



Bill Barrett Corp.  
Project: Weld Co., CO  
Site: Sec.10-T6N-R62W  
Well: Dutch Lake #8-10H  
Wellbore: Wellbore #1  
Design: Design#3  
Lat: 40° 30' 27.010 N  
Long: 104° 19' 1.670 W  
Pad GL: 4772.00  
KB: WELL @ 4788.00usft

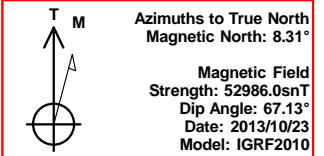
# Archer

## SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
6804.00	89.41	92.14	6484.71	16.87	297.90	0.00	0.00	298.09	Start DLS 2.00 TFO -99.01
6950.61	90.35	89.37	6485.01	14.94	444.48	2.00	-71.18	444.64	
11158.15	90.35	89.37	6459.00	61.37	4651.68	0.00	0.00	4652.09	TD at 11158.05

## PROJECT DETAILS: Weld Co., CO

Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level



## WELL DETAILS: Dutch Lake #8-10H

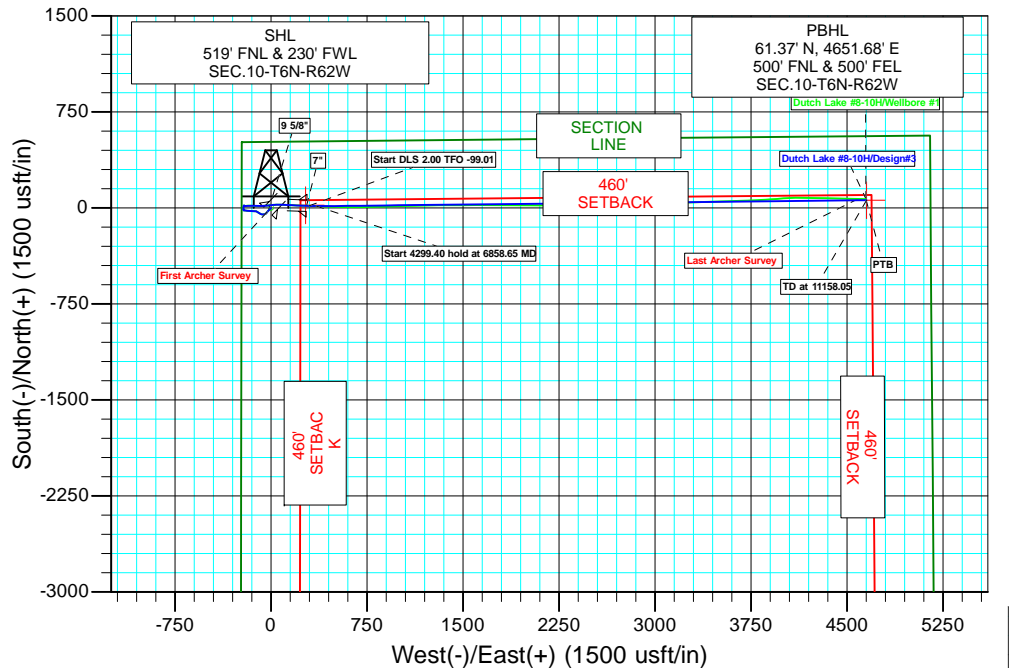
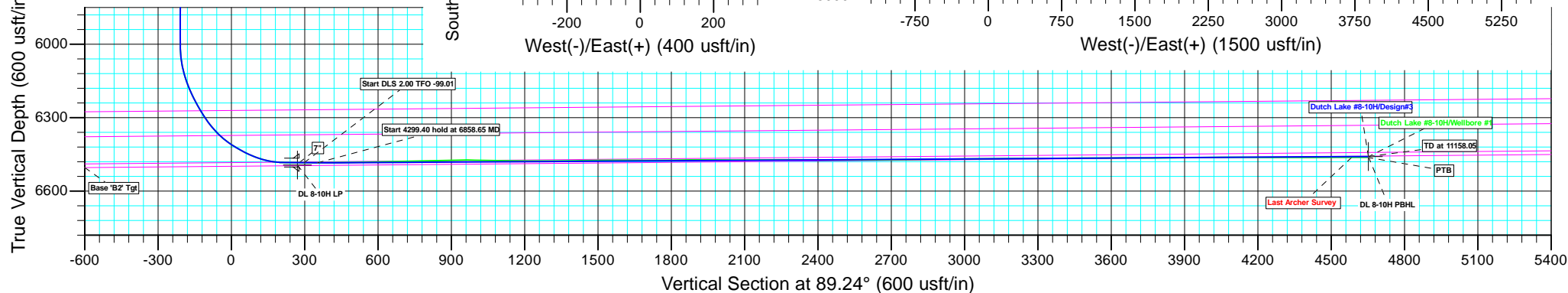
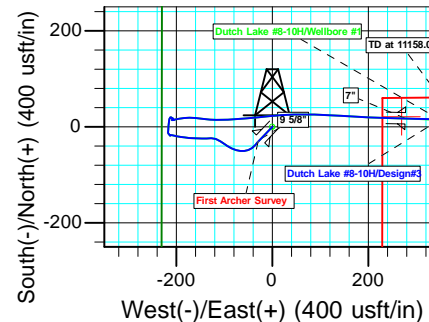
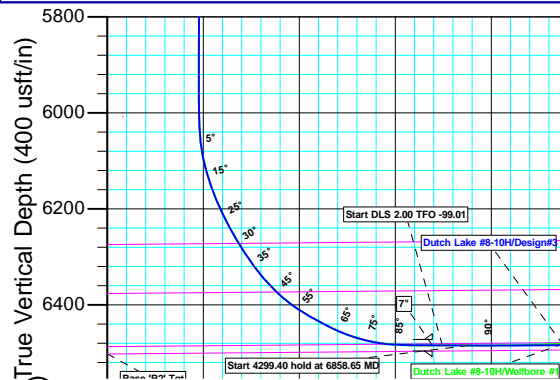
+N/-S	+E/-W	Northing	Ground Level: Easting	4772.00 Latitude	Longitude	Slot
0.00	0.00	1429917.560	3328909.220	40° 30' 27.010 N	104° 19' 1.670 W	

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape Point
DL 8-10H PBHL	6459.00	61.37	4651.68	40° 30' 27.612 N	104° 18' 1.447 W	
DL 8-10H LP	6494.00	21.27	269.85	40° 30' 27.220 N	104° 18' 58.176 W	

## CASING DETAILS

TVD	MD	Name
798.99	800.00	9 5/8"
6484.50	6783.29	7"



Plan: Design#3 (Dutch Lake #8-10H/Wellbore #1)

Created By: Bret Wolford

Date: 8:21, November 08 2013



**Bill Barrett Corporation**

## **Bill Barrett Corp.**

**Weld Co., CO**

**Sec.10-T6N-R62W**

**Dutch Lake #8-10H**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**08 November, 2013**

# **Archer**

<b>Company:</b>	Bill Barrett Corp.	<b>Local Co-ordinate Reference:</b>	Well Dutch Lake #8-10H
<b>Project:</b>	Weld Co., CO	<b>TVD Reference:</b>	WELL @ 4788.00usft
<b>Site:</b>	Sec.10-T6N-R62W	<b>MD Reference:</b>	WELL @ 4788.00usft
<b>Well:</b>	Dutch Lake #8-10H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

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

Site		Sec.10-T6N-R62W			
Site Position:		Northing:	1,429,917.560 usft	Latitude:	40° 30' 27.010 N
From:	Map	Easting:	3,328,909.220 usft	Longitude:	104° 19' 1.670 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.76 °

Well	Dutch Lake #8-10H					
Well Position	+N/-S	0.00 usft	Northing:	1,429,917.560 usft	Latitude:	40° 30' 27.010 N
	+E/-W	0.00 usft	Easting:	3,328,909.220 usft	Longitude:	104° 19' 1.670 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,772.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2013/10/23	8.31	67.13	52,986

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	89.24

<b>Survey Program</b>	<b>Date</b>	2013/11/08		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
883.00	11,155.00	Survey #1 (Wellbore #1)	MWD	MWD - Standard

<b>Survey</b>									
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>First Archer Survey</b>									
883.00	5.50	223.90	881.64	-30.51	-29.36	-29.76	0.62	0.62	0.00
913.00	5.80	222.10	911.50	-32.67	-31.38	-31.81	1.16	1.00	-6.00
1,005.00	5.90	220.30	1,003.02	-39.73	-37.55	-38.07	0.23	0.11	-1.96
1,098.00	7.00	240.60	1,095.44	-46.16	-45.58	-46.19	2.70	1.18	21.83
1,190.00	6.90	264.60	1,186.78	-49.43	-55.97	-56.62	3.14	-0.11	26.09
1,282.00	6.90	271.70	1,278.12	-49.79	-67.00	-67.65	0.93	0.00	7.72
1,374.00	7.10	291.90	1,369.45	-47.50	-77.80	-78.42	2.67	0.22	21.96
1,466.00	7.20	300.70	1,460.74	-42.44	-88.03	-88.58	1.19	0.11	9.57
1,560.00	7.00	301.20	1,554.01	-36.46	-97.99	-98.47	0.22	-0.21	0.53
1,655.00	7.10	301.70	1,648.30	-30.38	-107.94	-108.33	0.12	0.11	0.53
1,749.00	6.20	295.10	1,741.66	-25.17	-117.48	-117.80	1.25	-0.96	-7.02

<b>Company:</b>	Bill Barrett Corp.	<b>Local Co-ordinate Reference:</b>	Well Dutch Lake #8-10H
<b>Project:</b>	Weld Co., CO	<b>TVD Reference:</b>	WELL @ 4788.00usft
<b>Site:</b>	Sec.10-T6N-R62W	<b>MD Reference:</b>	WELL @ 4788.00usft
<b>Well:</b>	Dutch Lake #8-10H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

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)	
1,843.00	5.90	265.10	1,835.16	-23.43	-126.89	-127.19	3.34	-0.32	-31.91	
1,938.00	5.80	266.10	1,929.67	-24.18	-136.55	-136.85	0.15	-0.11	1.05	
2,033.00	5.80	273.50	2,024.18	-24.21	-146.13	-146.43	0.79	0.00	7.79	
2,127.00	5.30	272.80	2,117.74	-23.71	-155.20	-155.50	0.54	-0.53	-0.74	
2,222.00	5.40	269.30	2,212.33	-23.55	-164.06	-164.35	0.36	0.11	-3.68	
2,316.00	5.60	276.80	2,305.90	-23.06	-173.03	-173.32	0.79	0.21	7.98	
2,410.00	5.50	277.30	2,399.46	-21.94	-182.06	-182.33	0.12	-0.11	0.53	
2,505.00	5.20	278.60	2,494.04	-20.72	-190.83	-191.09	0.34	-0.32	1.37	
2,599.00	4.20	278.70	2,587.73	-19.56	-198.44	-198.68	1.06	-1.06	0.11	
2,693.00	3.60	287.10	2,681.51	-18.18	-204.67	-204.89	0.88	-0.64	8.94	
2,787.00	2.10	281.60	2,775.39	-16.96	-209.17	-209.38	1.62	-1.60	-5.85	
2,881.00	0.80	225.60	2,869.36	-17.07	-211.33	-211.54	1.89	-1.38	-59.57	
2,976.00	0.80	215.90	2,964.35	-18.08	-212.19	-212.41	0.14	0.00	-10.21	
3,070.00	0.80	311.60	3,058.35	-18.17	-213.07	-213.29	1.26	0.00	101.81	
3,165.00	0.70	341.40	3,153.34	-17.18	-213.75	-213.96	0.42	-0.11	31.37	
3,259.00	0.60	326.60	3,247.33	-16.23	-214.20	-214.40	0.21	-0.11	-15.74	
3,353.00	1.10	324.70	3,341.32	-15.08	-215.00	-215.18	0.53	0.53	-2.02	
3,448.00	1.10	302.60	3,436.31	-13.84	-216.29	-216.46	0.44	0.00	-23.26	
3,542.00	2.10	0.00	3,530.27	-11.63	-217.05	-217.19	1.88	1.06	61.06	
3,637.00	2.50	8.70	3,625.20	-7.85	-216.74	-216.82	0.56	0.42	9.16	
3,731.00	2.40	4.30	3,719.11	-3.86	-216.28	-216.31	0.23	-0.11	-4.68	
3,826.00	2.70	0.00	3,814.02	0.36	-216.13	-216.11	0.37	0.32	-4.53	
3,920.00	3.40	7.10	3,907.88	5.34	-215.79	-215.70	0.84	0.74	7.55	
4,015.00	3.30	7.40	4,002.72	10.85	-215.09	-214.93	0.11	-0.11	0.32	
4,110.00	3.20	14.00	4,097.57	16.14	-214.09	-213.86	0.41	-0.11	6.95	
4,204.00	1.80	49.20	4,191.48	19.65	-212.34	-212.06	2.14	-1.49	37.45	
4,299.00	1.00	128.10	4,286.46	20.11	-210.56	-210.28	1.98	-0.84	83.05	
4,393.00	0.90	133.50	4,380.45	19.10	-209.38	-209.11	0.14	-0.11	5.74	
4,488.00	0.90	103.70	4,475.43	18.41	-208.11	-207.85	0.49	0.00	-31.37	
4,582.00	0.70	149.80	4,569.43	17.73	-207.11	-206.85	0.69	-0.21	49.04	
4,677.00	0.60	171.50	4,664.42	16.74	-206.74	-206.50	0.28	-0.11	22.84	
4,771.00	0.70	140.20	4,758.41	15.81	-206.30	-206.07	0.39	0.11	-33.30	
4,866.00	0.50	115.80	4,853.41	15.19	-205.56	-205.34	0.34	-0.21	-25.68	
4,961.00	0.30	99.90	4,948.41	14.96	-204.94	-204.72	0.24	-0.21	-16.74	
5,055.00	0.80	299.20	5,042.40	15.24	-205.27	-205.05	1.16	0.53	-170.96	
5,150.00	0.60	297.20	5,137.40	15.79	-206.29	-206.06	0.21	-0.21	-2.11	
5,244.00	0.30	259.50	5,231.39	15.97	-206.97	-206.74	0.43	-0.32	-40.11	
5,338.00	0.00	107.90	5,325.39	15.93	-207.21	-206.98	0.32	-0.32	0.00	
5,433.00	0.50	237.40	5,420.39	15.70	-207.56	-207.33	0.53	0.53	0.00	
5,527.00	0.50	239.20	5,514.39	15.27	-208.26	-208.04	0.02	0.00	1.91	
5,622.00	0.20	253.00	5,609.39	15.01	-208.77	-208.56	0.33	-0.32	14.53	
5,717.00	0.40	168.40	5,704.39	14.64	-208.86	-208.65	0.45	0.21	-89.05	
5,811.00	0.10	275.70	5,798.39	14.33	-208.88	-208.67	0.47	-0.32	114.15	
5,906.00	0.10	226.70	5,893.39	14.28	-209.02	-208.82	0.09	0.00	-51.58	
5,948.00	0.20	192.40	5,935.39	14.18	-209.07	-208.86	0.31	0.24	-81.67	
5,980.00	0.20	105.50	5,967.39	14.11	-209.02	-208.82	0.86	0.00	-271.56	
6,011.00	0.30	129.70	5,998.39	14.04	-208.91	-208.71	0.46	0.32	78.06	
6,043.00	2.90	71.40	6,030.37	14.25	-208.08	-207.87	8.61	8.12	-182.19	
6,074.00	7.20	77.10	6,061.24	14.93	-205.44	-205.22	13.95	13.87	18.39	
6,106.00	11.50	78.90	6,092.81	16.00	-200.35	-200.12	13.47	13.44	5.62	
6,137.00	15.70	79.30	6,122.94	17.37	-193.19	-192.95	13.55	13.55	1.29	
6,169.00	19.60	83.70	6,153.42	18.76	-183.60	-183.34	12.87	12.19	13.75	
6,200.00	22.90	90.00	6,182.32	19.33	-172.40	-172.13	12.93	10.65	20.32	
6,232.00	26.10	96.00	6,211.44	18.60	-159.17	-158.91	12.66	10.00	18.75	

<b>Company:</b>	Bill Barrett Corp.	<b>Local Co-ordinate Reference:</b>	Well Dutch Lake #8-10H
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<b>Site:</b>	Sec.10-T6N-R62W	<b>MD Reference:</b>	WELL @ 4788.00usft
<b>Well:</b>	Dutch Lake #8-10H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

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)	
6,263.00	28.40	96.20	6,238.99	17.09	-145.05	-144.81	7.43	7.42	0.65	
6,295.00	30.70	95.00	6,266.83	15.56	-129.35	-129.13	7.42	7.19	-3.75	
6,326.00	33.60	90.40	6,293.08	14.81	-112.88	-112.68	12.24	9.35	-14.84	
6,358.00	36.20	87.60	6,319.32	15.14	-94.58	-94.37	9.54	8.12	-8.75	
6,389.00	40.40	86.30	6,343.64	16.17	-75.40	-75.18	13.79	13.55	-4.19	
6,421.00	45.40	85.20	6,367.08	17.80	-53.69	-53.45	15.80	15.62	-3.44	
6,452.00	50.40	84.20	6,387.86	19.93	-30.79	-30.53	16.31	16.13	-3.23	
6,484.00	55.60	83.80	6,407.11	22.60	-5.38	-5.09	16.28	16.25	-1.25	
6,515.00	60.20	86.90	6,423.58	24.71	20.78	21.10	17.08	14.84	10.00	
6,547.00	62.00	88.60	6,439.04	25.81	48.77	49.11	7.30	5.62	5.31	
6,578.00	65.80	90.40	6,452.68	26.04	76.60	76.94	13.32	12.26	5.81	
6,610.00	70.50	92.40	6,464.59	25.31	106.28	106.61	15.79	14.69	6.25	
6,641.00	76.00	94.00	6,473.52	23.65	135.91	136.21	18.42	17.74	5.16	
6,673.00	81.00	93.50	6,479.90	21.60	167.19	167.46	15.70	15.62	-1.56	
6,704.00	87.10	92.20	6,483.11	20.07	197.97	198.22	20.11	19.68	-4.19	
6,736.00	89.50	91.50	6,484.06	19.03	229.94	230.17	7.81	7.50	-2.19	
<b>DL 8-10H LP</b>										
6,775.91	89.45	91.88	6,484.43	17.86	269.83	270.04	0.96	-0.14	0.95	
6,810.00	89.40	92.20	6,484.77	16.65	303.89	304.09	0.96	-0.14	0.95	
6,873.00	89.80	92.10	6,485.21	14.28	366.85	367.00	0.65	0.63	-0.16	
6,968.00	91.60	92.20	6,484.05	10.72	461.77	461.87	1.90	1.89	0.11	
7,062.00	91.70	90.80	6,481.34	8.26	555.70	555.76	1.49	0.11	-1.49	
7,156.00	89.90	91.00	6,480.03	6.78	649.67	649.70	1.93	-1.91	0.21	
7,251.00	91.60	87.90	6,478.79	7.69	744.64	744.68	3.72	1.79	-3.26	
7,346.00	91.70	88.20	6,476.05	10.93	839.55	839.62	0.33	0.11	0.32	
7,440.00	90.70	88.90	6,474.08	13.30	933.50	933.59	1.30	-1.06	0.74	
7,534.00	88.40	88.80	6,474.82	15.19	1,027.47	1,027.58	2.45	-2.45	-0.11	
7,628.00	89.20	88.30	6,476.79	17.57	1,121.42	1,121.55	1.00	0.85	-0.53	
7,723.00	89.90	88.80	6,477.53	19.97	1,216.38	1,216.54	0.91	0.74	0.53	
7,818.00	90.30	89.30	6,477.37	21.55	1,311.37	1,311.54	0.67	0.42	0.53	
7,913.00	90.70	89.80	6,476.54	22.29	1,406.36	1,406.53	0.67	0.42	0.53	
8,007.00	91.20	90.00	6,474.98	22.46	1,500.35	1,500.51	0.57	0.53	0.21	
8,102.00	89.50	89.80	6,474.40	22.62	1,595.34	1,595.50	1.80	-1.79	-0.21	
8,196.00	89.80	89.70	6,474.97	23.03	1,689.34	1,689.50	0.34	0.32	-0.11	
8,290.00	91.00	91.00	6,474.32	22.46	1,783.33	1,783.47	1.88	1.28	1.38	
8,385.00	90.50	90.30	6,473.07	21.38	1,878.32	1,878.44	0.91	-0.53	-0.74	
8,479.00	89.50	90.00	6,473.07	21.13	1,972.32	1,972.42	1.11	-1.06	-0.32	
8,574.00	89.90	90.30	6,473.57	20.89	2,067.31	2,067.41	0.53	0.42	0.32	
8,668.00	90.40	90.90	6,473.33	19.90	2,161.31	2,161.38	0.83	0.53	0.64	
8,763.00	90.30	89.50	6,472.75	19.57	2,256.30	2,256.36	1.48	-0.11	-1.47	
8,857.00	89.20	88.50	6,473.16	21.21	2,350.29	2,350.36	1.58	-1.17	-1.06	
8,952.00	89.40	88.60	6,474.32	23.61	2,445.25	2,445.35	0.24	0.21	0.11	
9,046.00	91.30	88.90	6,473.74	25.66	2,539.22	2,539.34	2.05	2.02	0.32	
9,141.00	90.00	88.90	6,472.66	27.49	2,634.19	2,634.33	1.37	-1.37	0.00	
9,235.00	90.30	88.80	6,472.42	29.37	2,728.17	2,728.32	0.34	0.32	-0.11	
9,330.00	90.80	89.90	6,471.51	30.45	2,823.16	2,823.32	1.27	0.53	1.16	
9,425.00	90.90	88.60	6,470.10	31.70	2,918.14	2,918.31	1.37	0.11	-1.37	
9,519.00	90.20	87.90	6,469.19	34.57	3,012.09	3,012.29	1.05	-0.74	-0.74	
9,613.00	91.00	88.70	6,468.21	37.35	3,106.04	3,106.27	1.20	0.85	0.85	
9,708.00	89.50	87.80	6,467.80	40.26	3,200.99	3,201.25	1.84	-1.58	-0.95	
9,802.00	90.30	88.00	6,467.96	43.70	3,294.93	3,295.22	0.88	0.85	0.21	
9,897.00	91.60	87.90	6,466.39	47.10	3,389.85	3,390.18	1.37	1.37	-0.11	
9,991.00	89.60	87.80	6,465.40	50.62	3,483.78	3,484.14	2.13	-2.13	-0.11	
10,085.00	90.70	88.00	6,465.15	54.07	3,577.71	3,578.12	1.19	1.17	0.21	

<b>Company:</b>	Bill Barrett Corp.	<b>Local Co-ordinate Reference:</b>	Well Dutch Lake #8-10H
<b>Project:</b>	Weld Co., CO	<b>TVD Reference:</b>	WELL @ 4788.00usft
<b>Site:</b>	Sec.10-T6N-R62W	<b>MD Reference:</b>	WELL @ 4788.00usft
<b>Well:</b>	Dutch Lake #8-10H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

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)	
10,180.00	89.60	88.60	6,464.91	56.89	3,672.67	3,673.10	1.32	-1.16	0.63	
10,274.00	90.00	87.70	6,465.23	59.92	3,766.62	3,767.08	1.05	0.43	-0.96	
10,369.00	90.60	86.30	6,464.74	64.89	3,861.48	3,862.00	1.60	0.63	-1.47	
10,463.00	91.20	85.20	6,463.26	71.86	3,955.21	3,955.82	1.33	0.64	-1.17	
10,558.00	89.90	86.80	6,462.35	78.48	4,049.97	4,050.65	2.17	-1.37	1.68	
10,652.00	89.90	90.80	6,462.51	80.45	4,143.93	4,144.63	4.26	0.00	4.26	
10,747.00	89.90	91.30	6,462.68	78.71	4,238.92	4,239.59	0.53	0.00	0.53	
10,841.00	90.00	91.20	6,462.76	76.66	4,332.89	4,333.53	0.15	0.11	-0.11	
10,936.00	90.10	91.30	6,462.68	74.59	4,427.87	4,428.47	0.15	0.11	0.11	
11,030.00	90.20	91.20	6,462.43	72.54	4,521.85	4,522.41	0.15	0.11	-0.11	
Last Archer Survey										
11,092.00	90.10	91.20	6,462.27	71.24	4,583.83	4,584.37	0.16	-0.16	0.00	
PTB - DL 8-10H PBHL										
11,155.00	90.10	91.20	6,462.16	69.92	4,646.82	4,647.34	0.00	0.00	0.00	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
883.00	881.64	-30.51	-29.36	First Archer Survey	
11,092.00	6,462.27	71.24	4,583.83	Last Archer Survey	
11,155.00	6,462.16	69.92	4,646.82	PTB	

Checked By: \_\_\_\_\_
Approved By: \_\_\_\_\_
Date: \_\_\_\_\_