



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton Federal 30-21W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248011
 Longitude: -107.808814
 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 Federal 30-21W, True North
 Vertical (TVD) Reference: well @ 7665.0usft (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7665.0usft (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton Federal 30-21W

Ground Level: 7643.0
 Easting: 2346228.43
 Latitude: 39.248011
 Longitude: -107.808814
 +N/-S: 0.0
 +E/-W: 0.0
 Northing: 1523536.50

DESIGN TARGET DETAILS

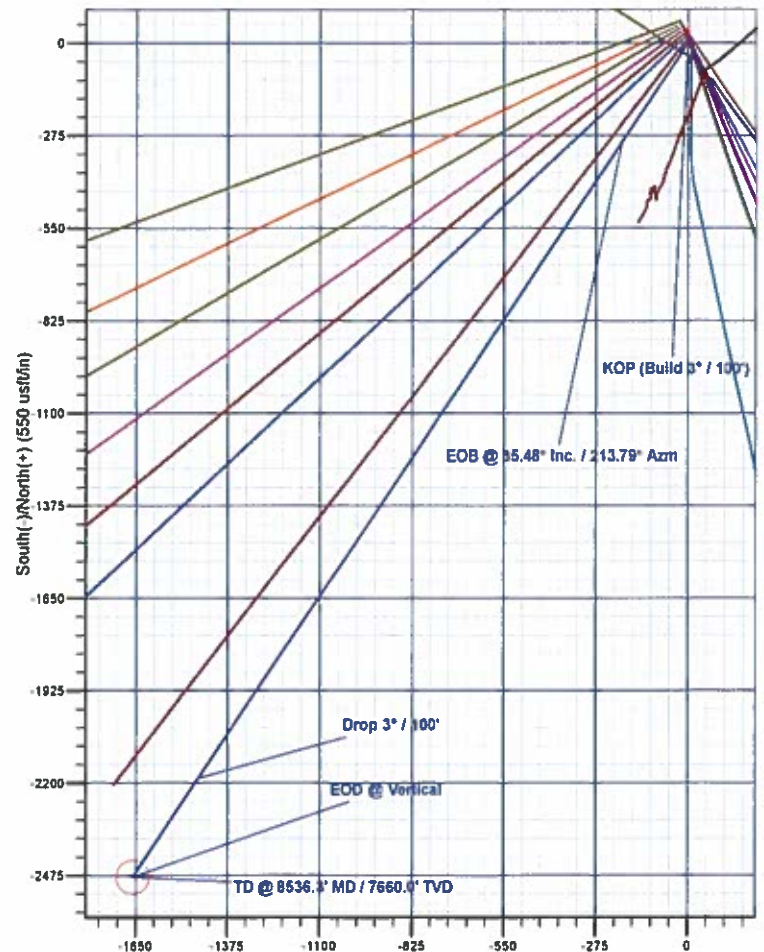
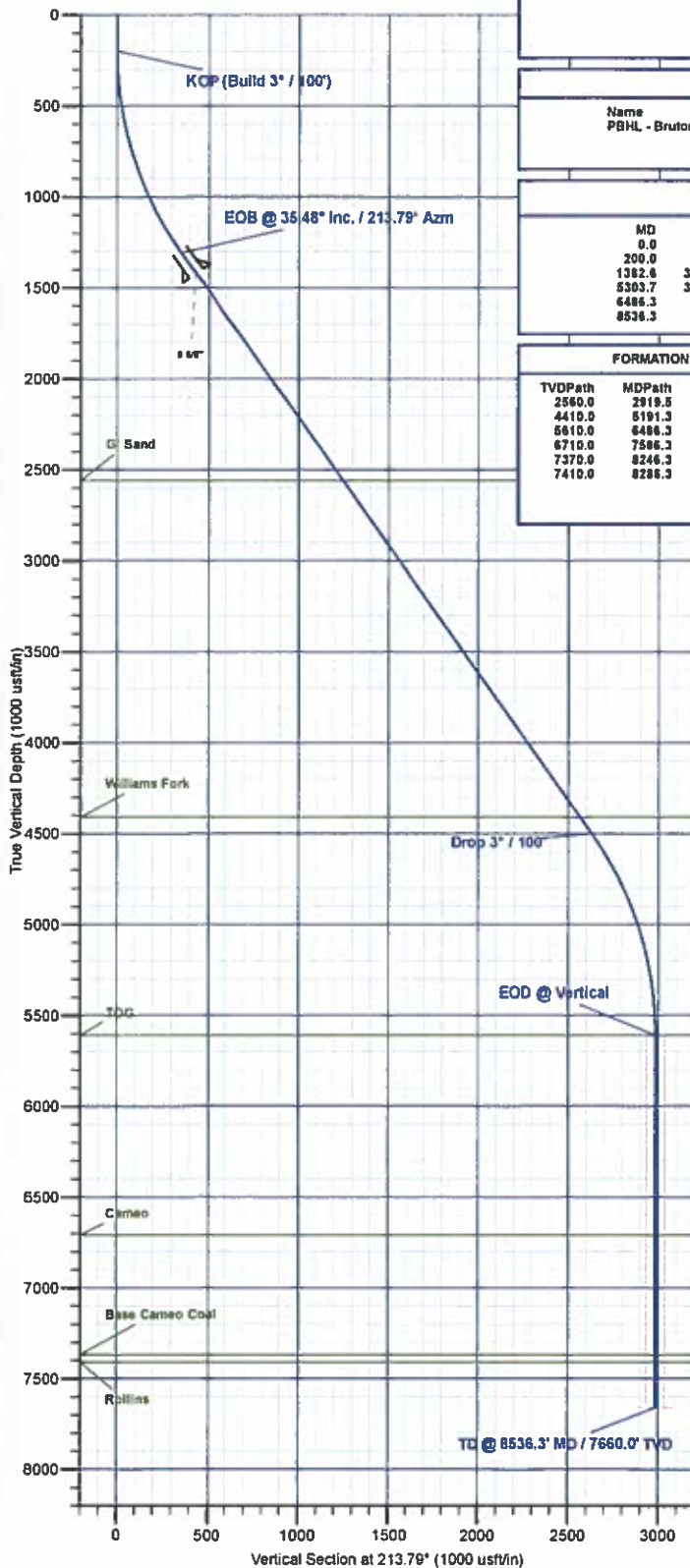
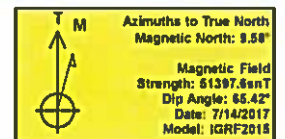
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton Federal 30-21W	7660.0	-2480.6	-1660.2	1521092.06	2344503.68	39.241200	-107.814676

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	KOP (Build 3° / 100')
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	EOB @ 35.48° Inc. / 213.79° Azm
1382.6	35.48	213.79	1308.5	-294.7	-197.2	3.00	213.79	354.6	Drop 3° / 100'
5303.7	35.48	213.79	4801.5	-2185.9	-1463.0	0.00	0.00	2630.3	EOB @ Vertical
6486.3	0.00	0.00	6610.0	-2480.6	-1660.2	3.00	180.00	2984.8	TD @ 8536.3' MD / 7660.0' TVD
8536.3	0.00	0.00	7660.0	-2480.6	-1660.2	0.00	0.00	2984.8	

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
2560.0	2919.5	G' Sand
4410.0	5191.3	Williams Fork
6610.0	6486.3	TOG
6710.0	7586.3	Cameo
7370.0	8246.3	Base Cameo Coal
7410.0	8286.3	Rollins



Plan: Design #1 (Bruton Federal 30-21W/Wellbore #1)

Created By: Will Jircik Date: 7:39, July 17 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton Federal 30-21W

Wellbore #1

Plan: Design #1

QES Well Planning Report

17 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-21W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665.0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton Federal 30-21W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Mesa County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		Bruton 30-10 Pad			
Site Position:		Northing:	1,523,424.58 usft	Latitude:	39.247725
From:	Map	Easting:	2,346,291.81 usft	Longitude:	-107.808574
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.46

Well	Bruton Federal 30-21W					
Well Position	+N/-S	104.2 usft	Northing:	1,523,530.51 usft	Latitude:	39.248011
	+E/-W	-68.0 usft	Easting:	2,346,226.44 usft	Longitude:	-107.808814
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,643.0 usft

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/14/2017	9.58	65.42	51,398

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	213.79

Plan Sections										
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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,382.6	35.48	213.79	1,308.5	-294.7	-197.2	3.00	3.00	0.00	213.79	
5,303.7	35.48	213.79	4,501.5	-2,185.9	-1,463.0	0.00	0.00	0.00	0.00	
6,486.3	0.00	0.00	5,610.0	-2,480.6	-1,660.2	3.00	-3.00	0.00	180.00	
8,536.3	0.00	0.00	7,660.0	-2,480.6	-1,660.2	0.00	0.00	0.00	0.00	PBHL - Bruton Feders



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-21W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665 0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton Federal 30-21W	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
KOP (Build 3° / 100')									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	213.79	300.0	-2.2	-1.5	2.6	3.00	3.00	0.00
400.0	6.00	213.79	399.6	-8.7	-5.8	10.5	3.00	3.00	0.00
500.0	9.00	213.79	498.8	-19.5	-13.1	23.5	3.00	3.00	0.00
600.0	12.00	213.79	597.1	-34.7	-23.2	41.7	3.00	3.00	0.00
700.0	15.00	213.79	694.3	-54.1	-36.2	65.1	3.00	3.00	0.00
800.0	18.00	213.79	790.2	-77.7	-52.0	93.5	3.00	3.00	0.00
900.0	21.00	213.79	884.4	-105.4	-70.6	126.9	3.00	3.00	0.00
1,000.0	24.00	213.79	976.8	-137.2	-91.8	165.1	3.00	3.00	0.00
1,100.0	27.00	213.79	1,067.1	-173.0	-115.8	208.2	3.00	3.00	0.00
1,200.0	30.00	213.79	1,154.9	-212.6	-142.3	255.9	3.00	3.00	0.00
1,300.0	33.00	213.79	1,240.2	-256.1	-171.4	308.1	3.00	3.00	0.00
EOB @ 35.48° Inc. / 213.79° Azm									
1,382.6	35.48	213.79	1,308.5	-294.7	-197.2	354.6	3.00	3.00	0.00
1,400.0	35.48	213.79	1,322.6	-303.1	-202.8	364.7	0.00	0.00	0.00
1,500.0	35.48	213.79	1,404.1	-351.3	-235.1	422.7	0.00	0.00	0.00
8 5/8"									
1,522.0	35.48	213.79	1,422.0	-361.9	-242.2	435.5	0.00	0.00	0.00
1,600.0	35.48	213.79	1,485.5	-399.5	-267.4	480.8	0.00	0.00	0.00
1,700.0	35.48	213.79	1,566.9	-447.8	-299.7	538.8	0.00	0.00	0.00
1,800.0	35.48	213.79	1,648.4	-496.0	-332.0	596.8	0.00	0.00	0.00
1,900.0	35.48	213.79	1,729.8	-544.2	-364.3	654.9	0.00	0.00	0.00
2,000.0	35.48	213.79	1,811.2	-592.5	-396.5	712.9	0.00	0.00	0.00
2,100.0	35.48	213.79	1,892.7	-640.7	-428.8	771.0	0.00	0.00	0.00
2,200.0	35.48	213.79	1,974.1	-688.9	-461.1	829.0	0.00	0.00	0.00
2,300.0	35.48	213.79	2,055.5	-737.2	-493.4	887.0	0.00	0.00	0.00
2,400.0	35.48	213.79	2,137.0	-785.4	-525.7	945.1	0.00	0.00	0.00
2,500.0	35.48	213.79	2,218.4	-833.6	-557.9	1,003.1	0.00	0.00	0.00
2,600.0	35.48	213.79	2,299.8	-881.9	-590.2	1,061.2	0.00	0.00	0.00
2,700.0	35.48	213.79	2,381.3	-930.1	-622.5	1,119.2	0.00	0.00	0.00
2,800.0	35.48	213.79	2,462.7	-978.3	-654.8	1,177.2	0.00	0.00	0.00
2,900.0	35.48	213.79	2,544.1	-1,026.6	-687.1	1,235.3	0.00	0.00	0.00
G' Sand									
2,919.5	35.48	213.79	2,560.0	-1,036.0	-693.4	1,246.6	0.00	0.00	0.00
3,000.0	35.48	213.79	2,625.6	-1,074.8	-719.4	1,293.3	0.00	0.00	0.00
3,100.0	35.48	213.79	2,707.0	-1,123.0	-751.6	1,351.4	0.00	0.00	0.00
3,200.0	35.48	213.79	2,788.4	-1,171.3	-783.9	1,409.4	0.00	0.00	0.00
3,300.0	35.48	213.79	2,869.9	-1,219.5	-816.2	1,467.4	0.00	0.00	0.00
3,400.0	35.48	213.79	2,951.3	-1,267.7	-848.5	1,525.5	0.00	0.00	0.00
3,500.0	35.48	213.79	3,032.7	-1,316.0	-880.8	1,583.5	0.00	0.00	0.00
3,600.0	35.48	213.79	3,114.2	-1,364.2	-913.0	1,641.6	0.00	0.00	0.00
3,700.0	35.48	213.79	3,195.6	-1,412.4	-945.3	1,699.6	0.00	0.00	0.00
3,800.0	35.48	213.79	3,277.0	-1,460.7	-977.6	1,757.6	0.00	0.00	0.00
3,900.0	35.48	213.79	3,358.5	-1,508.9	-1,009.9	1,815.7	0.00	0.00	0.00
4,000.0	35.48	213.79	3,439.9	-1,557.1	-1,042.2	1,873.7	0.00	0.00	0.00
4,100.0	35.48	213.79	3,521.3	-1,605.4	-1,074.5	1,931.7	0.00	0.00	0.00
4,200.0	35.48	213.79	3,602.8	-1,653.6	-1,106.7	1,989.8	0.00	0.00	0.00
4,300.0	35.48	213.79	3,684.2	-1,701.8	-1,139.0	2,047.8	0.00	0.00	0.00
4,400.0	35.48	213.79	3,765.6	-1,750.1	-1,171.3	2,105.9	0.00	0.00	0.00
4,500.0	35.48	213.79	3,847.1	-1,798.3	-1,203.6	2,163.9	0.00	0.00	0.00
4,600.0	35.48	213.79	3,928.5	-1,846.5	-1,235.9	2,221.9	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-21W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665 0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton Federal 30-21W	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	35.48	213.79	4,009.9	-1,894.8	-1,268.1	2,280.0	0.00	0.00	0.00
4,800.0	35.48	213.79	4,091.4	-1,943.0	-1,300.4	2,338.0	0.00	0.00	0.00
4,900.0	35.48	213.79	4,172.8	-1,991.2	-1,332.7	2,396.1	0.00	0.00	0.00
5,000.0	35.48	213.79	4,254.2	-2,039.5	-1,365.0	2,454.1	0.00	0.00	0.00
5,100.0	35.48	213.79	4,335.7	-2,087.7	-1,397.3	2,512.1	0.00	0.00	0.00
Williams Fork									
5,191.3	35.48	213.79	4,410.0	-2,131.7	-1,426.7	2,565.1	0.00	0.00	0.00
5,200.0	35.48	213.79	4,417.1	-2,135.9	-1,429.6	2,570.2	0.00	0.00	0.00
5,300.0	35.48	213.79	4,498.5	-2,184.2	-1,461.8	2,628.2	0.00	0.00	0.00
Drop 3° / 100'									
5,303.7	35.48	213.79	4,501.5	-2,185.9	-1,463.0	2,630.3	0.00	0.00	0.00
5,400.0	32.59	213.79	4,581.4	-2,230.7	-1,493.0	2,684.3	3.00	-3.00	0.00
5,500.0	29.59	213.79	4,667.0	-2,273.6	-1,521.7	2,735.9	3.00	-3.00	0.00
5,600.0	26.59	213.79	4,755.2	-2,312.8	-1,547.9	2,783.0	3.00	-3.00	0.00
5,700.0	23.59	213.79	4,845.7	-2,348.0	-1,571.5	2,825.4	3.00	-3.00	0.00
5,800.0	20.59	213.79	4,938.4	-2,379.2	-1,592.4	2,863.0	3.00	-3.00	0.00
5,900.0	17.59	213.79	5,032.9	-2,406.4	-1,610.6	2,895.7	3.00	-3.00	0.00
6,000.0	14.59	213.79	5,129.0	-2,429.4	-1,626.0	2,923.4	3.00	-3.00	0.00
6,100.0	11.59	213.79	5,226.4	-2,448.3	-1,638.6	2,946.0	3.00	-3.00	0.00
6,200.0	8.59	213.79	5,324.8	-2,462.8	-1,648.3	2,963.5	3.00	-3.00	0.00
6,300.0	5.59	213.79	5,424.0	-2,473.1	-1,655.2	2,975.9	3.00	-3.00	0.00
6,400.0	2.59	213.79	5,523.8	-2,479.0	-1,659.2	2,983.0	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,486.3	0.00	0.00	5,610.0	-2,480.6	-1,660.2	2,984.9	3.00	-3.00	0.00
6,500.0	0.00	0.00	5,623.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
6,600.0	0.00	0.00	5,723.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
6,700.0	0.00	0.00	5,823.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
6,800.0	0.00	0.00	5,923.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
6,900.0	0.00	0.00	6,023.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,000.0	0.00	0.00	6,123.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,100.0	0.00	0.00	6,223.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,200.0	0.00	0.00	6,323.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,300.0	0.00	0.00	6,423.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,400.0	0.00	0.00	6,523.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,500.0	0.00	0.00	6,623.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
Cameo									
7,586.3	0.00	0.00	6,710.0	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,600.0	0.00	0.00	6,723.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,700.0	0.00	0.00	6,823.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,800.0	0.00	0.00	6,923.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
7,900.0	0.00	0.00	7,023.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
8,000.0	0.00	0.00	7,123.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
8,100.0	0.00	0.00	7,223.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
8,200.0	0.00	0.00	7,323.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
Base Cameo Coal									
8,246.3	0.00	0.00	7,370.0	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
Rollins									
8,286.3	0.00	0.00	7,410.0	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
8,300.0	0.00	0.00	7,423.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
8,400.0	0.00	0.00	7,523.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
8,500.0	0.00	0.00	7,623.7	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00
TD @ 8536.3' MD / 7660.0' TVD									
8,536.3	0.00	0.00	7,660.0	-2,480.6	-1,660.2	2,984.9	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-21W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665 0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton Federal 30-21W	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)
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Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL - Bruton Federal 3	0.00	0.00	7,660.0	-2,480.6	-1,660.2	1,521,092.88	2,344,503.69	39.241200	-107.814676
- plan hits target center									
- Circle (radius 50.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,422.0	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,919.5	2,560.0	G' Sand			
5,191.3	4,410.0	Williams Fork			
6,486.3	5,610.0	TOG			
7,586.3	6,710.0	Cameo			
8,246.3	7,370.0	Base Cameo Coal			
8,286.3	7,410.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	200.0	0.0	0.0	KOP (Build 3" / 100')
1,382.6	1,308.5	-294.7	-197.2	EOB @ 35.48° Inc. / 213.79° Azm
5,303.7	4,501.5	-2,185.9	-1,463.0	Drop 3" / 100'
6,486.3	5,610.0	-2,480.6	-1,660.2	EOD @ Vertical
8,536.3	7,660.0	-2,480.6	-1,660.2	TD @ 8536.3' MD / 7660.0' TVD