



Project: Mesa County, CO
 Site: Bruton 30-01 Pad
 Well: Bruton 19-20W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.255136
 Longitude: -107.806158
 Ground Level: 7425.0
 well @ 7455.0usft (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 (NE) Reference: Well Bruton 19-20W, True North
 Vertical (TVD) Reference: well @ 7455.0usft (H&P #522)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7455.0usft (H&P #522)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-20W

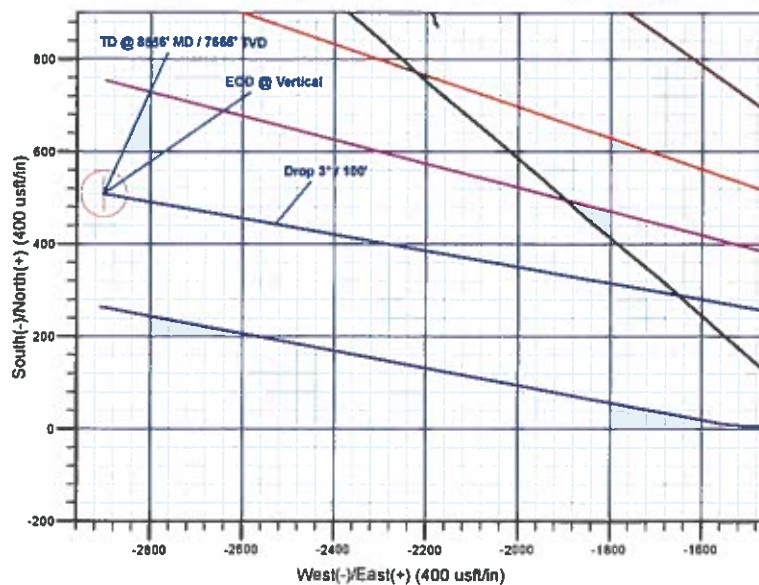
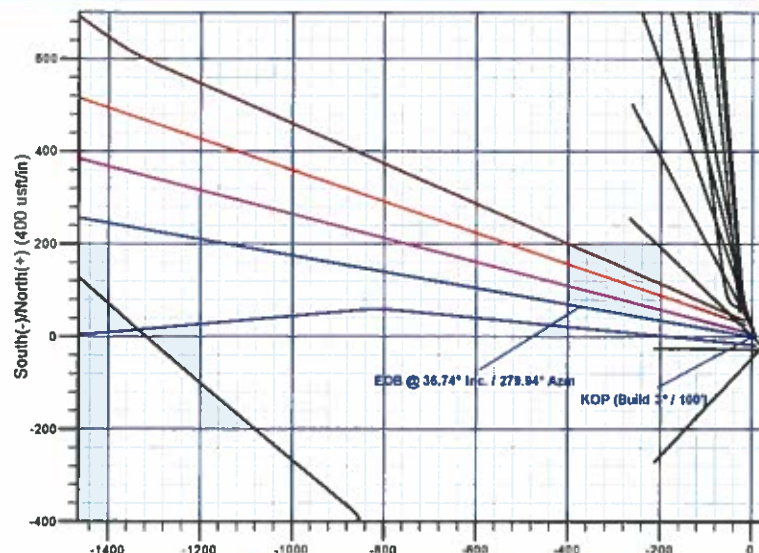
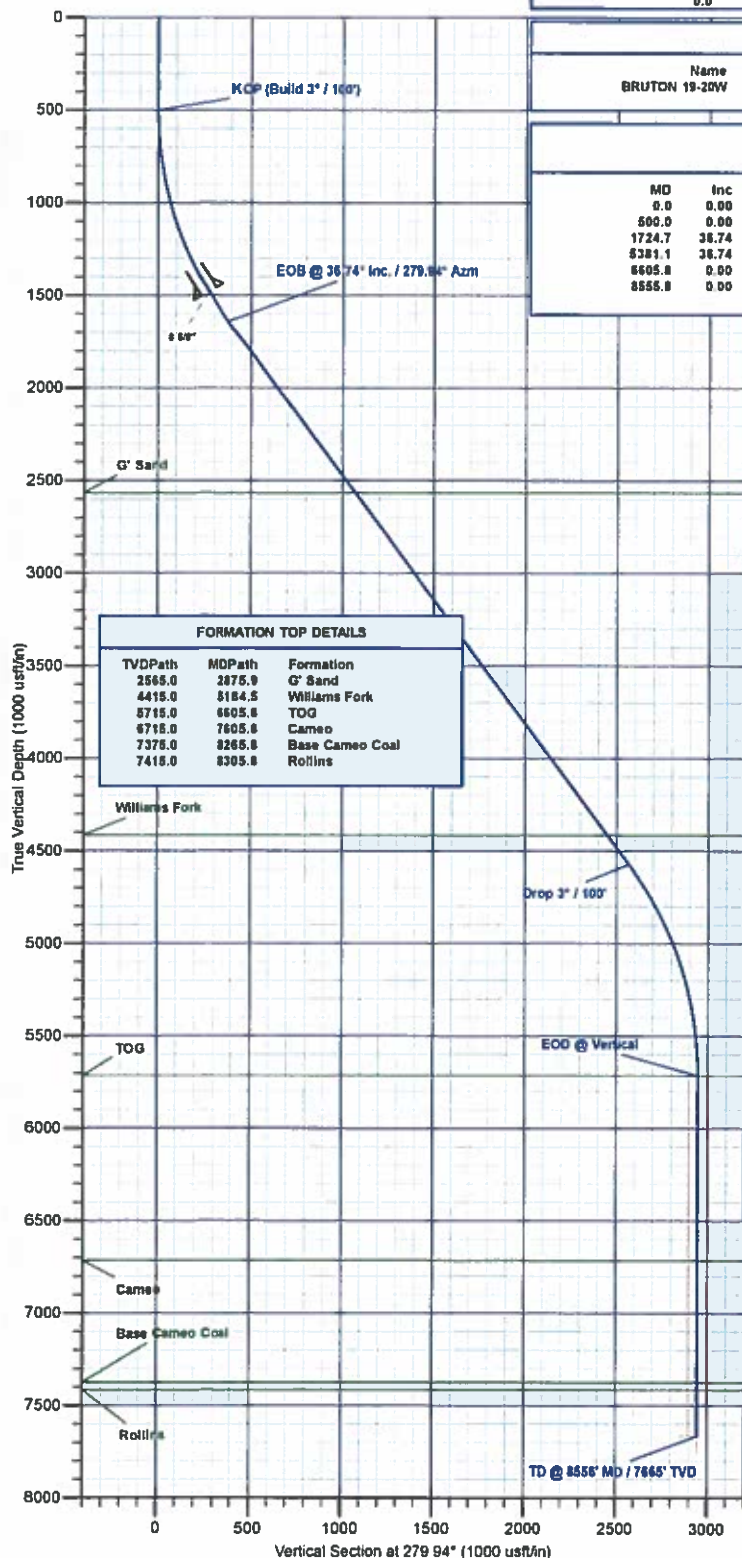
+N/-S	+E/-W	Northing	Ground Level: Easting	7425.0 Latitude	Longitude
0.0	0.0	1526105.85	2347044.13	39.255136	-107.806158

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BRUTON 19-20W	7665.0	508.6	-2901.7	1526687.72	2344156.24	39.256532	-107.816406

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dieg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1724.7	36.74	279.94	1642.4	65.6	-373.7	1.00	279.94	379.4	EOB @ 36.74° Inc. / 279.94° Azm
5381.1	36.74	279.94	4572.6	443.1	-2528.1	0.00	0.00	2566.6	Drop 3° / 100'
5605.8	0.00	0.00	5715.0	508.6	-2901.7	3.00	180.00	2946.0	EOD @ Vertical
8556.8	0.00	0.00	7665.0	508.6	-2901.7	0.00	0.00	2946.0	TD @ 8556' MD / 7665' TVD



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

Created By: Will Jircik Date: 9:43, January 10 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-01 Pad

Bruton 19-20W

Wellbore #1

Plan: Design #1

QES Well Planning Report

10 January, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-20W
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 19-20W	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 19-20W					
Well Position	+N/-S	27.3 usft	Northing:	1,526,105.66 usft	Latitude:	39.255136
	+E/-W	-13.4 usft	Easting:	2,347,044.13 usft	Longitude:	-107.806159
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	279.94

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,724.7	36.74	279.94	1,642.4	65.5	-373.7	3.00	3.00	0.00	279.94	
5,381.1	36.74	279.94	4,572.6	443.1	-2,528.1	0.00	0.00	0.00	0.00	
6,605.8	0.00	0.00	5,715.0	508.6	-2,901.7	3.00	-3.00	0.00	180.00	
8,555.8	0.00	0.00	7,665.0	508.6	-2,901.7	0.00	0.00	0.00	0.00	BRUTON 19-20W



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-20W
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 19-20W	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
KOP (Build 3° / 100')									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	3.00	279.94	600.0	0.5	-2.6	2.6	3.00	3.00	0.00
700.0	6.00	279.94	699.8	1.8	-10.3	10.5	3.00	3.00	0.00
800.0	9.00	279.94	798.8	4.1	-23.2	23.5	3.00	3.00	0.00
900.0	12.00	279.94	897.1	7.2	-41.1	41.7	3.00	3.00	0.00
1,000.0	15.00	279.94	994.3	11.2	-64.1	65.1	3.00	3.00	0.00
1,100.0	18.00	279.94	1,090.2	16.1	-92.1	93.5	3.00	3.00	0.00
1,200.0	21.00	279.94	1,184.4	21.9	-124.9	126.9	3.00	3.00	0.00
1,300.0	24.00	279.94	1,276.8	28.5	-162.6	165.1	3.00	3.00	0.00
1,400.0	27.00	279.94	1,367.1	35.9	-205.0	208.2	3.00	3.00	0.00
1,500.0	30.00	279.94	1,454.9	44.2	-252.0	255.9	3.00	3.00	0.00
8 5/8"									
1,530.0	30.90	279.94	1,480.8	46.8	-267.0	271.1	3.00	3.00	0.00
1,600.0	33.00	279.94	1,540.2	53.2	-303.5	308.1	3.00	3.00	0.00
1,700.0	36.00	279.94	1,622.6	63.0	-359.3	364.8	3.00	3.00	0.00
EOB @ 36.74° Inc. / 279.94° Azm									
1,724.7	36.74	279.94	1,642.4	65.5	-373.7	379.4	3.00	3.00	0.00
1,800.0	36.74	279.94	1,702.8	73.3	-418.1	424.4	0.00	0.00	0.00
1,900.0	36.74	279.94	1,783.0	83.6	-477.0	484.3	0.00	0.00	0.00
2,000.0	36.74	279.94	1,863.1	93.9	-535.9	544.1	0.00	0.00	0.00
2,100.0	36.74	279.94	1,943.2	104.3	-594.8	603.9	0.00	0.00	0.00
2,200.0	36.74	279.94	2,023.4	114.6	-653.7	663.7	0.00	0.00	0.00
2,300.0	36.74	279.94	2,103.5	124.9	-712.7	723.5	0.00	0.00	0.00
2,400.0	36.74	279.94	2,183.6	135.2	-771.6	783.4	0.00	0.00	0.00
2,500.0	36.74	279.94	2,263.8	145.6	-830.5	843.2	0.00	0.00	0.00
2,600.0	36.74	279.94	2,343.9	155.9	-889.4	903.0	0.00	0.00	0.00
2,700.0	36.74	279.94	2,424.0	166.2	-948.4	962.8	0.00	0.00	0.00
2,800.0	36.74	279.94	2,504.2	176.5	-1,007.3	1,022.6	0.00	0.00	0.00
G' Sand									
2,875.9	36.74	279.94	2,565.0	184.4	-1,052.0	1,068.0	0.00	0.00	0.00
2,900.0	36.74	279.94	2,584.3	186.9	-1,066.2	1,082.4	0.00	0.00	0.00
3,000.0	36.74	279.94	2,664.4	197.2	-1,125.1	1,142.3	0.00	0.00	0.00
3,100.0	36.74	279.94	2,744.6	207.5	-1,184.0	1,202.1	0.00	0.00	0.00
3,200.0	36.74	279.94	2,824.7	217.8	-1,243.0	1,261.9	0.00	0.00	0.00
3,300.0	36.74	279.94	2,904.9	228.2	-1,301.9	1,321.7	0.00	0.00	0.00
3,400.0	36.74	279.94	2,985.0	238.5	-1,360.8	1,381.5	0.00	0.00	0.00
3,500.0	36.74	279.94	3,065.1	248.8	-1,419.7	1,441.4	0.00	0.00	0.00
3,600.0	36.74	279.94	3,145.3	259.2	-1,478.6	1,501.2	0.00	0.00	0.00
3,700.0	36.74	279.94	3,225.4	269.5	-1,537.6	1,561.0	0.00	0.00	0.00
3,800.0	36.74	279.94	3,305.5	279.8	-1,596.5	1,620.8	0.00	0.00	0.00
3,900.0	36.74	279.94	3,385.7	290.1	-1,655.4	1,680.6	0.00	0.00	0.00
4,000.0	36.74	279.94	3,465.8	300.5	-1,714.3	1,740.4	0.00	0.00	0.00
4,100.0	36.74	279.94	3,545.9	310.8	-1,773.2	1,800.3	0.00	0.00	0.00
4,200.0	36.74	279.94	3,626.1	321.1	-1,832.2	1,860.1	0.00	0.00	0.00
4,300.0	36.74	279.94	3,706.2	331.4	-1,891.1	1,919.9	0.00	0.00	0.00
4,400.0	36.74	279.94	3,786.4	341.8	-1,950.0	1,979.7	0.00	0.00	0.00
4,500.0	36.74	279.94	3,866.5	352.1	-2,008.9	2,039.5	0.00	0.00	0.00
4,600.0	36.74	279.94	3,946.6	362.4	-2,067.8	2,099.4	0.00	0.00	0.00



Well Planning Report



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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 19-20W	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	36.74	279.94	4,026.8	372.8	-2,126.8	2,159.2	0.00	0.00	0.00
4,800.0	36.74	279.94	4,106.9	383.1	-2,185.7	2,219.0	0.00	0.00	0.00
4,900.0	36.74	279.94	4,187.0	393.4	-2,244.6	2,278.8	0.00	0.00	0.00
5,000.0	36.74	279.94	4,267.2	403.7	-2,303.5	2,338.6	0.00	0.00	0.00
5,100.0	36.74	279.94	4,347.3	414.1	-2,362.4	2,398.4	0.00	0.00	0.00
Williams Fork									
5,184.5	36.74	279.94	4,415.0	422.8	-2,412.2	2,449.0	0.00	0.00	0.00
5,200.0	36.74	279.94	4,427.4	424.4	-2,421.4	2,458.3	0.00	0.00	0.00
5,300.0	36.74	279.94	4,507.6	434.7	-2,480.3	2,518.1	0.00	0.00	0.00
Drop 3° / 100'									
5,381.1	36.74	279.94	4,572.6	443.1	-2,528.1	2,566.6	0.00	0.00	0.00
5,400.0	36.17	279.94	4,587.8	445.0	-2,539.1	2,577.8	3.00	-3.00	0.00
5,500.0	33.17	279.94	4,670.0	454.8	-2,595.2	2,634.7	3.00	-3.00	0.00
5,600.0	30.17	279.94	4,755.1	463.9	-2,646.9	2,687.2	3.00	-3.00	0.00
5,700.0	27.17	279.94	4,842.8	472.2	-2,694.1	2,735.2	3.00	-3.00	0.00
5,800.0	24.17	279.94	4,932.9	479.7	-2,736.8	2,778.5	3.00	-3.00	0.00
5,900.0	21.17	279.94	5,025.2	486.3	-2,774.7	2,817.0	3.00	-3.00	0.00
6,000.0	18.17	279.94	5,119.4	492.1	-2,807.9	2,850.7	3.00	-3.00	0.00
6,100.0	15.17	279.94	5,215.1	497.1	-2,836.2	2,879.4	3.00	-3.00	0.00
6,200.0	12.17	279.94	5,312.3	501.2	-2,859.4	2,903.0	3.00	-3.00	0.00
6,300.0	9.17	279.94	5,410.6	504.4	-2,877.7	2,921.5	3.00	-3.00	0.00
6,400.0	6.17	279.94	5,509.6	506.7	-2,890.8	2,934.9	3.00	-3.00	0.00
6,500.0	3.17	279.94	5,609.3	508.1	-2,898.9	2,943.0	3.00	-3.00	0.00
6,600.0	0.17	279.94	5,709.2	508.6	-2,901.7	2,946.0	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,605.8	0.00	0.00	5,715.0	508.6	-2,901.7	2,946.0	3.00	-3.00	1,391.98
6,700.0	0.00	0.00	5,809.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
6,800.0	0.00	0.00	5,909.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,009.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,000.0	0.00	0.00	6,109.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,100.0	0.00	0.00	6,209.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,200.0	0.00	0.00	6,309.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,300.0	0.00	0.00	6,409.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,400.0	0.00	0.00	6,509.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,500.0	0.00	0.00	6,609.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,600.0	0.00	0.00	6,709.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
Cameo									
7,605.8	0.00	0.00	6,715.0	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,700.0	0.00	0.00	6,809.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,800.0	0.00	0.00	6,909.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,009.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
8,000.0	0.00	0.00	7,109.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
8,100.0	0.00	0.00	7,209.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
8,200.0	0.00	0.00	7,309.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
Base Cameo Coal									
8,265.8	0.00	0.00	7,375.0	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
8,300.0	0.00	0.00	7,409.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
Rollins									
8,305.8	0.00	0.00	7,415.0	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
8,400.0	0.00	0.00	7,509.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
8,500.0	0.00	0.00	7,609.2	508.6	-2,901.7	2,946.0	0.00	0.00	0.00
TD @ 8556' MD / 7665' TVD									
8,555.8	0.00	0.00	7,665.0	508.6	-2,901.7	2,946.0	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-20W
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 19-20W	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)

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									
BRUTON 19-20W	0.00	0.00	7,665.0	508.6	-2,901.7	1,526,687.73	2,344,156.24	39.256532	-107.816406
- plan hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,530.0	1,480.8	8 5/8"	8-5/8	11	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,875.9	2,565.0	G' Sand				
5,184.5	4,415.0	Williams Fork				
6,605.8	5,715.0	TOG				
7,605.8	6,715.0	Cameo				
8,265.8	7,375.0	Base Cameo Coal				
8,305.8	7,415.0	Rollins				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
500.0	500.0	0.0	0.0	KOP (Build 3° / 100')	
1,724.7	1,642.4	65.5	-373.7	EOB @ 36.74° Inc. / 279.94° Azm	
5,381.1	4,572.6	443.1	-2,528.1	Drop 3° / 100'	
6,605.8	5,715.0	508.6	-2,901.7	EOD @ Vertical	
8,555.8	7,665.0	508.6	-2,901.7	TD @ 8556' MD / 7665' TVD	