



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton 30-16E
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248144
 Longitude: -107.808872
 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 30-16E, True North
 Vertical (TVD) Reference: well @ 7665.0usft (H&P #290)
 Section (VS) Reference: Slope -10.0N, 0.0E
 Measured Depth Reference: well @ 7665.0usft (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 30-16E

+N-S	+E-W	Northing	Ground Level: 7643.0	Latitude	Longitude
0.0	0.0	1523579.35	2346211.24	39.248144	-107.808872

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-16E	7730.0	-1283.8	528.5	1522282.48	2346706.91	39.244819	-107.807008

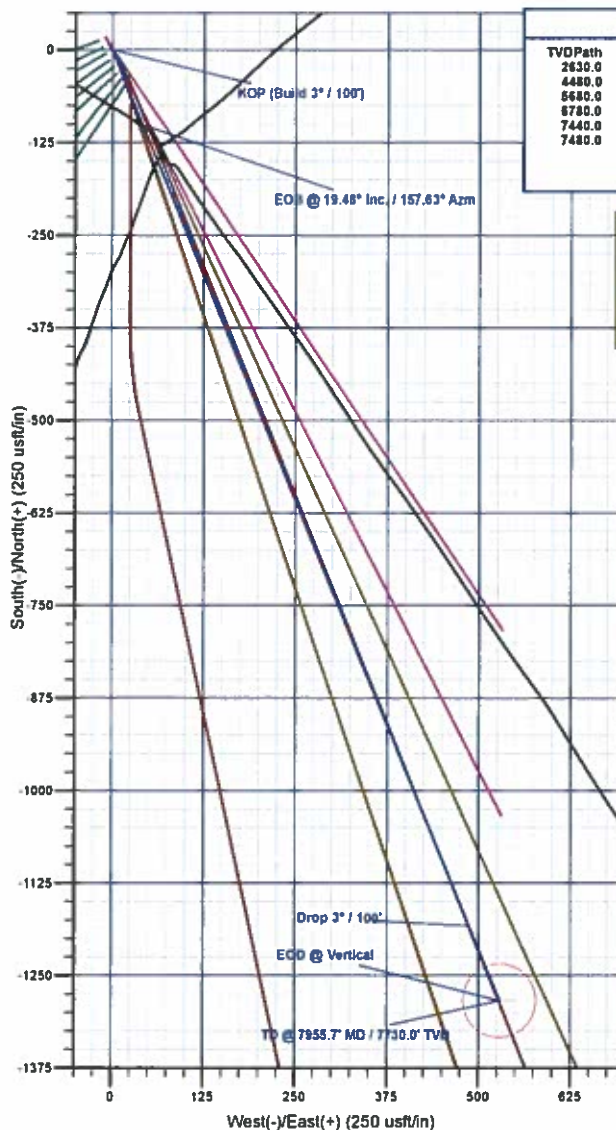
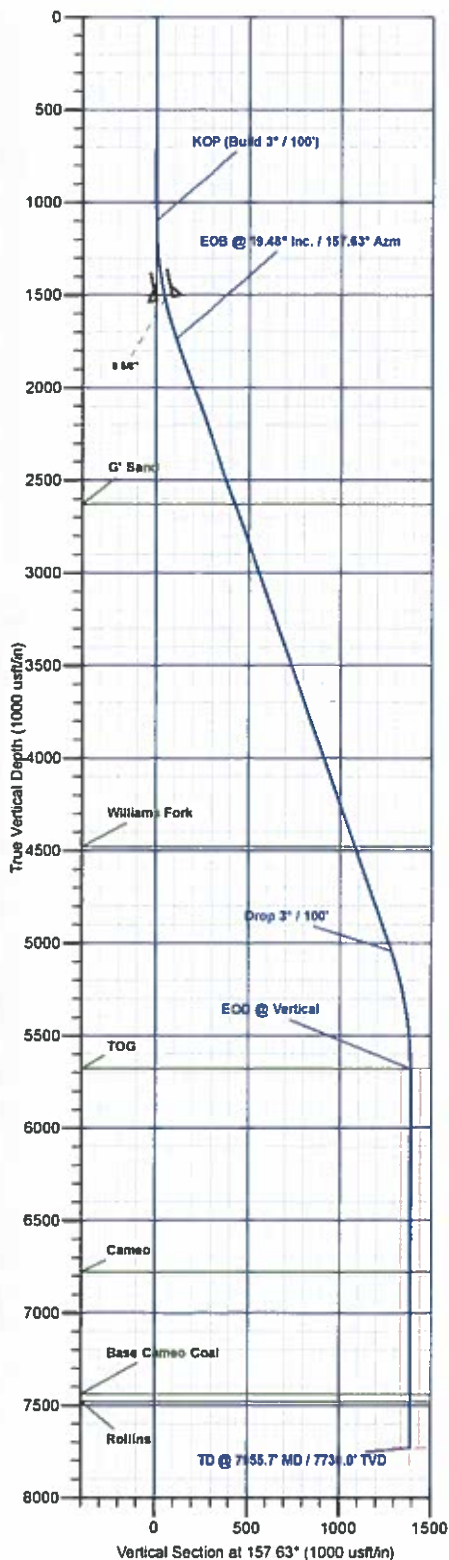
SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Deg	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')
1100.0	0.00	0.00	1100.0	0.0	0.0	0.00	0.00	0.0	EOB @ 19.48" Inc. / 157.63" Azm
1749.4	19.48	157.63	1737.0	-101.1	41.6	3.00	157.63	109.4	EOB @ 19.48" Inc. / 157.63" Azm
5258.2	19.48	157.63	5043.0	-1182.7	466.8	0.00	0.00	1279.0	Drop 3" / 100'
5905.7	0.00	0.00	5680.0	-1283.8	528.5	3.00	180.00	1308.4	EOB @ Vertical
7955.7	0.00	0.00	7730.0	-1283.8	528.5	0.00	0.00	1308.4	TD @ 7955.7" MD / 7730.0" TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2630.0	2596.7	G' Sand
4480.0	4659.1	Williams Fork
5580.0	5905.7	TOG
6780.0	7005.7	Cameo
7440.0	7455.7	Base Cameo Coal
7480.0	7705.7	Rollins

Azimuths to True North
 Magnetic North: 9.58°
 Magnetic Field
 Strength: 51397.6nT
 Dip Angle: 65.42°
 Date: 7/14/2017
 Model: IGRF2015



Plan: Design #1 (Bruton 30-16E/Wellbore #1)

Created By: Will Jircik Date: 8:38, July 17 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton 30-16E

Wellbore #1

Plan: Design #1

QES Well Planning Report

17 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-16E
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 30-16E	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 30-16E			
Well Position	+N/-S	152.7 usft	Northing:	1,523,579.35 usft
	+E/-W	-84.5 usft	Easting:	2,346,211.25 usft
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	157.63

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	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,749.4	19.48	157.63	1,737.0	-101.1	41.6	3.00	3.00	0.00	157.63	
5,256.2	19.48	157.63	5,043.0	-1,182.7	486.8	0.00	0.00	0.00	0.00	
5,905.7	0.00	0.00	5,680.0	-1,283.8	528.5	3.00	-3.00	0.00	180.00	
7,955.7	0.00	0.00	7,730.0	-1,283.8	528.5	0.00	0.00	0.00	0.00	PBHL - Bruton 30-16E



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-16E
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 30-16E	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
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
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	3.00	157.63	1,200.0	-2.4	1.0	2.6	3.00	3.00	0.00
1,300.0	6.00	157.63	1,299.6	-9.7	4.0	10.5	3.00	3.00	0.00
1,400.0	9.00	157.63	1,398.8	-21.7	9.0	23.5	3.00	3.00	0.00
1,500.0	12.00	157.63	1,497.1	-38.6	15.9	41.7	3.00	3.00	0.00
8 5/8"									
1,522.0	12.66	157.63	1,518.6	-42.9	17.7	46.4	3.00	3.00	0.00
1,600.0	15.00	157.63	1,594.3	-60.2	24.8	65.1	3.00	3.00	0.00
1,700.0	18.00	157.63	1,690.2	-86.4	35.6	93.5	3.00	3.00	0.00
EOB @ 19.48° Inc. / 157.63° Azm									
1,749.4	19.48	157.63	1,737.0	-101.1	41.6	109.4	3.00	3.00	0.00
1,800.0	19.48	157.63	1,784.7	-116.7	48.0	126.2	0.00	0.00	0.00
1,900.0	19.48	157.63	1,878.9	-147.8	60.7	159.6	0.00	0.00	0.00
2,000.0	19.48	157.63	1,973.2	-178.4	73.4	192.9	0.00	0.00	0.00
2,100.0	19.48	157.63	2,067.5	-209.2	86.1	226.3	0.00	0.00	0.00
2,200.0	19.48	157.63	2,161.8	-240.1	98.8	259.6	0.00	0.00	0.00
2,300.0	19.48	157.63	2,256.0	-270.9	111.5	293.0	0.00	0.00	0.00
2,400.0	19.48	157.63	2,350.3	-301.8	124.2	326.3	0.00	0.00	0.00
2,500.0	19.48	157.63	2,444.6	-332.6	136.9	359.7	0.00	0.00	0.00
2,600.0	19.48	157.63	2,538.9	-363.5	149.6	393.1	0.00	0.00	0.00
G' Sand									
2,696.7	19.48	157.63	2,630.0	-393.3	161.9	425.3	0.00	0.00	0.00
2,700.0	19.48	157.63	2,633.1	-394.3	162.3	426.4	0.00	0.00	0.00
2,800.0	19.48	157.63	2,727.4	-425.1	175.0	459.8	0.00	0.00	0.00
2,900.0	19.48	157.63	2,821.7	-456.0	187.7	493.1	0.00	0.00	0.00
3,000.0	19.48	157.63	2,915.9	-486.8	200.4	526.5	0.00	0.00	0.00
3,100.0	19.48	157.63	3,010.2	-517.7	213.1	559.8	0.00	0.00	0.00
3,200.0	19.48	157.63	3,104.5	-548.5	225.8	593.2	0.00	0.00	0.00
3,300.0	19.48	157.63	3,198.8	-579.4	238.5	626.5	0.00	0.00	0.00
3,400.0	19.48	157.63	3,293.0	-610.2	251.2	659.9	0.00	0.00	0.00
3,500.0	19.48	157.63	3,387.3	-641.0	263.9	693.2	0.00	0.00	0.00
3,600.0	19.48	157.63	3,481.6	-671.9	276.6	726.6	0.00	0.00	0.00
3,700.0	19.48	157.63	3,575.9	-702.7	289.3	759.9	0.00	0.00	0.00
3,800.0	19.48	157.63	3,670.1	-733.6	302.0	793.3	0.00	0.00	0.00
3,900.0	19.48	157.63	3,764.4	-764.4	314.7	826.6	0.00	0.00	0.00
4,000.0	19.48	157.63	3,858.7	-795.3	327.4	860.0	0.00	0.00	0.00
4,100.0	19.48	157.63	3,953.0	-826.1	340.0	893.4	0.00	0.00	0.00
4,200.0	19.48	157.63	4,047.2	-856.9	352.7	926.7	0.00	0.00	0.00
4,300.0	19.48	157.63	4,141.5	-887.8	365.4	960.1	0.00	0.00	0.00
4,400.0	19.48	157.63	4,235.8	-918.6	378.1	993.4	0.00	0.00	0.00
4,500.0	19.48	157.63	4,330.1	-949.5	390.8	1,026.8	0.00	0.00	0.00
4,600.0	19.48	157.63	4,424.3	-980.3	403.5	1,060.1	0.00	0.00	0.00



Well Planning Report



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Project:	Mesa County, CO	MD Reference:	well @ 7665.0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-16E	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)
Williams Fork									
4,659.1	19.48	157.63	4,480.0	-998.5	411.0	1,079.8	0.00	0.00	0.00
4,700.0	19.48	157.63	4,518.6	-1,011.2	416.2	1,093.5	0.00	0.00	0.00
4,800.0	19.48	157.63	4,612.9	-1,042.0	428.9	1,126.8	0.00	0.00	0.00
4,900.0	19.48	157.63	4,707.1	-1,072.8	441.6	1,160.2	0.00	0.00	0.00
5,000.0	19.48	157.63	4,801.4	-1,103.7	454.3	1,193.5	0.00	0.00	0.00
5,100.0	19.48	157.63	4,895.7	-1,134.5	467.0	1,226.9	0.00	0.00	0.00
5,200.0	19.48	157.63	4,990.0	-1,165.4	479.7	1,260.2	0.00	0.00	0.00
Drop 3" / 100'									
5,256.2	19.48	157.63	5,043.0	-1,182.7	486.8	1,279.0	0.00	0.00	0.00
5,300.0	18.17	157.63	5,084.4	-1,195.8	492.2	1,293.1	3.00	-3.00	0.00
5,400.0	15.17	157.63	5,180.2	-1,222.3	503.1	1,321.8	3.00	-3.00	0.00
5,500.0	12.17	157.63	5,277.3	-1,244.2	512.1	1,345.4	3.00	-3.00	0.00
5,600.0	9.17	157.63	5,375.6	-1,261.3	519.2	1,363.9	3.00	-3.00	0.00
5,700.0	6.17	157.63	5,474.7	-1,273.6	524.3	1,377.3	3.00	-3.00	0.00
5,800.0	3.17	157.63	5,574.4	-1,281.1	527.4	1,385.4	3.00	-3.00	0.00
5,900.0	0.17	157.63	5,674.3	-1,283.8	528.5	1,388.4	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,905.7	0.00	0.00	5,680.0	-1,283.8	528.5	1,388.4	3.00	-3.00	0.00
6,000.0	0.00	0.00	5,774.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,100.0	0.00	0.00	5,874.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,200.0	0.00	0.00	5,974.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,300.0	0.00	0.00	6,074.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,400.0	0.00	0.00	6,174.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,500.0	0.00	0.00	6,274.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,600.0	0.00	0.00	6,374.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,700.0	0.00	0.00	6,474.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,574.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
6,900.0	0.00	0.00	6,674.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,000.0	0.00	0.00	6,774.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
Cameo									
7,005.7	0.00	0.00	6,780.0	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,100.0	0.00	0.00	6,874.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,200.0	0.00	0.00	6,974.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,300.0	0.00	0.00	7,074.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,400.0	0.00	0.00	7,174.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,500.0	0.00	0.00	7,274.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,600.0	0.00	0.00	7,374.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
Base Cameo Coal									
7,665.7	0.00	0.00	7,440.0	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,700.0	0.00	0.00	7,474.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
Rollins									
7,705.7	0.00	0.00	7,480.0	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,800.0	0.00	0.00	7,574.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
7,900.0	0.00	0.00	7,674.3	-1,283.8	528.5	1,388.4	0.00	0.00	0.00
TD @ 7955.7' MD / 7730.0' TVD									
7,955.7	0.00	0.00	7,730.0	-1,283.8	528.5	1,388.4	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)
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Well:	Bruton 30-16E	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 30-16E	0.00	0.00	7,730.0	-1,283.8	528.5	1,522,282.49	2,346,706.92	39.244619	-107.807006
- plan hits target center									
- Circle (radius 50.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,518.6	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,696.7	2,630.0	G' Sand			
4,859.1	4,480.0	Williams Fork			
5,905.7	5,680.0	TOG			
7,005.7	6,780.0	Cameo			
7,665.7	7,440.0	Base Cameo Coal			
7,705.7	7,480.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,100.0	1,100.0	0.0	0.0	KOP (Build 3" / 100')
1,749.4	1,737.0	-101.1	41.6	EOB @ 19.48° Inc. / 157.63° Azm
5,256.2	5,043.0	-1,182.7	486.8	Drop 3" / 100'
5,905.7	5,680.0	-1,283.8	528.5	EOD @ Vertical
7,955.7	7,730.0	-1,283.8	528.5	TD @ 7955.7' MD / 7730.0' TVD