50	76.80
Start 1349.0 hold at 5875.6 MD - Back to Vertical									
5,900.0	0.00	0.00	5,002.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,102.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,202.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,200.0	0.00	0.00	5,302.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,300.0	0.00	0.00	5,402.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,328.3	0.00	0.00	5,431.0	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
Cameo									
6,400.0	0.00	0.00	5,502.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,500.0	0.00	0.00	5,602.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,600.0	0.00	0.00	5,702.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,700.0	0.00	0.00	5,802.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,746.3	0.00	0.00	5,849.0	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
Rollins									
6,800.0	0.00	0.00	5,902.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,002.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,102.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,202.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
7,200.0	0.00	0.00	6,302.7	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
7,246.3	0.00	0.00	6,349.0	734.9	-2,689.0	2,787.6	0.00	0.00	0.00
TD at 7246.3 - BHL 39.4408820 -108.0561282									

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 32A-13-07-96
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 32A-13-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
32A-13-07-96 TGT	0.00	0.00	3,813.0	734.9	-2,689.0	1,595,626.24	2,278,189.79	39.440882000	-108.056128200
- plan misses target center by 385.1usft at 4875.0usft MD (4042.9 TVD, 653.4 N, -2390.9 E)									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
3,588.8	3,042.0	Williams Fork		0.00		
4,581.2	3,813.0	Top of Gas		0.00		
6,328.3	5,431.0	Cameo		0.00		
6,746.3	5,849.0	Rollins		0.00		

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
0.1	0.1	0.0	0.0	SHL 39.438864934 -108.046607569
400.0	400.0	0.0	0.0	Start Build 3.50
1,514.8	1,430.6	96.3	-352.2	Start 3406.9 hold at 1384.3 MD
1,861.5	1,700.0	153.8	-562.8	Surface Casing
4,782.5	3,969.4	638.6	-2,336.7	Start Drop -3.50
5,897.3	5,000.0	734.9	-2,689.0	Start 1349.0 hold at 5875.6 MD
5,897.3	5,000.0	734.9	-2,689.0	Back to Vertical
7,246.3	6,349.0	734.9	-2,689.0	TD at 7246.3
7,246.3	6,349.0	734.9	-2,689.0	BHL 39.4408820 -108.0561282



Well Name: BMC B 32A-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 Slot
0.0 0.0 1594816.34 2280856.97 39.438864934 -108.046607569
Est KB BMC B 32A-13-07-96 @ 5117.0usft (Est KB)



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 32A-13-07-96
Design #1
13:52, November 22 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
32A-13-07-96 TGT	3813.0	734.9	-2689.0	1595626.24	2278189.79	39.440882000	-108.056128200	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	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	1514.8	39.02	285.29	1430.6	96.3	-352.2	3.50	285.29	365.2	
4	4782.5	39.02	285.29	3969.4	638.6	-2336.7	0.00	0.00	2422.4	
5	5897.3	0.00	0.00	5000.0	734.9	-2689.0	3.50	180.00	2787.6	
6	7246.3	0.00	0.00	6349.0	734.9	-2689.0	0.00	0.00	2787.6	

ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.438864934 -108.046607569
400.0	400.0	Start Build 3.50
1430.6	1514.8	Start 3406.9 hold at 1384.3 MD
1700.0	1861.5	Surface Casing
3969.4	4782.5	Start Drop -3.50
5000.0	5897.3	Start 1349.0 hold at 5875.6 MD
5000.0	5897.3	Back to Vertical
6349.0	7246.3	TD at 7246.3
6349.0	7246.3	BHL 39.4408820 -108.0561282

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3042.0	3588.8	Williams Fork	0.00	
3813.0	4581.2	Top of Gas	0.00	
5431.0	6328.3	Cameo	0.00	
5849.0	6746.3	Rollins	0.00	

