



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 41B-13-07-96

Wellbore #1

Design: Actual

End of Well Report

08 September, 2017



Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well BMC B 41B-13-07-96
Project:	Rockies Region	TVD Reference:	BMC B 41B-13-07-96 @ 5117.0usft (Plan KB)
Site:	BMC B	MD Reference:	BMC B 41B-13-07-96 @ 5117.0usft (Plan KB)
Well:	BMC B 41B-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:		Slot Radius:		13-3/16 "	
				Latitude: 39.438867241	
				Longitude: -108.046501442	
				Grid Convergence: -1.61 °	

Well		BMC B 41B-13-07-96, SHL: Lat 39.438868010 Long -108.046466066				
Well Position	+N/-S	0.0 usft	Northing:	1,594,816.34 usft	Latitude:	39.438868010
	+E/-W	0.0 usft	Easting:	2,280,896.95 usft	Longitude:	-108.046466066
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	9/8/2017	9.69	65.53	51,473

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	320.55

Survey Program		Date	9/8/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
139.0	6,680.0	Actual (Wellbore #1)	MWD	MWD - Standard	

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Well:	BMC B 41B-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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
139.0	0.79	2.39	139.0	0.7	1.0	0.0	0.57	0.57	0.00	
169.0	0.83	10.56	169.0	1.0	1.4	0.1	0.41	0.13	27.23	
200.0	0.66	3.09	200.0	1.3	1.8	0.1	0.63	-0.55	-24.10	
229.0	0.75	4.72	229.0	1.5	2.1	0.2	0.32	0.31	5.62	
260.0	0.79	8.10	260.0	1.8	2.5	0.2	0.20	0.13	10.90	
290.0	0.83	351.15	290.0	2.2	3.0	0.2	0.81	0.13	-56.50	
320.0	0.92	5.82	320.0	2.5	3.4	0.2	0.80	0.30	48.90	
351.0	0.88	14.92	351.0	2.8	3.9	0.3	0.48	-0.13	29.35	
380.0	0.88	6.96	380.0	3.1	4.3	0.4	0.42	0.00	-27.45	
411.0	1.10	5.16	411.0	3.5	4.9	0.4	0.72	0.71	-5.81	
440.0	1.67	349.12	440.0	4.1	5.6	0.4	2.36	1.97	-55.31	
471.0	2.68	341.47	470.9	5.1	6.7	0.1	3.38	3.26	-24.68	
501.0	3.56	336.02	500.9	6.7	8.2	-0.5	3.09	2.93	-18.17	
531.0	4.61	333.12	530.8	8.8	10.1	-1.5	3.57	3.50	-9.67	
562.0	5.67	331.01	561.7	11.5	12.6	-2.8	3.47	3.42	-6.81	
592.0	6.64	329.96	591.5	14.6	15.4	-4.4	3.25	3.23	-3.50	
623.0	7.60	328.60	622.3	18.4	18.7	-6.3	3.14	3.10	-4.39	
654.0	8.53	325.91	653.0	22.8	22.3	-8.7	3.24	3.00	-8.68	
683.0	9.62	324.73	681.6	27.3	26.1	-11.3	3.81	3.76	-4.07	
713.0	10.72	321.79	711.1	32.6	30.3	-14.5	4.05	3.67	-9.80	
743.0	11.51	321.30	740.6	38.4	34.9	-18.1	2.65	2.63	-1.63	
774.0	12.48	319.59	770.9	44.8	39.8	-22.2	3.33	3.13	-5.52	
804.0	13.44	318.42	800.1	51.6	44.9	-26.6	3.32	3.20	-3.90	
834.0	14.72	317.83	829.2	58.9	50.3	-31.5	4.29	4.27	-1.97	
876.0	16.83	318.05	869.6	70.3	58.8	-39.1	5.03	5.02	0.52	
918.0	18.54	318.18	909.7	83.0	68.3	-47.6	4.07	4.07	0.31	

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Well:	BMC B 41B-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)	
961.0	19.91	319.37	950.3	97.2	79.0	-56.9	3.31	3.19	2.77	
1,003.0	20.92	320.20	989.6	111.8	90.2	-66.4	2.50	2.40	1.98	
1,045.0	22.22	320.39	1,028.7	127.2	102.0	-76.3	3.10	3.10	0.45	
1,087.0	23.75	320.28	1,067.3	143.6	114.7	-86.7	3.64	3.64	-0.26	
1,129.0	25.21	320.30	1,105.6	161.1	128.0	-97.9	3.48	3.48	0.05	
1,171.0	26.85	321.13	1,143.3	179.5	142.3	-109.5	4.00	3.90	1.98	
1,213.0	28.43	322.62	1,180.5	199.0	157.6	-121.5	4.11	3.76	3.55	
1,256.0	29.65	322.85	1,218.1	219.8	174.3	-134.2	2.85	2.84	0.53	
1,298.0	31.12	321.64	1,254.3	241.0	191.0	-147.2	3.79	3.50	-2.88	
1,340.0	32.92	320.89	1,289.9	263.3	208.4	-161.1	4.39	4.29	-1.79	
1,382.0	34.63	320.29	1,324.9	286.7	226.5	-176.0	4.15	4.07	-1.43	
1,424.0	36.04	320.12	1,359.1	311.0	245.1	-191.5	3.37	3.36	-0.40	
1,466.0	36.47	319.68	1,393.0	335.8	264.1	-207.5	1.20	1.02	-1.05	
1,508.0	36.74	318.89	1,426.7	360.8	283.1	-223.8	1.29	0.64	-1.88	
1,551.0	37.10	318.77	1,461.1	386.6	302.5	-240.8	0.85	0.84	-0.28	
1,593.0	37.27	318.05	1,494.5	412.0	321.5	-257.7	1.11	0.40	-1.71	
1,635.0	37.49	317.83	1,527.9	437.5	340.5	-274.8	0.61	0.52	-0.52	
1,677.0	37.13	318.36	1,561.3	462.9	359.4	-291.8	1.15	-0.86	1.26	
1,719.0	37.09	318.18	1,594.8	488.2	378.3	-308.6	0.28	-0.10	-0.43	
1,761.0	36.74	319.37	1,628.4	513.5	397.3	-325.3	1.89	-0.83	2.83	
1,800.0	36.74	319.25	1,659.6	536.8	415.0	-340.5	0.18	0.00	-0.31	
Last PZD Surface Survey										
1,875.0	37.13	318.93	1,719.6	581.8	449.0	-370.0	0.58	0.52	-0.43	
1,962.0	36.30	317.22	1,789.3	633.8	487.7	-404.7	1.51	-0.95	-1.97	
2,046.0	35.64	319.81	1,857.3	683.1	524.7	-437.4	1.97	-0.79	3.08	
2,133.0	36.08	320.77	1,927.8	734.0	563.9	-470.0	0.82	0.51	1.10	
2,217.0	35.42	318.97	1,996.0	783.1	601.4	-501.6	1.48	-0.79	-2.14	

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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)	
2,301.0	35.11	321.52	2,064.6	831.6	638.7	-532.6	1.79	-0.37	3.04	
2,388.0	36.17	321.79	2,135.3	882.3	678.4	-564.1	1.23	1.22	0.31	
2,474.0	37.09	321.26	2,204.3	933.6	718.6	-596.0	1.13	1.07	-0.62	
2,558.0	36.65	319.59	2,271.5	984.0	757.5	-628.1	1.30	-0.52	-1.99	
2,643.0	36.21	321.04	2,339.9	1,034.5	796.3	-660.3	1.14	-0.52	1.71	
2,729.0	35.68	319.94	2,409.5	1,084.9	835.2	-692.4	0.97	-0.62	-1.28	
2,813.0	35.90	319.54	2,477.7	1,134.1	872.7	-724.2	0.38	0.26	-0.48	
2,897.0	34.89	318.01	2,546.1	1,182.7	909.3	-756.2	1.60	-1.20	-1.82	
2,982.0	34.72	321.21	2,615.9	1,231.2	946.3	-787.7	2.16	-0.20	3.76	
3,066.0	34.58	320.51	2,685.0	1,278.9	983.3	-817.8	0.50	-0.17	-0.83	
3,151.0	33.84	318.80	2,755.3	1,326.7	1,019.7	-848.7	1.43	-0.87	-2.01	
3,237.0	34.32	320.03	2,826.6	1,374.9	1,056.3	-880.1	0.98	0.56	1.43	
3,323.0	35.33	322.27	2,897.2	1,424.0	1,094.6	-910.9	1.90	1.17	2.60	
3,407.0	35.07	322.27	2,965.8	1,472.4	1,132.9	-940.5	0.31	-0.31	0.00	
3,492.0	36.97	323.08	3,034.6	1,522.3	1,172.6	-970.8	2.30	2.24	0.95	
3,580.0	36.96	321.43	3,104.9	1,575.2	1,214.5	-1,003.2	1.13	-0.01	-1.87	
3,664.0	35.99	319.90	3,172.4	1,625.2	1,253.1	-1,034.8	1.58	-1.15	-1.82	
3,749.0	35.01	318.57	3,241.6	1,674.5	1,290.5	-1,067.1	1.47	-1.15	-1.56	
3,833.0	34.19	316.64	3,310.8	1,722.1	1,325.7	-1,099.2	1.63	-0.98	-2.30	
3,917.0	30.81	319.24	3,381.6	1,767.2	1,359.2	-1,129.5	4.35	-4.02	3.10	
4,002.0	28.08	322.45	3,455.6	1,809.0	1,391.5	-1,155.9	3.71	-3.21	3.78	
4,086.0	26.15	320.91	3,530.4	1,847.2	1,421.6	-1,179.6	2.44	-2.30	-1.83	
4,170.0	24.30	318.71	3,606.4	1,883.0	1,448.9	-1,202.7	2.47	-2.20	-2.62	
4,256.0	20.00	318.67	3,686.0	1,915.4	1,473.3	-1,224.1	5.00	-5.00	-0.05	
4,339.0	18.72	323.72	3,764.3	1,942.9	1,494.7	-1,241.3	2.54	-1.54	6.08	
4,423.0	17.71	322.93	3,844.1	1,969.1	1,515.7	-1,257.0	1.24	-1.20	-0.94	

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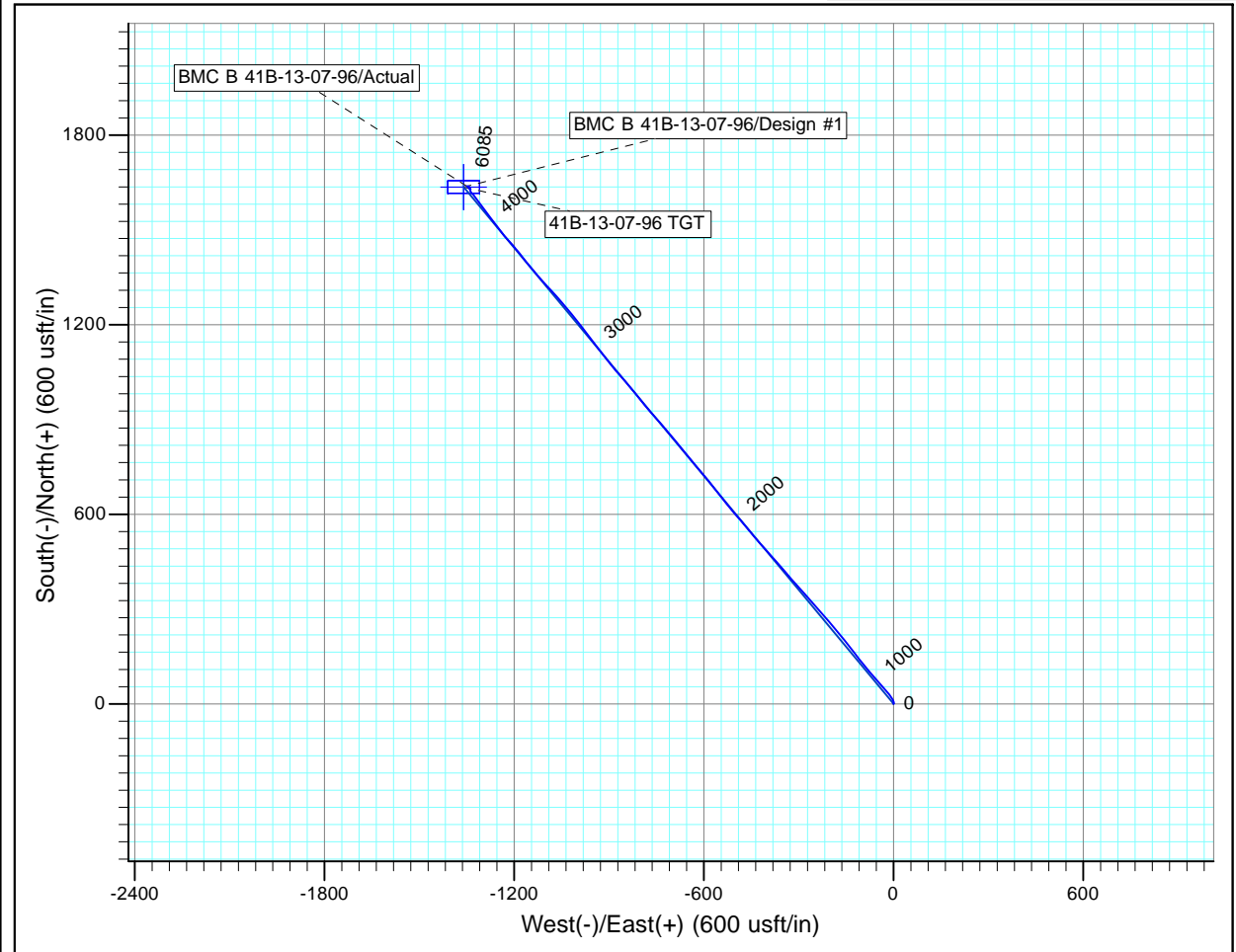
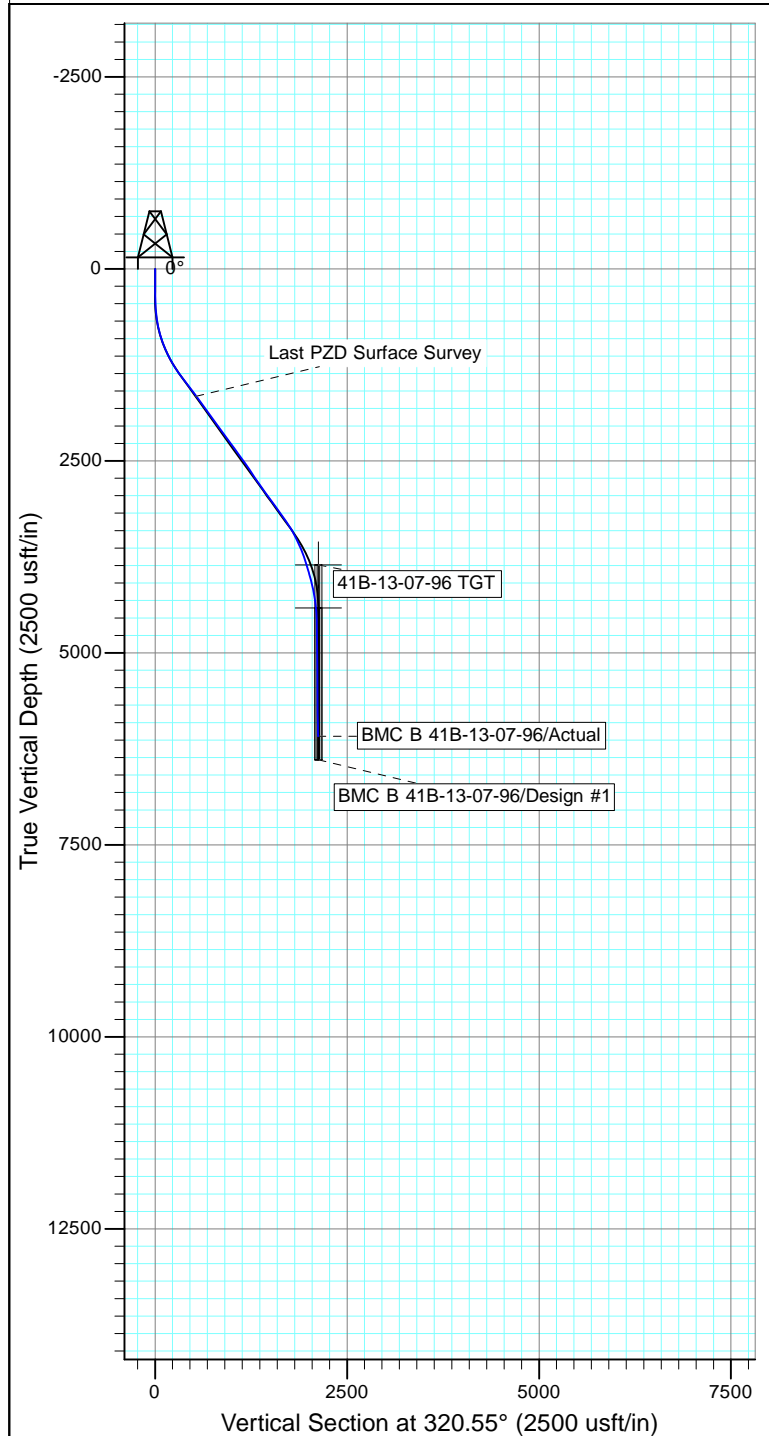
Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
4,482.2	17.07	321.15	3,900.6	1,986.8	1,529.7	-1,267.9	1.41	-1.09	-3.00	
41B-13-07-96 TGT										
4,508.0	16.79	320.34	3,925.3	1,994.3	1,535.5	-1,272.7	1.41	-1.07	-3.16	
4,592.0	14.72	322.88	4,006.1	2,017.1	1,553.4	-1,286.8	2.60	-2.46	3.02	
4,679.0	13.58	325.52	4,090.5	2,038.4	1,570.6	-1,299.3	1.51	-1.31	3.03	
4,763.0	12.61	322.78	4,172.3	2,057.3	1,586.0	-1,310.4	1.37	-1.15	-3.26	
4,847.0	10.02	322.66	4,254.7	2,073.8	1,599.1	-1,320.4	3.08	-3.08	-0.14	
4,933.0	7.95	321.30	4,339.6	2,087.2	1,609.7	-1,328.7	2.42	-2.41	-1.58	
5,014.5	5.64	322.59	4,420.6	2,096.9	1,617.3	-1,334.6	2.83	-2.83	1.58	
41B-13-07-96										
5,020.0	5.49	322.71	4,426.0	2,097.4	1,617.7	-1,334.9	2.83	-2.83	2.28	
5,104.0	2.94	322.27	4,509.8	2,103.6	1,622.6	-1,338.7	3.04	-3.04	-0.52	
5,188.0	0.62	25.33	4,593.7	2,105.9	1,624.8	-1,339.8	3.23	-2.76	75.07	
5,273.0	1.45	37.99	4,678.7	2,106.4	1,626.0	-1,339.0	1.01	0.98	14.89	
5,359.0	1.23	13.69	4,764.7	2,107.2	1,627.8	-1,338.1	0.70	-0.26	-28.26	
5,444.0	0.70	318.36	4,849.7	2,108.2	1,629.1	-1,338.2	1.19	-0.62	-65.09	
5,528.0	1.05	356.33	4,933.7	2,109.4	1,630.2	-1,338.6	0.78	0.42	45.20	
5,614.0	1.14	325.78	5,019.6	2,110.8	1,631.7	-1,339.1	0.68	0.10	-35.52	
5,699.0	1.41	290.98	5,104.6	2,112.6	1,632.8	-1,340.6	0.95	0.32	-40.94	
5,785.0	1.85	265.10	5,190.6	2,114.3	1,633.0	-1,343.0	0.98	0.51	-30.09	
5,869.0	0.46	188.31	5,274.6	2,114.9	1,632.6	-1,344.4	2.14	-1.65	-91.42	
5,955.0	0.97	94.32	5,360.6	2,114.1	1,632.2	-1,343.7	1.28	0.59	-109.29	
6,040.0	0.67	149.69	5,445.6	2,113.1	1,631.7	-1,342.7	0.95	-0.35	65.14	
6,126.0	0.48	222.47	5,531.6	2,112.6	1,631.0	-1,342.7	0.81	-0.22	84.63	
6,210.0	2.02	21.51	5,615.5	2,113.2	1,632.1	-1,342.4	2.95	1.83	189.33	
6,294.0	1.67	359.67	5,699.5	2,114.9	1,634.7	-1,341.9	0.93	-0.42	-26.00	
6,380.0	1.41	319.19	5,785.5	2,116.9	1,636.8	-1,342.6	1.27	-0.30	-47.07	

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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)	
6,467.0	1.54	283.51	5,872.4	2,119.0	1,637.9	-1,344.4	1.05	0.15	-41.01	
6,551.0	1.63	272.79	5,956.4	2,120.7	1,638.2	-1,346.7	0.37	0.11	-12.76	
6,625.0	1.58	275.99	6,030.4	2,122.1	1,638.3	-1,348.7	0.14	-0.07	4.32	
Last PZD Survey										
6,680.0	1.58	275.99	6,085.4	2,123.2	1,638.5	-1,350.3	0.00	0.00	0.00	
Straightline Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,800.0	1,659.6	415.0	-340.5	Last PZD Surface Survey	
6,625.0	6,030.4	1,638.3	-1,348.7	Last PZD Survey	
6,680.0	6,085.4	1,638.5	-1,350.3	Straightline Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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Design: Actual (BMC B 41B-13-07-96/Wellbore #1)

Created By: Derek Stephens Date: 10:15, September 08 2017

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