



Project: Mesa County, CO  
 Site: Bruton 30-03 Pad  
 Well: Bruton 30-04E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.252664  
 Longitude: -107.814267  
 Ground Level: 7512.0  
 well @ 7534.0usft (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 30-04E, True North  
 Vertical (TVD) Reference: well @ 7534.0usft (H&P #290)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7534.0usft (H&P #290)  
 Calculation Method: Minimum Curvature

#### WELL DETAILS: Bruton 30-04E

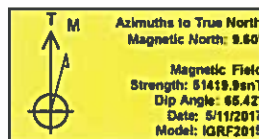
Ground Level: 7512.0  
 +N-S +E-W Northing Easting Latitude Longitude  
 0.0 0.0 1525283.94 2344725.84 39.252664 -107.814267

#### DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-04E	7732.0	69.7	2082.8	1525280.53	2344809.69	39.252655	-107.806912

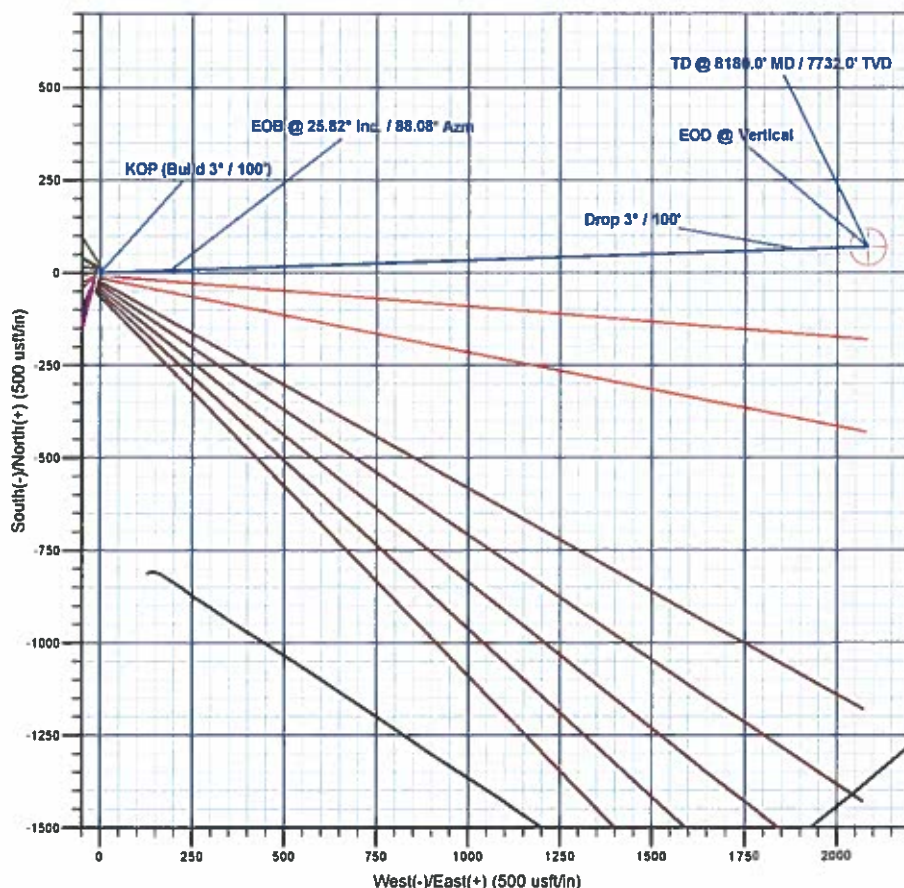
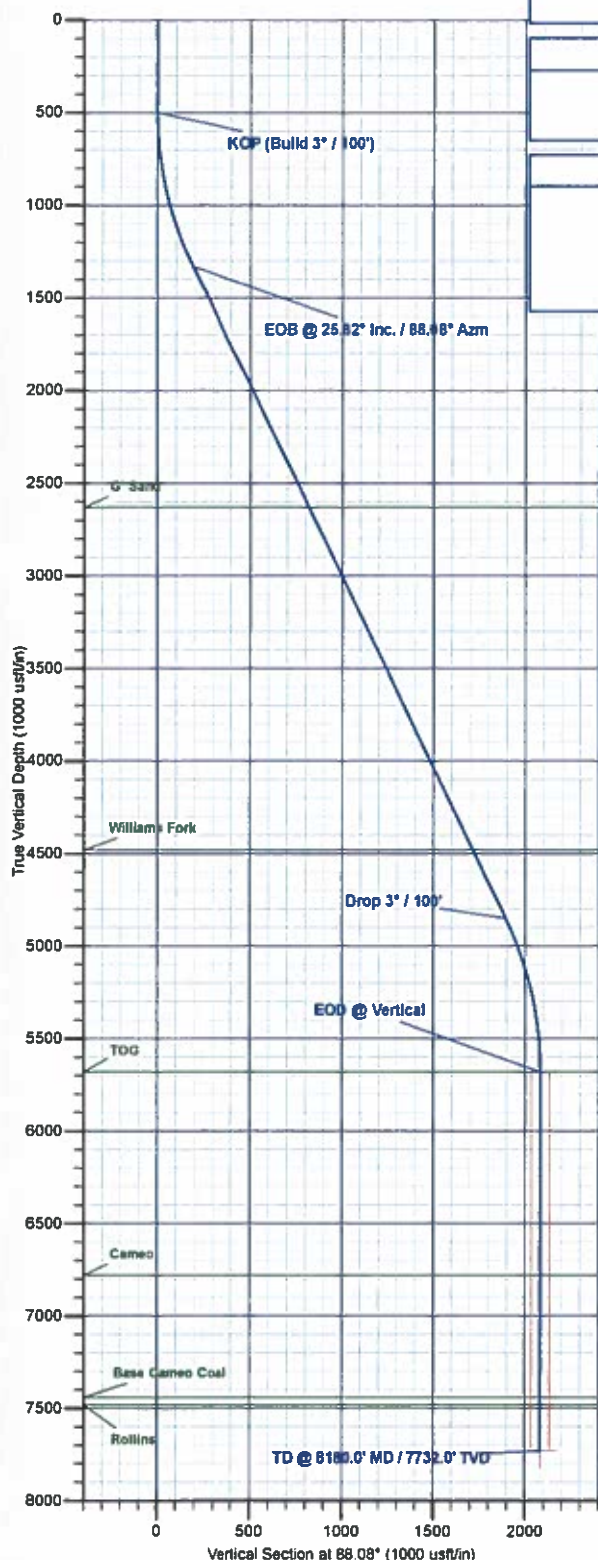
#### SECTION DETAILS

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3' / 100')
1360.8	25.82	88.08	1331.9	6.4	190.8	3.00	88.88	190.7	EOB @ 25.82° Inc. / 88.08° Azm
5269.2	25.82	88.08	4850.1	63.4	1892.1	0.00	0.00	1892.2	Drop 3' / 100'
6130.0	0.00	0.00	5882.0	69.7	2082.8	3.00	180.00	2082.8	EOB @ Vertical
8180.0	0.00	0.00	7732.0	69.7	2082.8	0.00	0.00	2082.8	TD @ 8180.0' MD / 7732.0' TVD



#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2632.0	2805.1	G' Sand
4482.0	4860.3	Williams Fork
5682.0	6130.0	TOG
6782.0	7230.0	Cameo
7442.0	7890.0	Base Cameo Coal
7482.0	7930.0	Rollins



Plan: Design #1 (Bruton 30-04E Wellbore #1)

Created By: Will Jirclik Date: 13:35, May 15 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 30-03 Pad**

**Bruton 30-04E**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**15 May, 2017**





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-04E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7534.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7534.0usft (H&P #290)
<b>Site:</b>	Bruton 30-03 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-04E	<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 30-03 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,525,281.27 usft	<b>Latitude:</b> 39.252711
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,344,720.08 usft	<b>Longitude:</b> -107.814289
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -1.46 "

<b>Well</b>	Bruton 30-04E			
<b>Well Position</b>	+N-S	-17.2 usft	<b>Northing:</b>	1,525,263.95 usft
	+E-W	6.2 usft	<b>Easting:</b>	2,344,725.84 usft
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	0.0 usft
			<b>Ground Level:</b>	7,512.0 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	5/11/2017	9.60	65.42	51,420

<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) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	88.08

<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	
1,360.8	25.82	88.08	1,331.9	6.4	190.6	3.00	3.00	0.00	88.08	
5,269.2	25.82	88.08	4,850.1	63.3	1,892.1	0.00	0.00	0.00	0.00	
6,130.0	0.00	0.00	5,682.0	69.7	2,082.8	3.00	-3.00	0.00	180.00	
8,180.0	0.00	0.00	7,732.0	69.7	2,082.8	0.00	0.00	0.00	0.00	PBHL - Bruton 30-04E





## Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-04E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534.0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-04E	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	88.08	600.0	0.1	2.6	2.6	3.00	3.00	0.00
700.0	6.00	88.08	699.6	0.3	10.5	10.5	3.00	3.00	0.00
800.0	9.00	88.08	798.8	0.8	23.5	23.5	3.00	3.00	0.00
900.0	12.00	88.08	897.1	1.4	41.7	41.7	3.00	3.00	0.00
1,000.0	15.00	88.08	994.3	2.2	65.0	65.1	3.00	3.00	0.00
1,100.0	18.00	88.08	1,090.2	3.1	93.4	93.5	3.00	3.00	0.00
1,200.0	21.00	88.08	1,184.4	4.2	126.8	126.9	3.00	3.00	0.00
1,300.0	24.00	88.08	1,276.8	5.5	165.0	165.1	3.00	3.00	0.00
EOB @ 25.82° Inc. / 88.08° Azm									
1,360.8	25.82	88.08	1,331.9	6.4	190.6	190.7	3.00	3.00	0.00
1,400.0	25.82	88.08	1,367.2	6.9	207.7	207.8	0.00	0.00	0.00
1,500.0	25.82	88.08	1,457.3	8.4	251.2	251.4	0.00	0.00	0.00
8 5/8"									
1,522.0	25.82	88.08	1,477.1	8.7	260.8	260.9	0.00	0.00	0.00
1,600.0	25.82	88.08	1,547.3	9.9	294.8	294.9	0.00	0.00	0.00
1,700.0	25.82	88.08	1,637.3	11.3	338.3	338.5	0.00	0.00	0.00
1,800.0	25.82	88.08	1,727.3	12.8	381.8	382.0	0.00	0.00	0.00
1,900.0	25.82	88.08	1,817.3	14.2	425.4	425.6	0.00	0.00	0.00
2,000.0	25.82	88.08	1,907.3	15.7	468.9	469.2	0.00	0.00	0.00
2,100.0	25.82	88.08	1,997.3	17.1	512.4	512.7	0.00	0.00	0.00
2,200.0	25.82	88.08	2,087.4	18.6	556.0	556.3	0.00	0.00	0.00
2,300.0	25.82	88.08	2,177.4	20.1	599.5	599.8	0.00	0.00	0.00
2,400.0	25.82	88.08	2,267.4	21.5	643.0	643.4	0.00	0.00	0.00
2,500.0	25.82	88.08	2,357.4	23.0	686.6	687.0	0.00	0.00	0.00
2,600.0	25.82	88.08	2,447.4	24.4	730.1	730.5	0.00	0.00	0.00
2,700.0	25.82	88.08	2,537.4	25.9	773.6	774.1	0.00	0.00	0.00
2,800.0	25.82	88.08	2,627.4	27.3	817.2	817.6	0.00	0.00	0.00
G' Sand									
2,805.1	25.82	88.08	2,632.0	27.4	819.4	819.8	0.00	0.00	0.00
2,900.0	25.82	88.08	2,717.5	28.8	860.7	861.2	0.00	0.00	0.00
3,000.0	25.82	88.08	2,807.5	30.2	904.2	904.8	0.00	0.00	0.00
3,100.0	25.82	88.08	2,897.5	31.7	947.8	948.3	0.00	0.00	0.00
3,200.0	25.82	88.08	2,987.5	33.2	991.3	991.9	0.00	0.00	0.00
3,300.0	25.82	88.08	3,077.5	34.6	1,034.9	1,035.4	0.00	0.00	0.00
3,400.0	25.82	88.08	3,167.5	36.1	1,078.4	1,079.0	0.00	0.00	0.00
3,500.0	25.82	88.08	3,257.5	37.5	1,121.9	1,122.5	0.00	0.00	0.00
3,600.0	25.82	88.08	3,347.6	39.0	1,165.5	1,166.1	0.00	0.00	0.00
3,700.0	25.82	88.08	3,437.6	40.4	1,209.0	1,209.7	0.00	0.00	0.00
3,800.0	25.82	88.08	3,527.6	41.9	1,252.5	1,253.2	0.00	0.00	0.00
3,900.0	25.82	88.08	3,617.6	43.3	1,296.1	1,296.8	0.00	0.00	0.00
4,000.0	25.82	88.08	3,707.6	44.8	1,339.6	1,340.3	0.00	0.00	0.00
4,100.0	25.82	88.08	3,797.6	46.3	1,383.1	1,383.9	0.00	0.00	0.00
4,200.0	25.82	88.08	3,887.6	47.7	1,426.7	1,427.5	0.00	0.00	0.00
4,300.0	25.82	88.08	3,977.7	49.2	1,470.2	1,471.0	0.00	0.00	0.00
4,400.0	25.82	88.08	4,067.7	50.6	1,513.7	1,514.6	0.00	0.00	0.00
4,500.0	25.82	88.08	4,157.7	52.1	1,557.3	1,558.1	0.00	0.00	0.00
4,600.0	25.82	88.08	4,247.7	53.5	1,600.8	1,601.7	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-04E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7534 0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7534 0usft (H&P #290)
<b>Site:</b>	Bruton 30-03 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-04E	<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)
4,700.0	25.82	88.08	4,337.7	55.0	1,644.3	1,645.3	0.00	0.00	0.00
4,800.0	25.82	88.08	4,427.7	56.5	1,687.9	1,688.8	0.00	0.00	0.00
<b>Williams Fork</b>									
4,860.3	25.82	88.08	4,482.0	57.3	1,714.1	1,715.1	0.00	0.00	0.00
4,900.0	25.82	88.08	4,517.7	57.9	1,731.4	1,732.4	0.00	0.00	0.00
5,000.0	25.82	88.08	4,607.8	59.4	1,774.9	1,775.9	0.00	0.00	0.00
5,100.0	25.82	88.08	4,697.8	60.8	1,818.5	1,819.5	0.00	0.00	0.00
5,200.0	25.82	88.08	4,787.8	62.3	1,862.0	1,863.1	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,269.2	25.82	88.08	4,850.1	63.3	1,892.1	1,893.2	0.00	0.00	0.00
5,300.0	24.90	88.08	4,877.9	63.7	1,905.3	1,906.4	3.00	-3.00	0.00
5,400.0	21.90	88.08	4,969.7	65.1	1,945.0	1,946.1	3.00	-3.00	0.00
5,500.0	18.90	88.08	5,063.4	66.2	1,979.8	1,981.0	3.00	-3.00	0.00
5,600.0	15.90	88.08	5,158.8	67.2	2,009.7	2,010.9	3.00	-3.00	0.00
5,700.0	12.90	88.08	5,255.6	68.0	2,034.6	2,035.7	3.00	-3.00	0.00
5,800.0	9.90	88.08	5,353.7	68.7	2,054.3	2,055.5	3.00	-3.00	0.00
5,900.0	6.90	88.08	5,452.6	69.2	2,068.9	2,070.1	3.00	-3.00	0.00
6,000.0	3.90	88.08	5,552.1	69.5	2,078.3	2,079.5	3.00	-3.00	0.00
6,100.0	0.90	88.08	5,652.0	69.7	2,082.5	2,083.7	3.00	-3.00	0.00
<b>EOD @ Vertical - TOG</b>									
6,130.0	0.00	0.00	5,682.0	69.7	2,082.8	2,083.9	3.00	-3.00	0.00
6,200.0	0.00	0.00	5,752.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
6,300.0	0.00	0.00	5,852.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
6,400.0	0.00	0.00	5,952.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
6,500.0	0.00	0.00	6,052.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
6,600.0	0.00	0.00	6,152.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
6,700.0	0.00	0.00	6,252.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
6,800.0	0.00	0.00	6,352.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
6,900.0	0.00	0.00	6,452.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,000.0	0.00	0.00	6,552.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,100.0	0.00	0.00	6,652.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,200.0	0.00	0.00	6,752.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
<b>Cameo</b>									
7,230.0	0.00	0.00	6,782.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,300.0	0.00	0.00	6,852.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,400.0	0.00	0.00	6,952.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,500.0	0.00	0.00	7,052.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,600.0	0.00	0.00	7,152.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,700.0	0.00	0.00	7,252.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,800.0	0.00	0.00	7,352.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
7,890.0	0.00	0.00	7,442.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
7,900.0	0.00	0.00	7,452.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
<b>Rollins</b>									
7,930.0	0.00	0.00	7,482.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
8,000.0	0.00	0.00	7,552.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
8,100.0	0.00	0.00	7,652.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00
<b>TD @ 8180.0' MD / 7732.0' TVD</b>									
8,180.0	0.00	0.00	7,732.0	69.7	2,082.8	2,083.9	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-04E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7534.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7534.0usft (H&P #290)
<b>Site:</b>	Bruton 30-03 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-04E	<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 30-04E	0.00	0.00	7,732.0	69.7	2,082.8	1,525,280.53	2,346,809.69	39.252855	-107.806912
- plan hits target center									
- Point									

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,477.1	8 5/8"	8 5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,805.1	2,632.0	G' Sand			
4,860.3	4,482.0	Williams Fork			
6,130.0	5,682.0	TOG			
7,230.0	6,782.0	Cameo			
7,890.0	7,442.0	Base Cameo Coal			
7,930.0	7,482.0	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')
1,360.8	1,331.9	6.4	190.6	EOB @ 25.82° Inc. / 88.08° Azm
5,269.2	4,850.1	63.3	1,892.1	Drop 3" / 100'
6,130.0	5,682.0	69.7	2,082.8	EOD @ Vertical
8,180.0	7,732.0	69.7	2,082.8	TD @ 8180.0' MD / 7732.0' TVD