



Bill Barrett Corporation

Bill Barrett Corp.

Weld Co., CO

Sec.23-T6N-R62W

Pappenheim 6-62-23-0560BH

Wellbore #1

Design: Wellbore #1

Standard Survey Report

21 June, 2013

Archer

Company:	Bill Barrett Corp.	Local Co-ordinate Reference:	Well Pappenheim 6-62-23-0560BH
Project:	Weld Co., CO	TVD Reference:	WELL @ 4715.00usft
Site:	Sec.23-T6N-R62W	MD Reference:	WELL @ 4715.00usft
Well:	Pappenheim 6-62-23-0560BH	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Weld Co., CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec.23-T6N-R62W			
Site Position:		Northing:	1,419,853.167 usft	Latitude:	40° 28' 46.596 N
From:	Lat/Long	Easting:	3,336,176.889 usft	Longitude:	104° 17' 29.364 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.78 °

Well		Pappenheim 6-62-23-0560BH				
Well Position	+N/-S	0.00 usft	Northing:	1,419,853.143 usft	Latitude:	40° 28' 46.596 N
	+E/-W	0.00 usft	Easting:	3,336,176.890 usft	Longitude:	104° 17' 29.364 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,699.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2013/06/04	8.35	67.12	53,016

Design	Wellbore #1			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	182.17

Survey Program	Date	2013/06/21			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	715.00	Survey #1-MS Gyro (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
874.00	10,747.00	Survey #2-Archer MWD (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
First MS Gyro Survey										
100.00	0.13	354.59	100.00	0.11	-0.01	-0.11	0.13	0.13	0.00	
200.00	0.06	208.78	200.00	0.18	-0.05	-0.18	0.18	-0.07	-145.81	
300.00	0.35	183.59	300.00	-0.17	-0.09	0.17	0.30	0.29	-25.19	
400.00	0.36	172.02	400.00	-0.79	-0.07	0.79	0.07	0.01	-11.57	
500.00	0.35	163.03	500.00	-1.39	0.07	1.39	0.06	-0.01	-8.99	
600.00	0.20	160.43	599.99	-1.85	0.21	1.84	0.15	-0.15	-2.60	
700.00	0.33	247.73	699.99	-2.12	0.01	2.12	0.38	0.13	87.30	
Tie-In / Gyro Survey										
715.00	0.36	265.34	714.99	-2.14	-0.08	2.14	0.73	0.20	117.40	
First Archer Survey										

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Site:	Sec.23-T6N-R62W	MD Reference:	WELL @ 4715.00usft
Well:	Pappenheim 6-62-23-0560BH	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
874.00	0.40	151.30	873.99	-2.67	-0.31	2.68	0.40	0.03	-71.72	
914.00	0.80	102.40	913.99	-2.85	0.03	2.85	1.54	1.00	-122.25	
1,008.00	4.00	72.20	1,007.90	-1.99	3.79	1.84	3.55	3.40	-32.13	
1,101.00	4.80	69.90	1,100.62	0.34	10.53	-0.74	0.88	0.86	-2.47	
1,193.00	4.50	82.50	1,192.32	2.13	17.73	-2.80	1.15	-0.33	13.70	
1,284.00	8.10	56.40	1,282.77	6.15	26.61	-7.15	4.96	3.96	-28.68	
1,377.00	9.80	45.40	1,374.64	15.33	37.70	-16.75	2.59	1.83	-11.83	
1,469.00	12.90	47.50	1,464.84	27.77	50.85	-29.68	3.40	3.37	2.28	
1,563.00	18.00	60.60	1,555.44	42.01	71.26	-44.67	6.54	5.43	13.94	
1,658.00	15.80	72.50	1,646.35	53.10	96.40	-56.71	4.30	-2.32	12.53	
1,753.00	13.20	72.00	1,738.32	60.35	119.05	-64.81	2.74	-2.74	-0.53	
1,847.00	12.20	89.30	1,830.05	63.79	139.20	-69.01	4.17	-1.06	18.40	
1,942.00	12.30	93.10	1,922.89	63.36	159.34	-69.35	0.86	0.11	4.00	
2,036.00	12.00	86.60	2,014.79	63.40	179.09	-70.13	1.49	-0.32	-6.91	
2,131.00	11.80	84.80	2,107.75	64.87	198.62	-72.34	0.44	-0.21	-1.89	
2,225.00	10.80	81.10	2,199.93	67.10	216.90	-75.26	1.31	-1.06	-3.94	
2,320.00	10.70	78.00	2,293.26	70.31	234.32	-79.13	0.62	-0.11	-3.26	
2,415.00	11.00	81.60	2,386.56	73.47	251.91	-82.95	0.78	0.32	3.79	
2,509.00	9.70	73.10	2,479.04	77.08	268.36	-87.18	2.13	-1.38	-9.04	
2,604.00	10.20	75.10	2,572.61	81.57	284.15	-92.26	0.64	0.53	2.11	
2,698.00	12.70	82.50	2,664.74	85.06	302.44	-96.44	3.08	2.66	7.87	
2,793.00	12.90	86.80	2,757.38	87.01	323.38	-99.19	1.02	0.21	4.53	
2,887.00	11.90	80.80	2,849.19	89.15	343.43	-102.08	1.73	-1.06	-6.38	
2,982.00	11.80	77.30	2,942.16	92.85	362.57	-106.51	0.76	-0.11	-3.68	
3,076.00	12.40	75.10	3,034.07	97.56	381.70	-111.93	0.80	0.64	-2.34	
3,170.00	16.00	78.70	3,125.19	102.69	404.17	-117.92	3.94	3.83	3.83	
3,264.00	15.10	82.40	3,215.75	106.85	429.01	-123.01	1.42	-0.96	3.94	
3,360.00	13.30	75.50	3,308.82	111.27	452.10	-128.30	2.57	-1.87	-7.19	
3,454.00	12.80	77.40	3,400.39	116.25	472.73	-134.06	0.70	-0.53	2.02	
3,549.00	13.00	79.40	3,492.99	120.51	493.50	-139.10	0.51	0.21	2.11	
3,643.00	15.80	83.00	3,584.03	124.02	516.60	-143.48	3.13	2.98	3.83	
3,737.00	16.80	82.90	3,674.25	127.26	542.78	-147.71	1.06	1.06	-0.11	
3,832.00	16.60	81.60	3,765.25	130.94	569.83	-152.41	0.45	-0.21	-1.37	
3,927.00	15.80	78.20	3,856.48	135.56	595.91	-158.02	1.31	-0.84	-3.58	
4,021.00	14.80	74.70	3,947.15	141.35	620.02	-164.71	1.45	-1.06	-3.72	
4,116.00	14.60	75.80	4,039.04	147.49	643.33	-171.73	0.36	-0.21	1.16	
4,210.00	13.50	73.10	4,130.22	153.58	665.32	-178.65	1.36	-1.17	-2.87	
4,305.00	13.90	72.70	4,222.52	160.20	686.82	-186.08	0.43	0.42	-0.42	
4,399.00	14.70	73.80	4,313.61	166.88	709.06	-193.60	0.90	0.85	1.17	
4,494.00	13.50	77.80	4,405.75	172.59	731.47	-200.15	1.63	-1.26	4.21	
4,589.00	11.90	77.30	4,498.42	177.09	751.87	-205.42	1.69	-1.68	-0.53	
4,620.00	11.70	77.70	4,528.76	178.46	758.05	-207.02	0.70	-0.65	1.29	
4,652.00	11.60	76.80	4,560.11	179.89	764.36	-208.68	0.65	-0.31	-2.81	
4,683.00	11.40	75.80	4,590.48	181.35	770.36	-210.37	0.91	-0.65	-3.23	
4,714.00	11.30	76.00	4,620.88	182.84	776.28	-212.08	0.35	-0.32	0.65	
4,746.00	10.90	80.40	4,652.28	184.10	782.30	-213.57	2.93	-1.25	13.75	
4,777.00	10.80	81.50	4,682.72	185.02	788.07	-214.71	0.74	-0.32	3.55	
4,809.00	10.60	80.50	4,714.17	185.95	793.93	-215.86	0.85	-0.62	-3.12	
4,841.00	10.10	80.10	4,745.65	186.91	799.60	-217.04	1.58	-1.56	-1.25	
4,872.00	8.90	78.10	4,776.22	187.88	804.63	-218.19	4.01	-3.87	-6.45	
4,904.00	7.90	78.60	4,807.88	188.82	809.20	-219.31	3.13	-3.12	1.56	
4,935.00	7.60	80.20	4,838.60	189.59	813.31	-220.23	1.19	-0.97	5.16	
4,967.00	7.10	83.10	4,870.33	190.19	817.36	-220.99	1.95	-1.56	9.06	
4,998.00	6.70	86.80	4,901.11	190.52	821.07	-221.46	1.93	-1.29	11.94	

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5,030.00	5.70	89.70	4,932.92	190.63	824.52	-221.70	3.27	-3.12	9.06	
5,061.00	6.00	88.60	4,963.76	190.68	827.68	-221.87	1.03	0.97	-3.55	
5,093.00	3.60	88.50	4,995.64	190.75	830.36	-222.04	7.50	-7.50	-0.31	
5,124.00	3.60	88.00	5,026.58	190.81	832.30	-222.17	0.10	0.00	-1.61	
5,156.00	3.30	80.70	5,058.53	190.99	834.22	-222.42	1.66	-0.94	-22.81	
5,187.00	2.90	80.50	5,089.48	191.26	835.87	-222.76	1.29	-1.29	-0.65	
5,219.00	1.90	66.80	5,121.45	191.61	837.16	-223.15	3.58	-3.12	-42.81	
5,250.00	1.30	56.10	5,152.44	192.01	837.92	-223.58	2.15	-1.94	-34.52	
5,282.00	1.10	50.70	5,184.43	192.40	838.46	-224.00	0.72	-0.62	-16.87	
5,313.00	1.30	42.90	5,215.43	192.85	838.93	-224.46	0.83	0.65	-25.16	
5,408.00	1.50	51.20	5,310.40	194.42	840.63	-226.09	0.30	0.21	8.74	
5,502.00	1.40	25.00	5,404.37	196.23	842.07	-227.96	0.71	-0.11	-27.87	
5,597.00	1.50	32.10	5,499.34	198.33	843.23	-230.10	0.22	0.11	7.47	
5,691.00	1.80	22.10	5,593.30	200.74	844.44	-232.56	0.44	0.32	-10.64	
5,735.00	2.00	14.00	5,637.27	202.13	844.88	-233.96	0.76	0.45	-18.41	
5,754.00	1.80	6.20	5,656.26	202.75	844.99	-234.58	1.72	-1.05	-41.05	
5,786.00	1.70	4.90	5,688.25	203.72	845.09	-235.56	0.34	-0.31	-4.06	
5,817.00	1.50	354.10	5,719.24	204.58	845.09	-236.42	1.16	-0.65	-34.84	
5,848.00	1.10	359.90	5,750.23	205.28	845.04	-237.12	1.36	-1.29	18.71	
5,881.00	0.60	29.00	5,783.23	205.75	845.13	-237.59	1.96	-1.52	88.18	
5,911.00	0.80	4.20	5,813.22	206.10	845.22	-237.94	1.20	0.67	-82.67	
5,943.00	6.80	170.30	5,845.16	204.45	845.55	-236.30	23.68	18.75	519.06	
5,974.00	10.90	175.70	5,875.78	199.72	846.08	-231.59	13.48	13.23	17.42	
6,006.00	15.20	178.40	5,906.95	192.50	846.43	-224.40	13.57	13.44	8.44	
6,038.00	19.60	176.70	5,937.48	182.95	846.85	-214.86	13.84	13.75	-5.31	
6,069.00	23.60	180.70	5,966.29	171.55	847.08	-203.48	13.74	12.90	12.90	
6,101.00	27.80	180.40	5,995.12	157.67	846.95	-189.61	13.13	13.12	-0.94	
6,132.00	31.40	181.40	6,022.07	142.36	846.70	-174.31	11.72	11.61	3.23	
6,163.00	35.80	181.80	6,047.89	125.22	846.22	-157.16	14.21	14.19	1.29	
6,194.00	40.40	182.50	6,072.28	106.11	845.49	-138.03	14.90	14.84	2.26	
6,226.00	44.50	181.90	6,095.88	84.53	844.67	-116.44	12.87	12.81	-1.87	
6,257.00	48.20	181.90	6,117.28	62.12	843.93	-94.01	11.94	11.94	0.00	
6,289.00	51.30	182.30	6,137.95	37.72	843.03	-69.59	9.73	9.69	1.25	
6,321.00	55.30	182.30	6,157.07	12.08	842.00	-43.94	12.50	12.50	0.00	
6,352.00	59.20	181.80	6,173.84	-13.97	841.07	-17.87	12.65	12.58	-1.61	
6,383.00	61.90	180.50	6,189.08	-40.95	840.53	9.11	9.44	8.71	-4.19	
6,415.00	62.80	179.70	6,203.93	-69.30	840.48	37.44	3.58	2.81	-2.50	
6,446.00	64.40	178.90	6,217.71	-97.06	840.82	65.17	5.66	5.16	-2.58	
6,478.00	65.70	178.00	6,231.21	-126.06	841.61	94.12	4.80	4.06	-2.81	
6,510.00	65.80	177.60	6,244.35	-155.22	842.73	123.21	1.18	0.31	-1.25	
6,541.00	65.60	177.40	6,257.11	-183.44	843.96	151.37	0.87	-0.65	-0.65	
6,573.00	67.00	177.90	6,269.97	-212.72	845.16	180.58	4.60	4.37	1.56	
6,604.00	70.20	179.10	6,281.28	-241.57	845.91	209.38	10.93	10.32	3.87	
6,636.00	73.80	180.50	6,291.17	-272.00	846.02	239.78	11.99	11.25	4.37	
6,667.00	75.60	181.80	6,299.35	-301.89	845.42	269.68	7.08	5.81	4.19	
6,699.00	77.60	182.20	6,306.76	-333.00	844.33	300.81	6.37	6.25	1.25	
6,730.00	82.10	182.40	6,312.23	-363.48	843.10	331.31	14.53	14.52	0.65	
6,793.00	90.40	183.10	6,316.34	-426.22	840.09	394.12	13.22	13.17	1.11	
6,825.00	91.10	183.10	6,315.92	-458.17	838.36	426.11	2.19	2.19	0.00	
6,856.00	91.70	182.90	6,315.17	-489.12	836.74	457.10	2.04	1.94	-0.65	
6,888.00	89.90	182.20	6,314.72	-521.08	835.31	489.09	6.04	-5.62	-2.19	
6,919.00	89.90	182.00	6,314.77	-552.06	834.18	520.09	0.65	0.00	-0.65	
6,951.00	89.70	180.50	6,314.89	-584.05	833.48	552.09	4.73	-0.62	-4.69	
7,046.00	90.50	179.00	6,314.72	-679.04	833.89	647.00	1.79	0.84	-1.58	

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

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,140.00	89.40	178.80	6,314.80	-773.03	835.70	740.85	1.19	-1.17	-0.21	
7,235.00	90.30	178.80	6,315.05	-868.00	837.69	835.68	0.95	0.95	0.00	
7,329.00	92.00	180.70	6,313.16	-961.98	838.10	929.57	2.71	1.81	2.02	
7,424.00	92.10	180.60	6,309.77	-1,056.91	837.02	1,024.48	0.15	0.11	-0.11	
7,519.00	89.80	183.10	6,308.19	-1,151.83	833.95	1,119.45	3.58	-2.42	2.63	
7,613.00	90.60	182.30	6,307.86	-1,245.73	829.53	1,213.44	1.20	0.85	-0.85	
7,707.00	89.10	183.20	6,308.11	-1,339.61	825.02	1,307.43	1.86	-1.60	0.96	
7,801.00	90.60	182.50	6,308.35	-1,433.49	820.34	1,401.42	1.76	1.60	-0.74	
7,896.00	88.80	181.60	6,308.85	-1,528.43	816.94	1,496.42	2.12	-1.89	-0.95	
7,990.00	90.50	181.50	6,309.43	-1,622.39	814.40	1,590.40	1.81	1.81	-0.11	
8,085.00	89.90	181.10	6,309.09	-1,717.36	812.25	1,685.39	0.76	-0.63	-0.42	
8,179.00	89.60	180.80	6,309.51	-1,811.35	810.69	1,779.37	0.45	-0.32	-0.32	
8,273.00	89.30	180.50	6,310.41	-1,905.34	809.62	1,873.33	0.45	-0.32	-0.32	
8,369.00	90.40	180.10	6,310.66	-2,001.33	809.12	1,969.28	1.22	1.15	-0.42	
8,463.00	90.40	178.90	6,310.00	-2,095.33	809.94	2,063.17	1.28	0.00	-1.28	
8,557.00	89.80	178.00	6,309.84	-2,189.29	812.48	2,156.97	1.15	-0.64	-0.96	
8,652.00	91.90	180.40	6,308.43	-2,284.26	813.81	2,251.82	3.36	2.21	2.53	
8,747.00	92.00	180.60	6,305.20	-2,379.20	812.98	2,346.73	0.24	0.11	0.21	
8,841.00	91.80	181.00	6,302.08	-2,473.14	811.67	2,440.65	0.48	-0.21	0.43	
8,935.00	89.80	182.30	6,300.77	-2,567.08	808.96	2,534.63	2.54	-2.13	1.38	
9,029.00	88.80	182.40	6,301.92	-2,661.00	805.11	2,628.62	1.07	-1.06	0.11	
9,124.00	90.10	181.80	6,302.83	-2,755.93	801.63	2,723.61	1.51	1.37	-0.63	
9,218.00	89.60	182.20	6,303.07	-2,849.87	798.35	2,817.61	0.68	-0.53	0.43	
9,313.00	90.50	184.50	6,302.99	-2,944.70	792.80	2,912.59	2.60	0.95	2.42	
9,407.00	89.50	182.80	6,302.99	-3,038.50	786.81	3,006.55	2.10	-1.06	-1.81	
9,501.00	90.90	182.00	6,302.66	-3,132.42	782.88	3,100.55	1.72	1.49	-0.85	
9,596.00	90.50	181.40	6,301.50	-3,227.37	780.06	3,195.53	0.76	-0.42	-0.63	
9,689.00	90.50	182.30	6,300.69	-3,320.31	777.06	3,288.53	0.97	0.00	0.97	
9,784.00	90.50	181.90	6,299.86	-3,415.25	773.57	3,383.52	0.42	0.00	-0.42	
9,878.00	90.20	181.40	6,299.29	-3,509.21	770.87	3,477.52	0.62	-0.32	-0.53	
9,973.00	91.00	180.50	6,298.29	-3,604.19	769.29	3,572.49	1.27	0.84	-0.95	
10,068.00	89.30	180.20	6,298.04	-3,699.18	768.71	3,667.44	1.82	-1.79	-0.32	
10,162.00	89.40	181.10	6,299.11	-3,793.17	767.65	3,761.40	0.96	0.11	0.96	
10,257.00	89.30	180.40	6,300.19	-3,888.15	766.40	3,856.36	0.74	-0.11	-0.74	
10,351.00	89.10	179.60	6,301.50	-3,982.14	766.40	3,950.28	0.88	-0.21	-0.85	
10,446.00	89.20	179.20	6,302.91	-4,077.13	767.40	4,045.16	0.43	0.11	-0.42	
10,540.00	89.70	179.20	6,303.81	-4,171.11	768.71	4,139.03	0.53	0.53	0.00	
10,635.00	89.20	178.10	6,304.72	-4,266.08	770.95	4,233.85	1.27	-0.53	-1.16	
Last Archer Survey										
10,691.00	89.90	177.50	6,305.16	-4,322.04	773.10	4,289.68	1.65	1.25	-1.07	
PTB										
10,747.00	90.60	177.50	6,304.92	-4,377.98	775.54	4,345.50	1.25	1.25	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
100.00	100.00	0.11	-0.01	First MS Gyro Survey	
715.00	714.99	-2.14	-0.08	Tie-In / Gyro Survey	
874.00	873.99	-2.67	-0.31	First Archer Survey	
10,691.00	6,305.16	-4,322.04	773.10	Last Archer Survey	
10,747.00	6,304.92	-4,377.98	775.54	PTB	

Company:	Bill Barrett Corp.	Local Co-ordinate Reference:	Well Pappenheim 6-62-23-0560BH
Project:	Weld Co., CO	TVD Reference:	WELL @ 4715.00usft
Site:	Sec.23-T6N-R62W	MD Reference:	WELL @ 4715.00usft
Well:	Pappenheim 6-62-23-0560BH	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Checked By: _____ Approved By: _____ Date: _____