



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton Federal 30-17W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248106
 Longitude: -107.808886
 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 30-17W, 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 30-17W

Ground Level: 7643.0
 +N-S +E-W Northing Easting Latitude Longitude
 0.0 0.0 1523565.81 2346206.93 39.248106 -107.808886

DESIGN TARGET DETAILS

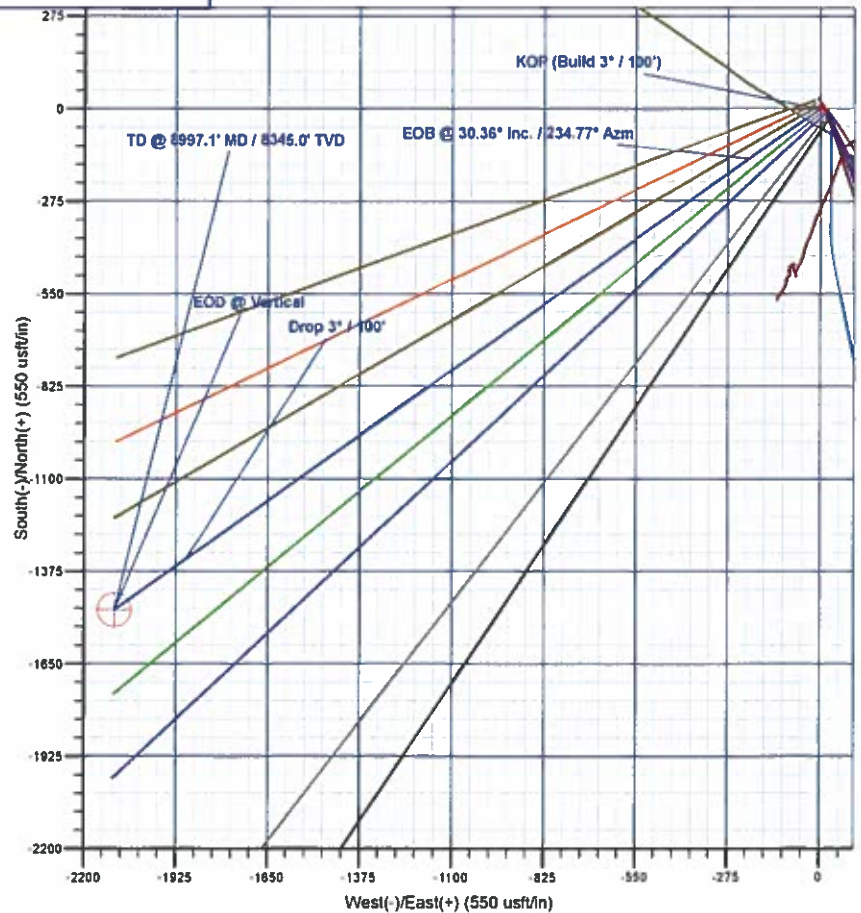
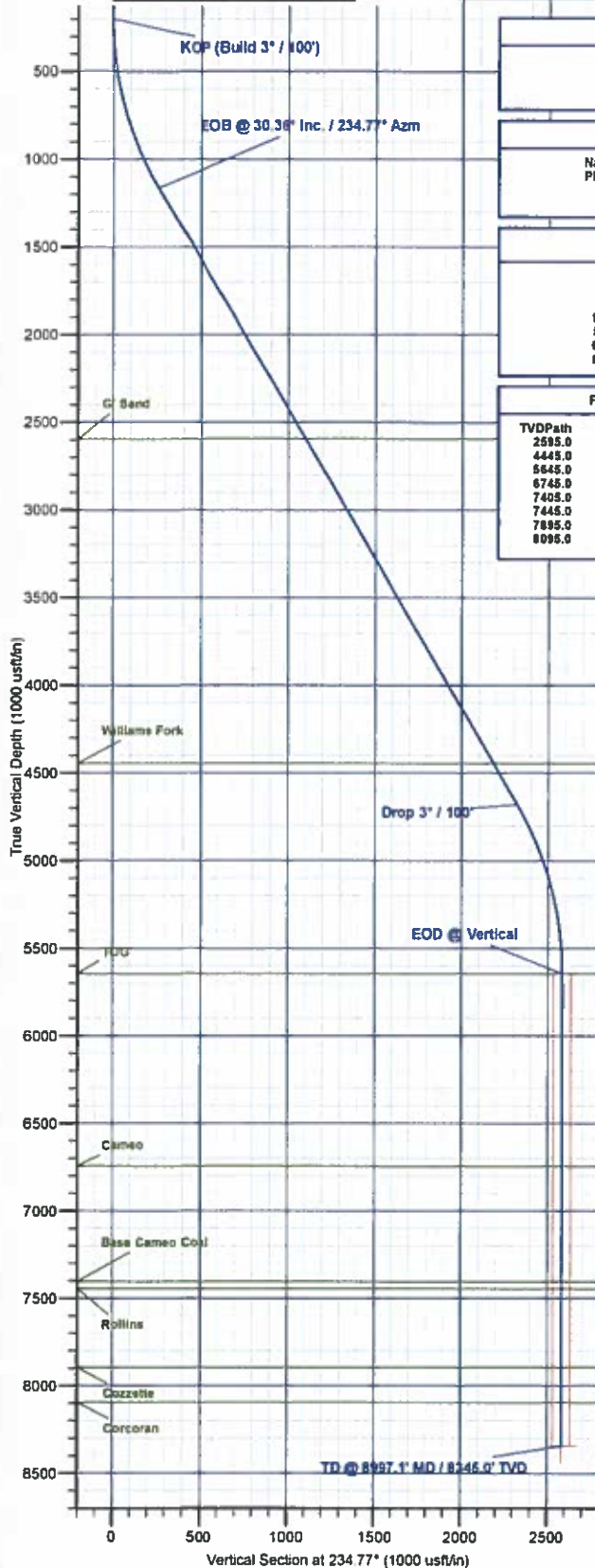
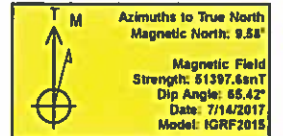
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton Federal 30-17W	8345.0	-1489.9	-2109.6	1822129.79	2344060.11	39.244015	-107.816335

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100°)
1212.1	30.36	234.77	1165.4	-151.1	-214.0	3.00	234.77	282.0	EOB @ 30.36° Inc. / 234.77° Azm
5285.0	30.36	234.77	4879.8	-1338.8	-1885.7	0.00	0.00	2329.7	Drop 3° / 100°
6287.1	0.00	0.00	5548.0	-1489.9	-2109.6	3.00	180.00	2582.7	EOD @ Vertical
8997.1	0.00	0.00	8345.0	-1489.9	-2109.6	0.00	0.00	2682.7	TD @ 8997.1' MD / 8345.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2595.0	2069.0	G' Sand
4445.0	5013.1	Williams Fork
5645.0	6297.1	TOG
6745.0	7397.1	Cameo
7405.0	8057.1	Base Cameo Coal
7445.0	8097.1	Rollins
7895.0	8547.1	Cozzette
8095.0	8747.1	Corcoran



Plan: Design #1 (Bruton Federal 30-17W/Wellbore #1)

Created By: Will Jircik Date: 19:58, July 14 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton Federal 30-17W

Wellbore #1

Plan: Design #1

QES Well Planning Report

14 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-17W
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 30-17W	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 30-17W				
Well Position	+N/-S	138.8 usft	Northing:	1,523,565.62 usft	Latitude: 39.248106
	+E/-W	-88.4 usft	Easting:	2,346,206.93 usft	Longitude: -107.808886
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	234.77

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	
1,212.1	30.36	234.77	1,165.4	-151.1	-214.0	3.00	3.00	0.00	234.77	
5,285.0	30.36	234.77	4,679.6	-1,338.8	-1,895.7	0.00	0.00	0.00	0.00	
6,297.1	0.00	0.00	5,645.0	-1,489.9	-2,109.6	3.00	-3.00	0.00	180.00	
8,997.1	0.00	0.00	8,345.0	-1,489.9	-2,109.6	0.00	0.00	0.00	0.00	PBHL - Bruton Feder



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-17W
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 30-17W	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	234.77	300.0	-1.5	-2.1	2.6	3.00	3.00	0.00
400.0	6.00	234.77	399.6	-6.0	-8.5	10.5	3.00	3.00	0.00
500.0	9.00	234.77	498.8	-13.6	-19.2	23.5	3.00	3.00	0.00
600.0	12.00	234.77	597.1	-24.1	-34.1	41.7	3.00	3.00	0.00
700.0	15.00	234.77	694.3	-37.5	-53.2	65.1	3.00	3.00	0.00
800.0	18.00	234.77	790.2	-53.9	-76.4	93.5	3.00	3.00	0.00
900.0	21.00	234.77	884.4	-73.2	-103.6	126.9	3.00	3.00	0.00
1,000.0	24.00	234.77	976.8	-95.3	-134.9	165.1	3.00	3.00	0.00
1,100.0	27.00	234.77	1,067.1	-120.1	-170.0	208.2	3.00	3.00	0.00
1,200.0	30.00	234.77	1,154.9	-147.6	-209.0	255.9	3.00	3.00	0.00
EOB @ 30.36° Inc. / 234.77° Azm									
1,212.1	30.36	234.77	1,165.4	-151.1	-214.0	262.0	3.00	3.00	0.00
1,300.0	30.36	234.77	1,241.2	-176.7	-250.3	306.4	0.00	0.00	0.00
1,400.0	30.36	234.77	1,327.5	-205.9	-291.6	356.9	0.00	0.00	0.00
1,500.0	30.36	234.77	1,413.8	-235.1	-332.8	407.5	0.00	0.00	0.00
8 5/8"									
1,522.0	30.36	234.77	1,432.8	-241.5	-341.9	418.6	0.00	0.00	0.00
1,600.0	30.36	234.77	1,500.1	-264.2	-374.1	458.0	0.00	0.00	0.00
1,700.0	30.36	234.77	1,586.4	-293.4	-415.4	508.6	0.00	0.00	0.00
1,800.0	30.36	234.77	1,672.6	-322.6	-456.7	559.1	0.00	0.00	0.00
1,900.0	30.36	234.77	1,758.9	-351.7	-498.0	609.7	0.00	0.00	0.00
2,000.0	30.36	234.77	1,845.2	-380.9	-539.3	660.2	0.00	0.00	0.00
2,100.0	30.36	234.77	1,931.5	-410.0	-580.6	710.8	0.00	0.00	0.00
2,200.0	30.36	234.77	2,017.8	-439.2	-621.9	761.3	0.00	0.00	0.00
2,300.0	30.36	234.77	2,104.1	-468.4	-663.2	811.9	0.00	0.00	0.00
2,400.0	30.36	234.77	2,190.3	-497.5	-704.5	862.4	0.00	0.00	0.00
2,500.0	30.36	234.77	2,276.6	-526.7	-745.7	913.0	0.00	0.00	0.00
2,600.0	30.36	234.77	2,362.9	-555.8	-787.0	963.5	0.00	0.00	0.00
2,700.0	30.36	234.77	2,449.2	-585.0	-828.3	1,014.1	0.00	0.00	0.00
2,800.0	30.36	234.77	2,535.5	-614.2	-869.6	1,064.6	0.00	0.00	0.00
G' Sand									
2,869.0	30.36	234.77	2,595.0	-634.3	-898.1	1,099.5	0.00	0.00	0.00
2,900.0	30.36	234.77	2,621.8	-643.3	-910.9	1,115.2	0.00	0.00	0.00
3,000.0	30.36	234.77	2,708.0	-672.5	-952.2	1,165.7	0.00	0.00	0.00
3,100.0	30.36	234.77	2,794.3	-701.6	-993.5	1,216.3	0.00	0.00	0.00
3,200.0	30.36	234.77	2,880.6	-730.8	-1,034.8	1,266.8	0.00	0.00	0.00
3,300.0	30.36	234.77	2,966.9	-760.0	-1,076.1	1,317.4	0.00	0.00	0.00
3,400.0	30.36	234.77	3,053.2	-789.1	-1,117.4	1,367.9	0.00	0.00	0.00
3,500.0	30.36	234.77	3,139.5	-818.3	-1,158.6	1,418.5	0.00	0.00	0.00
3,600.0	30.36	234.77	3,225.7	-847.4	-1,199.9	1,469.0	0.00	0.00	0.00
3,700.0	30.36	234.77	3,312.0	-876.6	-1,241.2	1,519.6	0.00	0.00	0.00
3,800.0	30.36	234.77	3,398.3	-905.8	-1,282.5	1,570.1	0.00	0.00	0.00
3,900.0	30.36	234.77	3,484.6	-934.9	-1,323.8	1,620.7	0.00	0.00	0.00
4,000.0	30.36	234.77	3,570.9	-964.1	-1,365.1	1,671.2	0.00	0.00	0.00
4,100.0	30.36	234.77	3,657.2	-993.2	-1,406.4	1,721.8	0.00	0.00	0.00
4,200.0	30.36	234.77	3,743.4	-1,022.4	-1,447.7	1,772.3	0.00	0.00	0.00
4,300.0	30.36	234.77	3,829.7	-1,051.6	-1,489.0	1,822.9	0.00	0.00	0.00
4,400.0	30.36	234.77	3,916.0	-1,080.7	-1,530.3	1,873.4	0.00	0.00	0.00
4,500.0	30.36	234.77	4,002.3	-1,109.9	-1,571.5	1,924.0	0.00	0.00	0.00
4,600.0	30.36	234.77	4,088.6	-1,139.1	-1,612.8	1,974.5	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-17W
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 30-17W	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	30.36	234.77	4,174.9	-1,168.2	-1,654.1	2,025.1	0.00	0.00	0.00
4,800.0	30.36	234.77	4,261.1	-1,197.4	-1,695.4	2,075.6	0.00	0.00	0.00
4,900.0	30.36	234.77	4,347.4	-1,226.5	-1,736.7	2,126.2	0.00	0.00	0.00
5,000.0	30.36	234.77	4,433.7	-1,255.7	-1,778.0	2,176.7	0.00	0.00	0.00
Williams Fork									
5,013.1	30.36	234.77	4,445.0	-1,259.5	-1,783.4	2,183.3	0.00	0.00	0.00
5,100.0	30.36	234.77	4,520.0	-1,284.9	-1,819.3	2,227.2	0.00	0.00	0.00
5,200.0	30.36	234.77	4,606.3	-1,314.0	-1,860.6	2,277.8	0.00	0.00	0.00
Drop 3° / 100'									
5,285.0	30.36	234.77	4,679.6	-1,338.8	-1,895.7	2,320.7	0.00	0.00	0.00
5,300.0	29.91	234.77	4,692.6	-1,343.1	-1,901.8	2,328.3	3.00	-3.00	0.00
5,400.0	26.91	234.77	4,780.5	-1,370.6	-1,940.7	2,375.9	3.00	-3.00	0.00
5,500.0	23.91	234.77	4,870.9	-1,395.3	-1,975.7	2,418.8	3.00	-3.00	0.00
5,600.0	20.91	234.77	4,963.3	-1,417.3	-2,006.9	2,456.9	3.00	-3.00	0.00
5,700.0	17.91	234.77	5,057.6	-1,436.5	-2,034.0	2,490.1	3.00	-3.00	0.00
5,800.0	14.91	234.77	5,153.5	-1,452.8	-2,057.1	2,518.4	3.00	-3.00	0.00
5,900.0	11.91	234.77	5,250.8	-1,466.2	-2,076.0	2,541.6	3.00	-3.00	0.00
6,000.0	8.91	234.77	5,349.1	-1,476.6	-2,090.8	2,559.7	3.00	-3.00	0.00
6,100.0	5.91	234.77	5,448.3	-1,484.1	-2,101.3	2,572.6	3.00	-3.00	0.00
6,200.0	2.91	234.77	5,548.0	-1,488.5	-2,107.6	2,580.2	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,297.1	0.00	0.00	5,645.0	-1,489.9	-2,109.6	2,582.7	3.00	-3.00	128.99
6,300.0	0.00	0.00	5,647.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
6,400.0	0.00	0.00	5,747.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
6,500.0	0.00	0.00	5,847.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
6,600.0	0.00	0.00	5,947.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
6,700.0	0.00	0.00	6,047.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,147.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
6,900.0	0.00	0.00	6,247.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,347.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,100.0	0.00	0.00	6,447.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,200.0	0.00	0.00	6,547.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,300.0	0.00	0.00	6,647.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
Cameo									
7,397.1	0.00	0.00	6,745.0	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,400.0	0.00	0.00	6,747.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,500.0	0.00	0.00	6,847.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,600.0	0.00	0.00	6,947.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,700.0	0.00	0.00	7,047.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,800.0	0.00	0.00	7,147.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
7,900.0	0.00	0.00	7,247.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
8,000.0	0.00	0.00	7,347.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
Base Cameo Coal									
8,057.1	0.00	0.00	7,405.0	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
Rollins									
8,097.1	0.00	0.00	7,445.0	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
8,100.0	0.00	0.00	7,447.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
8,200.0	0.00	0.00	7,547.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
8,300.0	0.00	0.00	7,647.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
8,400.0	0.00	0.00	7,747.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
8,500.0	0.00	0.00	7,847.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00
Cozzette									
8,547.1	0.00	0.00	7,895.0	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-17W
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 30-17W	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)	
8,600.0	0.00	0.00	7,947.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00	
8,700.0	0.00	0.00	8,047.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00	
Corcoran										
8,747.1	0.00	0.00	8,095.0	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00	
8,800.0	0.00	0.00	8,147.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00	
8,900.0	0.00	0.00	8,247.9	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00	
TD @ 8997.1' MD / 8345.0' TVD										
8,997.1	0.00	0.00	8,345.0	-1,489.9	-2,109.6	2,582.7	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude		
- hit/miss target										
- Shape								Longitude		
PBHL - Bruton Federal 3	0.00	0.00	8,345.0	-1,489.9	-2,109.6	1,522,129.79	2,344,060.11	39 244015		
- plan hits target center								-107.816335		
- Circle (radius 50.0)										

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name					Casing Diameter (")	Hole Diameter (")		
1,522.0	1,432.8	8 5/8"					8-5/8	11		

Formations										
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)					
2,869.0	2,595.0	G' Sand								
5,013.1	4,445.0	Williams Fork								
6,297.1	5,645.0	TOG								
7,397.1	6,745.0	Cameo								
8,057.1	7,405.0	Base Cameo Coal								
8,097.1	7,445.0	Rollins								
8,547.1	7,895.0	Cozzette								
8,747.1	8,095.0	Corcoran								

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')						
1,212.1	1,165.4	-151.1	-214.0	EOB @ 30.38° Inc. / 234.77° Azm						
5,285.0	4,679.6	-1,338.8	-1,895.7	Drop 3" / 100'						
6,297.1	5,645.0	-1,489.9	-2,109.6	EOD @ Vertical						
8,997.1	8,345.0	-1,489.9	-2,109.6	TD @ 8997.1' MD / 8345.0' TVD						