



Project: Mesa County, CO  
 Site: HG Fed 35-01W Pad  
 Well: HG Fed 35-01W  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.328340  
 Longitude: -107.635160  
 Ground Level: 7985.0  
 well @ 7996.0usft (RKB 11')



#### PROJECT DETAILS: Mesa County, CO

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

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well HG Fed 35-01W, True North  
 Vertical (TVD) Reference: well @ 7996.0usft (RKB 11')  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7996.0usft (RKB 11')  
 Calculation Method: Minimum Curvature

#### WELL DETAILS: HG Fed 35-01W

+N-S	+E-W	Northing	Ground Level: Easting	7985.0 Latitude	Longitude
0.0	0.0	1581577.14	2396077.19	39.328340	-107.635160

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

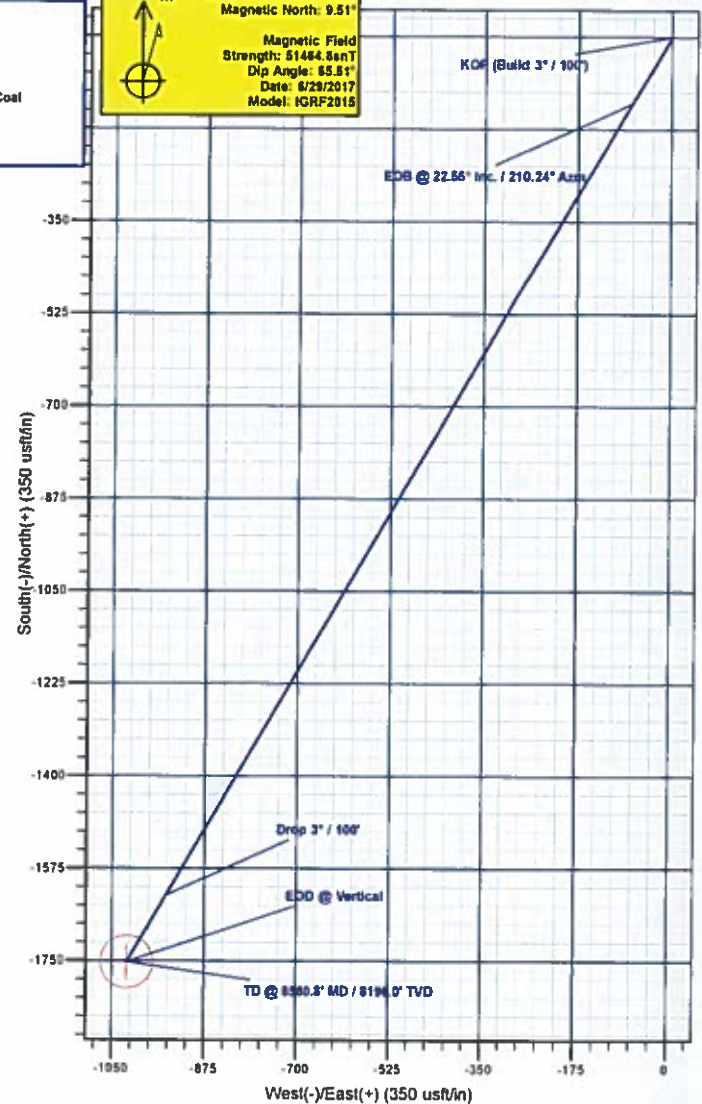
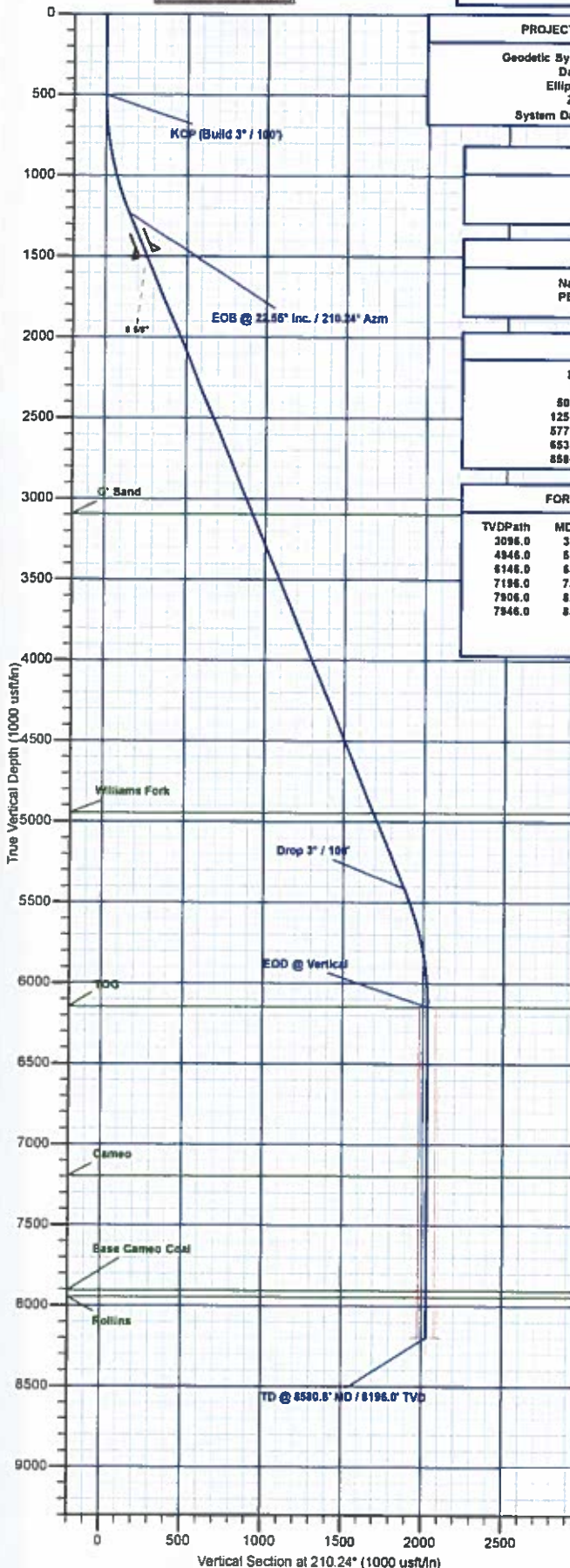
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - HG Fed 35-01W	8196.0	-1752.4	-1021.7	1549849.20	2395014.57	39.323528	-107.636772

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3" / 100')
1251.6	22.55	210.24	1232.5	-126.2	-73.6	3.00	210.24	146.1	EOB @ 22.55" Inc. / 210.24" Azm
5779.0	22.55	210.24	5413.5	-1626.2	-948.2	0.00	0.00	1882.5	Drop 3" / 100'
6530.8	0.00	0.00	6146.0	-1752.4	-1021.7	3.00	180.00	2028.5	EOB @ Vertical
8580.8	0.00	0.00	8196.0	-1752.4	-1021.7	0.00	0.00	2028.5	TD @ 8580.8' MD / 8196.0' TVD

#### FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
3096.0	3269.6	G' Sand
4946.0	5272.8	Williams Fork
6146.0	6530.8	TOG
7196.0	7580.8	Cameo
7906.0	8290.8	Base Cameo Coal
7946.0	8330.8	Rollins



Plan: Design #1 (HG Fed 35-01W/Wellbore #1)

Created By: Will Jircik Date: 10:27, June 29 2017



# **Laramie Energy, LLC**

**Mesa County, CO  
HG Fed 35-01W Pad  
HG Fed 35-01W**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**29 June, 2017**





# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well HG Fed 35-01W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7996.0usft (RKB 11')
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7996.0usft (RKB 11')
<b>Site:</b>	HG Fed 35-01W Pad	<b>North Reference:</b>	True
<b>Well:</b>	HG Fed 35-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Mesa County, 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 Central Zone		

<b>Site</b>	HG Fed 35-01W Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,551,577.15 usft	<b>Latitude:</b> 39.328340
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,396,077.19 usft	<b>Longitude:</b> -107.635160
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -1.35 "

<b>Well</b>	HG Fed 35-01W			
<b>Well Position</b>	+N/-S	0.0 usft	<b>Northing:</b>	1,551,577.15 usft
	+E/-W	0.0 usft	<b>Easting:</b>	2,396,077.19 usft
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	0.0 usft	<b>Ground Level:</b> 7,985.0 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</b>
	IGRF2015	6/29/2017	(°)	(°)	(nT)
			9.51	65.51	51,465

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	210.24

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,251.8	22.55	210.24	1,232.5	-126.2	-73.6	3.00	3.00	0.00	210.24	
5,779.0	22.55	210.24	5,413.5	-1,626.2	-948.2	0.00	0.00	0.00	0.00	
6,530.8	0.00	0.00	6,146.0	-1,752.4	-1,021.7	3.00	-3.00	0.00	180.00	
8,580.8	0.00	0.00	8,196.0	-1,752.4	-1,021.7	0.00	0.00	0.00	0.00	PBHL - HG Fed 35-01





# Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well HG Fed 35-01W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7996.0usft (RKB 11')
Project:	Mesa County, CO	MD Reference:	well @ 7996.0usft (RKB 11')
Site:	HG Fed 35-01W Pad	North Reference:	True
Well:	HG Fed 35-01W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

## Planned 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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	3.00	210.24	600.0	-2.3	-1.3	2.6	3.00	3.00	0.00
700.0	6.00	210.24	699.6	-9.0	-5.3	10.5	3.00	3.00	0.00
800.0	9.00	210.24	798.8	-20.3	-11.8	23.5	3.00	3.00	0.00
900.0	12.00	210.24	897.1	-36.1	-21.0	41.7	3.00	3.00	0.00
1,000.0	15.00	210.24	994.3	-56.2	-32.8	65.1	3.00	3.00	0.00
1,100.0	18.00	210.24	1,090.2	-80.8	-47.1	93.5	3.00	3.00	0.00
1,200.0	21.00	210.24	1,184.4	-109.6	-63.9	126.9	3.00	3.00	0.00
EOB @ 22.55° Inc. / 210.24° Azm									
1,251.8	22.55	210.24	1,232.5	-126.2	-73.6	146.1	3.00	3.00	0.00
1,300.0	22.55	210.24	1,277.0	-142.2	-82.9	164.6	0.00	0.00	0.00
1,400.0	22.55	210.24	1,369.4	-175.3	-102.2	202.9	0.00	0.00	0.00
1,500.0	22.55	210.24	1,461.8	-208.4	-121.5	241.3	0.00	0.00	0.00
8 5/8"									
1,530.0	22.55	210.24	1,489.5	-218.4	-127.3	252.8	0.00	0.00	0.00
1,600.0	22.55	210.24	1,554.1	-241.6	-140.8	279.6	0.00	0.00	0.00
1,700.0	22.55	210.24	1,646.5	-274.7	-160.2	318.0	0.00	0.00	0.00
1,800.0	22.55	210.24	1,738.8	-307.8	-179.5	356.3	0.00	0.00	0.00
1,900.0	22.55	210.24	1,831.2	-341.0	-198.8	394.7	0.00	0.00	0.00
2,000.0	22.55	210.24	1,923.5	-374.1	-218.1	433.0	0.00	0.00	0.00
2,100.0	22.55	210.24	2,015.9	-407.2	-237.4	471.4	0.00	0.00	0.00
2,200.0	22.55	210.24	2,108.2	-440.4	-256.7	509.8	0.00	0.00	0.00
2,300.0	22.55	210.24	2,200.6	-473.5	-276.1	548.1	0.00	0.00	0.00
2,400.0	22.55	210.24	2,292.9	-506.6	-295.4	586.5	0.00	0.00	0.00
2,500.0	22.55	210.24	2,385.3	-539.8	-314.7	624.8	0.00	0.00	0.00
2,600.0	22.55	210.24	2,477.6	-572.9	-334.0	663.2	0.00	0.00	0.00
2,700.0	22.55	210.24	2,570.0	-606.0	-353.3	701.5	0.00	0.00	0.00
2,800.0	22.55	210.24	2,662.3	-639.2	-372.7	739.9	0.00	0.00	0.00
2,900.0	22.55	210.24	2,754.7	-672.3	-392.0	778.2	0.00	0.00	0.00
3,000.0	22.55	210.24	2,847.0	-705.4	-411.3	816.6	0.00	0.00	0.00
3,100.0	22.55	210.24	2,939.4	-738.6	-430.6	854.9	0.00	0.00	0.00
3,200.0	22.55	210.24	3,031.7	-771.7	-449.9	893.3	0.00	0.00	0.00
G' Sand									
3,269.6	22.55	210.24	3,096.0	-794.8	-463.4	920.0	0.00	0.00	0.00
3,300.0	22.55	210.24	3,124.1	-804.9	-469.3	931.7	0.00	0.00	0.00
3,400.0	22.55	210.24	3,216.4	-838.0	-488.6	970.0	0.00	0.00	0.00
3,500.0	22.55	210.24	3,308.8	-871.1	-507.9	1,008.4	0.00	0.00	0.00
3,600.0	22.55	210.24	3,401.1	-904.3	-527.2	1,046.7	0.00	0.00	0.00
3,700.0	22.55	210.24	3,493.5	-937.4	-546.5	1,085.1	0.00	0.00	0.00
3,800.0	22.55	210.24	3,585.8	-970.5	-565.8	1,123.4	0.00	0.00	0.00
3,900.0	22.55	210.24	3,678.2	-1,003.7	-585.2	1,161.8	0.00	0.00	0.00
4,000.0	22.55	210.24	3,770.6	-1,036.8	-604.5	1,200.1	0.00	0.00	0.00
4,100.0	22.55	210.24	3,862.9	-1,069.9	-623.8	1,238.5	0.00	0.00	0.00
4,200.0	22.55	210.24	3,955.3	-1,103.1	-643.1	1,276.9	0.00	0.00	0.00
4,300.0	22.55	210.24	4,047.6	-1,136.2	-662.4	1,315.2	0.00	0.00	0.00
4,400.0	22.55	210.24	4,140.0	-1,169.3	-681.8	1,353.6	0.00	0.00	0.00
4,500.0	22.55	210.24	4,232.3	-1,202.5	-701.1	1,391.9	0.00	0.00	0.00
4,600.0	22.55	210.24	4,324.7	-1,235.6	-720.4	1,430.3	0.00	0.00	0.00



# Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well HG Fed 35-01W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7996 Dufs (RKB 11')
Project:	Mesa County, CO	MD Reference:	well @ 7996 Dufs (RKB 11')
Site:	HG Fed 35-01W Pad	North Reference:	True
Well:	HG Fed 35-01W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

## Planned 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)
4,700.0	22.55	210.24	4,417.0	-1,268.7	-739.7	1,468.6	0.00	0.00	0.00
4,800.0	22.55	210.24	4,509.4	-1,301.9	-759.0	1,507.0	0.00	0.00	0.00
4,900.0	22.55	210.24	4,601.7	-1,335.0	-778.3	1,545.3	0.00	0.00	0.00
5,000.0	22.55	210.24	4,694.1	-1,368.1	-797.7	1,583.7	0.00	0.00	0.00
5,100.0	22.55	210.24	4,786.4	-1,401.3	-817.0	1,622.0	0.00	0.00	0.00
5,200.0	22.55	210.24	4,878.8	-1,434.4	-836.3	1,660.4	0.00	0.00	0.00
<b>Williams Fork</b>									
5,272.8	22.55	210.24	4,948.0	-1,458.5	-850.4	1,688.3	0.00	0.00	0.00
5,300.0	22.55	210.24	4,971.1	-1,467.5	-855.6	1,698.8	0.00	0.00	0.00
5,400.0	22.55	210.24	5,083.5	-1,500.7	-874.9	1,737.1	0.00	0.00	0.00
5,500.0	22.55	210.24	5,155.8	-1,533.8	-894.3	1,775.5	0.00	0.00	0.00
5,600.0	22.55	210.24	5,248.2	-1,566.9	-913.6	1,813.8	0.00	0.00	0.00
5,700.0	22.55	210.24	5,340.5	-1,600.1	-932.9	1,852.2	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,779.0	22.55	210.24	5,413.5	-1,626.2	-948.2	1,882.5	0.00	0.00	0.00
5,800.0	21.92	210.24	5,432.9	-1,633.1	-952.2	1,890.4	3.00	-3.00	0.00
5,900.0	18.92	210.24	5,526.6	-1,663.3	-969.7	1,925.3	3.00	-3.00	0.00
6,000.0	15.92	210.24	5,622.0	-1,689.1	-984.8	1,955.3	3.00	-3.00	0.00
6,100.0	12.92	210.24	5,718.9	-1,710.6	-997.4	1,980.2	3.00	-3.00	0.00
6,200.0	9.92	210.24	5,816.9	-1,727.8	-1,007.3	2,000.0	3.00	-3.00	0.00
6,300.0	6.92	210.24	5,915.8	-1,740.4	-1,014.7	2,014.6	3.00	-3.00	0.00
6,400.0	3.92	210.24	6,015.3	-1,748.6	-1,019.5	2,024.1	3.00	-3.00	0.00
6,500.0	0.92	210.24	6,115.2	-1,752.2	-1,021.6	2,028.3	3.00	-3.00	0.00
<b>EOD @ Vertical - TOG</b>									
6,530.8	0.00	0.00	6,146.0	-1,752.4	-1,021.7	2,028.5	3.00	-3.00	0.00
6,600.0	0.00	0.00	6,215.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
6,700.0	0.00	0.00	6,315.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,415.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
6,900.0	0.00	0.00	6,515.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,615.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,100.0	0.00	0.00	6,715.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,200.0	0.00	0.00	6,815.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,300.0	0.00	0.00	6,915.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,015.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,500.0	0.00	0.00	7,115.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
<b>Cameo</b>									
7,580.8	0.00	0.00	7,196.0	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,215.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,700.0	0.00	0.00	7,315.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,800.0	0.00	0.00	7,415.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
7,900.0	0.00	0.00	7,515.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
8,000.0	0.00	0.00	7,615.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
8,100.0	0.00	0.00	7,715.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
8,200.0	0.00	0.00	7,815.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
8,290.8	0.00	0.00	7,906.0	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
8,300.0	0.00	0.00	7,915.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
<b>Rollins</b>									
8,330.8	0.00	0.00	7,946.0	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
8,400.0	0.00	0.00	8,015.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
8,500.0	0.00	0.00	8,115.2	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00
<b>TD @ 8580.8' MD / 8196.0' TVD</b>									
8,580.8	0.00	0.00	8,196.0	-1,752.4	-1,021.7	2,028.5	0.00	0.00	0.00



# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well HG Fed 35-01W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7996.0usft (RKB 11')
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7996.0usft (RKB 11')
<b>Site:</b>	HG Fed 35-01W Pad	<b>North Reference:</b>	True
<b>Well:</b>	HG Fed 35-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## Planned 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)
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## Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL - HG Fed 35-01W - plan hits target center - Point	0.00	0.00	8,196.0	-1,752.4	-1,021.7	1,549,849.21	2,395,014.57	39.323529	-107.638772

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,489.5	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,269.6	3,096.0	G' Sand			
5,272.8	4,946.0	Williams Fork			
6,530.8	6,146.0	TOG			
7,580.8	7,196.0	Cameo			
8,290.8	7,906.0	Base Cameo Coal			
8,330.8	7,946.0	Rollins			

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.0	500.0	0.0	0.0	KOP (Build 3° / 100')
1,251.8	1,232.5	-126.2	-73.6	EOB @ 22.55° Inc. / 210.24° Azm
5,779.0	5,413.5	-1,626.2	-948.2	Drop 3° / 100'
6,530.8	6,146.0	-1,752.4	-1,021.7	EOD @ Vertical
8,580.8	8,196.0	-1,752.4	-1,021.7	TD @ 8580.8' MD / 8196.0' TVD