



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 23D-18-07-95

Wellbore #1

Design: Actual

End of Well Report

12 June, 2017



Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well BMC B 23D-18-07-95
Project:	Rockies Region	TVD Reference:	BMC B 23D-18-07-95 @ 5117.0usft (Plan KB)
Site:	BMC B	MD Reference:	BMC B 23D-18-07-95 @ 5117.0usft (Plan KB)
Well:	BMC B 23D-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 B							
Site Position:		Northing:		1,594,816.34	usft	Latitude:		39.438867241	
From:	Lat/Long	Easting:		2,280,886.96	usft	Longitude:		-108.046501442	
Position Uncertainty:		0.0	usft	Slot Radius:		13-3/16	"	Grid Convergence:	-1.61 °

Well		BMC B 23D-18-07-95, SHL: Lat 39.438801293 Long -108.046693777				
Well Position	+N/-S	0.0 usft	Northing:	1,594,793.86 usft	Latitude:	39.438801293
	+E/-W	0.0 usft	Easting:	2,280,831.98 usft	Longitude:	-108.046693777
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	6/12/2017	9.72	65.53	51,500

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	141.23

Survey Program		Date	6/12/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
109.0	6,691.0	Actual (Wellbore #1)	MWD	MWD - Standard	

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Well:	BMC B 23D-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	0.55	197.61	109.0	0.3	-0.5	-0.2	0.50	0.50	0.00	
138.0	0.88	188.37	138.0	0.5	-0.9	-0.2	1.20	1.14	-31.86	
168.0	1.27	165.65	168.0	1.0	-1.4	-0.2	1.90	1.30	-75.73	
198.0	1.93	150.18	198.0	1.8	-2.2	0.1	2.61	2.20	-51.57	
228.0	2.60	142.77	228.0	3.0	-3.1	0.8	2.43	2.23	-24.70	
259.0	3.12	138.01	258.9	4.5	-4.3	1.8	1.84	1.68	-15.35	
289.0	3.56	146.97	288.9	6.2	-5.7	2.9	2.27	1.47	29.87	
320.0	4.64	143.95	319.8	8.5	-7.5	4.1	3.55	3.48	-9.74	
350.0	5.80	141.70	349.7	11.2	-9.7	5.8	3.93	3.87	-7.50	
380.0	6.50	144.95	379.5	14.4	-12.3	7.7	2.61	2.33	10.83	
411.0	7.25	142.71	410.3	18.1	-15.3	9.9	2.57	2.42	-7.23	
441.0	8.44	137.61	440.0	22.2	-18.4	12.5	4.59	3.97	-17.00	
472.0	10.15	137.52	470.6	27.2	-22.1	15.9	5.52	5.52	-0.29	
502.0	11.38	137.52	500.0	32.8	-26.2	19.7	4.10	4.10	0.00	
533.0	12.44	138.05	530.4	39.2	-31.0	24.0	3.44	3.42	1.71	
564.0	13.06	137.82	560.6	46.0	-36.1	28.6	2.01	2.00	-0.74	
594.0	13.84	138.31	589.8	53.0	-41.2	33.2	2.63	2.60	1.63	
624.0	14.41	140.69	618.9	60.3	-46.8	38.0	2.71	1.90	7.93	
655.0	14.81	142.18	648.9	68.1	-52.9	42.8	1.77	1.29	4.81	
685.0	15.73	144.42	677.8	76.0	-59.3	47.6	3.64	3.07	7.47	
716.0	17.01	144.42	707.6	84.7	-66.4	52.6	4.13	4.13	0.00	
747.0	18.11	142.93	737.1	94.1	-73.9	58.2	3.83	3.55	-4.81	
789.0	19.82	143.50	776.8	107.7	-84.8	66.4	4.10	4.07	1.36	
832.0	22.32	142.66	817.0	123.1	-97.2	75.6	5.86	5.81	-1.95	
873.0	24.18	142.50	854.6	139.3	-110.0	85.5	4.54	4.54	-0.39	
915.0	25.93	141.96	892.7	157.1	-124.1	96.4	4.20	4.17	-1.29	

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Well:	BMC B 23D-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)
958.0	27.33	140.82	931.1	176.4	-139.2	108.4	3.47	3.26	-2.65
1,000.0	28.70	140.25	968.2	196.1	-154.4	120.9	3.32	3.26	-1.36
1,042.0	30.10	140.51	1,004.8	216.7	-170.3	134.1	3.35	3.33	0.62
1,084.0	31.25	139.19	1,040.9	238.1	-186.6	147.9	3.17	2.74	-3.14
1,126.0	32.08	139.81	1,076.7	260.2	-203.4	162.2	2.12	1.98	1.48
1,168.0	33.18	140.60	1,112.0	282.8	-220.8	176.7	2.81	2.62	1.88
1,210.0	34.76	141.30	1,146.9	306.3	-239.0	191.5	3.88	3.76	1.67
1,253.0	36.43	143.59	1,181.8	331.3	-258.9	206.7	4.97	3.88	5.33
1,295.0	37.62	143.68	1,215.4	356.6	-279.2	221.7	2.84	2.83	0.21
1,337.0	38.32	144.47	1,248.5	382.4	-300.2	236.9	2.03	1.67	1.88
1,379.0	39.59	143.63	1,281.1	408.8	-321.5	252.4	3.27	3.02	-2.00
1,421.0	41.09	144.38	1,313.1	435.9	-343.5	268.4	3.75	3.57	1.79
1,463.0	42.28	143.31	1,344.5	463.8	-366.1	284.9	3.30	2.83	-2.55
1,505.0	43.50	143.39	1,375.3	492.4	-389.0	301.9	2.91	2.90	0.19
1,547.0	44.56	142.84	1,405.5	521.6	-412.4	319.4	2.68	2.52	-1.31
1,590.0	45.66	141.48	1,435.8	552.0	-436.4	338.1	3.40	2.56	-3.16
1,632.0	45.35	141.79	1,465.3	582.0	-459.9	356.7	0.91	-0.74	0.74
1,674.0	46.36	140.18	1,494.5	612.1	-483.3	375.7	3.65	2.40	-3.83
1,716.0	45.40	139.24	1,523.7	642.2	-506.3	395.2	2.79	-2.29	-2.24
1,758.0	44.73	139.00	1,553.4	672.0	-528.8	414.7	1.65	-1.60	-0.57
1,800.0	44.91	138.93	1,583.2	701.5	-551.1	434.1	0.44	0.43	-0.17
1,842.0	44.25	138.01	1,613.1	731.0	-573.2	453.6	2.20	-1.57	-2.19
1,885.0	43.90	138.97	1,644.0	760.9	-595.6	473.5	1.75	-0.81	2.23
Last PZD Surface Survey									
2,020.0	40.17	141.17	1,744.3	851.2	-664.9	531.5	2.97	-2.76	1.63
2,106.0	40.05	141.72	1,810.0	906.6	-708.2	566.0	0.44	-0.14	0.64
2,190.0	41.84	139.90	1,873.5	961.6	-750.8	600.8	2.56	2.13	-2.17

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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)	
2,274.0	40.69	140.60	1,936.6	1,017.0	-793.4	636.3	1.48	-1.37	0.83	
2,358.0	40.08	139.98	2,000.6	1,071.5	-835.3	671.0	0.87	-0.73	-0.74	
2,443.0	41.13	138.93	2,065.1	1,126.7	-877.3	707.0	1.47	1.24	-1.24	
2,527.0	40.91	141.30	2,128.5	1,181.9	-919.6	742.4	1.87	-0.26	2.82	
2,611.0	39.95	141.08	2,192.5	1,236.3	-962.1	776.5	1.16	-1.14	-0.26	
2,698.0	41.04	141.92	2,258.6	1,292.8	-1,006.3	811.7	1.40	1.25	0.97	
2,782.0	42.01	142.18	2,321.5	1,348.5	-1,050.2	845.9	1.17	1.15	0.31	
2,866.0	41.35	141.17	2,384.2	1,404.4	-1,094.0	880.5	1.12	-0.79	-1.20	
2,950.0	40.34	140.73	2,447.8	1,459.3	-1,136.7	915.1	1.25	-1.20	-0.52	
3,035.0	39.51	140.20	2,513.0	1,513.8	-1,178.8	949.9	1.06	-0.98	-0.62	
3,119.0	39.77	144.04	2,577.7	1,567.4	-1,221.0	982.8	2.93	0.31	4.57	
3,203.0	39.38	143.76	2,642.4	1,620.9	-1,264.3	1,014.3	0.51	-0.46	-0.33	
3,288.0	38.58	143.15	2,708.5	1,674.3	-1,307.2	1,046.1	1.04	-0.94	-0.72	
3,372.0	37.92	141.92	2,774.5	1,726.3	-1,348.5	1,077.7	1.20	-0.79	-1.46	
3,456.0	34.45	142.58	2,842.2	1,775.9	-1,387.7	1,108.1	4.16	-4.13	0.79	
3,540.0	32.39	142.23	2,912.4	1,822.1	-1,424.4	1,136.3	2.46	-2.45	-0.42	
3,625.0	28.56	142.01	2,985.6	1,865.2	-1,458.4	1,162.8	4.51	-4.51	-0.26	
3,709.0	26.77	141.50	3,060.0	1,904.2	-1,489.0	1,186.9	2.15	-2.13	-0.61	
3,793.0	24.83	140.95	3,135.6	1,940.8	-1,517.5	1,209.8	2.33	-2.31	-0.65	
3,878.0	20.52	144.03	3,214.0	1,973.5	-1,543.5	1,229.8	5.26	-5.07	3.62	
3,962.0	17.27	145.83	3,293.5	2,000.6	-1,565.7	1,245.5	3.93	-3.87	2.14	
4,046.0	15.51	143.59	3,374.1	2,024.3	-1,585.1	1,259.2	2.23	-2.10	-2.67	
4,130.0	12.96	138.23	3,455.5	2,044.9	-1,601.1	1,272.1	3.41	-3.04	-6.38	
4,215.0	10.33	144.69	3,538.7	2,062.1	-1,614.5	1,282.9	3.45	-3.09	7.60	
4,299.0	7.71	138.17	3,621.7	2,075.2	-1,624.8	1,291.0	3.34	-3.12	-7.76	
4,383.0	4.61	143.94	3,705.2	2,084.2	-1,631.7	1,296.7	3.76	-3.69	6.87	

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Design:	Actual	Database:	EDM 5000.1 Single User Db

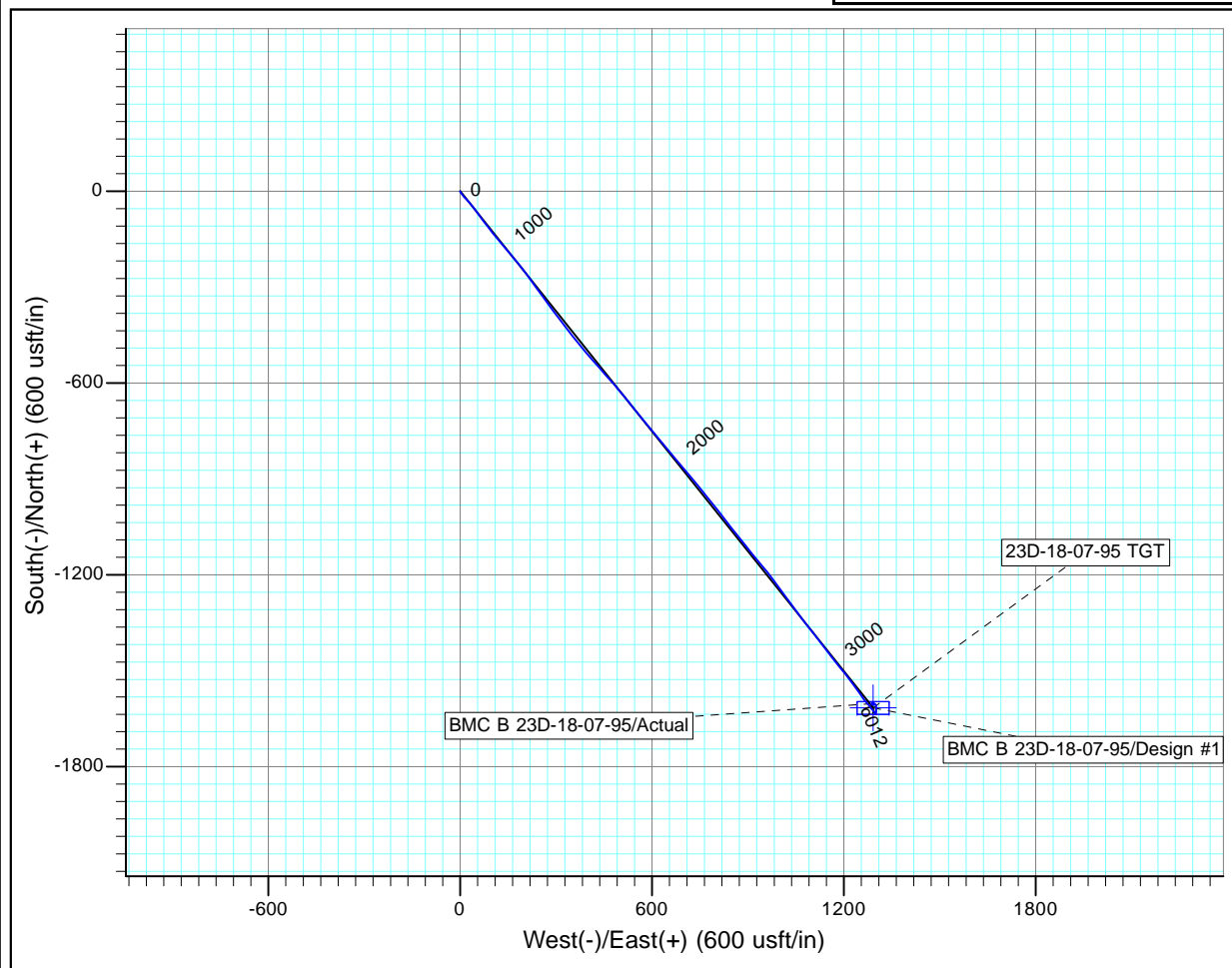
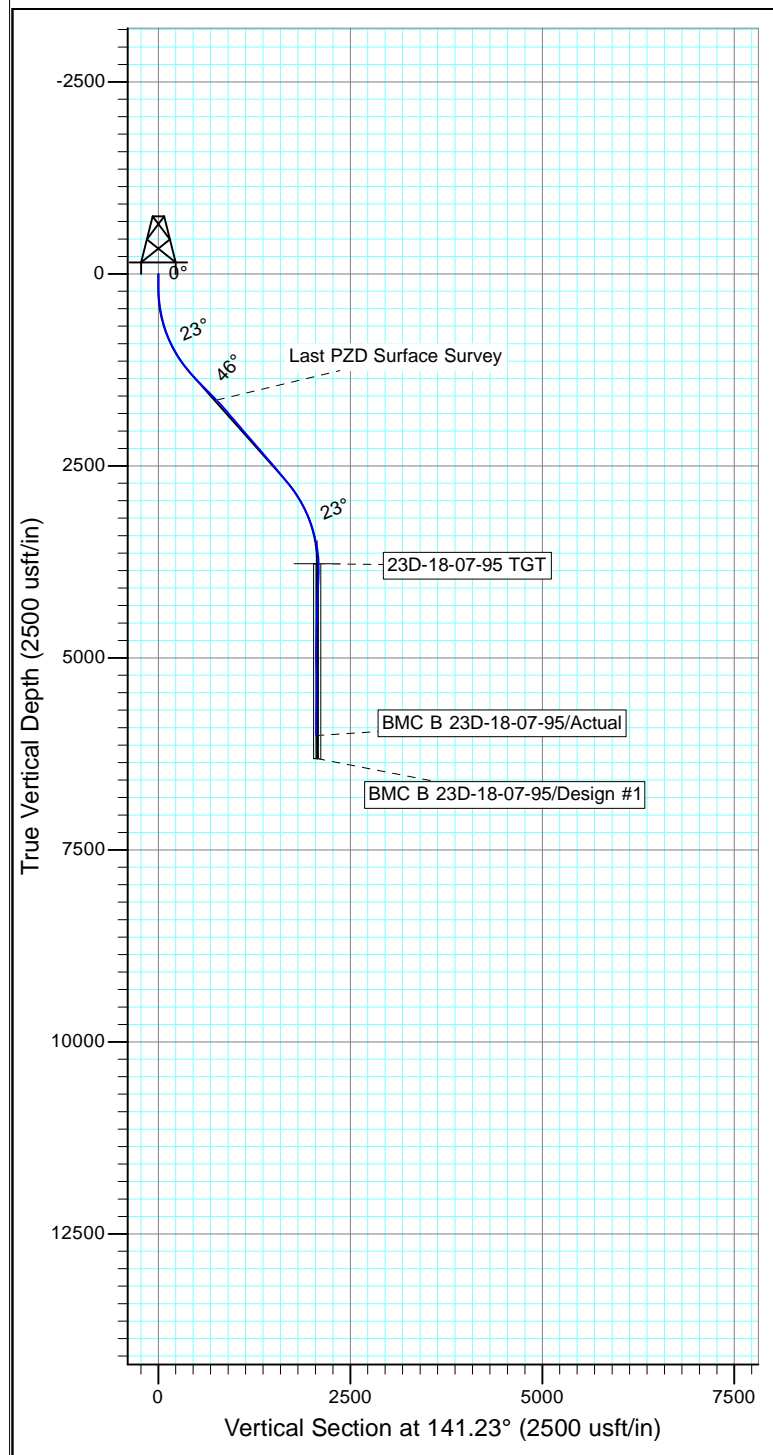
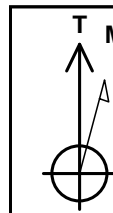
Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)		TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
4,450.9	2.02	141.69		3,773.0	2,088.1	-1,634.9	1,299.1	3.82	-3.81	-3.32
23D-18-07-95 TGT										
4,467.0	1.41	139.94		3,789.1	2,088.6	-1,635.3	1,299.4	3.82	-3.80	-10.84
4,552.0	1.85	8.02		3,874.1	2,088.7	-1,634.7	1,300.2	3.51	0.52	-155.20
4,636.0	4.57	359.75		3,957.9	2,085.2	-1,630.0	1,300.4	3.28	3.24	-9.85
4,722.0	5.05	1.73		4,043.6	2,079.6	-1,622.8	1,300.5	0.59	0.56	2.30
4,807.0	2.50	11.05		4,128.4	2,075.6	-1,617.2	1,301.0	3.08	-3.00	10.96
4,891.0	2.24	358.74		4,212.4	2,073.1	-1,613.8	1,301.3	0.68	-0.31	-14.65
4,977.0	2.02	352.20		4,298.3	2,070.5	-1,610.6	1,301.0	0.38	-0.26	-7.60
5,065.0	1.49	333.04		4,386.3	2,068.0	-1,608.1	1,300.3	0.89	-0.60	-21.77
5,150.0	2.05	319.61		4,471.2	2,065.4	-1,605.9	1,298.8	0.82	0.66	-15.80
5,234.0	1.59	309.71		4,555.2	2,062.8	-1,604.0	1,297.0	0.66	-0.55	-11.79
5,318.0	1.71	293.84		4,639.1	2,060.5	-1,602.8	1,294.9	0.56	0.14	-18.89
5,405.0	1.71	269.40		4,726.1	2,058.5	-1,602.3	1,292.4	0.83	0.00	-28.09
5,490.0	1.98	270.15		4,811.1	2,056.8	-1,602.3	1,289.7	0.32	0.32	0.88
5,574.0	1.85	260.61		4,895.0	2,055.3	-1,602.5	1,286.9	0.41	-0.15	-11.36
5,658.0	1.01	209.73		4,979.0	2,054.9	-1,603.4	1,285.2	1.72	-1.00	-60.57
5,744.0	2.55	110.32		5,065.0	2,056.8	-1,604.7	1,286.6	3.36	1.79	-115.59
5,829.0	1.79	113.30		5,149.9	2,059.6	-1,605.9	1,289.6	0.90	-0.89	3.51
5,913.0	1.41	142.71		5,233.9	2,061.8	-1,607.2	1,291.4	1.06	-0.45	35.01
5,997.0	1.41	42.51		5,317.8	2,062.7	-1,607.3	1,292.8	2.58	0.00	-119.29
6,082.0	1.19	21.46		5,402.8	2,062.1	-1,605.7	1,293.8	0.61	-0.26	-24.76
6,166.0	1.05	1.03		5,486.8	2,061.0	-1,604.1	1,294.1	0.50	-0.17	-24.32
6,252.0	0.97	330.09		5,572.8	2,059.7	-1,602.7	1,293.8	0.63	-0.09	-35.98
6,336.0	1.01	298.58		5,656.8	2,058.3	-1,601.7	1,292.8	0.64	0.05	-37.51
6,420.0	1.01	269.62		5,740.8	2,057.2	-1,601.4	1,291.4	0.60	0.00	-34.48
6,505.0	0.92	255.43		5,825.8	2,056.4	-1,601.5	1,290.0	0.30	-0.11	-16.69

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6,589.0	0.92	237.02	5,909.8	2,056.1	-1,602.1	1,288.8	0.35	0.00	-21.92
6,631.0	1.01	246.95	5,951.7	2,056.0	-1,602.4	1,288.1	0.45	0.21	23.64
Last PZD Survey									
6,691.0	1.01	246.95	6,011.7	2,055.7	-1,602.8	1,287.2	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)		
1,885.0	1,644.0	-595.6	473.5	Last PZD Surface Survey	
6,631.0	5,951.7	-1,602.4	1,288.1	Last PZD Survey	
6,691.0	6,011.7	-1,602.8	1,287.2	Straightline Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Design: Actual (BMC B 23D-18-07-95/Wellbore #1)

Created By: Derek Stephens Date: 8:02, June 12 2017

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