



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 23B-18-07-95

Wellbore #1

Plan: Design #1

Standard Planning Report

28 October, 2015



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 23B-18-07-95
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (PLAN KB)
Project:	Rockies Region	MD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (PLAN KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	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		

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 23B-18-07-95, SHL LAT: 39.438804369 LONG: -108.046552274					
Well Position	+N/-S	-22.9 usft	Northing:	1,594,793.84 usft	Latitude:	39° 26' 19.696 N
	+E/-W	-14.4 usft	Easting:	2,280,871.96 usft	Longitude:	108° 2' 47.588 W
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)
	IGRF2010	10/23/2015	9.81	65.56	51,780

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	128.67

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	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,572.5	30.54	128.67	1,531.7	-141.9	177.3	3.50	3.50	0.00	128.67	
3,820.8	30.54	128.67	3,468.3	-855.6	1,069.2	0.00	0.00	0.00	0.00	
4,693.3	0.00	0.00	4,300.0	-997.5	1,246.4	3.50	-3.50	0.00	180.00	
6,725.3	0.00	0.00	6,332.0	-997.5	1,246.4	0.00	0.00	0.00	0.00	

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Project:	Rockies Region	MD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (PLAN KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	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: 39.438804369 -108.046552274									
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
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 3.50									
800.0	3.50	128.67	799.9	-1.9	2.4	3.1	3.50	3.50	0.00
900.0	7.00	128.67	899.5	-7.6	9.5	12.2	3.50	3.50	0.00
1,000.0	10.50	128.67	998.3	-17.1	21.4	27.4	3.50	3.50	0.00
1,100.0	14.00	128.67	1,096.0	-30.4	38.0	48.6	3.50	3.50	0.00
1,200.0	17.50	128.67	1,192.3	-47.3	59.2	75.8	3.50	3.50	0.00
1,300.0	21.00	128.67	1,286.7	-67.9	84.9	108.7	3.50	3.50	0.00
1,400.0	24.50	128.67	1,378.9	-92.1	115.1	147.4	3.50	3.50	0.00
1,500.0	28.00	128.67	1,468.5	-119.7	149.6	191.6	3.50	3.50	0.00
1,572.5	30.54	128.67	1,531.7	-141.9	177.3	227.0	3.50	3.50	0.00
Start 2248.3 hold at 1572.5 MD									
1,600.0	30.54	128.67	1,555.5	-150.6	188.2	241.0	0.00	0.00	0.00
1,700.0	30.54	128.67	1,641.6	-182.3	227.9	291.8	0.00	0.00	0.00
1,767.8	30.54	128.67	1,700.0	-203.9	254.8	326.3	0.00	0.00	0.00
Surface Casing									
1,800.0	30.54	128.67	1,727.7	-214.1	267.5	342.6	0.00	0.00	0.00
1,900.0	30.54	128.67	1,813.9	-245.8	307.2	393.5	0.00	0.00	0.00
2,000.0	30.54	128.67	1,900.0	-277.6	346.9	444.3	0.00	0.00	0.00
2,100.0	30.54	128.67	1,986.1	-309.3	386.5	495.1	0.00	0.00	0.00
2,200.0	30.54	128.67	2,072.2	-341.1	426.2	545.9	0.00	0.00	0.00
2,300.0	30.54	128.67	2,158.4	-372.8	465.9	596.7	0.00	0.00	0.00
2,400.0	30.54	128.67	2,244.5	-404.6	505.5	647.5	0.00	0.00	0.00
2,500.0	30.54	128.67	2,330.6	-436.3	545.2	698.3	0.00	0.00	0.00
2,600.0	30.54	128.67	2,416.8	-468.1	584.9	749.1	0.00	0.00	0.00
2,700.0	30.54	128.67	2,502.9	-499.8	624.6	799.9	0.00	0.00	0.00
2,800.0	30.54	128.67	2,589.0	-531.6	664.2	850.7	0.00	0.00	0.00
2,900.0	30.54	128.67	2,675.2	-563.3	703.9	901.5	0.00	0.00	0.00
3,000.0	30.54	128.67	2,761.3	-595.0	743.6	952.3	0.00	0.00	0.00
3,100.0	30.54	128.67	2,847.4	-626.8	783.2	1,003.2	0.00	0.00	0.00
3,200.0	30.54	128.67	2,933.6	-658.5	822.9	1,054.0	0.00	0.00	0.00
3,300.0	30.54	128.67	3,019.7	-690.3	862.6	1,104.8	0.00	0.00	0.00
3,306.2	30.54	128.67	3,025.0	-692.2	865.0	1,107.9	0.00	0.00	0.00
Williams Fork									
3,400.0	30.54	128.67	3,105.8	-722.0	902.2	1,155.6	0.00	0.00	0.00
3,500.0	30.54	128.67	3,191.9	-753.8	941.9	1,206.4	0.00	0.00	0.00
3,600.0	30.54	128.67	3,278.1	-785.5	981.6	1,257.2	0.00	0.00	0.00
3,700.0	30.54	128.67	3,364.2	-817.3	1,021.2	1,308.0	0.00	0.00	0.00
3,800.0	30.54	128.67	3,450.3	-849.0	1,060.9	1,358.8	0.00	0.00	0.00
3,820.8	30.54	128.67	3,468.3	-855.6	1,069.2	1,369.4	0.00	0.00	0.00
Start Drop -3.50									
3,900.0	27.76	128.67	3,537.4	-879.7	1,099.3	1,408.0	3.50	-3.50	0.00

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Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	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)
4,000.0	24.26	128.67	3,627.3	-907.1	1,133.5	1,451.8	3.50	-3.50	0.00
4,100.0	20.76	128.67	3,719.6	-931.0	1,163.4	1,490.1	3.50	-3.50	0.00
4,180.9	17.93	128.67	3,796.0	-947.8	1,184.3	1,516.9	3.50	-3.50	0.00
Top of Gas									
4,200.0	17.26	128.67	3,814.2	-951.4	1,188.8	1,522.7	3.50	-3.50	0.00
4,300.0	13.76	128.67	3,910.5	-968.1	1,209.7	1,549.4	3.50	-3.50	0.00
4,400.0	10.26	128.67	4,008.3	-981.1	1,226.0	1,570.2	3.50	-3.50	0.00
4,500.0	6.76	128.67	4,107.2	-990.4	1,237.5	1,585.0	3.50	-3.50	0.00
4,600.0	3.26	128.67	4,206.8	-995.8	1,244.4	1,593.8	3.50	-3.50	0.00
4,693.3	0.00	0.00	4,300.0	-997.5	1,246.4	1,596.4	3.50	-3.50	-137.96
Back to Vertical - Start 2032.0 hold at 4693.3 MD									
4,700.0	0.00	0.00	4,306.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
4,800.0	0.00	0.00	4,406.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
4,900.0	0.00	0.00	4,506.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,000.0	0.00	0.00	4,606.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,100.0	0.00	0.00	4,706.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,200.0	0.00	0.00	4,806.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,300.0	0.00	0.00	4,906.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,400.0	0.00	0.00	5,006.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,500.0	0.00	0.00	5,106.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,600.0	0.00	0.00	5,206.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,700.0	0.00	0.00	5,306.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,800.0	0.00	0.00	5,406.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
5,807.3	0.00	0.00	5,414.0	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
Cameo									
5,900.0	0.00	0.00	5,506.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,000.0	0.00	0.00	5,606.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,100.0	0.00	0.00	5,706.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,200.0	0.00	0.00	5,806.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,225.3	0.00	0.00	5,832.0	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
Rollins									
6,300.0	0.00	0.00	5,906.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,400.0	0.00	0.00	6,006.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,500.0	0.00	0.00	6,106.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,600.0	0.00	0.00	6,206.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,700.0	0.00	0.00	6,306.7	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
6,725.2	0.00	0.00	6,331.9	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
BHL: 39.4360657 -108.0421392									
6,725.3	0.00	0.00	6,332.0	-997.5	1,246.4	1,596.4	0.00	0.00	0.00
TD at 6725.3									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
23B-18-07-95 TGT	0.00	0.00	3,796.0	-997.5	1,246.4	1,593,761.82	2,282,089.95	39° 26' 9.836 N	108° 2' 31.701 W
- hit/miss target									
- Shape									
- plan misses target center by 75.9usft at 4202.2usft MD (3816.3 TVD, -951.8 N, 1189.4 E)									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

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Project:	Rockies Region	MD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (PLAN KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

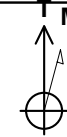
Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,306.2	3,025.0	Williams Fork		0.00	
4,180.9	3,796.0	Top of Gas		0.00	
5,807.3	5,414.0	Cameo		0.00	
6,225.3	5,832.0	Rollins		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
0.1	0.1	0.0	0.0	SHL: 39.438804369 -108.046552274	
700.0	700.0	0.0	0.0	Start Build 3.50	
1,572.5	1,531.7	-141.9	177.3	Start 2248.3 hold at 1572.5 MD	
1,767.8	1,700.0	-203.9	254.8	Surface Casing	
3,820.8	3,468.3	-855.6	1,069.2	Start Drop -3.50	
4,693.3	4,300.0	-997.5	1,246.4	Back to Vertical	
4,693.3	4,300.0	-997.5	1,246.4	Start 2032.0 hold at 4693.3 MD	
6,725.2	6,331.9	-997.5	1,246.4	BHL: 39.4360657 -108.0421392	
6,725.3	6,332.0	-997.5	1,246.4	TD at 6725.3	



Well Name: BMC B 23B-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 1594793.84 2280871.96 39° 26' 19.696 N 108° 2' 47.588 W
PLAN KB BMC B 23B-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 23B-18-07-95
Design #1
10:53, October 28 2015

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
23B-18-07-95 TGT	3796.0	-997.5	1246.4	1593761.82	2282089.95	39° 26' 9.836 N	108° 2' 31.701 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	700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.0	
3	1572.5	30.54	128.67	1531.7	-141.9	177.3	3.50	128.67	227.0	
4	3820.8	30.54	128.67	3468.3	-855.6	1069.2	0.00	0.00	1369.4	
5	4693.3	0.00	0.00	4300.0	-997.5	1246.4	3.50	180.00	1596.4	
6	6725.3	0.00	0.00	6332.0	-997.5	1246.4	0.00	0.00	1596.4	

ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.438804369 -108.046552274
700.0	700.0	Start Build 3.50
1531.7	1572.5	Start 2248.3 hold at 1572.5 MD
1700.0	1767.8	Surface Casing
3468.3	3820.8	Start Drop -3.50
4300.0	4693.3	Back to Vertical
4300.0	4693.3	Start 2032.0 hold at 4693.3 MD
6331.9	6725.2	BHL: 39.4360657 -108.0421392
6332.0	6725.3	TD at 6725.3

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3025.0	3306.2	Williams Fork	0.00	
3796.0	4180.9	Top of Gas	0.00	
5414.0	5807.3	Cameo	0.00	
5832.0	6225.3	Rollins	0.00	

