



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

**BMC B 22D-18-07-95**

**Wellbore #1**

**Design: Actual**

## **End of Well Report**

**19 July, 2017**



<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well BMC B 22D-18-07-95
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	BMC B 22D-18-07-95 @ 5117.0usft (Plan KB)
<b>Site:</b>	BMC B	<b>MD Reference:</b>	BMC B 22D-18-07-95 @ 5117.0usft (Plan KB)
<b>Well:</b>	BMC B 22D-18-07-95	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual	<b>Database:</b>	EDM 5000.1 Single User Db

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:		Latitude:	
From:	Lat/Long	Easting:		Longitude:	
Position Uncertainty:	0.0 usft	Slot Radius:		Grid Convergence:	
		1,594,816.34 usft		39.438867241	
		2,280,886.96 usft		-108.046501442	
		13-3/16 "		-1.61 °	

Well		BMC B 22D-18-07-95, SHL: Lat 39.438809751 Long -108.046304645				
Well Position	+N/-S	0.0 usft	Northing:	1,594,793.85 usft	Latitude:	39.438809751
	+E/-W	0.0 usft	Easting:	2,280,941.93 usft	Longitude:	-108.046304645
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	7/19/2017	9.71	65.53	51,489

Design		Actual			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.0	0.0	0.0	105.64

Survey Program		Date	7/19/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
138.0	6,280.0	Actual (Wellbore #1)	MWD	MWD - Standard	

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
138.0	0.57	46.20	138.0	0.3	0.5	0.5	0.41	0.41	0.00	
169.0	0.83	71.08	169.0	0.6	0.7	0.8	1.27	0.84	80.26	
199.0	0.97	67.47	199.0	1.0	0.8	1.3	0.50	0.47	-12.03	
229.0	0.97	51.57	229.0	1.3	1.1	1.7	0.89	0.00	-53.00	
259.0	1.19	65.45	259.0	1.7	1.4	2.2	1.13	0.73	46.27	
289.0	0.95	53.21	289.0	2.1	1.6	2.7	1.10	-0.80	-40.80	
319.0	0.66	54.42	319.0	2.4	1.9	3.0	0.97	-0.97	4.03	
349.0	0.37	58.04	349.0	2.5	2.0	3.2	0.97	-0.97	12.07	
379.0	0.31	110.10	379.0	2.7	2.1	3.4	1.01	-0.20	173.53	
409.0	0.44	73.76	409.0	2.9	2.1	3.6	0.88	0.43	-121.13	
439.0	0.14	186.29	439.0	3.0	2.1	3.7	1.70	-1.00	375.10	
469.0	0.13	205.15	469.0	3.0	2.0	3.7	0.15	-0.03	62.87	
498.0	0.62	190.13	498.0	3.0	1.8	3.6	1.71	1.69	-51.79	
528.0	0.57	173.73	528.0	3.1	1.5	3.6	0.59	-0.17	-54.67	
558.0	0.83	139.24	558.0	3.3	1.2	3.8	1.61	0.87	-114.97	
589.0	1.85	123.33	589.0	4.0	0.8	4.3	3.47	3.29	-51.32	
619.0	2.86	117.70	618.9	5.2	0.1	5.4	3.45	3.37	-18.77	
650.0	4.22	117.48	649.9	7.0	-0.7	7.1	4.39	4.39	-0.71	
680.0	5.48	112.63	679.8	9.5	-1.8	9.4	4.41	4.20	-16.17	
710.0	6.59	114.41	709.6	12.7	-3.1	12.3	3.75	3.70	5.93	
740.0	7.73	113.31	739.4	16.4	-4.6	15.7	3.83	3.80	-3.67	
770.0	8.83	111.60	769.1	20.6	-6.2	19.7	3.76	3.67	-5.70	
800.0	10.15	109.09	798.6	25.6	-7.9	24.3	4.61	4.40	-8.37	
831.0	11.25	107.90	829.1	31.3	-9.8	29.8	3.62	3.55	-3.84	
873.0	12.79	106.54	870.2	40.1	-12.3	38.1	3.73	3.67	-3.24	
917.0	14.50	104.65	912.9	50.4	-15.1	48.1	4.02	3.89	-4.30	

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<b>Site:</b>	BMC B	<b>MD Reference:</b>	BMC B 22D-18-07-95 @ 5117.0usft (Plan KB)
<b>Well:</b>	BMC B 22D-18-07-95	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
959.0	16.08	104.78	953.4	61.5	-17.9	58.9	3.76	3.76	0.31	
1,002.0	17.45	106.85	994.6	73.9	-21.3	70.8	3.48	3.19	4.81	
1,044.0	19.04	109.00	1,034.5	87.1	-25.4	83.3	4.11	3.79	5.12	
1,086.0	20.52	110.06	1,074.0	101.2	-30.1	96.7	3.63	3.52	2.52	
1,130.0	22.68	107.73	1,114.9	117.4	-35.4	112.0	5.28	4.91	-5.30	
1,172.0	24.39	106.59	1,153.4	134.2	-40.3	128.0	4.21	4.07	-2.71	
1,214.0	24.57	106.94	1,191.7	151.6	-45.3	144.7	0.55	0.43	0.83	
1,256.0	25.00	105.66	1,229.8	169.2	-50.3	161.6	1.64	1.02	-3.05	
1,298.0	25.40	104.56	1,267.8	187.0	-54.9	178.9	1.47	0.95	-2.62	
1,341.0	25.71	103.16	1,306.6	205.6	-59.4	196.9	1.58	0.72	-3.26	
1,383.0	25.88	102.94	1,344.4	223.8	-63.5	214.7	0.46	0.40	-0.52	
1,427.0	25.98	102.70	1,384.0	243.1	-67.8	233.4	0.33	0.23	-0.55	
1,470.0	26.32	103.25	1,422.6	262.0	-72.0	251.9	0.97	0.79	1.28	
1,512.0	26.15	104.39	1,460.3	280.5	-76.5	269.9	1.27	-0.40	2.71	
1,554.0	26.28	104.87	1,497.9	299.1	-81.1	287.9	0.59	0.31	1.14	
1,596.0	25.58	106.50	1,535.7	317.5	-86.1	305.6	2.38	-1.67	3.88	
1,638.0	25.48	106.68	1,573.6	335.6	-91.3	322.9	0.30	-0.24	0.43	
1,681.0	25.44	106.19	1,612.4	354.0	-96.5	340.6	0.50	-0.09	-1.14	
1,723.0	25.32	104.69	1,650.4	372.0	-101.3	358.0	1.56	-0.29	-3.57	
1,755.0	25.40	104.08	1,679.3	385.7	-104.7	371.3	0.85	0.25	-1.91	
Last PZD Surface Survey										
1,823.0	25.75	100.96	1,740.6	415.0	-111.1	399.9	2.05	0.51	-4.59	
1,907.0	25.44	104.74	1,816.4	451.3	-119.1	435.3	1.98	-0.37	4.50	
1,992.0	25.18	105.53	1,893.2	487.6	-128.6	470.4	0.50	-0.31	0.93	
2,076.0	24.26	104.83	1,969.5	522.7	-137.8	504.3	1.15	-1.10	-0.83	
2,161.0	25.18	106.98	2,046.7	558.3	-147.6	538.4	1.51	1.08	2.53	
2,245.0	26.10	107.68	2,122.5	594.6	-158.4	573.1	1.15	1.10	0.83	

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Survey										
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2,329.0	25.54	107.25		2,198.1	631.2	-169.4	608.0	0.70	-0.67	-0.51
2,413.0	25.66	106.50		2,273.8	667.5	-179.9	642.8	0.41	0.14	-0.89
2,500.0	26.85	108.30		2,351.9	705.9	-191.4	679.5	1.65	1.37	2.07
2,584.0	26.02	107.07		2,427.1	743.3	-202.8	715.1	1.18	-0.99	-1.46
2,671.0	24.96	106.72		2,505.6	780.7	-213.7	750.9	1.23	-1.22	-0.40
2,757.0	25.93	107.02		2,583.3	817.7	-224.4	786.3	1.14	1.13	0.35
2,843.0	24.83	106.32		2,661.0	854.5	-235.0	821.6	1.33	-1.28	-0.81
2,927.0	24.83	107.20		2,737.2	889.8	-245.1	855.4	0.44	0.00	1.05
3,013.0	25.53	106.32		2,815.0	926.4	-255.7	890.4	0.92	0.81	-1.02
3,100.0	24.60	105.25		2,893.8	963.2	-265.7	925.9	1.19	-1.07	-1.23
3,186.0	22.94	104.39		2,972.5	997.9	-274.6	959.4	1.97	-1.93	-1.00
3,270.0	22.02	102.85		3,050.2	1,030.0	-282.2	990.6	1.30	-1.10	-1.83
3,356.0	20.30	107.38		3,130.4	1,061.0	-290.2	1,020.5	2.76	-2.00	5.27
3,441.0	18.59	107.51		3,210.5	1,089.3	-298.7	1,047.5	2.01	-2.01	0.15
3,525.0	17.27	105.88		3,290.4	1,115.1	-306.1	1,072.3	1.68	-1.57	-1.94
3,609.0	15.51	105.79		3,371.0	1,138.8	-312.6	1,095.1	2.10	-2.10	-0.11
3,694.0	12.88	108.83		3,453.4	1,159.7	-318.8	1,115.0	3.21	-3.09	3.58
3,778.0	9.76	112.74		3,535.8	1,176.1	-324.5	1,130.4	3.82	-3.71	4.65
3,862.0	7.34	100.56		3,618.8	1,188.5	-328.3	1,142.3	3.58	-2.88	-14.50
3,952.0	6.37	95.14		3,708.2	1,199.1	-329.8	1,152.9	1.29	-1.08	-6.02
4,036.0	5.14	94.15		3,791.8	1,207.4	-330.5	1,161.3	1.47	-1.46	-1.18
4,072.9	4.74	94.66		3,828.5	1,210.5	-330.7	1,164.5	1.09	-1.08	1.38
22D-18-07-95 TGT										
4,120.0	4.23	95.45		3,875.5	1,214.1	-331.0	1,168.1	1.09	-1.08	1.68
4,204.0	3.78	93.40		3,959.3	1,219.9	-331.5	1,174.0	0.56	-0.54	-2.44
4,288.0	3.05	92.30		4,043.1	1,224.8	-331.7	1,179.0	0.87	-0.87	-1.31
4,375.0	2.64	93.75		4,130.0	1,229.0	-332.0	1,183.3	0.48	-0.47	1.67

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
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Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
4,460.0	2.37	96.74	4,214.9	1,232.6	-332.3	1,187.0	0.35	-0.32	3.52
4,544.0	2.04	109.02	4,298.9	1,235.8	-333.0	1,190.1	0.68	-0.39	14.62
4,628.0	1.71	120.16	4,382.8	1,238.5	-334.1	1,192.6	0.58	-0.39	13.26
4,713.0	1.10	154.44	4,467.8	1,240.3	-335.5	1,194.1	1.19	-0.72	40.33
4,797.0	1.14	178.30	4,551.8	1,241.1	-337.0	1,194.5	0.55	0.05	28.40
4,883.0	1.27	201.55	4,637.8	1,241.2	-338.8	1,194.1	0.58	0.15	27.03
4,967.0	1.54	215.70	4,721.8	1,240.8	-340.6	1,193.1	0.52	0.32	16.85
5,052.0	0.97	304.60	4,806.7	1,239.7	-341.1	1,191.9	2.12	-0.67	104.59
5,138.0	2.59	13.69	4,892.7	1,238.9	-338.8	1,191.7	2.81	1.88	80.34
5,222.0	1.93	355.23	4,976.6	1,238.4	-335.5	1,192.1	1.16	-0.79	-21.98
5,311.0	1.80	306.67	5,065.6	1,236.6	-333.2	1,190.8	1.73	-0.15	-54.56
5,392.0	1.76	299.20	5,146.6	1,234.2	-331.8	1,188.7	0.29	-0.05	-9.22
5,480.0	1.45	300.74	5,234.5	1,231.8	-330.6	1,186.6	0.36	-0.35	1.75
5,565.0	1.93	274.28	5,319.5	1,229.3	-329.9	1,184.2	1.06	0.56	-31.13
5,651.0	2.02	263.65	5,405.4	1,226.5	-330.0	1,181.3	0.44	0.10	-12.36
5,735.0	2.77	259.08	5,489.4	1,223.3	-330.6	1,177.8	0.92	0.89	-5.44
5,823.0	3.69	253.63	5,577.2	1,219.0	-331.8	1,173.0	1.10	1.05	-6.19
5,908.0	3.30	244.93	5,662.1	1,214.8	-333.6	1,168.2	0.77	-0.46	-10.24
5,994.0	3.65	245.94	5,747.9	1,210.9	-335.7	1,163.4	0.41	0.41	1.17
6,078.0	3.08	238.77	5,831.8	1,207.3	-338.0	1,159.0	0.84	-0.68	-8.54
6,162.0	2.99	240.53	5,915.6	1,204.2	-340.2	1,155.2	0.15	-0.11	2.10
6,225.0	2.64	239.08	5,978.6	1,202.0	-341.8	1,152.5	0.57	-0.56	-2.30
<b>Last PZD Survey</b>									
6,280.0	2.64	239.08	6,033.5	1,200.3	-343.1	1,150.4	0.00	0.00	0.00
<b>Straightline Projection to TD</b>									

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### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,755.0	1,679.3	-104.7	371.3	Last PZD Surface Survey
6,225.0	5,978.6	-341.8	1,152.5	Last PZD Survey
6,280.0	6,033.5	-343.1	1,150.4	Straightline Projection to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

