



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton Federal 30-19W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248058
 Longitude: -107.808850
 Ground Level: 7643.0
 well @ 7665.0ust (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 30-19W, True North
 Vertical (TVD) Reference: well @ 7665.0ust (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7665.0ust (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton Federal 30-19W

Ground Level: 7643.0
 +N/-S +E/-W Northing Easting Latitude Longitude
 0.0 0.0 1523547.58 2346216.58 39.248058 -107.808850

DESIGN TARGET DETAILS

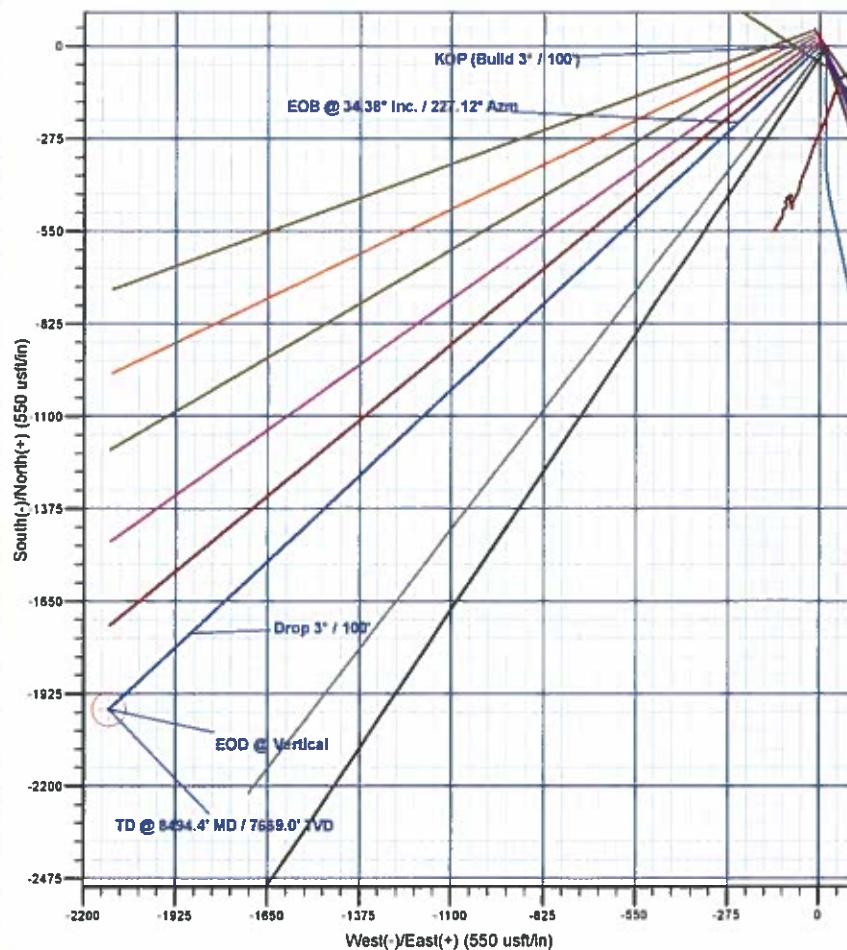
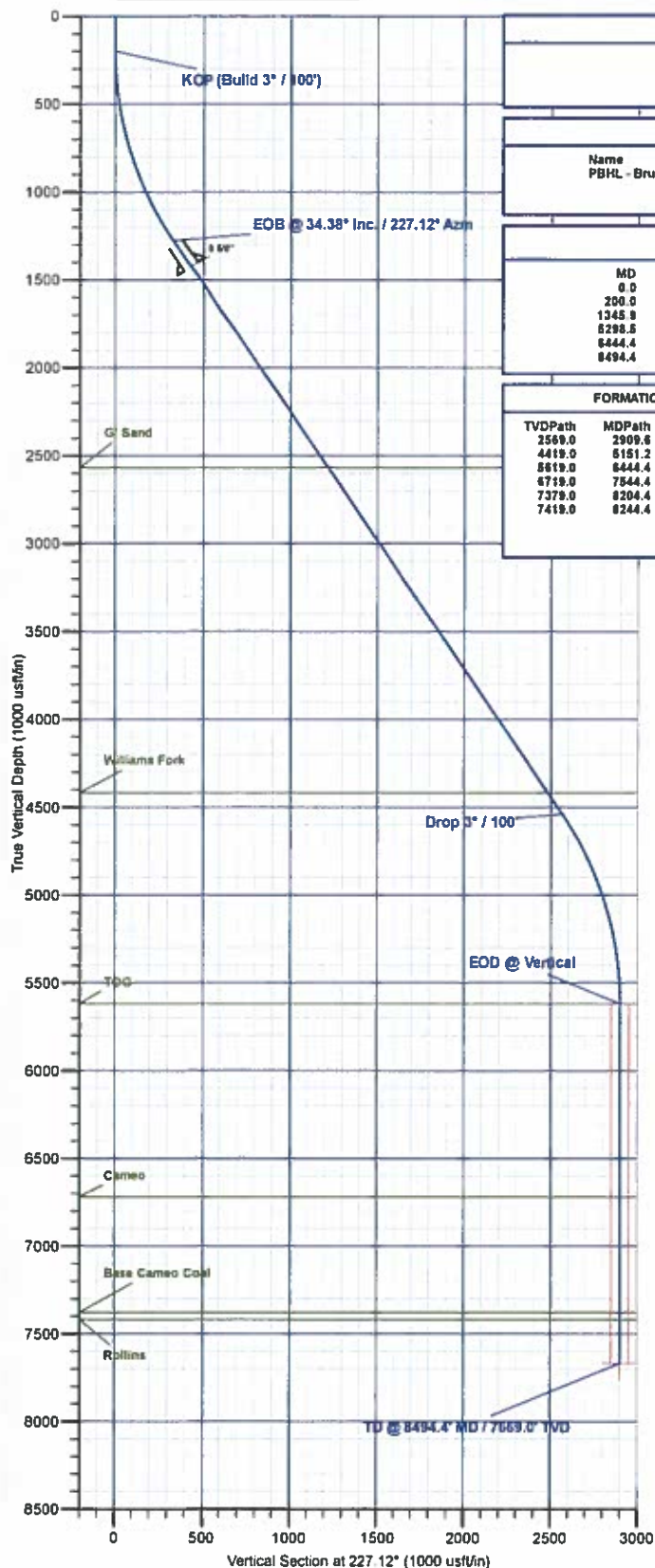
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton Federal 30-19W	7669.0	-1972.5	-2124.4	1521630.00	2344042.83	39.242642	-107.816351

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	KOP (Build 3° / 100')
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	EOB @ 34.38° Inc. / 227.12° Azm
1345.9	34.38	227.12	1279.4	-227.0	-244.8	3.00	227.12	333.6	Drop 3° / 100'
5298.5	34.38	227.12	4540.6	-1745.5	-1880.0	0.00	0.00	2565.4	EOB @ Vertical
6444.4	0.00	0.00	5619.0	-1972.5	-2124.4	3.00	180.00	2898.9	TD @ 8494.4' MD / 7669.0' TVD
8494.4	0.00	0.00	7669.0	-1972.5	-2124.4	0.00	0.00	2898.9	

FORMATION TOP DETAILS

TVDPth	MDPth	Formation
2569.0	2909.6	G' Sand
4419.0	5151.2	Williams Fork
5619.0	6444.4	TOG
6719.0	7544.4	Cameo
7379.0	8204.4	Base Cameo Coal
7419.0	8244.4	Rollins



Plan: Design #1 (Bruton Federal 30-19W/Wellbore #1)

Created By: Will Jircik Date: 7:21, July 17 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton Federal 30-19W

Wellbore #1

Plan: Design #1

QES Well Planning Report

17 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-19W
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 30-19W	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 30-19W					
Well Position	+N/-S	121.3 usft	Northing:	1,523,547.88 usft	Latitude:	39.248058
	+E/-W	-78.2 usft	Easting:	2,346,216.68 usft	Longitude:	-107.808850
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	227.12

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	
1,345.9	34.38	227.12	1,278.4	-227.0	-244.5	3.00	3.00	0.00	227.12	
5,298.5	34.38	227.12	4,540.6	-1,745.5	-1,880.0	0.00	0.00	0.00	0.00	
6,444.4	0.00	0.00	5,619.0	-1,972.5	-2,124.4	3.00	-3.00	0.00	180.00	
8,484.4	0.00	0.00	7,669.0	-1,972.5	-2,124.4	0.00	0.00	0.00	0.00	PBHL - Bruton Federal



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-19W
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 30-19W	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	227.12	300.0	-1.8	-1.9	2.6	3.00	3.00	0.00
400.0	6.00	227.12	399.6	-7.1	-7.7	10.5	3.00	3.00	0.00
500.0	9.00	227.12	498.8	-16.0	-17.2	23.5	3.00	3.00	0.00
600.0	12.00	227.12	597.1	-28.4	-30.6	41.7	3.00	3.00	0.00
700.0	15.00	227.12	694.3	-44.3	-47.7	65.1	3.00	3.00	0.00
800.0	18.00	227.12	790.2	-63.6	-68.5	93.5	3.00	3.00	0.00
900.0	21.00	227.12	884.4	-86.3	-93.0	126.9	3.00	3.00	0.00
1,000.0	24.00	227.12	976.8	-112.3	-121.0	165.1	3.00	3.00	0.00
1,100.0	27.00	227.12	1,067.1	-141.6	-152.5	208.2	3.00	3.00	0.00
1,200.0	30.00	227.12	1,154.9	-174.1	-187.5	255.9	3.00	3.00	0.00
1,300.0	33.00	227.12	1,240.2	-209.6	-225.8	308.1	3.00	3.00	0.00
EOB @ 34.38° Inc. / 227.12° Azm									
1,345.9	34.38	227.12	1,278.4	-227.0	-244.5	333.6	3.00	3.00	0.00
1,400.0	34.38	227.12	1,323.0	-247.8	-266.8	364.1	0.00	0.00	0.00
1,500.0	34.38	227.12	1,405.6	-286.2	-308.2	420.6	0.00	0.00	0.00
8 5/8"									
1,522.0	34.38	227.12	1,423.7	-294.6	-317.3	433.0	0.00	0.00	0.00
1,600.0	34.38	227.12	1,488.1	-324.6	-349.6	477.0	0.00	0.00	0.00
1,700.0	34.38	227.12	1,570.6	-363.0	-391.0	533.5	0.00	0.00	0.00
1,800.0	34.38	227.12	1,653.2	-401.4	-432.3	590.0	0.00	0.00	0.00
1,900.0	34.38	227.12	1,735.7	-439.9	-473.7	646.4	0.00	0.00	0.00
2,000.0	34.38	227.12	1,818.2	-478.3	-515.1	702.9	0.00	0.00	0.00
2,100.0	34.38	227.12	1,900.8	-516.7	-556.5	759.4	0.00	0.00	0.00
2,200.0	34.38	227.12	1,983.3	-555.1	-597.9	815.8	0.00	0.00	0.00
2,300.0	34.38	227.12	2,065.8	-593.5	-639.2	872.3	0.00	0.00	0.00
2,400.0	34.38	227.12	2,148.4	-631.9	-680.6	928.8	0.00	0.00	0.00
2,500.0	34.38	227.12	2,230.9	-670.4	-722.0	985.2	0.00	0.00	0.00
2,600.0	34.38	227.12	2,313.4	-708.8	-763.4	1,041.7	0.00	0.00	0.00
2,700.0	34.38	227.12	2,396.0	-747.2	-804.7	1,098.1	0.00	0.00	0.00
2,800.0	34.38	227.12	2,478.5	-785.6	-846.1	1,154.6	0.00	0.00	0.00
2,900.0	34.38	227.12	2,561.0	-824.0	-887.5	1,211.1	0.00	0.00	0.00
G' Sand									
2,909.6	34.38	227.12	2,569.0	-827.7	-891.5	1,216.5	0.00	0.00	0.00
3,000.0	34.38	227.12	2,643.6	-862.5	-928.9	1,267.5	0.00	0.00	0.00
3,100.0	34.38	227.12	2,726.1	-900.9	-970.3	1,324.0	0.00	0.00	0.00
3,200.0	34.38	227.12	2,808.6	-939.3	-1,011.6	1,380.5	0.00	0.00	0.00
3,300.0	34.38	227.12	2,891.2	-977.7	-1,053.0	1,436.9	0.00	0.00	0.00
3,400.0	34.38	227.12	2,973.7	-1,016.1	-1,094.4	1,493.4	0.00	0.00	0.00
3,500.0	34.38	227.12	3,056.2	-1,054.6	-1,135.8	1,549.9	0.00	0.00	0.00
3,600.0	34.38	227.12	3,138.8	-1,093.0	-1,177.1	1,606.3	0.00	0.00	0.00
3,700.0	34.38	227.12	3,221.3	-1,131.4	-1,218.5	1,662.8	0.00	0.00	0.00
3,800.0	34.38	227.12	3,303.8	-1,169.8	-1,259.9	1,719.2	0.00	0.00	0.00
3,900.0	34.38	227.12	3,386.4	-1,208.2	-1,301.3	1,775.7	0.00	0.00	0.00
4,000.0	34.38	227.12	3,468.9	-1,246.7	-1,342.7	1,832.2	0.00	0.00	0.00
4,100.0	34.38	227.12	3,551.4	-1,285.1	-1,384.0	1,888.6	0.00	0.00	0.00
4,200.0	34.38	227.12	3,634.0	-1,323.5	-1,425.4	1,945.1	0.00	0.00	0.00
4,300.0	34.38	227.12	3,716.5	-1,361.9	-1,466.8	2,001.6	0.00	0.00	0.00
4,400.0	34.38	227.12	3,799.0	-1,400.3	-1,508.2	2,058.0	0.00	0.00	0.00
4,500.0	34.38	227.12	3,881.6	-1,438.7	-1,549.5	2,114.5	0.00	0.00	0.00
4,600.0	34.38	227.12	3,964.1	-1,477.2	-1,590.9	2,171.0	0.00	0.00	0.00



Well Planning Report



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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 30-19W	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	34.38	227.12	4,046.6	-1,515.6	-1,632.3	2,227.4	0.00	0.00	0.00
4,800.0	34.38	227.12	4,129.2	-1,554.0	-1,673.7	2,283.9	0.00	0.00	0.00
4,900.0	34.38	227.12	4,211.7	-1,592.4	-1,715.1	2,340.3	0.00	0.00	0.00
5,000.0	34.38	227.12	4,294.2	-1,630.8	-1,756.4	2,396.8	0.00	0.00	0.00
5,100.0	34.38	227.12	4,376.8	-1,669.3	-1,797.8	2,453.3	0.00	0.00	0.00
Williams Fork									
5,151.2	34.38	227.12	4,419.0	-1,688.9	-1,819.0	2,482.2	0.00	0.00	0.00
5,200.0	34.38	227.12	4,459.3	-1,707.7	-1,839.2	2,509.7	0.00	0.00	0.00
Drop 3° / 100'									
5,298.5	34.38	227.12	4,540.6	-1,745.5	-1,880.0	2,565.4	0.00	0.00	0.00
5,300.0	34.33	227.12	4,541.9	-1,746.1	-1,880.6	2,566.2	3.00	-3.00	0.00
5,400.0	31.33	227.12	4,625.9	-1,783.0	-1,920.3	2,620.4	3.00	-3.00	0.00
5,500.0	28.33	227.12	4,712.6	-1,816.8	-1,956.7	2,670.2	3.00	-3.00	0.00
5,600.0	25.33	227.12	4,801.8	-1,847.5	-1,989.8	2,715.3	3.00	-3.00	0.00
5,700.0	22.33	227.12	4,893.3	-1,875.0	-2,019.4	2,755.7	3.00	-3.00	0.00
5,800.0	19.33	227.12	4,986.7	-1,899.2	-2,045.5	2,791.3	3.00	-3.00	0.00
5,900.0	16.33	227.12	5,081.9	-1,920.1	-2,067.9	2,821.9	3.00	-3.00	0.00
6,000.0	13.33	227.12	5,178.6	-1,937.5	-2,086.7	2,847.5	3.00	-3.00	0.00
6,100.0	10.33	227.12	5,276.4	-1,951.4	-2,101.7	2,868.0	3.00	-3.00	0.00
6,200.0	7.33	227.12	5,375.3	-1,961.9	-2,113.0	2,883.3	3.00	-3.00	0.00
6,300.0	4.33	227.12	5,474.7	-1,968.8	-2,120.4	2,893.5	3.00	-3.00	0.00
6,400.0	1.33	227.12	5,574.6	-1,972.1	-2,124.0	2,898.4	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,444.4	0.00	0.00	5,619.0	-1,972.5	-2,124.4	2,898.9	3.00	-3.00	0.00
6,500.0	0.00	0.00	5,674.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
6,600.0	0.00	0.00	5,774.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
6,700.0	0.00	0.00	5,874.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
6,800.0	0.00	0.00	5,974.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
6,900.0	0.00	0.00	6,074.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,000.0	0.00	0.00	6,174.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,100.0	0.00	0.00	6,274.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,200.0	0.00	0.00	6,374.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,300.0	0.00	0.00	6,474.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,400.0	0.00	0.00	6,574.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,500.0	0.00	0.00	6,674.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
Cameo									
7,544.4	0.00	0.00	6,719.0	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,600.0	0.00	0.00	6,774.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,700.0	0.00	0.00	6,874.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,800.0	0.00	0.00	6,974.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
7,900.0	0.00	0.00	7,074.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
8,000.0	0.00	0.00	7,174.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
8,100.0	0.00	0.00	7,274.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
8,200.0	0.00	0.00	7,374.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
Base Cameo Coal									
8,204.4	0.00	0.00	7,379.0	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
Rollins									
8,244.4	0.00	0.00	7,419.0	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
8,300.0	0.00	0.00	7,474.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
8,400.0	0.00	0.00	7,574.6	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00
TD @ 8494.4' MD / 7669.0' TVD									
8,494.4	0.00	0.00	7,669.0	-1,972.5	-2,124.4	2,898.9	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-19W
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 30-19W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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 Federal 2	0.00	0.00	7,669.0	-1,972.5	-2,124.4	1,521,630.00	2,344,042.83	39 242642	-107.816351
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,423.7	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,909.6	2,569.0	G' Sand			
5,151.2	4,419.0	Williams Fork			
6,444.4	5,619.0	TOG			
7,544.4	6,719.0	Cameo			
8,204.4	7,379.0	Base Cameo Coal			
8,244.4	7,419.0	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')
1,345.9	1,278.4	-227.0	-244.5	EOB @ 34.38° Inc. / 227.12° Azm
5,298.5	4,540.6	-1,745.5	-1,880.0	Drop 3" / 100'
6,444.4	5,619.0	-1,972.5	-2,124.4	EOD @ Vertical
8,494.4	7,669.0	-1,972.5	-2,124.4	TD @ 8494.4' MD / 7669.0' TVD