



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC D**

**BMC D 31B-18-07-95**

**Wellbore #1**

**Design: Actual**

## **End of Well Report**

**09 October, 2017**



<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well BMC D 31B-18-07-95
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	BMC D 31B-18-07-95 @ 5285.0usft (Plan KB)
<b>Site:</b>	BMC D	<b>MD Reference:</b>	BMC D 31B-18-07-95 @ 5285.0usft (Plan KB)
<b>Well:</b>	BMC D 31B-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

<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

<b>Site</b>	BMC D		
<b>Site Position:</b>		<b>Northing:</b>	1,595,755.80 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,282,541.08 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	39.441572650
		<b>Longitude:</b>	-108.040739971
		<b>Grid Convergence:</b>	-1.60 °

Well		BMC D 31B-18-07-95, SHL 39.441523431 -108.040825079				
Well Position	+N/-S	0.0 usft	Northing:	1,595,738.56 usft	Latitude:	39.441523431
	+E/-W	0.0 usft	Easting:	2,282,516.55 usft	Longitude:	-108.040825079
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	10/9/2017	9.68	65.53	51,465

<b>Design</b>	Actual			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<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	47.01

<b>Survey Program</b>	<b>Date</b>	10/7/2017		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
108.0	6,550.0	Actual (Wellbore #1)	MWD	MWD - Standard

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<b>Well:</b>	BMC D 31B-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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
108.0	1.41	342.81	108.0	0.6	1.3	-0.4	1.31	1.31	0.00	
139.0	1.71	357.52	139.0	1.0	2.1	-0.5	1.61	0.97	47.45	
168.0	2.07	8.43	168.0	1.7	3.0	-0.5	1.75	1.24	37.62	
198.0	2.50	17.74	197.9	2.7	4.2	-0.2	1.89	1.43	31.03	
227.0	3.08	20.03	226.9	4.0	5.5	0.3	2.04	2.00	7.90	
257.0	3.82	32.24	256.8	5.7	7.1	1.1	3.46	2.47	40.70	
288.0	4.53	33.69	287.8	7.9	9.0	2.3	2.32	2.29	4.68	
317.0	5.41	40.55	316.7	10.3	11.0	3.8	3.66	3.03	23.66	
348.0	6.37	43.93	347.5	13.5	13.4	6.0	3.29	3.10	10.90	
377.0	7.29	45.08	376.3	16.9	15.8	8.4	3.21	3.17	3.97	
407.0	8.48	42.04	406.0	21.0	18.8	11.2	4.20	3.97	-10.13	
437.0	9.76	40.90	435.6	25.8	22.4	14.4	4.31	4.27	-3.80	
468.0	11.22	43.94	466.1	31.4	26.5	18.2	5.04	4.71	9.81	
499.0	12.44	45.11	496.4	37.7	31.1	22.6	4.01	3.94	3.77	
529.0	13.23	46.13	525.7	44.4	35.7	27.4	2.74	2.63	3.40	
559.0	13.80	48.24	554.9	51.4	40.5	32.6	2.51	1.90	7.03	
589.0	14.77	46.35	583.9	58.8	45.5	38.0	3.59	3.23	-6.30	
619.0	15.78	46.61	612.9	66.7	51.0	43.7	3.37	3.37	0.87	
649.0	16.44	43.10	641.7	75.0	56.9	49.6	3.92	2.20	-11.70	
679.0	16.92	44.24	670.4	83.6	63.1	55.5	1.94	1.60	3.80	
709.0	17.23	44.55	699.1	92.4	69.4	61.7	1.08	1.03	1.03	
738.0	16.92	46.17	726.8	100.9	75.4	67.8	1.96	-1.07	5.59	
768.0	16.39	48.02	755.6	109.5	81.2	74.0	2.50	-1.77	6.17	
799.0	16.57	48.11	785.3	118.3	87.1	80.6	0.59	0.58	0.29	
829.0	16.57	48.24	814.1	126.9	92.8	87.0	0.12	0.00	0.43	
871.0	16.74	47.84	854.3	138.9	100.8	95.9	0.49	0.40	-0.95	

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<b>Well:</b>	BMC D 31B-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)	
916.0	17.75	46.97	897.3	152.3	109.9	105.7	2.32	2.24	-1.93	
958.0	17.62	47.84	937.3	165.0	118.5	115.1	0.70	-0.31	2.07	
1,000.0	17.23	51.10	977.4	177.6	126.7	124.7	2.50	-0.93	7.76	
1,042.0	17.09	52.68	1,017.5	189.9	134.3	134.4	1.16	-0.33	3.76	
1,084.0	17.45	52.24	1,057.6	202.3	141.9	144.3	0.91	0.86	-1.05	
1,127.0	17.62	49.29	1,098.6	215.3	150.1	154.3	2.10	0.40	-6.86	
1,169.0	17.84	47.67	1,138.6	228.1	158.6	163.9	1.29	0.52	-3.86	
1,211.0	17.97	46.44	1,178.6	241.0	167.4	173.4	0.95	0.31	-2.93	
1,253.0	18.13	46.91	1,218.5	254.0	176.3	182.8	0.52	0.38	1.12	
1,295.0	18.33	47.62	1,258.4	267.1	185.2	192.5	0.71	0.48	1.69	
1,337.0	18.59	47.32	1,298.2	280.4	194.2	202.3	0.66	0.62	-0.71	
1,380.0	18.33	46.48	1,339.0	294.0	203.5	212.2	0.86	-0.60	-1.95	
1,422.0	18.59	45.82	1,378.9	307.3	212.8	221.8	0.79	0.62	-1.57	
1,464.0	18.88	46.38	1,418.6	320.8	222.1	231.5	0.81	0.69	1.33	
1,506.0	18.98	47.23	1,458.4	334.4	231.4	241.5	0.70	0.24	2.02	
1,548.0	19.29	49.47	1,498.0	348.2	240.6	251.8	1.90	0.74	5.33	
1,590.0	19.78	50.53	1,537.6	362.2	249.6	262.5	1.44	1.17	2.52	
1,633.0	20.26	50.44	1,578.0	376.9	259.0	273.9	1.12	1.12	-0.21	
1,677.0	20.39	50.00	1,619.3	392.2	268.8	285.6	0.46	0.30	-1.00	
1,721.0	20.70	49.21	1,660.5	407.6	278.8	297.4	0.95	0.70	-1.80	
1,745.0	20.83	49.12	1,682.9	416.1	284.3	303.8	0.56	0.54	-0.37	
Last PZD Surface Survey										
1,907.0	20.96	46.53	1,834.3	473.9	323.1	346.6	0.58	0.08	-1.60	
1,991.0	21.23	45.08	1,912.7	504.1	344.2	368.3	0.70	0.32	-1.73	
2,076.0	21.75	46.48	1,991.7	535.2	365.9	390.6	0.86	0.61	1.65	
2,160.0	22.46	47.14	2,069.6	566.8	387.5	413.7	0.90	0.85	0.79	
2,244.0	21.80	49.51	2,147.4	598.5	408.6	437.3	1.32	-0.79	2.82	

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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)	
2,329.0	20.79	47.27	2,226.6	629.3	429.1	460.4	1.53	-1.19	-2.64	
2,413.0	21.75	49.43	2,304.9	659.8	449.3	483.1	1.48	1.14	2.57	
2,497.0	21.11	49.14	2,383.1	690.4	469.3	506.4	0.77	-0.76	-0.35	
2,582.0	21.09	47.32	2,462.4	721.0	489.7	529.2	0.77	-0.02	-2.14	
2,666.0	21.80	48.46	2,540.5	751.7	510.3	552.0	0.98	0.85	1.36	
2,750.0	21.58	47.76	2,618.6	782.8	531.0	575.1	0.40	-0.26	-0.83	
2,835.0	21.31	46.39	2,697.7	813.8	552.2	597.9	0.67	-0.32	-1.61	
2,919.0	21.75	50.09	2,775.8	844.6	572.7	620.9	1.70	0.52	4.40	
3,004.0	21.40	49.21	2,854.9	875.9	592.9	644.7	0.56	-0.41	-1.04	
3,088.0	20.74	48.86	2,933.3	906.0	612.7	667.5	0.80	-0.79	-0.42	
3,172.0	20.30	47.49	3,011.9	935.5	632.3	689.4	0.78	-0.52	-1.63	
3,257.0	21.31	48.90	3,091.4	965.7	652.5	711.9	1.33	1.19	1.66	
3,341.0	22.50	50.44	3,169.3	997.0	672.7	735.8	1.57	1.42	1.83	
3,426.0	21.58	49.08	3,248.1	1,028.8	693.3	760.2	1.24	-1.08	-1.60	
3,510.0	19.60	46.79	3,326.8	1,058.4	713.1	782.1	2.54	-2.36	-2.73	
3,594.0	20.17	48.11	3,405.8	1,086.9	732.4	803.2	0.86	0.68	1.57	
3,679.0	19.34	47.58	3,485.7	1,115.6	751.7	824.5	1.00	-0.98	-0.62	
3,763.0	17.14	47.49	3,565.5	1,141.9	769.4	843.9	2.62	-2.62	-0.11	
3,848.0	13.84	46.17	3,647.4	1,164.6	785.0	860.5	3.90	-3.88	-1.55	
3,932.0	10.94	46.83	3,729.5	1,182.7	797.4	873.5	3.46	-3.45	0.79	
4,017.0	8.04	51.01	3,813.3	1,196.7	806.6	884.0	3.50	-3.41	4.92	
4,101.0	5.01	62.74	3,896.7	1,206.0	812.0	891.9	3.92	-3.61	13.96	
4,185.0	4.09	62.65	3,980.5	1,212.5	815.1	897.8	1.10	-1.10	-0.11	
4,269.0	3.49	61.41	4,064.3	1,217.8	817.7	902.7	0.72	-0.71	-1.48	
4,348.2	2.90	60.34	4,143.4	1,222.1	819.8	906.5	0.75	-0.74	-1.36	
<b>31B-18-07-95 TGT</b>										
4,354.0	2.86	60.24	4,149.2	1,222.4	820.0	906.8	0.75	-0.74	-1.65	

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Survey										
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4,438.0	2.43	60.40	4,233.1	1,226.2	821.9	910.2	0.51	-0.51	0.19	
4,526.0	2.24	59.36	4,321.0	1,229.7	823.7	913.3	0.22	-0.22	-1.18	
4,615.0	1.99	57.71	4,409.9	1,232.9	825.4	916.1	0.29	-0.28	-1.85	
4,701.0	1.49	51.10	4,495.9	1,235.5	826.9	918.2	0.63	-0.58	-7.69	
4,786.0	2.20	27.44	4,580.8	1,238.1	829.0	919.8	1.21	0.84	-27.84	
4,870.0	2.29	20.69	4,664.8	1,241.1	832.0	921.1	0.33	0.11	-8.04	
4,954.0	1.71	7.99	4,748.7	1,243.6	834.8	921.9	0.86	-0.69	-15.12	
5,041.0	2.24	34.44	4,835.7	1,246.3	837.5	923.1	1.20	0.61	30.40	
5,126.0	1.98	27.81	4,920.6	1,249.3	840.2	924.7	0.42	-0.31	-7.80	
5,214.0	1.54	14.05	5,008.6	1,251.7	842.7	925.7	0.69	-0.50	-15.64	
5,302.0	0.64	7.08	5,096.6	1,253.1	844.3	926.0	1.03	-1.02	-7.92	
5,386.0	0.44	330.19	5,180.6	1,253.5	845.1	925.9	0.47	-0.24	-43.92	
5,472.0	0.65	271.62	5,266.6	1,253.2	845.4	925.3	0.66	0.24	-68.10	
5,558.0	1.19	231.23	5,352.6	1,252.0	844.8	924.1	0.94	0.63	-46.97	
5,642.0	0.75	36.59	5,436.5	1,251.7	844.7	923.7	2.29	-0.52	196.86	
5,727.0	1.05	335.33	5,521.5	1,252.5	845.9	923.7	1.12	0.35	-72.07	
5,815.0	0.70	316.17	5,609.5	1,252.7	847.0	923.0	0.51	-0.40	-21.77	
5,903.0	1.10	281.63	5,697.5	1,252.2	847.5	921.8	0.75	0.45	-39.25	
5,989.0	1.23	258.08	5,783.5	1,250.9	847.5	920.1	0.57	0.15	-27.38	
6,078.0	1.80	259.62	5,872.5	1,248.9	847.1	917.8	0.64	0.64	1.73	
6,164.0	2.37	253.03	5,958.4	1,246.2	846.3	914.8	0.72	0.66	-7.66	
6,249.0	2.72	245.99	6,043.3	1,242.7	845.0	911.3	0.55	0.41	-8.28	
6,333.0	3.03	230.48	6,127.2	1,238.6	842.8	907.7	0.99	0.37	-18.46	
6,419.0	3.74	217.47	6,213.1	1,233.6	839.1	904.3	1.21	0.83	-15.13	
6,495.0	3.60	218.57	6,288.9	1,228.8	835.2	901.3	0.21	-0.18	1.45	
Last PZD Survey										

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6,550.0	3.60	218.57	6,343.8	1,225.4	832.5	899.1	0.00	0.00	0.00
Straightline Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,745.0	1,682.9	284.3	303.8	Last PZD Surface Survey
6,495.0	6,288.9	835.2	901.3	Last PZD Survey
6,550.0	6,343.8	832.5	899.1	Straightline Projection to TD

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

