



Project: Mesa County, CO
 Site: Bruton 30-01 Pad
 Well: Bruton 19-20E
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.255147
 Longitude: -107.806128
 Ground Level: 7425.0
 well @ 7455.0ustft (H&P #522)



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 19-20E, True North
 Vertical (TVD) Reference: well @ 7455.0ustft (H&P #522)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7455.0ustft (H&P #522)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-20E

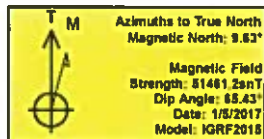
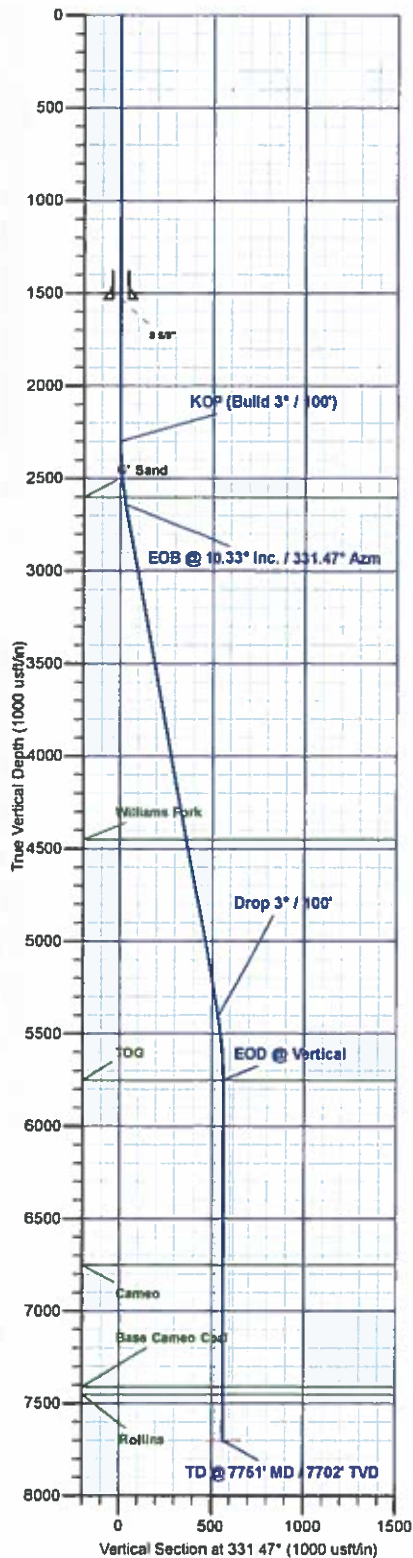
+N/-S	+E/-W	Northing	Ground Level: 7425.0 Easting	Latitude	Longitude
0.0	0.0	1526109.48	2347052.88	39.255147	-107.806128

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BRUTON 19-20E	7702.0	497.5	-270.5	1526613.64	2346795.12	39.256513	-107.807063

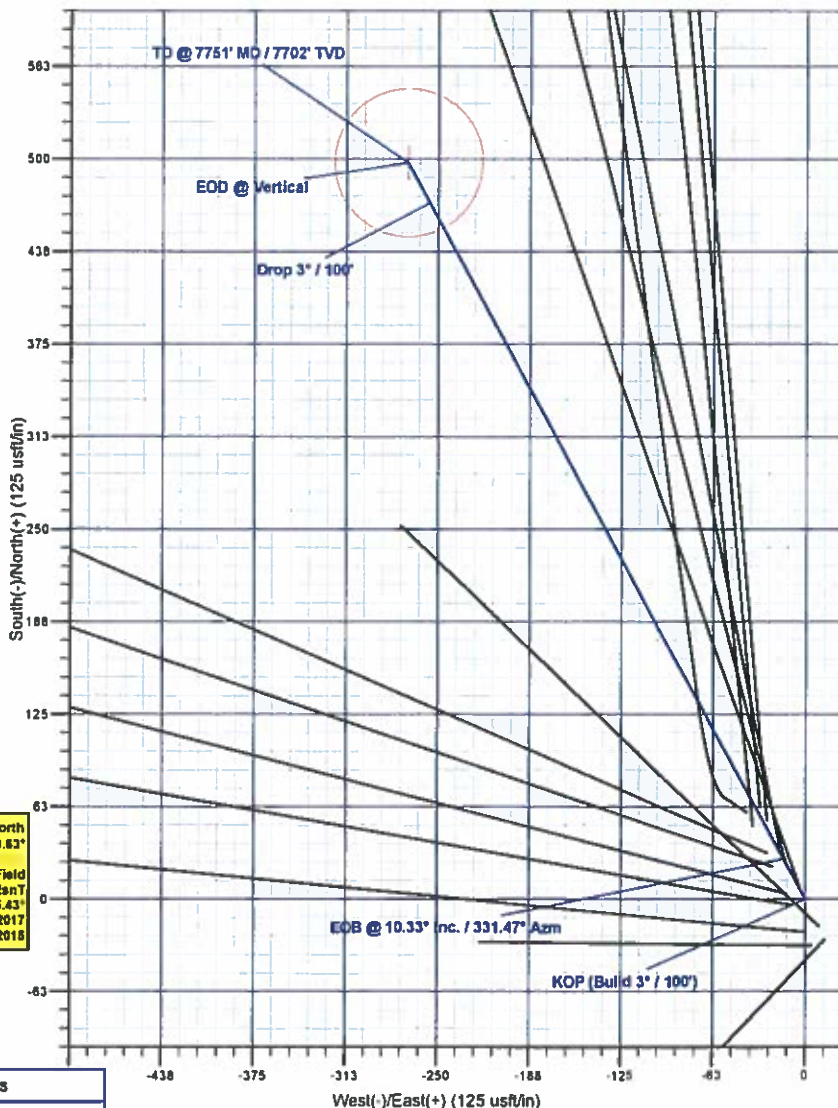
SECTION DETAILS

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	
2300.0	0.00	0.00	2300.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
2644.3	10.33	331.47	2642.4	27.2	-14.8	3.00	331.47	31.0	EOB @ 10.33° Inc. / 331.47° Azm
5457.0	10.33	331.47	5409.5	470.3	-255.7	0.00	0.00	535.3	Drop 3° / 100'
5801.3	0.00	0.00	5752.0	497.5	-270.5	3.00	180.00	566.2	EOD @ Vertical
7751.3	0.00	0.00	7702.0	497.5	-270.5	0.00	0.00	566.2	TD @ 7751' MD / 7702' TVD



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2602.0	2603.3	O' Sand
4452.0	4483.7	Williams Fork
5752.0	5801.3	TOG
5752.0	5801.3	Cameo
7412.0	7461.3	Base Cameo Coal
7452.0	7501.3	Rollins



Plan: Design #1 (Bruton 19-20E/Wellbore #1)

Created By: Will Jirick Date: 16:03, January 09 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-01 Pad

Bruton 19-20E

Wellbore #1

Plan: Design #1

QES Well Planning Report

09 January, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-20E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-20E	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 30-01 Pad			
Site Position:		Northing:	1,526,078.02 usft	Latitude: 39.255061
From:	Lat/Long	Easting:	2,347,056.81 usft	Longitude: -107.806111
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.45 °

Well	Bruton 19-20E			
Well Position	+N/-S	31.4 usft	Northing:	1,526,109.48 usft
	+E/-W	-4.7 usft	Easting:	2,347,052.89 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft
			Ground Level:	7,425.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/5/2017	9.63	65.43	51,461

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	331.47

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	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,644.3	10.33	331.47	2,642.4	27.2	-14.8	3.00	3.00	0.00	331.47	
5,457.0	10.33	331.47	5,409.6	470.3	-255.7	0.00	0.00	0.00	0.00	
5,801.3	0.00	0.00	5,752.0	497.5	-270.5	3.00	-3.00	0.00	180.00	
7,751.3	0.00	0.00	7,702.0	497.5	-270.5	0.00	0.00	0.00	0.00	BRUTON 19-20E



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-20E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-20E	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
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	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
1,530.0	0.00	0.00	1,530.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	3.00	331.47	2,400.0	2.3	-1.3	2.6	3.00	3.00	0.00
2,500.0	6.00	331.47	2,499.6	9.2	-5.0	10.5	3.00	3.00	0.00
2,600.0	9.00	331.47	2,598.8	20.7	-11.2	23.5	3.00	3.00	0.00
G' Sand									
2,603.3	9.10	331.47	2,602.0	21.1	-11.5	24.0	3.00	3.00	0.00
EOB @ 10.33° Inc. / 331.47° Azm									
2,644.3	10.33	331.47	2,642.4	27.2	-14.8	31.0	3.00	3.00	0.00
2,700.0	10.33	331.47	2,697.2	36.0	-19.6	40.9	0.00	0.00	0.00
2,800.0	10.33	331.47	2,795.6	51.7	-28.1	58.9	0.00	0.00	0.00
2,900.0	10.33	331.47	2,894.0	67.5	-36.7	76.8	0.00	0.00	0.00
3,000.0	10.33	331.47	2,992.4	83.2	-45.3	94.7	0.00	0.00	0.00
3,100.0	10.33	331.47	3,090.8	99.0	-53.8	112.7	0.00	0.00	0.00
3,200.0	10.33	331.47	3,189.1	114.7	-62.4	130.6	0.00	0.00	0.00
3,300.0	10.33	331.47	3,287.5	130.5	-70.9	148.5	0.00	0.00	0.00
3,400.0	10.33	331.47	3,385.9	146.2	-79.5	166.5	0.00	0.00	0.00
3,500.0	10.33	331.47	3,484.3	162.0	-88.1	184.4	0.00	0.00	0.00
3,600.0	10.33	331.47	3,582.8	177.7	-96.6	202.3	0.00	0.00	0.00
3,700.0	10.33	331.47	3,681.0	193.5	-105.2	220.2	0.00	0.00	0.00
3,800.0	10.33	331.47	3,779.4	209.2	-113.8	238.2	0.00	0.00	0.00
3,900.0	10.33	331.47	3,877.8	225.0	-122.3	256.1	0.00	0.00	0.00
4,000.0	10.33	331.47	3,976.2	240.7	-130.9	274.0	0.00	0.00	0.00
4,100.0	10.33	331.47	4,074.5	256.5	-139.5	292.0	0.00	0.00	0.00
4,200.0	10.33	331.47	4,172.9	272.3	-148.0	309.9	0.00	0.00	0.00
4,300.0	10.33	331.47	4,271.3	288.0	-156.6	327.8	0.00	0.00	0.00
4,400.0	10.33	331.47	4,369.7	303.8	-165.2	345.8	0.00	0.00	0.00
Williams Fork									
4,483.7	10.33	331.47	4,452.0	316.9	-172.3	360.8	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-20E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-20E	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	10.33	331.47	4,468.1	318.5	-173.7	363.7	0.00	0.00	0.00
4,600.0	10.33	331.47	4,566.4	335.3	-182.3	381.6	0.00	0.00	0.00
4,700.0	10.33	331.47	4,664.8	351.0	-190.9	399.5	0.00	0.00	0.00
4,800.0	10.33	331.47	4,763.2	366.8	-199.4	417.5	0.00	0.00	0.00
4,900.0	10.33	331.47	4,861.6	382.5	-208.0	435.4	0.00	0.00	0.00
5,000.0	10.33	331.47	4,960.0	398.3	-216.6	453.3	0.00	0.00	0.00
5,100.0	10.33	331.47	5,058.3	414.0	-225.1	471.3	0.00	0.00	0.00
5,200.0	10.33	331.47	5,156.7	429.8	-233.7	489.2	0.00	0.00	0.00
5,300.0	10.33	331.47	5,255.1	445.5	-242.2	507.1	0.00	0.00	0.00
5,400.0	10.33	331.47	5,353.5	461.3	-250.8	525.1	0.00	0.00	0.00
Drop 3° / 100'									
5,457.0	10.33	331.47	5,409.6	470.3	-255.7	535.3	0.00	0.00	0.00
5,500.0	9.04	331.47	5,451.9	476.6	-259.2	542.5	3.00	-3.00	0.00
5,600.0	6.04	331.47	5,551.1	488.1	-265.4	555.6	3.00	-3.00	0.00
5,700.0	3.04	331.47	5,650.7	495.1	-269.2	563.5	3.00	-3.00	0.00
5,800.0	0.04	331.47	5,750.7	497.4	-270.5	566.2	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,801.3	0.00	0.00	5,752.0	497.5	-270.5	566.2	3.00	-3.00	0.00
5,900.0	0.00	0.00	5,850.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,000.0	0.00	0.00	5,950.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,100.0	0.00	0.00	6,050.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,200.0	0.00	0.00	6,150.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,300.0	0.00	0.00	6,250.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,400.0	0.00	0.00	6,350.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,500.0	0.00	0.00	6,450.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,600.0	0.00	0.00	6,550.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,700.0	0.00	0.00	6,650.7	497.5	-270.5	566.2	0.00	0.00	0.00
6,800.0	0.00	0.00	6,750.7	497.5	-270.5	566.2	0.00	0.00	0.00
Cameo									
6,801.3	0.00	0.00	6,752.0	497.5	-270.5	566.2	0.00	0.00	0.00
6,900.0	0.00	0.00	6,850.7	497.5	-270.5	566.2	0.00	0.00	0.00
7,000.0	0.00	0.00	6,950.7	497.5	-270.5	566.2	0.00	0.00	0.00
7,100.0	0.00	0.00	7,050.7	497.5	-270.5	566.2	0.00	0.00	0.00
7,200.0	0.00	0.00	7,150.7	497.5	-270.5	566.2	0.00	0.00	0.00
7,300.0	0.00	0.00	7,250.7	497.5	-270.5	566.2	0.00	0.00	0.00
7,400.0	0.00	0.00	7,350.7	497.5	-270.5	566.2	0.00	0.00	0.00
Base Cameo Coal									
7,461.3	0.00	0.00	7,412.0	497.5	-270.5	566.2	0.00	0.00	0.00
7,500.0	0.00	0.00	7,450.7	497.5	-270.5	566.2	0.00	0.00	0.00
Rollins									
7,501.3	0.00	0.00	7,452.0	497.5	-270.5	566.2	0.00	0.00	0.00
7,600.0	0.00	0.00	7,550.7	497.5	-270.5	566.2	0.00	0.00	0.00
7,700.0	0.00	0.00	7,650.7	497.5	-270.5	566.2	0.00	0.00	0.00
TD @ 7751' MD / 7702' TVD									
7,751.3	0.00	0.00	7,702.0	497.5	-270.5	566.2	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-20E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455.0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-20E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BRUTON 19-20E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,702.0	497.5	-270.5	1,526,613.64	2,346,795.12	39.256513	-107.807083

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,530.0	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,603.3	2,602.0	G' Sand			
4,483.7	4,452.0	Williams Fork			
5,801.3	5,752.0	TOG			
6,801.3	6,752.0	Cameo			
7,461.3	7,412.0	Base Cameo Coal			
7,501.3	7,452.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,300.0	2,300.0	0.0	0.0	KOP (Build 3" / 100')
2,644.3	2,642.4	27.2	-14.8	EOB @ 10.33° Inc. / 331.47° Azm
5,457.0	5,409.6	470.3	-255.7	Drop 3" / 100'
5,801.3	5,752.0	497.5	-270.5	EOD @ Vertical
7,751.3	7,702.0	497.5	-270.5	TD @ 7751' MD / 7702' TVD