



Ursa Operating Company, LLC

Rockies Region

BMC D

BMC D 22B-18-07-95

Wellbore #1

Design: Actual

End of Well Report

24 April, 2017



Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well BMC D 22B-18-07-95
Project:	Rockies Region	TVD Reference:	BMC D 22B-18-07-95 @ 5285.0usft (Plan KB)
Site:	BMC D	MD Reference:	BMC D 22B-18-07-95 @ 5285.0usft (Plan KB)
Well:	BMC D 22B-18-07-95	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 D			
Site Position:		Northing:		Latitude:	
From:	Lat/Long	Easting:		Longitude:	
Position Uncertainty:	0.0 usft	Slot Radius:		Grid Convergence:	
		1,595,755.80 usft		39.441572650	
		2,282,541.08 usft		-108.040739971	
		13-3/16 "		-1.60 °	

Well		BMC D 22B-18-07-95, SHL Lat: 39.441531360 Long: -108.040678178				
Well Position	+N-S	0.0 usft	Northing:	1,595,740.28 usft	Latitude:	39.441531360
	+E-W	0.0 usft	Easting:	2,282,558.11 usft	Longitude:	-108.040678178
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,285.0 usft	Ground Level:	5,268.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/24/2017	9.73	65.54	51,516

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	212.99

Survey Program		Date	4/24/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
109.0	6,356.0	Actual (Wellbore #1)	MWD	MWD - Standard	

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Well:	BMC D 22B-18-07-95	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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
109.0	0.62	208.86	109.0	0.6	-0.5	-0.3	0.57	0.57	0.00	
137.0	0.92	190.31	137.0	0.9	-0.9	-0.4	1.38	1.07	-66.25	
167.0	0.97	194.18	167.0	1.4	-1.4	-0.5	0.27	0.17	12.90	
197.0	0.88	188.07	197.0	1.9	-1.8	-0.6	0.44	-0.30	-20.37	
228.0	0.88	209.30	228.0	2.3	-2.3	-0.7	1.05	0.00	68.48	
258.0	0.79	209.12	258.0	2.7	-2.7	-1.0	0.30	-0.30	-0.60	
289.0	0.88	191.98	289.0	3.2	-3.1	-1.1	0.85	0.29	-55.29	
319.0	1.01	200.99	319.0	3.7	-3.5	-1.3	0.66	0.43	30.03	
350.0	1.36	203.49	350.0	4.3	-4.1	-1.5	1.14	1.13	8.06	
381.0	2.11	206.62	381.0	5.2	-5.0	-1.9	2.44	2.42	10.10	
411.0	2.94	206.18	410.9	6.5	-6.2	-2.5	2.77	2.77	-1.47	
442.0	3.74	213.25	441.9	8.3	-7.7	-3.4	2.90	2.58	22.81	
472.0	4.66	212.72	471.8	10.5	-9.6	-4.6	3.07	3.07	-1.77	
503.0	5.19	211.49	502.7	13.2	-11.8	-6.0	1.74	1.71	-3.97	
533.0	6.33	210.57	532.5	16.2	-14.4	-7.6	3.81	3.80	-3.07	
564.0	7.60	211.80	563.3	20.0	-17.6	-9.5	4.12	4.10	3.97	
594.0	9.09	213.93	593.0	24.3	-21.3	-11.9	5.07	4.97	7.10	
625.0	10.42	216.11	623.5	29.6	-25.6	-14.9	4.45	4.29	7.03	
656.0	11.30	215.23	654.0	35.4	-30.3	-18.3	2.89	2.84	-2.84	
686.0	12.04	215.58	683.4	41.5	-35.3	-21.8	2.48	2.47	1.17	
717.0	12.39	212.86	713.6	48.0	-40.7	-25.5	2.17	1.13	-8.77	
747.0	13.01	213.01	742.9	54.6	-46.2	-29.1	2.07	2.07	0.50	
778.0	13.58	210.97	773.1	61.7	-52.3	-32.9	2.38	1.84	-6.58	
809.0	13.67	210.88	803.2	69.0	-58.5	-36.6	0.30	0.29	-0.29	
839.0	14.24	210.00	832.3	76.3	-64.8	-40.3	2.03	1.90	-2.93	
882.0	14.37	209.16	874.0	86.9	-74.0	-45.5	0.57	0.30	-1.95	

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Site:	BMC D	MD Reference:	BMC D 22B-18-07-95 @ 5285.0usft (Plan KB)
Well:	BMC D 22B-18-07-95	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)
925.0	14.77	211.98	915.6	97.7	-83.3	-51.0	1.89	0.93	6.56
967.0	14.06	216.99	956.3	108.1	-91.9	-56.9	3.42	-1.69	11.93
1,010.0	13.67	218.70	998.0	118.4	-100.1	-63.2	1.32	-0.91	3.98
1,053.0	12.82	216.89	1,039.9	128.2	-107.9	-69.3	2.20	-1.98	-4.21
1,096.0	12.79	215.93	1,081.8	137.7	-115.5	-74.9	0.50	-0.07	-2.23
1,138.0	13.01	215.54	1,122.8	147.1	-123.1	-80.4	0.56	0.52	-0.93
1,181.0	13.18	213.21	1,164.6	156.8	-131.2	-85.9	1.29	0.40	-5.42
1,224.0	13.05	213.25	1,206.5	166.6	-139.3	-91.3	0.30	-0.30	0.09
1,266.0	13.27	212.90	1,247.4	176.1	-147.3	-96.5	0.56	0.52	-0.83
1,309.0	13.30	213.37	1,289.3	186.0	-155.6	-101.9	0.26	0.07	1.09
1,352.0	13.01	212.55	1,331.1	195.8	-163.8	-107.2	0.80	-0.67	-1.91
1,394.0	13.14	211.05	1,372.1	205.3	-171.9	-112.2	0.87	0.31	-3.57
1,437.0	13.10	211.19	1,413.9	215.0	-180.3	-117.3	0.12	-0.09	0.33
1,480.0	13.34	209.88	1,455.8	224.9	-188.7	-122.3	0.89	0.56	-3.05
1,522.0	13.84	211.32	1,496.6	234.7	-197.2	-127.3	1.44	1.19	3.43
1,565.0	14.11	211.19	1,538.3	245.1	-206.1	-132.7	0.63	0.63	-0.30
1,608.0	13.97	211.10	1,580.1	255.5	-215.0	-138.1	0.33	-0.33	-0.21
1,650.0	14.46	210.26	1,620.8	265.8	-223.9	-143.3	1.27	1.17	-2.00
Last PZD Surface Survey									
1,786.0	14.83	209.29	1,752.4	300.2	-253.7	-160.4	0.33	0.27	-0.71
1,870.0	14.33	213.29	1,833.6	321.3	-271.8	-171.4	1.34	-0.60	4.76
1,955.0	13.58	212.72	1,916.1	341.8	-289.0	-182.5	0.90	-0.88	-0.67
2,039.0	14.41	214.31	1,997.6	362.1	-305.9	-193.8	1.09	0.99	1.89
2,123.0	14.41	212.94	2,079.0	383.0	-323.3	-205.3	0.41	0.00	-1.63
2,207.0	13.40	213.51	2,160.5	403.2	-340.2	-216.4	1.21	-1.20	0.68
2,292.0	14.24	215.76	2,243.1	423.5	-356.9	-227.9	1.17	0.99	2.65
2,376.0	14.11	212.68	2,324.5	444.0	-373.9	-239.5	0.91	-0.15	-3.67

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
2,460.0	13.67	211.36	2,406.1	464.2	-391.0	-250.2	0.65	-0.52	-1.57	
2,545.0	14.02	211.67	2,488.6	484.5	-408.4	-260.8	0.42	0.41	0.36	
2,629.0	13.54	211.54	2,570.2	504.5	-425.4	-271.3	0.57	-0.57	-0.15	
2,713.0	13.13	211.15	2,651.9	523.9	-441.9	-281.4	0.50	-0.49	-0.46	
2,797.0	12.77	207.86	2,733.8	542.7	-458.3	-290.7	0.98	-0.43	-3.92	
2,882.0	12.48	208.99	2,816.7	561.2	-474.7	-299.5	0.45	-0.34	1.33	
2,966.0	13.01	211.75	2,898.7	579.7	-490.6	-308.9	0.96	0.63	3.29	
3,050.0	14.02	218.74	2,980.3	599.3	-506.6	-320.2	2.28	1.20	8.32	
3,135.0	14.06	212.28	3,062.8	619.9	-523.4	-332.2	1.84	0.05	-7.60	
3,219.0	13.27	211.84	3,144.4	639.7	-540.2	-342.7	0.95	-0.94	-0.52	
3,303.0	13.84	213.43	3,226.1	659.4	-556.8	-353.3	0.81	0.68	1.89	
3,387.0	13.01	213.29	3,307.8	678.9	-573.1	-364.1	0.99	-0.99	-0.17	
3,472.0	12.57	212.94	3,390.7	697.7	-588.8	-374.3	0.53	-0.52	-0.41	
3,556.0	11.91	210.44	3,472.8	715.5	-604.0	-383.7	1.01	-0.79	-2.98	
3,640.0	10.77	209.69	3,555.1	732.0	-618.3	-392.0	1.37	-1.36	-0.89	
3,725.0	10.20	209.82	3,638.7	747.4	-631.7	-399.7	0.67	-0.67	0.15	
3,809.0	8.61	207.93	3,721.6	761.1	-643.7	-406.3	1.93	-1.89	-2.25	
3,893.0	8.13	208.86	3,804.7	773.3	-654.4	-412.1	0.59	-0.57	1.11	
3,978.0	5.89	205.87	3,889.0	783.6	-663.6	-416.9	2.67	-2.64	-3.52	
4,062.0	3.69	214.70	3,972.7	790.6	-669.7	-420.3	2.75	-2.62	10.51	
4,130.3	2.12	219.67	4,041.0	794.1	-672.5	-422.4	2.32	-2.29	7.27	
22B-18-07-95 TGT										
4,146.0	1.77	222.04	4,056.6	794.6	-672.9	-422.7	2.32	-2.26	15.14	
4,230.0	0.20	34.32	4,140.6	795.7	-673.8	-423.5	2.34	-1.87	205.10	
4,315.0	0.62	342.01	4,225.6	795.3	-673.2	-423.6	0.61	0.49	-61.54	
4,399.0	0.70	299.21	4,309.6	795.1	-672.5	-424.2	0.58	0.10	-50.95	
4,483.0	0.48	348.47	4,393.6	794.8	-671.9	-424.7	0.63	-0.26	58.64	

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

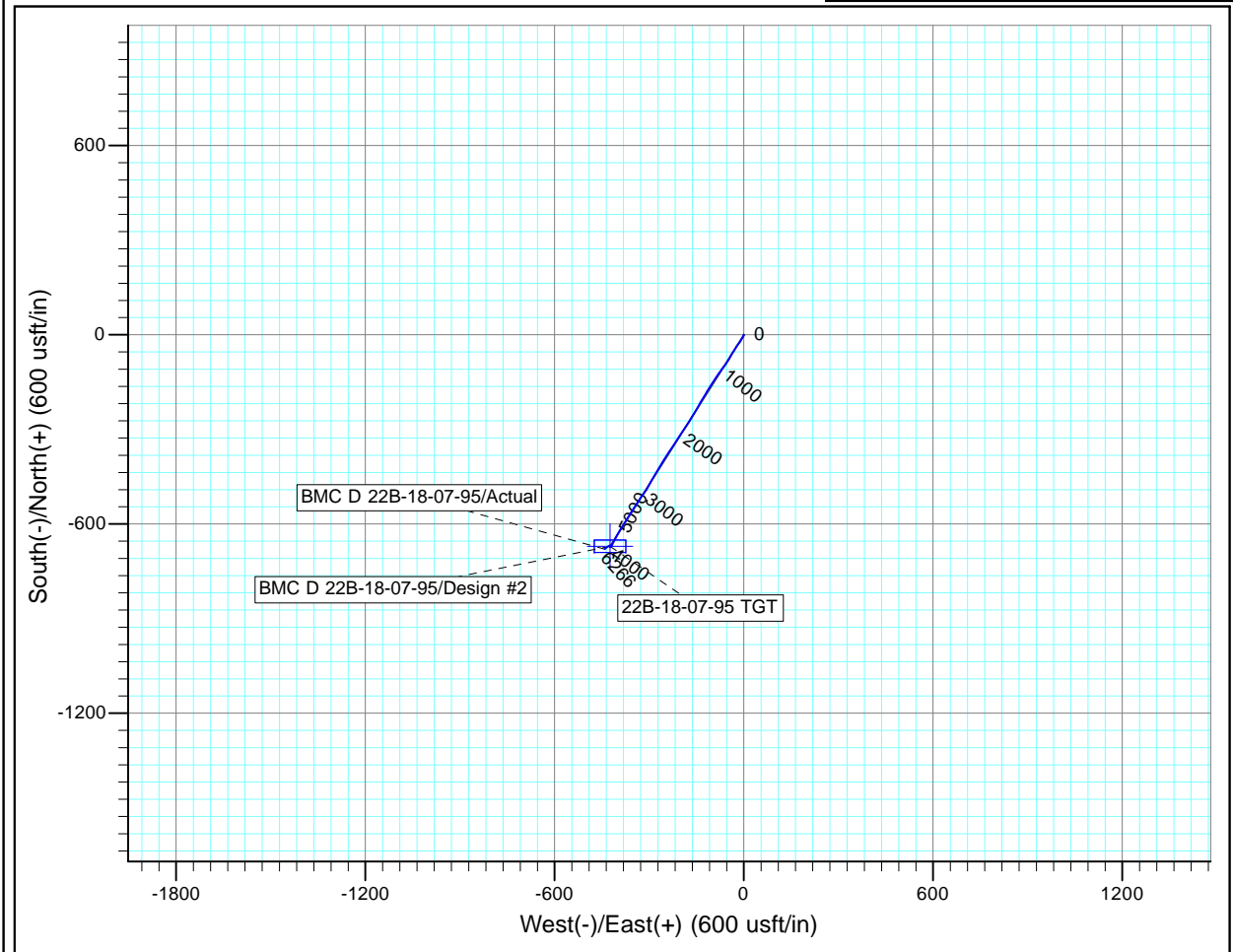
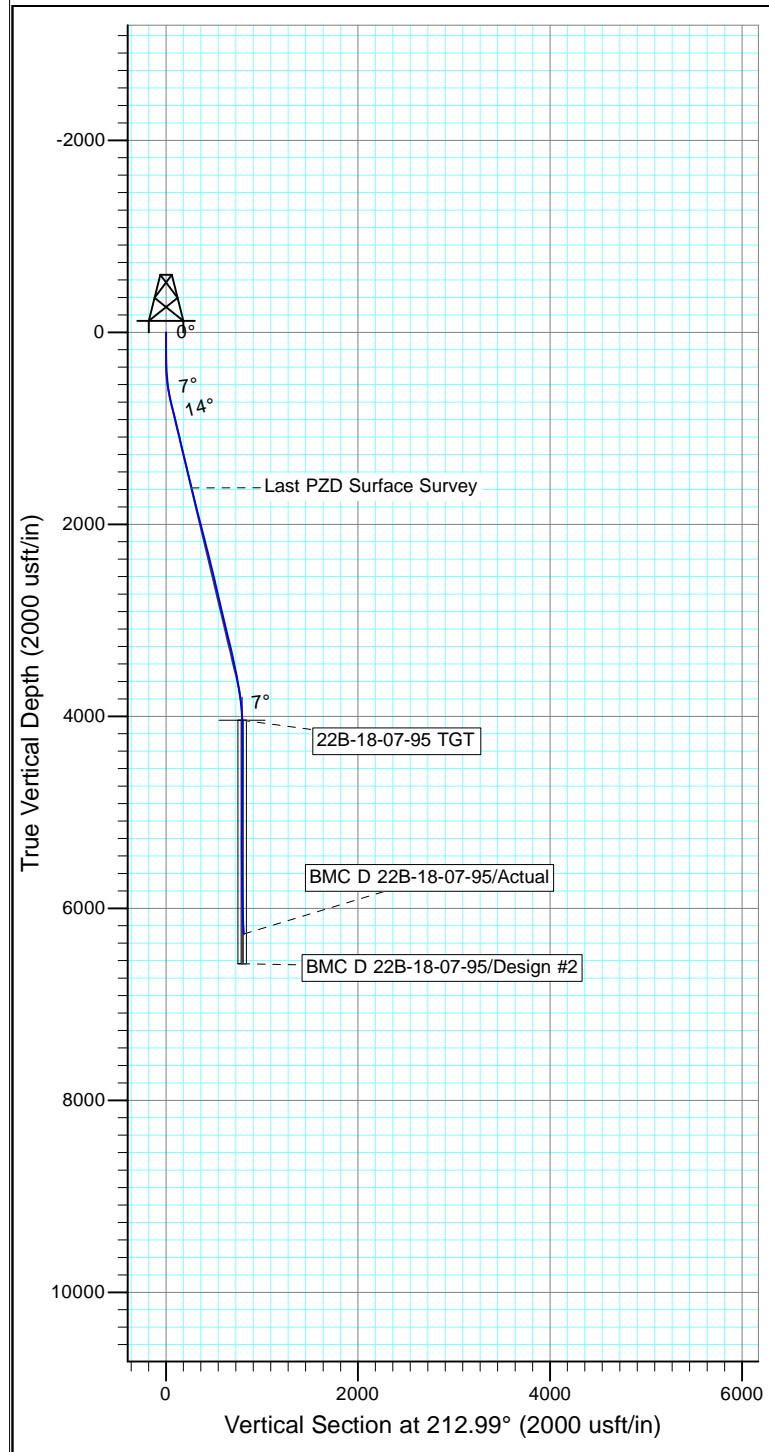
Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
4,568.0	0.44	357.22	4,478.6	794.3	-671.3	-424.8	0.09	-0.05	10.29	
4,652.0	0.33	294.82	4,562.6	794.1	-670.8	-425.0	0.49	-0.13	-74.29	
4,736.0	0.48	286.86	4,646.6	794.2	-670.6	-425.6	0.19	0.18	-9.48	
4,821.0	0.26	10.88	4,731.6	794.1	-670.3	-425.9	0.61	-0.26	98.85	
4,905.0	0.44	7.19	4,815.6	793.7	-669.8	-425.8	0.22	0.21	-4.39	
4,989.0	0.62	277.10	4,899.6	793.6	-669.5	-426.2	0.91	0.21	-107.25	
5,074.0	0.31	139.99	4,984.6	793.9	-669.6	-426.5	1.03	-0.36	-161.31	
5,158.0	1.14	88.53	5,068.6	793.4	-669.7	-425.5	1.16	0.99	-61.26	
5,242.0	1.10	105.94	5,152.6	792.7	-669.9	-423.9	0.41	-0.05	20.73	
5,326.0	0.77	126.23	5,236.6	792.5	-670.5	-422.7	0.55	-0.39	24.15	
5,411.0	1.23	78.29	5,321.6	791.9	-670.6	-421.3	1.08	0.54	-56.40	
5,495.0	0.92	43.53	5,405.5	790.6	-670.0	-420.0	0.84	-0.37	-41.38	
5,579.0	0.51	352.91	5,489.5	789.7	-669.1	-419.6	0.85	-0.49	-60.26	
5,664.0	0.92	318.31	5,574.5	789.2	-668.2	-420.1	0.68	0.48	-40.71	
5,748.0	1.01	291.30	5,658.5	789.2	-667.4	-421.2	0.55	0.11	-32.15	
5,832.0	1.67	261.94	5,742.5	790.1	-667.3	-423.1	1.11	0.79	-34.95	
5,916.0	2.16	250.09	5,826.5	792.2	-668.1	-425.8	0.75	0.58	-14.11	
6,001.0	2.20	239.79	5,911.4	794.9	-669.4	-428.7	0.46	0.05	-12.12	
6,085.0	2.24	234.52	5,995.3	797.9	-671.2	-431.5	0.25	0.05	-6.27	
6,169.0	2.77	229.07	6,079.2	801.4	-673.5	-434.3	0.69	0.63	-6.49	
6,254.0	2.77	229.16	6,164.1	805.3	-676.2	-437.4	0.01	0.00	0.11	
6,296.0	2.81	227.31	6,206.1	807.3	-677.5	-439.0	0.23	0.10	-4.40	
Last PZD Survey										
6,356.0	2.81	227.31	6,266.0	810.1	-679.5	-441.1	0.00	0.00	0.00	
Straight Line Projection to TD										

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Site:	BMC D	MD Reference:	BMC D 22B-18-07-95 @ 5285.0usft (Plan KB)
Well:	BMC D 22B-18-07-95	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,650.0	1,620.8	-223.9	-143.3	Last PZD Surface Survey
6,296.0	6,206.1	-677.5	-439.0	Last PZD Survey
6,356.0	6,266.0	-679.5	-441.1	Straight Line Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Design: Actual (BMC D 22B-18-07-95/Wellbore #1)

Created By: Derek Stephens Date: 8:28, April 24 2017

THIS SURVEY IS CORRECT TO THE BEST OF
 MY KNOWLEDGE AND IS SUPPORTED
 BY ACTUAL FIELD DATA