



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton Federal 31-01E
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248025
 Longitude: -107.808783
 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 31-01E, 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 31-01E

+N-S	+E-W	Northing	Ground Level: 7643.0	Latitude	Longitude
0.0	0.0	1523535.38	2346236.34	39.248025	-107.808783

DESIGN TARGET DETAILS

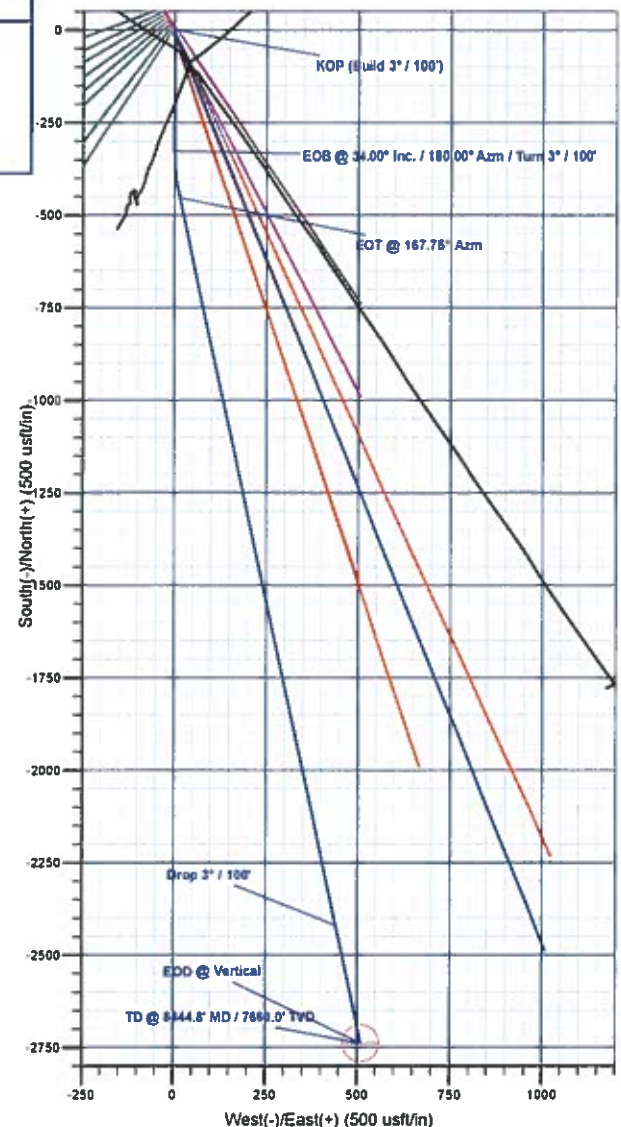
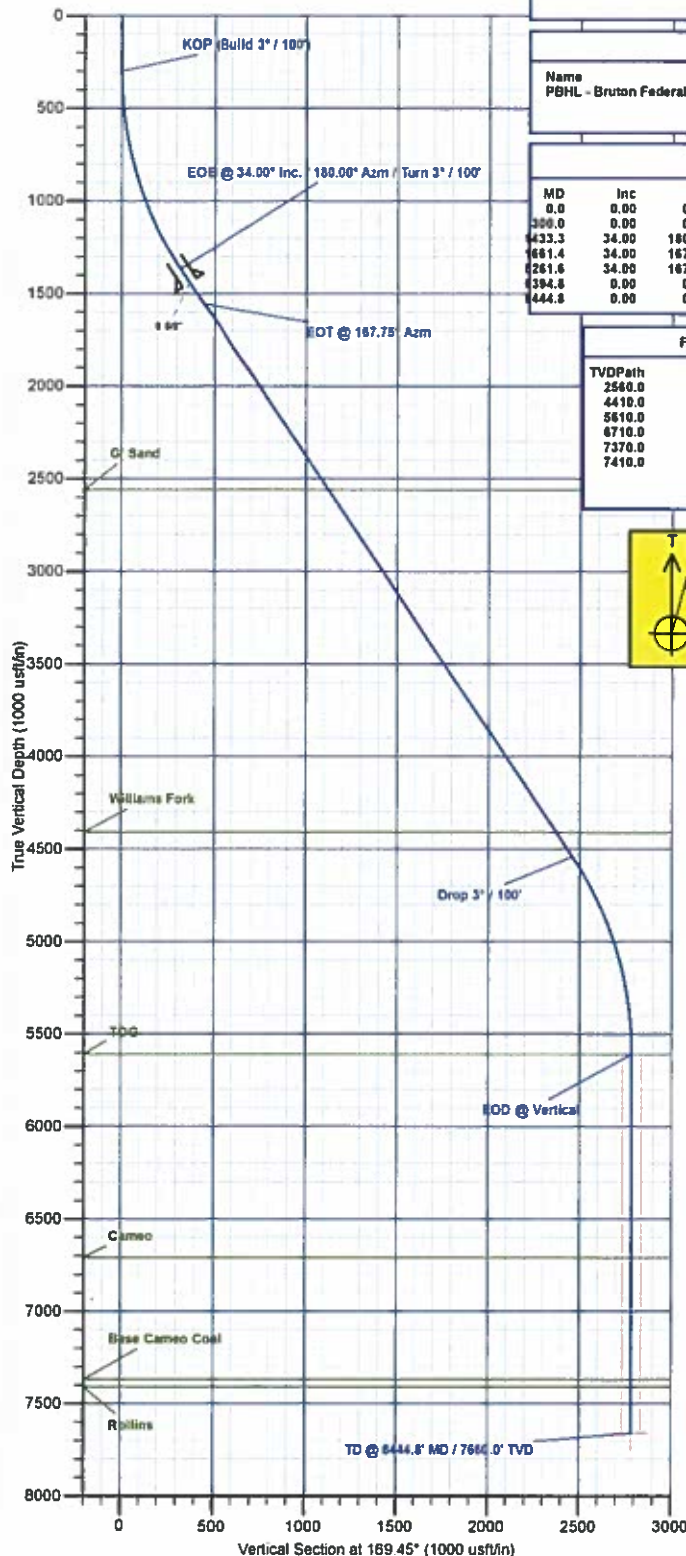
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton Federal 31-01E	7660.0	-2738.9	510.1	1520784.41	2346675.56	39.240505	-107.806982

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VFace	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	EOB @ 34.00° Inc. / 180.00° Azm / Turn 3° / 100'
433.3	34.00	180.00	1368.0	-326.5	0.0	3.00	180.00	321.0	EOB @ 34.00° Inc. / 180.00° Azm / Turn 3° / 100'
581.4	34.00	167.75	1557.3	-452.8	13.6	3.00	-95.12	447.6	EOB @ 167.75° Azm
621.6	34.00	167.75	1557.3	-452.8	13.6	3.00	-95.12	447.6	Drop 3° / 100'
1394.8	0.00	0.00	5610.0	-2738.9	510.1	3.00	180.00	2786.0	EOD @ Vertical
1444.8	0.00	0.00	7660.0	-2738.9	510.1	0.00	0.00	2786.0	TD @ 8444.8' MD / 7660.0' TVD

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
2560.0	2870.8	G' Sand
4410.0	5102.2	Williams Fork
5610.0	6394.8	TGG
6710.0	7494.8	Cameo
7370.0	8154.8	Base Cameo Coal
7410.0	8194.8	Rollins



Plan: Design #1 (Bruton Federal 31-01E/Wellbore #1)

Created By: Will Jircik Date: 12:51, July 17 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton Federal 31-01E

Wellbore #1

Plan: Design #1

QES Well Planning Report

17 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 31-01E
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 31-01E	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 31-01E					
Well Position	+N-S	109.3 usft	Northing:	1,523,535.38 usft	Latitude:	39.248025
	+E-W	-59.3 usft	Easting:	2,346,235.34 usft	Longitude:	-107.808783
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	169.45

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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,433.3	34.00	180.00	1,368.0	-326.5	0.0	3.00	3.00	0.00	180.00	
1,661.4	34.00	167.75	1,557.3	-452.8	13.6	3.00	0.00	-5.37	-95.12	
5,261.6	34.00	167.75	4,542.1	-2,419.9	440.8	0.00	0.00	0.00	0.00	
6,394.8	0.00	0.00	5,610.0	-2,738.9	510.1	3.00	-3.00	0.00	180.00	
8,444.8	0.00	0.00	7,660.0	-2,738.9	510.1	0.00	0.00	0.00	0.00	PBHL - Bruton Federal



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 31-01E
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 31-01E	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
KOP (Build 3° / 100')									
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	3.00	180.00	400.0	-2.6	0.0	2.6	3.00	3.00	0.00
500.0	6.00	180.00	499.6	-10.5	0.0	10.3	3.00	3.00	0.00
600.0	9.00	180.00	598.8	-23.5	0.0	23.1	3.00	3.00	0.00
700.0	12.00	180.00	697.1	-41.7	0.0	41.0	3.00	3.00	0.00
800.0	15.00	180.00	794.3	-65.1	0.0	64.0	3.00	3.00	0.00
900.0	18.00	180.00	890.2	-93.5	0.0	91.9	3.00	3.00	0.00
1,000.0	21.00	180.00	984.4	-126.9	0.0	124.7	3.00	3.00	0.00
1,100.0	24.00	180.00	1,076.8	-165.1	0.0	162.3	3.00	3.00	0.00
1,200.0	27.00	180.00	1,167.1	-208.2	0.0	204.6	3.00	3.00	0.00
1,300.0	30.00	180.00	1,254.9	-255.9	0.0	251.5	3.00	3.00	0.00
1,400.0	33.00	180.00	1,340.2	-308.1	0.0	302.9	3.00	3.00	0.00
EOB @ 34.00° Inc. / 180.00° Azm / Turn 3° / 100'									
1,433.3	34.00	180.00	1,368.0	-326.5	0.0	321.0	3.00	3.00	0.00
1,500.0	33.87	176.42	1,423.3	-363.7	1.2	357.8	3.00	-0.19	-5.36
8 5/8"									
1,522.0	33.85	175.24	1,441.6	-375.9	2.0	369.9	3.00	-0.09	-5.38
1,600.0	33.88	171.04	1,506.3	-419.1	7.2	413.3	3.00	0.03	-5.38
EOT @ 167.75° Azm									
1,661.4	34.00	167.75	1,557.3	-452.8	13.6	447.6	3.00	0.19	-5.36
1,700.0	34.00	167.75	1,589.3	-473.8	18.1	469.1	0.00	0.00	0.00
1,800.0	34.00	167.75	1,672.2	-528.5	30.0	525.0	0.00	0.00	0.00
1,900.0	34.00	167.75	1,755.1	-583.1	41.9	580.9	0.00	0.00	0.00
2,000.0	34.00	167.75	1,838.0	-637.7	53.7	636.8	0.00	0.00	0.00
2,100.0	34.00	167.75	1,920.9	-692.4	65.6	692.7	0.00	0.00	0.00
2,200.0	34.00	167.75	2,003.8	-747.0	77.5	748.6	0.00	0.00	0.00
2,300.0	34.00	167.75	2,086.7	-801.7	89.3	804.5	0.00	0.00	0.00
2,400.0	34.00	167.75	2,169.6	-856.3	101.2	860.4	0.00	0.00	0.00
2,500.0	34.00	167.75	2,252.5	-910.9	113.1	916.3	0.00	0.00	0.00
2,600.0	34.00	167.75	2,335.5	-965.6	124.9	972.1	0.00	0.00	0.00
2,700.0	34.00	167.75	2,418.4	-1,020.2	136.8	1,028.0	0.00	0.00	0.00
2,800.0	34.00	167.75	2,501.3	-1,074.9	148.7	1,083.9	0.00	0.00	0.00
G' Sand									
2,870.8	34.00	167.75	2,560.0	-1,113.6	157.1	1,123.5	0.00	0.00	0.00
2,900.0	34.00	167.75	2,584.2	-1,128.5	160.5	1,139.8	0.00	0.00	0.00
3,000.0	34.00	167.75	2,667.1	-1,184.1	172.4	1,195.7	0.00	0.00	0.00
3,100.0	34.00	167.75	2,750.0	-1,238.8	184.3	1,251.6	0.00	0.00	0.00
3,200.0	34.00	167.75	2,832.9	-1,293.4	196.1	1,307.5	0.00	0.00	0.00
3,300.0	34.00	167.75	2,915.8	-1,348.1	208.0	1,363.4	0.00	0.00	0.00
3,400.0	34.00	167.75	2,998.7	-1,402.7	219.9	1,419.3	0.00	0.00	0.00
3,500.0	34.00	167.75	3,081.6	-1,457.3	231.7	1,475.1	0.00	0.00	0.00
3,600.0	34.00	167.75	3,164.5	-1,512.0	243.6	1,531.0	0.00	0.00	0.00
3,700.0	34.00	167.75	3,247.4	-1,566.6	255.5	1,586.9	0.00	0.00	0.00
3,800.0	34.00	167.75	3,330.3	-1,621.3	267.3	1,642.8	0.00	0.00	0.00
3,900.0	34.00	167.75	3,413.3	-1,675.9	279.2	1,698.7	0.00	0.00	0.00
4,000.0	34.00	167.75	3,496.2	-1,730.5	291.1	1,754.6	0.00	0.00	0.00
4,100.0	34.00	167.75	3,579.1	-1,785.2	302.9	1,810.5	0.00	0.00	0.00
4,200.0	34.00	167.75	3,662.0	-1,839.8	314.8	1,866.4	0.00	0.00	0.00
4,300.0	34.00	167.75	3,744.9	-1,894.5	326.7	1,922.3	0.00	0.00	0.00
4,400.0	34.00	167.75	3,827.8	-1,949.1	338.6	1,978.1	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 31-01E	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)
4,500.0	34.00	167.75	3,910.7	-2,003.7	350.4	2,034.0	0.00	0.00	0.00
4,600.0	34.00	167.75	3,993.6	-2,058.4	362.3	2,089.9	0.00	0.00	0.00
4,700.0	34.00	167.75	4,076.5	-2,113.0	374.2	2,145.8	0.00	0.00	0.00
4,800.0	34.00	167.75	4,159.4	-2,167.7	386.0	2,201.7	0.00	0.00	0.00
4,900.0	34.00	167.75	4,242.3	-2,222.3	397.9	2,257.6	0.00	0.00	0.00
5,000.0	34.00	167.75	4,325.2	-2,276.9	409.8	2,313.5	0.00	0.00	0.00
5,100.0	34.00	167.75	4,408.1	-2,331.6	421.6	2,369.4	0.00	0.00	0.00
Williams Fork									
5,102.2	34.00	167.75	4,410.0	-2,332.8	421.9	2,370.6	0.00	0.00	0.00
5,200.0	34.00	167.75	4,491.0	-2,386.2	433.5	2,425.3	0.00	0.00	0.00
Drop 3° / 100'									
5,261.6	34.00	167.75	4,542.1	-2,419.9	440.8	2,459.7	0.00	0.00	0.00
5,300.0	32.84	167.75	4,574.2	-2,440.6	445.3	2,480.8	3.00	-3.00	0.00
5,400.0	29.84	167.75	4,659.6	-2,491.4	456.3	2,532.8	3.00	-3.00	0.00
5,500.0	26.84	167.75	4,747.6	-2,537.8	466.4	2,580.3	3.00	-3.00	0.00
5,600.0	23.84	167.75	4,837.9	-2,579.6	475.5	2,623.0	3.00	-3.00	0.00
5,700.0	20.84	167.75	4,930.4	-2,616.7	483.6	2,661.0	3.00	-3.00	0.00
5,800.0	17.84	167.75	5,024.8	-2,649.1	490.6	2,694.1	3.00	-3.00	0.00
5,900.0	14.84	167.75	5,120.7	-2,676.6	496.6	2,722.3	3.00	-3.00	0.00
6,000.0	11.84	167.75	5,218.0	-2,699.2	501.5	2,745.3	3.00	-3.00	0.00
6,100.0	8.84	167.75	5,316.4	-2,716.7	505.3	2,763.3	3.00	-3.00	0.00
6,200.0	5.84	167.75	5,415.5	-2,729.2	508.0	2,776.1	3.00	-3.00	0.00
6,300.0	2.84	167.75	5,515.2	-2,736.6	509.6	2,783.6	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,394.8	0.00	0.00	5,610.0	-2,738.9	510.1	2,786.0	3.00	-3.00	0.00
6,400.0	0.00	0.00	5,615.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
6,500.0	0.00	0.00	5,715.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
6,600.0	0.00	0.00	5,815.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
6,700.0	0.00	0.00	5,915.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,015.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,115.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,000.0	0.00	0.00	6,215.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,100.0	0.00	0.00	6,315.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,200.0	0.00	0.00	6,415.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,300.0	0.00	0.00	6,515.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,400.0	0.00	0.00	6,615.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
Cameo									
7,494.8	0.00	0.00	6,710.0	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,500.0	0.00	0.00	6,715.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,600.0	0.00	0.00	6,815.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,700.0	0.00	0.00	6,915.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,015.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,115.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
8,000.0	0.00	0.00	7,215.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
8,100.0	0.00	0.00	7,315.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
Base Cameo Coal									
8,154.8	0.00	0.00	7,370.0	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
Rollins									
8,194.8	0.00	0.00	7,410.0	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
8,200.0	0.00	0.00	7,415.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
8,300.0	0.00	0.00	7,515.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
8,400.0	0.00	0.00	7,615.2	-2,738.9	510.1	2,786.0	0.00	0.00	0.00
TD @ 8444.8' MD / 7660.0' TVD									



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 31-01E
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 31-01E	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)
8,444.8	0.00	0.00	7,660.0	-2,738.9	510.1	2,786.0	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	Longitude
- hit/miss target									
- Shape									
PBHL - Bruton Federal 3	0.00	0.00	7,660.0	-2,738.9	510.1	1,520,784.41	2,346,675.67	39.240505	-107.806982
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,441.6	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,870.8	2,560.0	G' Sand			
5,102.2	4,410.0	Williams Fork			
6,394.8	5,610.0	TOG			
7,494.8	6,710.0	Cameo			
8,154.8	7,370.0	Base Cameo Coal			
8,194.8	7,410.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
300.0	300.0	0.0	0.0	KOP (Build 3° / 100')
1,433.3	1,368.0	-326.5	0.0	EOB @ 34.00° Inc. / 180.00° Azm / Turn 3° / 100'
1,661.4	1,557.3	-452.8	13.6	EOT @ 167.75° Azm
5,261.6	4,542.1	-2,419.9	440.8	Drop 3° / 100'
6,394.8	5,610.0	-2,738.9	510.1	EOD @ Vertical
8,444.8	7,660.0	-2,738.9	510.1	TD @ 8444.8' MD / 7660.0' TVD