



Project: Mesa County, CO  
 Site: Bruton 30-01 Pad  
 Well: Bruton 30-02E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.255072  
 Longitude: -107.806081  
 Ground Level: 7425.0  
 well @ 7455.0usft (H&P #522)



#### 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 30-02E, True North  
 Vertical (TVD) Reference: well @ 7455.0usft (H&P #522)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7455.0usft (H&P #522)  
 Calculation Method: Minimum Curvature

#### WELL DETAILS: Bruton 30-02E

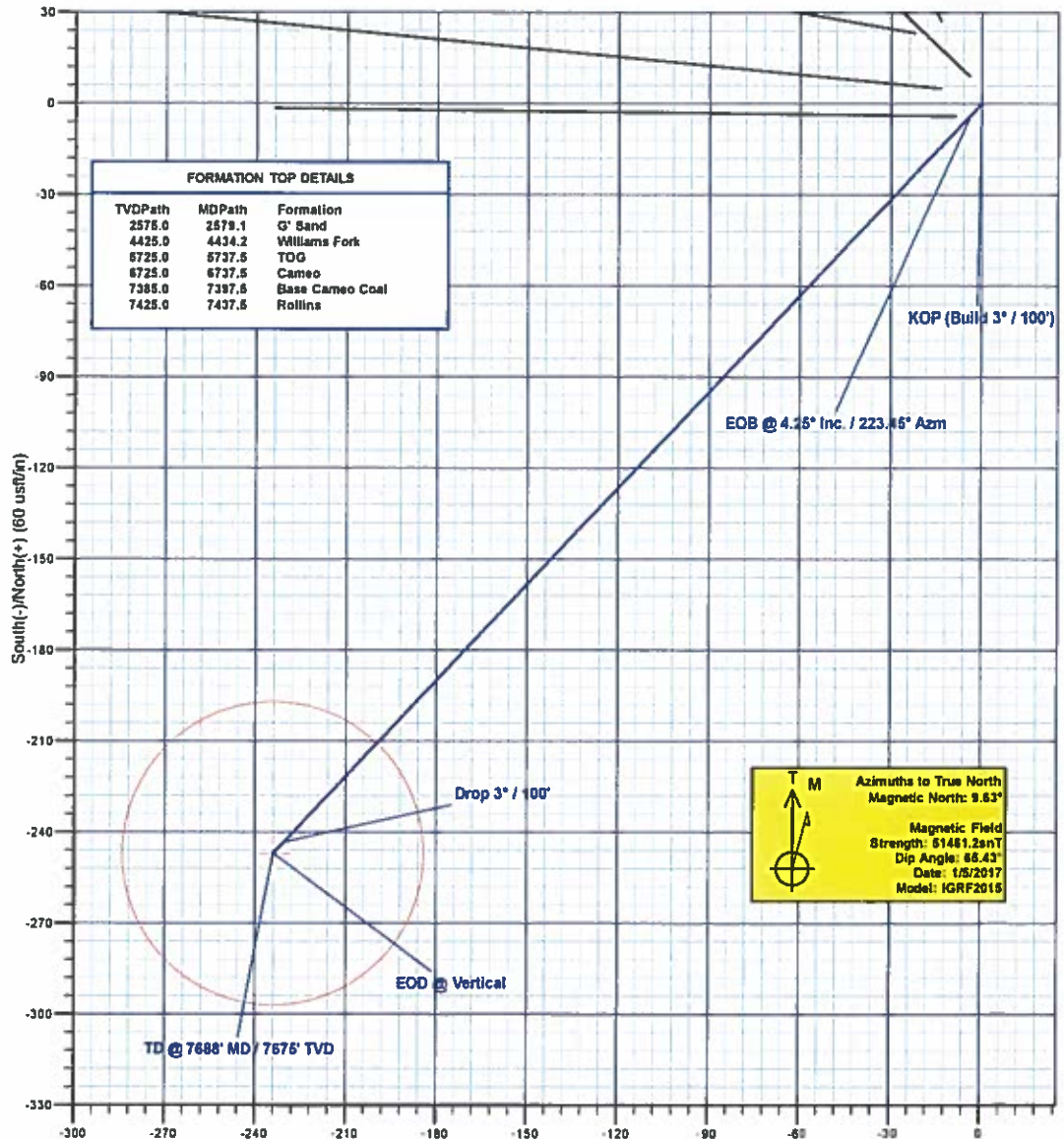
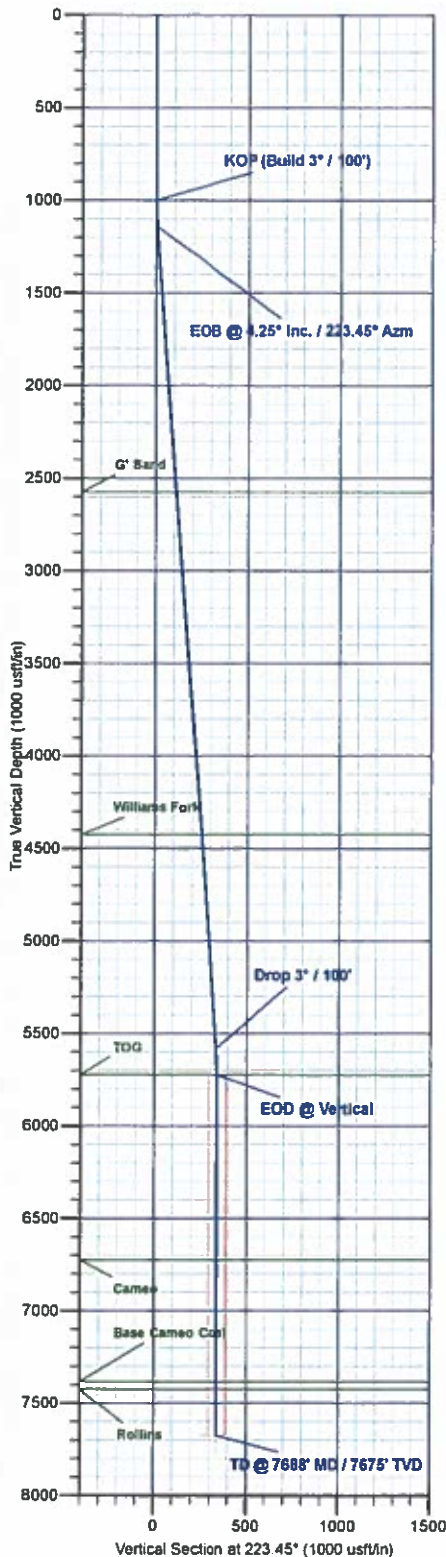
+N-S	+E-W	Northing	Ground Level: Easting	7425.0 Latitude	Longitude
0.0	0.0	1526081.93	2347065.56	39.255072	-107.806081

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

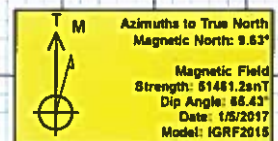
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
BRUTON 30-02E	7675.0	-247.0	-234.0	1526040.84	2346825.34	39.254394	-107.806907

#### 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	
1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1141.5	4.25	223.45	1141.4	-3.8	-3.6	3.00	223.45	6.2	EOB @ 4.25° Inc. / 223.45° Azm
8896.0	4.25	223.45	5583.6	-243.2	-230.4	0.00	0.00	335.0	Drop 3° / 100'
5737.5	0.00	0.00	5725.0	-247.0	-234.0	3.00	180.00	240.3	EOD @ Vertical
7687.5	0.00	0.00	7675.0	-247.0	-234.0	0.00	0.00	340.3	TD @ 7688' MD / 7675' TVD



TVDPath	MDPath	Formation
2575.0	2579.1	G' Sand
4425.0	4434.2	Williams Fork
5725.0	5737.5	TOG
5725.0	5737.5	Cameo
7385.0	7397.5	Base Cameo Coal
7425.0	7437.5	Rollins



Plan: Design #1 (Bruton 30-02E/Wellbore #1)

Created By: Will Jircik Date: 16:27, January 09 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 30-01 Pad**

**Bruton 30-02E**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**09 January, 2017**





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-02E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Site:</b>	Bruton 30-01 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-02E	<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 30-01 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,526,078.02 usft	<b>Latitude:</b> 39.255061
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,347,056.81 usft	<b>Longitude:</b> -107.806111
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -1.45 "

<b>Well</b>	Bruton 30-02E			
<b>Well Position</b>	+N/-S	4.0 usft	<b>Northing:</b>	1,526,081.84 usft
	+E/-W	8.7 usft	<b>Easting:</b>	2,347,065.56 usft
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	0.0 usft
			<b>Ground Level:</b>	7,425.0 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	1/5/2017	9.63	65.43	51,461

<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	223.45

<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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,141.5	4.25	223.45	1,141.4	-3.8	-3.6	3.00	3.00	0.00	223.45	
5,596.0	4.25	223.45	5,583.6	-243.2	-230.4	0.00	0.00	0.00	0.00	
5,737.5	0.00	0.00	5,725.0	-247.0	-234.0	3.00	-3.00	0.00	180.00	
7,687.5	0.00	0.00	7,675.0	-247.0	-234.0	0.00	0.00	0.00	0.00	BRUTON 30-02E





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-02E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Site:</b>	Bruton 30-01 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-02E	<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
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP (Build 3° / 100')</b>									
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	3.00	223.45	1,100.0	-1.9	-1.8	2.6	3.00	3.00	0.00
<b>EOB @ 4.25° Inc. / 223.45° Azm</b>									
1,141.5	4.25	223.45	1,141.4	-3.8	-3.6	5.2	3.00	3.00	0.00
1,200.0	4.25	223.45	1,199.7	-6.9	-6.6	9.6	0.00	0.00	0.00
1,300.0	4.25	223.45	1,299.4	-12.3	-11.7	17.0	0.00	0.00	0.00
1,400.0	4.25	223.45	1,399.2	-17.7	-16.8	24.4	0.00	0.00	0.00
1,500.0	4.25	223.45	1,498.9	-23.1	-21.9	31.8	0.00	0.00	0.00
<b>8 5/8"</b>									
1,530.0	4.25	223.45	1,528.8	-24.7	-23.4	34.0	0.00	0.00	0.00
1,600.0	4.25	223.45	1,598.6	-28.4	-26.9	39.2	0.00	0.00	0.00
1,700.0	4.25	223.45	1,698.3	-33.8	-32.0	46.6	0.00	0.00	0.00
1,800.0	4.25	223.45	1,798.1	-39.2	-37.1	54.0	0.00	0.00	0.00
1,900.0	4.25	223.45	1,897.8	-44.6	-42.2	61.4	0.00	0.00	0.00
2,000.0	4.25	223.45	1,997.5	-49.9	-47.3	68.8	0.00	0.00	0.00
2,100.0	4.25	223.45	2,097.2	-55.3	-52.4	76.2	0.00	0.00	0.00
2,200.0	4.25	223.45	2,197.0	-60.7	-57.5	83.6	0.00	0.00	0.00
2,300.0	4.25	223.45	2,296.7	-66.1	-62.6	91.0	0.00	0.00	0.00
2,400.0	4.25	223.45	2,396.4	-71.4	-67.7	98.4	0.00	0.00	0.00
2,500.0	4.25	223.45	2,496.1	-76.8	-72.8	105.8	0.00	0.00	0.00
<b>G' Sand</b>									
2,579.1	4.25	223.45	2,575.0	-81.1	-76.8	111.7	0.00	0.00	0.00
2,600.0	4.25	223.45	2,595.9	-82.2	-77.9	113.2	0.00	0.00	0.00
2,700.0	4.25	223.45	2,695.6	-87.6	-83.0	120.6	0.00	0.00	0.00
2,800.0	4.25	223.45	2,795.3	-92.9	-88.1	128.0	0.00	0.00	0.00
2,900.0	4.25	223.45	2,895.0	-98.3	-93.1	135.4	0.00	0.00	0.00
3,000.0	4.25	223.45	2,994.8	-103.7	-98.2	142.8	0.00	0.00	0.00
3,100.0	4.25	223.45	3,094.5	-109.1	-103.3	150.2	0.00	0.00	0.00
3,200.0	4.25	223.45	3,194.2	-114.4	-108.4	157.6	0.00	0.00	0.00
3,300.0	4.25	223.45	3,293.9	-119.8	-113.5	165.0	0.00	0.00	0.00
3,400.0	4.25	223.45	3,393.7	-125.2	-118.6	172.4	0.00	0.00	0.00
3,500.0	4.25	223.45	3,493.4	-130.6	-123.7	179.9	0.00	0.00	0.00
3,600.0	4.25	223.45	3,593.1	-135.9	-128.8	187.3	0.00	0.00	0.00
3,700.0	4.25	223.45	3,692.8	-141.3	-133.9	194.7	0.00	0.00	0.00
3,800.0	4.25	223.45	3,792.6	-146.7	-139.0	202.1	0.00	0.00	0.00
3,900.0	4.25	223.45	3,892.3	-152.1	-144.1	209.5	0.00	0.00	0.00
4,000.0	4.25	223.45	3,992.0	-157.4	-149.2	216.9	0.00	0.00	0.00
4,100.0	4.25	223.45	4,091.8	-162.8	-154.2	224.3	0.00	0.00	0.00
4,200.0	4.25	223.45	4,191.5	-168.2	-159.3	231.7	0.00	0.00	0.00
4,300.0	4.25	223.45	4,291.2	-173.6	-164.4	239.1	0.00	0.00	0.00
4,400.0	4.25	223.45	4,390.9	-178.9	-169.5	246.5	0.00	0.00	0.00
<b>Williams Fork</b>									
4,434.2	4.25	223.45	4,425.0	-180.8	-171.3	249.0	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-02E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7455 0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7455 0usft (H&P #522)
<b>Site:</b>	Bruton 30-01 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-02E	<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)
4,500.0	4.25	223.45	4,490.7	-184.3	-174.6	253.9	0.00	0.00	0.00
4,600.0	4.25	223.45	4,590.4	-189.7	-179.7	261.3	0.00	0.00	0.00
4,700.0	4.25	223.45	4,690.1	-195.1	-184.8	268.7	0.00	0.00	0.00
4,800.0	4.25	223.45	4,789.8	-200.4	-189.9	276.1	0.00	0.00	0.00
4,900.0	4.25	223.45	4,889.6	-205.8	-195.0	283.5	0.00	0.00	0.00
5,000.0	4.25	223.45	4,989.3	-211.2	-200.1	290.9	0.00	0.00	0.00
5,100.0	4.25	223.45	5,089.0	-216.6	-205.2	298.3	0.00	0.00	0.00
5,200.0	4.25	223.45	5,188.7	-221.9	-210.3	305.7	0.00	0.00	0.00
5,300.0	4.25	223.45	5,288.5	-227.3	-215.3	313.1	0.00	0.00	0.00
5,400.0	4.25	223.45	5,388.2	-232.7	-220.4	320.5	0.00	0.00	0.00
5,500.0	4.25	223.45	5,487.9	-238.0	-225.5	327.9	0.00	0.00	0.00
<b>Drop 3" / 100'</b>									
5,595.0	4.25	223.45	5,583.6	-243.2	-230.4	335.0	0.00	0.00	0.00
5,600.0	4.12	223.45	5,587.6	-243.4	-230.6	335.3	3.00	-3.00	0.00
5,700.0	1.12	223.45	5,687.5	-246.7	-233.8	339.9	3.00	-3.00	0.00
<b>EOD @ Vertical - TOG</b>									
5,737.5	0.00	0.00	5,725.0	-247.0	-234.0	340.3	3.00	-3.00	0.00
5,800.0	0.00	0.00	5,787.5	-247.0	-234.0	340.3	0.00	0.00	0.00
5,900.0	0.00	0.00	5,887.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,000.0	0.00	0.00	5,987.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,100.0	0.00	0.00	6,087.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,200.0	0.00	0.00	6,187.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,300.0	0.00	0.00	6,287.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,400.0	0.00	0.00	6,387.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,500.0	0.00	0.00	6,487.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,600.0	0.00	0.00	6,587.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,700.0	0.00	0.00	6,687.5	-247.0	-234.0	340.3	0.00	0.00	0.00
<b>Cameo</b>									
6,737.5	0.00	0.00	6,725.0	-247.0	-234.0	340.3	0.00	0.00	0.00
6,800.0	0.00	0.00	6,787.5	-247.0	-234.0	340.3	0.00	0.00	0.00
6,900.0	0.00	0.00	6,887.5	-247.0	-234.0	340.3	0.00	0.00	0.00
7,000.0	0.00	0.00	6,987.5	-247.0	-234.0	340.3	0.00	0.00	0.00
7,100.0	0.00	0.00	7,087.5	-247.0	-234.0	340.3	0.00	0.00	0.00
7,200.0	0.00	0.00	7,187.5	-247.0	-234.0	340.3	0.00	0.00	0.00
7,300.0	0.00	0.00	7,287.5	-247.0	-234.0	340.3	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
7,397.5	0.00	0.00	7,385.0	-247.0	-234.0	340.3	0.00	0.00	0.00
7,400.0	0.00	0.00	7,387.5	-247.0	-234.0	340.3	0.00	0.00	0.00
<b>Rollins</b>									
7,437.5	0.00	0.00	7,425.0	-247.0	-234.0	340.3	0.00	0.00	0.00
7,500.0	0.00	0.00	7,487.5	-247.0	-234.0	340.3	0.00	0.00	0.00
7,600.0	0.00	0.00	7,587.5	-247.0	-234.0	340.3	0.00	0.00	0.00
<b>TD @ 7688' MD / 7675' TVD</b>									
7,687.5	0.00	0.00	7,675.0	-247.0	-234.0	340.3	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 30-02E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Site:</b>	Bruton 30-01 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 30-02E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## 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
BRUTON 30-02E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,675.0	-247.0	-234.0	1,525,840.85	2,346,825.34	39 254394	-107 806907

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,528.8	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,579.1	2,575.0	G' Sand			
4,434.2	4,425.0	Williams Fork			
5,737.5	5,725.0	TOG			
6,737.5	6,725.0	Cameo			
7,397.5	7,385.0	Base Cameo Coal			
7,437.5	7,425.0	Rollins			

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
1,000.0	1,000.0	0.0	0.0	KOP (Build 3" / 100')
1,141.5	1,141.4	-3.8	-3.6	EOB @ 4.25" Inc. / 223.45° Azm
5,596.0	5,583.6	-243.2	-230.4	Drop 3" / 100'
5,737.5	5,725.0	-247.0	-234.0	EOD @ Vertical
7,687.5	7,675.0	-247.0	-234.0	TD @ 7688' MD / 7675' TVD