



Project: Mesa County, CO  
 Site: Bruton 30-10 Pad  
 Well: Bruton 30-20E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.248072  
 Longitude: -107.808819  
 Ground Level: 7643.0  
 well @ 7665.0usft (H&P #290)



#### 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 Bruton 30-20E, True North  
 Vertical (TVD) Reference: well @ 7665.0usft (H&P #290)  
 Section (VS) Reference: Slot = (0.0N, 0.8E)  
 Measured Depth Reference: well @ 7665.0usft (H&P #290)  
 Calculation Method: Minimum Curvature

#### WELL DETAILS: Bruton 30-20E

Ground Level: 7643.0  
 +N-S +E-W Northing Easting Latitude Longitude  
 0.0 0.0 1523552.75 2346225.58 39.248072 -107.808819

#### DESIGN TARGET DETAILS

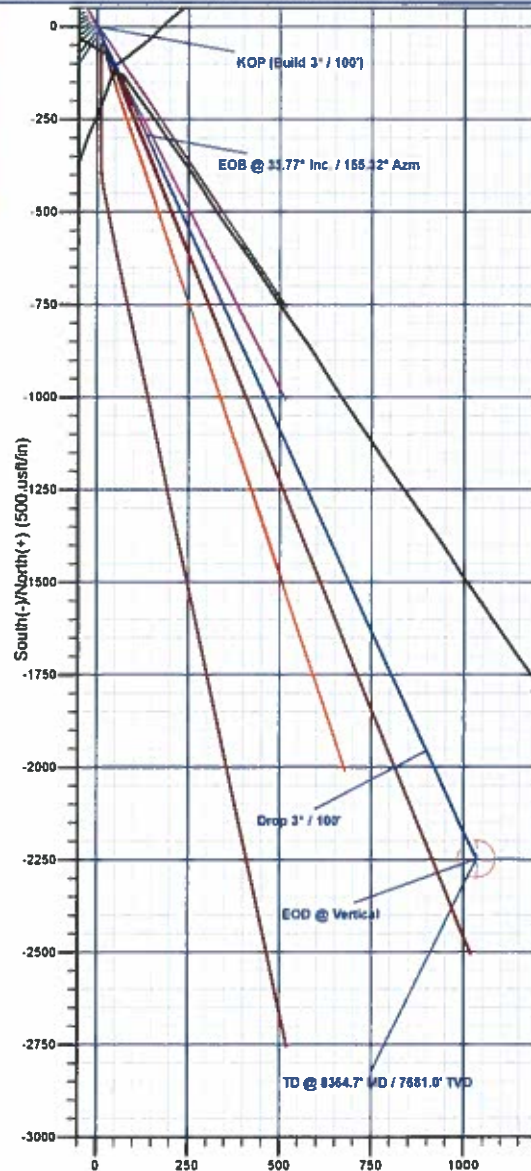
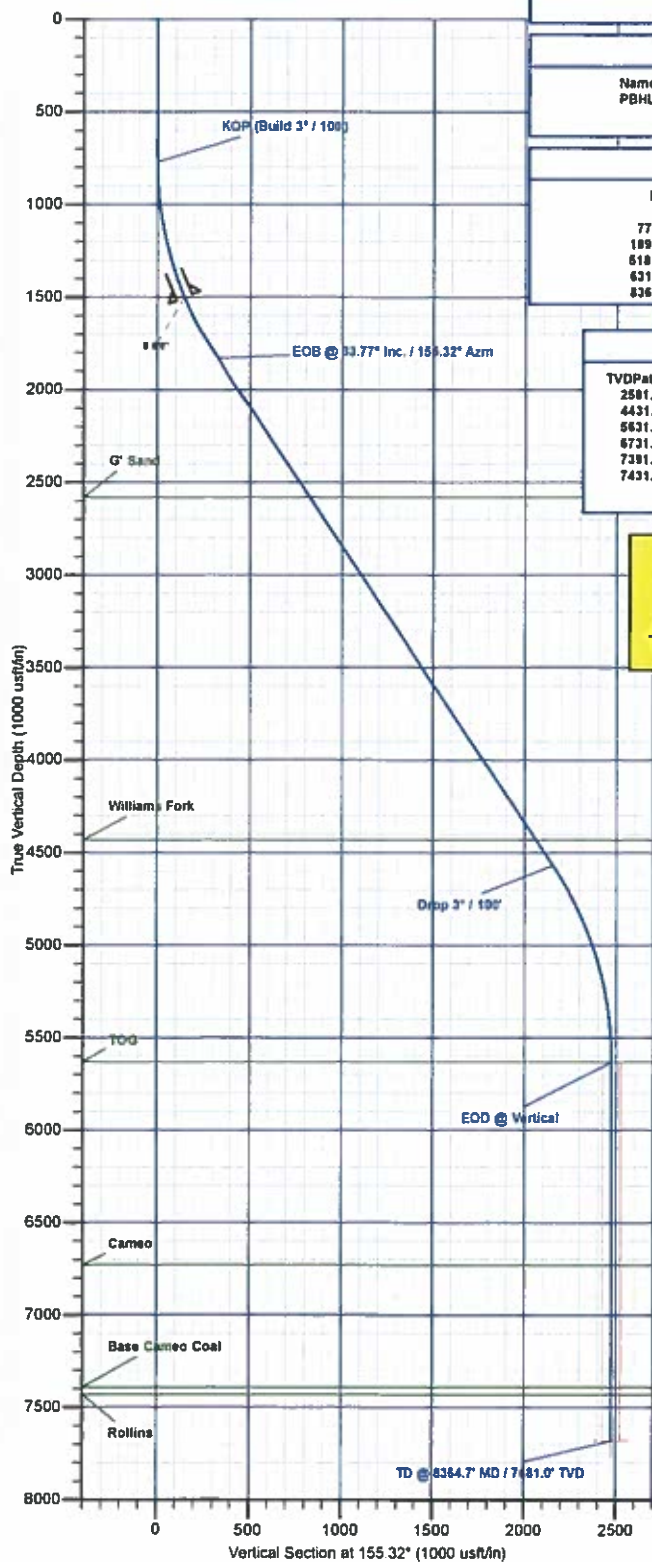
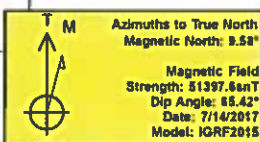
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-20E	7681.0	-2249.0	1033.5	1521278.21	2347201.56	39.241897	-107.805170

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSEct	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
770.0	0.00	0.00	770.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1895.6	33.77	155.32	1831.6	-292.8	134.8	3.00	155.32	322.2	EOB @ 33.77° Inc. / 155.32° Azm
5189.1	33.77	155.32	4569.4	-1956.2	898.9	0.00	0.00	2152.9	Drop 3° / 100'
6314.7	0.00	0.00	5631.0	-2249.0	1033.5	3.00	180.00	2476.1	EOD @ Vertical
8364.7	0.00	0.00	7681.0	-2249.0	1033.5	0.00	0.00	2476.1	TD @ 8364.7' MD / 7681.0' TVD

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2581.0	2797.1	G' Sand
4431.0	5022.6	Williams Fork
5631.0	6314.7	TOG
6731.0	7414.7	Cameo
7391.0	8074.7	Base Cameo Coal
7431.0	8114.7	Rollins



Plan: Design #1 (Bruton 30-20E/Wellbore #1)

Created By: Will Jirick Date: 12:29, July 17 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 30-10 Pad**

**Bruton 30-20E**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**17 July, 2017**





# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-20E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7665.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7665.0usft (H&P #290)
<b>Site:</b>	Bruton 30-10 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-20E	<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>	Bruton 30-10 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,523,424.58 usft	<b>Latitude:</b> 39.247725
<b>From:</b>	Map	<b>Easting:</b>	2,346,291.81 usft	<b>Longitude:</b> -107.808574
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b> -1.46°

<b>Well</b>	Bruton 30-20E			
<b>Well Position</b>	+N/-S	126.4 usft	<b>Northing:</b>	1,523,552.75 usft
	+E/-W	-69.5 usft	<b>Easting:</b>	2,346,225.58 usft
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	0.0 usft
			<b>Ground Level:</b>	7,643.0 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 (nT)</b>
	IGRF2015	7/14/2017	9.58	65.42	51,398

<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	155.32

<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	
770.0	0.00	0.00	770.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,895.6	33.77	155.32	1,831.6	-292.8	134.5	3.00	3.00	0.00	155.32	
5,189.1	33.77	155.32	4,569.4	-1,956.2	898.9	0.00	0.00	0.00	0.00	
6,314.7	0.00	0.00	5,631.0	-2,249.0	1,033.5	3.00	-3.00	0.00	180.00	
8,364.7	0.00	0.00	7,681.0	-2,249.0	1,033.5	0.00	0.00	0.00	0.00	PBHL - Bruton 30-20E



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-20E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7665 0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7665 0usft (H&P #290)
<b>Site:</b>	Bruton 30-10 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-20E	<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)
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
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP (Build 3° / 100')</b>									
770.0	0.00	0.00	770.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.90	155.32	800.0	-0.2	0.1	0.2	3.00	3.00	0.00
900.0	3.90	155.32	899.9	-4.0	1.8	4.4	3.00	3.00	0.00
1,000.0	6.90	155.32	999.4	-12.6	5.8	13.8	3.00	3.00	0.00
1,100.0	9.90	155.32	1,098.4	-25.8	11.9	28.4	3.00	3.00	0.00
1,200.0	12.90	155.32	1,196.4	-43.8	20.1	48.2	3.00	3.00	0.00
1,300.0	15.90	155.32	1,293.2	-66.4	30.5	73.1	3.00	3.00	0.00
1,400.0	18.90	155.32	1,388.6	-93.6	43.0	103.0	3.00	3.00	0.00
1,500.0	21.90	155.32	1,482.4	-125.2	57.5	137.8	3.00	3.00	0.00
<b>8 5/8"</b>									
1,522.0	22.56	155.32	1,502.7	-132.8	61.0	146.1	3.00	3.00	0.00
1,600.0	24.90	155.32	1,574.1	-161.3	74.1	177.5	3.00	3.00	0.00
1,700.0	27.90	155.32	1,663.7	-201.7	92.7	222.0	3.00	3.00	0.00
1,800.0	30.90	155.32	1,750.8	-246.3	113.2	271.1	3.00	3.00	0.00
<b>EOB @ 33.77° Inc. / 155.32° Azm</b>									
1,895.6	33.77	155.32	1,831.6	-292.8	134.5	322.2	3.00	3.00	0.00
1,900.0	33.77	155.32	1,835.2	-295.0	135.6	324.6	0.00	0.00	0.00
2,000.0	33.77	155.32	1,918.3	-345.5	158.8	380.2	0.00	0.00	0.00
2,100.0	33.77	155.32	2,001.5	-396.0	182.0	435.8	0.00	0.00	0.00
2,200.0	33.77	155.32	2,084.6	-446.5	205.2	491.4	0.00	0.00	0.00
2,300.0	33.77	155.32	2,167.7	-497.0	228.4	547.0	0.00	0.00	0.00
2,400.0	33.77	155.32	2,250.9	-547.5	251.6	602.6	0.00	0.00	0.00
2,500.0	33.77	155.32	2,334.0	-598.0	274.8	658.2	0.00	0.00	0.00
2,600.0	33.77	155.32	2,417.1	-648.5	298.0	713.7	0.00	0.00	0.00
2,700.0	33.77	155.32	2,500.2	-699.0	321.2	769.3	0.00	0.00	0.00
<b>G' Sand</b>									
2,797.1	33.77	155.32	2,581.0	-748.1	343.8	823.3	0.00	0.00	0.00
2,800.0	33.77	155.32	2,583.4	-749.6	344.4	824.9	0.00	0.00	0.00
2,900.0	33.77	155.32	2,666.5	-800.1	367.6	880.5	0.00	0.00	0.00
3,000.0	33.77	155.32	2,749.6	-850.6	390.9	936.1	0.00	0.00	0.00
3,100.0	33.77	155.32	2,832.8	-901.1	414.1	991.7	0.00	0.00	0.00
3,200.0	33.77	155.32	2,915.9	-951.6	437.3	1,047.2	0.00	0.00	0.00
3,300.0	33.77	155.32	2,999.0	-1,002.1	460.5	1,102.8	0.00	0.00	0.00
3,400.0	33.77	155.32	3,082.1	-1,052.6	483.7	1,158.4	0.00	0.00	0.00
3,500.0	33.77	155.32	3,165.3	-1,103.1	506.9	1,214.0	0.00	0.00	0.00
3,600.0	33.77	155.32	3,248.4	-1,153.6	530.1	1,269.6	0.00	0.00	0.00
3,700.0	33.77	155.32	3,331.5	-1,204.1	553.3	1,325.2	0.00	0.00	0.00
3,800.0	33.77	155.32	3,414.7	-1,254.6	576.5	1,380.7	0.00	0.00	0.00
3,900.0	33.77	155.32	3,497.8	-1,305.1	599.7	1,436.3	0.00	0.00	0.00
4,000.0	33.77	155.32	3,580.9	-1,355.6	622.9	1,491.9	0.00	0.00	0.00
4,100.0	33.77	155.32	3,664.1	-1,406.1	646.2	1,547.5	0.00	0.00	0.00
4,200.0	33.77	155.32	3,747.2	-1,456.7	669.4	1,603.1	0.00	0.00	0.00
4,300.0	33.77	155.32	3,830.3	-1,507.2	692.6	1,658.7	0.00	0.00	0.00
4,400.0	33.77	155.32	3,913.4	-1,557.7	715.8	1,714.3	0.00	0.00	0.00
4,500.0	33.77	155.32	3,996.6	-1,608.2	739.0	1,769.8	0.00	0.00	0.00



## Well Planning Report



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<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7665 0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7665 0usft (H&P #290)
<b>Site:</b>	Bruton 30-10 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-20E	<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)
4,600.0	33.77	155.32	4,079.7	-1,658.7	762.2	1,825.4	0.00	0.00	0.00
4,700.0	33.77	155.32	4,182.8	-1,709.2	785.4	1,881.0	0.00	0.00	0.00
4,800.0	33.77	155.32	4,246.0	-1,759.7	808.6	1,936.6	0.00	0.00	0.00
4,900.0	33.77	155.32	4,329.1	-1,810.2	831.8	1,992.2	0.00	0.00	0.00
5,000.0	33.77	155.32	4,412.2	-1,860.7	855.0	2,047.8	0.00	0.00	0.00
<b>Williams Fork</b>									
5,022.6	33.77	155.32	4,431.0	-1,872.1	860.3	2,060.3	0.00	0.00	0.00
5,100.0	33.77	155.32	4,495.3	-1,911.2	878.2	2,103.3	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,189.1	33.77	155.32	4,569.4	-1,956.2	898.9	2,152.9	0.00	0.00	0.00
5,200.0	33.44	155.32	4,578.5	-1,961.7	901.4	2,158.9	3.00	-3.00	0.00
5,300.0	30.44	155.32	4,663.3	-2,009.8	923.5	2,211.8	3.00	-3.00	0.00
5,400.0	27.44	155.32	4,750.8	-2,053.7	943.7	2,260.2	3.00	-3.00	0.00
5,500.0	24.44	155.32	4,840.7	-2,093.5	962.0	2,303.9	3.00	-3.00	0.00
5,600.0	21.44	155.32	4,932.8	-2,128.9	978.3	2,342.9	3.00	-3.00	0.00
5,700.0	18.44	155.32	5,026.8	-2,159.9	992.5	2,377.0	3.00	-3.00	0.00
5,800.0	15.44	155.32	5,122.5	-2,186.4	1,004.7	2,408.1	3.00	-3.00	0.00
5,900.0	12.44	155.32	5,219.5	-2,208.2	1,014.7	2,430.2	3.00	-3.00	0.00
6,000.0	9.44	155.32	5,317.7	-2,225.5	1,022.7	2,449.2	3.00	-3.00	0.00
6,100.0	6.44	155.32	5,416.7	-2,238.0	1,028.4	2,463.0	3.00	-3.00	0.00
6,200.0	3.44	155.32	5,516.3	-2,245.9	1,032.0	2,471.6	3.00	-3.00	0.00
6,300.0	0.44	155.32	5,616.3	-2,249.0	1,033.4	2,475.0	3.00	-3.00	0.00
<b>EOD @ Vertical - TOG</b>									
6,314.7	0.00	0.00	5,631.0	-2,249.0	1,033.5	2,475.1	3.00	-3.00	-1,053.73
6,400.0	0.00	0.00	5,716.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
6,500.0	0.00	0.00	5,816.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
6,600.0	0.00	0.00	5,916.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
6,700.0	0.00	0.00	6,016.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
6,800.0	0.00	0.00	6,116.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
6,900.0	0.00	0.00	6,216.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,000.0	0.00	0.00	6,316.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,100.0	0.00	0.00	6,416.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,200.0	0.00	0.00	6,516.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,300.0	0.00	0.00	6,616.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,400.0	0.00	0.00	6,716.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
<b>Cameo</b>									
7,414.7	0.00	0.00	6,731.0	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,500.0	0.00	0.00	6,816.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,600.0	0.00	0.00	6,916.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,700.0	0.00	0.00	7,016.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,800.0	0.00	0.00	7,116.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
7,900.0	0.00	0.00	7,216.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
8,000.0	0.00	0.00	7,316.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
8,074.7	0.00	0.00	7,391.0	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
8,100.0	0.00	0.00	7,416.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
<b>Rollins</b>									
8,114.7	0.00	0.00	7,431.0	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
8,200.0	0.00	0.00	7,516.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
8,300.0	0.00	0.00	7,616.3	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00
<b>TD @ 8364.7' MD / 7681.0' TVD</b>									
8,364.7	0.00	0.00	7,681.0	-2,249.0	1,033.5	2,475.1	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-20E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7665.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7665.0usft (H&P #290)
<b>Site:</b>	Bruton 30-10 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-20E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## Design Targets

## Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
PBHL - Bruton 30-20E	0.00	0.00	7,681.0	-2,249.0	1,033.5	1,521,278.21	2,347,201.57	39.241897	-107.805170
- plan hits target center									
- Point									

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,502.7	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,797.1	2,581.0	G' Sand			
5,022.6	4,431.0	Williams Fork			
6,314.7	5,631.0	TOG			
7,414.7	6,731.0	Cameo			
8,074.7	7,391.0	Base Cameo Coal			
8,114.7	7,431.0	Rollins			

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
770.0	770.0	0.0	0.0	KOP (Build 3" / 100')
1,895.6	1,831.6	-292.8	134.5	EOB @ 33.77° Inc. / 155.32° Azm
5,189.1	4,569.4	-1,956.2	898.9	Drop 3" / 100'
6,314.7	5,631.0	-2,249.0	1,033.5	EOD @ Vertical
8,364.7	7,681.0	-2,249.0	1,033.5	TD @ 8364.7' MD / 7681.0' TVD