



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 41D-13-07-96

Wellbore #1

Design: Actual

End of Well Report

31 August, 2017



Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well BMC B 41D-13-07-96
Project:	Rockies Region	TVD Reference:	BMC B 41D-13-07-96 @ 5117.0usft (Plan KB)
Site:	BMC B	MD Reference:	BMC B 41D-13-07-96 @ 5117.0usft (Plan KB)
Well:	BMC B 41D-13-07-96	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	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:		1,594,816.34	usft
From:	Lat/Long	Easting:		2,280,886.96	usft
Position Uncertainty:	0.0	Slot Radius:		13-3/16	"
				Latitude:	39.438867241
				Longitude:	-108.046501442
				Grid Convergence:	-1.61 °

Well		BMC B 41D-13-07-96, SHL: Lat 39.438866473 Long -108.046536818				
Well Position	+N-S	0.0 usft	Northing:	1,594,816.34 usft	Latitude:	39.438866473
	+E-W	0.0 usft	Easting:	2,280,876.96 usft	Longitude:	-108.046536818
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	8/31/2017	9.70	65.53	51,476

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	305.48

Survey Program		Date	8/31/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
109.0	6,490.0	Actual (Wellbore #1)	MWD	MWD - Standard	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	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	
109.0	0.35	67.96	109.0	-0.2	0.1	0.3	0.32	0.32	0.00	
139.0	0.53	81.36	139.0	-0.3	0.2	0.5	0.69	0.60	44.67	
169.0	0.31	93.84	169.0	-0.5	0.2	0.7	0.79	-0.73	41.60	
200.0	0.31	42.07	200.0	-0.6	0.3	0.9	0.87	0.00	-167.00	
229.0	0.13	303.46	229.0	-0.6	0.3	0.9	1.22	-0.62	-340.03	
260.0	0.53	299.68	260.0	-0.4	0.4	0.8	1.29	1.29	-12.19	
290.0	0.70	277.09	290.0	-0.1	0.5	0.5	0.98	0.57	-75.30	
320.0	0.97	290.50	320.0	0.3	0.6	0.0	1.11	0.90	44.70	
351.0	1.14	292.03	351.0	0.9	0.8	-0.5	0.56	0.55	4.94	
380.0	1.41	309.88	380.0	1.5	1.2	-1.0	1.65	0.93	61.55	
411.0	1.98	318.14	411.0	2.4	1.8	-1.7	2.00	1.84	26.65	
440.0	2.77	307.68	439.9	3.6	2.6	-2.6	3.10	2.72	-36.07	
471.0	3.63	311.24	470.9	5.3	3.7	-3.9	2.85	2.77	11.48	
501.0	4.61	317.30	500.8	7.5	5.2	-5.4	3.57	3.27	20.20	
531.0	5.32	311.55	530.7	10.0	7.0	-7.3	2.89	2.37	-19.17	
562.0	6.50	307.24	561.5	13.2	9.1	-9.8	4.06	3.81	-13.90	
592.0	7.56	313.70	591.3	16.9	11.4	-12.5	4.40	3.53	21.53	
623.0	8.48	313.57	622.0	21.1	14.4	-15.7	2.97	2.97	-0.42	
654.0	9.45	306.74	652.6	25.9	17.5	-19.4	4.64	3.13	-22.03	
683.0	10.24	303.42	681.2	30.9	20.4	-23.4	3.35	2.72	-11.45	
713.0	11.07	307.33	710.7	36.4	23.6	-27.9	3.67	2.77	13.03	
743.0	11.97	305.45	740.1	42.4	27.1	-32.8	3.25	3.00	-6.27	
774.0	12.57	303.81	770.4	49.0	30.9	-38.2	2.24	1.94	-5.29	
804.0	13.54	303.77	799.6	55.8	34.6	-43.8	3.23	3.23	-0.13	
834.0	14.81	304.87	828.7	63.1	38.8	-49.9	4.33	4.23	3.67	
877.0	16.57	303.86	870.1	74.8	45.3	-59.5	4.14	4.09	-2.35	

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Site:	BMC B	MD Reference:	BMC B 41D-13-07-96 @ 5117.0usft (Plan KB)
Well:	BMC B 41D-13-07-96	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	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)	
919.0	18.54	302.45	910.1	87.4	52.3	-70.1	4.80	4.69	-3.36	
961.0	19.82	304.08	949.8	101.2	59.8	-81.6	3.30	3.05	3.88	
1,003.0	21.14	302.49	989.1	115.9	67.9	-93.9	3.41	3.14	-3.79	
1,045.0	22.76	303.11	1,028.1	131.6	76.4	-107.1	3.90	3.86	1.48	
1,087.0	24.17	303.37	1,066.6	148.3	85.6	-121.1	3.37	3.36	0.62	
1,129.0	25.81	305.06	1,104.7	166.0	95.6	-135.8	4.26	3.90	4.02	
1,172.0	27.78	305.46	1,143.1	185.4	106.7	-151.6	4.60	4.58	0.93	
1,214.0	29.58	305.70	1,179.9	205.6	118.5	-168.0	4.29	4.29	0.57	
1,256.0	31.11	306.01	1,216.2	226.8	130.9	-185.2	3.66	3.64	0.74	
1,298.0	32.17	305.97	1,251.9	248.8	143.9	-203.0	2.52	2.52	-0.10	
1,340.0	32.43	305.31	1,287.4	271.3	156.9	-221.2	1.04	0.62	-1.57	
1,382.0	32.92	304.91	1,322.8	293.9	170.0	-239.8	1.27	1.17	-0.95	
1,424.0	33.31	304.34	1,357.9	316.9	183.0	-258.7	1.19	0.93	-1.36	
1,466.0	33.63	304.88	1,393.0	340.0	196.2	-277.7	1.04	0.76	1.29	
1,509.0	33.31	306.62	1,428.8	363.7	210.0	-297.0	2.35	-0.74	4.05	
1,551.0	33.44	306.89	1,463.9	386.8	223.8	-315.5	0.47	0.31	0.64	
1,593.0	33.84	306.84	1,498.9	410.1	237.8	-334.1	0.95	0.95	-0.12	
1,635.0	34.15	306.49	1,533.7	433.6	251.8	-353.0	0.87	0.74	-0.83	
1,677.0	34.54	305.97	1,568.4	457.3	265.8	-372.1	1.16	0.93	-1.24	
1,719.0	34.86	305.74	1,602.9	481.2	279.8	-391.4	0.82	0.76	-0.55	
1,761.0	34.89	305.17	1,637.4	505.2	293.8	-411.0	0.78	0.07	-1.36	
1,804.0	34.89	304.65	1,672.6	529.8	307.8	-431.2	0.69	0.00	-1.21	
Last PZD Surface Survey										
1,878.0	34.80	305.00	1,733.4	572.1	332.0	-465.9	0.30	-0.12	0.47	
1,962.0	35.24	305.31	1,802.2	620.3	359.7	-505.3	0.57	0.52	0.37	
2,048.0	34.32	303.55	1,872.8	669.3	387.5	-545.7	1.58	-1.07	-2.05	
2,133.0	34.19	306.14	1,943.1	717.1	414.8	-585.0	1.72	-0.15	3.05	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	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)	
2,217.0	33.93	305.04	2,012.7	764.2	442.2	-623.3	0.80	-0.31	-1.31	
2,301.0	34.10	307.81	2,082.3	811.2	470.1	-661.1	1.86	0.20	3.30	
2,387.0	33.35	306.40	2,153.8	858.9	498.9	-699.1	1.26	-0.87	-1.64	
2,473.0	32.26	304.95	2,226.1	905.5	526.1	-737.0	1.56	-1.27	-1.69	
2,560.0	32.21	306.23	2,299.7	951.9	553.1	-774.7	0.79	-0.06	1.47	
2,644.0	31.51	305.79	2,371.0	996.2	579.1	-810.6	0.88	-0.83	-0.52	
2,728.0	30.63	304.69	2,443.0	1,039.6	604.2	-846.0	1.25	-1.05	-1.31	
2,813.0	32.04	307.24	2,515.6	1,083.8	630.1	-881.7	2.28	1.66	3.00	
2,899.0	32.87	308.73	2,588.2	1,129.9	658.5	-918.1	1.34	0.97	1.73	
2,984.0	34.54	309.52	2,658.9	1,176.9	688.3	-954.7	2.03	1.96	0.93	
3,070.0	33.44	308.12	2,730.2	1,224.9	718.5	-992.1	1.57	-1.28	-1.63	
3,154.0	34.85	307.68	2,799.7	1,272.0	747.4	-1,029.3	1.70	1.68	-0.52	
3,238.0	34.10	307.86	2,868.9	1,319.5	776.5	-1,066.9	0.90	-0.89	0.21	
3,323.0	31.77	305.44	2,940.3	1,365.7	804.1	-1,104.0	3.15	-2.74	-2.85	
3,408.0	30.81	304.95	3,012.9	1,409.9	829.6	-1,140.1	1.17	-1.13	-0.58	
3,493.0	28.87	306.36	3,086.6	1,452.2	854.2	-1,174.4	2.43	-2.28	1.66	
3,579.0	25.04	304.78	3,163.3	1,491.1	876.9	-1,206.1	4.53	-4.45	-1.84	
3,664.0	21.53	302.63	3,241.3	1,524.7	895.6	-1,234.0	4.25	-4.13	-2.53	
3,748.0	18.90	303.72	3,320.2	1,553.7	911.5	-1,258.3	3.16	-3.13	1.30	
3,832.0	15.03	304.47	3,400.5	1,578.2	925.2	-1,278.6	4.61	-4.61	0.89	
3,919.0	10.75	302.17	3,485.3	1,597.6	935.9	-1,294.8	4.95	-4.92	-2.64	
4,005.0	7.43	302.27	3,570.2	1,611.2	943.1	-1,306.3	3.86	-3.86	0.12	
4,089.0	5.14	314.93	3,653.7	1,620.3	948.7	-1,313.6	3.17	-2.73	15.07	
4,174.0	3.75	339.18	3,738.4	1,626.4	954.0	-1,317.2	2.72	-1.64	28.53	
4,258.0	3.58	338.10	3,822.3	1,630.9	959.0	-1,319.2	0.22	-0.20	-1.29	
4,281.7	3.04	345.99	3,845.9	1,632.0	960.3	-1,319.6	2.97	-2.28	33.25	
41D-13-07-96 TGT										

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Design:	Actual	Database:	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)	
4,342.0	2.15	21.46	3,906.2	1,633.4	962.9	-1,319.6	2.97	-1.48	58.85	
4,427.0	2.07	42.03	3,991.1	1,633.7	965.5	-1,318.0	0.89	-0.09	24.20	
4,511.0	1.58	43.00	4,075.1	1,633.3	967.5	-1,316.2	0.58	-0.58	1.15	
4,597.0	1.41	40.49	4,161.0	1,633.1	969.2	-1,314.7	0.21	-0.20	-2.92	
4,682.0	1.05	29.24	4,246.0	1,633.1	970.6	-1,313.6	0.51	-0.42	-13.24	
4,766.0	0.88	12.64	4,330.0	1,633.4	971.9	-1,313.1	0.39	-0.20	-19.76	
4,850.0	0.40	342.13	4,414.0	1,633.9	972.8	-1,313.1	0.68	-0.57	-36.32	
4,935.0	0.38	303.37	4,499.0	1,634.4	973.3	-1,313.4	0.31	-0.02	-45.60	
5,021.0	0.66	268.92	4,585.0	1,635.1	973.4	-1,314.1	0.47	0.33	-40.06	
5,107.0	0.83	274.24	4,671.0	1,636.0	973.5	-1,315.2	0.21	0.20	6.19	
5,191.0	1.12	260.78	4,755.0	1,637.1	973.4	-1,316.6	0.44	0.35	-16.02	
5,276.0	1.64	257.17	4,840.0	1,638.5	973.0	-1,318.7	0.62	0.61	-4.25	
5,362.0	1.85	256.00	4,925.9	1,640.3	972.4	-1,321.2	0.25	0.24	-1.36	
5,450.0	2.02	253.45	5,013.9	1,642.1	971.6	-1,324.1	0.22	0.19	-2.90	
5,535.0	2.59	244.93	5,098.8	1,644.0	970.3	-1,327.2	0.78	0.67	-10.02	
5,621.0	0.66	238.11	5,184.8	1,645.1	969.2	-1,329.4	2.25	-2.24	-7.93	
5,705.0	0.66	215.35	5,268.7	1,645.3	968.6	-1,330.1	0.31	0.00	-27.10	
5,791.0	1.05	220.18	5,354.7	1,645.4	967.6	-1,330.9	0.46	0.45	5.62	
5,878.0	1.54	218.73	5,441.7	1,645.5	966.1	-1,332.2	0.56	0.56	-1.67	
5,962.0	1.85	215.44	5,525.7	1,645.6	964.1	-1,333.6	0.39	0.37	-3.92	
6,047.0	0.09	19.40	5,610.7	1,645.6	963.0	-1,334.4	2.28	-2.07	192.89	
6,131.0	0.22	16.89	5,694.7	1,645.7	963.2	-1,334.4	0.15	0.15	-2.99	
6,212.0	0.70	227.83	5,775.7	1,645.8	963.1	-1,334.7	1.11	0.59	-184.02	
6,300.0	1.36	234.73	5,863.6	1,646.3	962.1	-1,335.9	0.76	0.75	7.84	
6,384.0	1.63	229.06	5,947.6	1,646.9	960.7	-1,337.6	0.37	0.32	-6.75	
6,435.0	1.49	227.17	5,998.6	1,647.2	959.8	-1,338.7	0.29	-0.27	-3.71	
Last PZD Survey										

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6,490.0	1.49	227.17	6,053.6	1,647.5	958.8	-1,339.7	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)	
1,804.0	1,672.6	307.8	-431.2	Last PZD Surface Survey
6,435.0	5,998.6	959.8	-1,338.7	Last PZD Survey
6,490.0	6,053.6	958.8	-1,339.7	Straightline Projection to TD

Checked By: _____ Approved By: _____ Date: _____

