



Project: Mesa County, CO  
 Site: Bruton 19-06 Pad  
 Well: Bruton 19-08W  
 Wellbore: Wellbore #1  
 Design: Design #2  
 Latitude: 39.262672  
 Longitude: -107.815061  
 Ground Level: 7262.0  
 well @ 7286.0usft (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 19-08W, True North  
 Vertical (TVD) Reference: well @ 7286.0usft (H&P #290)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7286.0usft (H&P #290)  
 Calculation Method: Minimum Curvature

**WELL DETAILS: Bruton 19-08W**

+N-S	+E-W	Northing	Ground Level: Easting	7262.0 Latitude	Longitude
0.0	0.0	1528986.40	2344595.80	39.262672	-107.815061

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

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 19-08W	7586.0	640.3	-462.1	1528938.27	2344150.21	39.264630	-107.816693

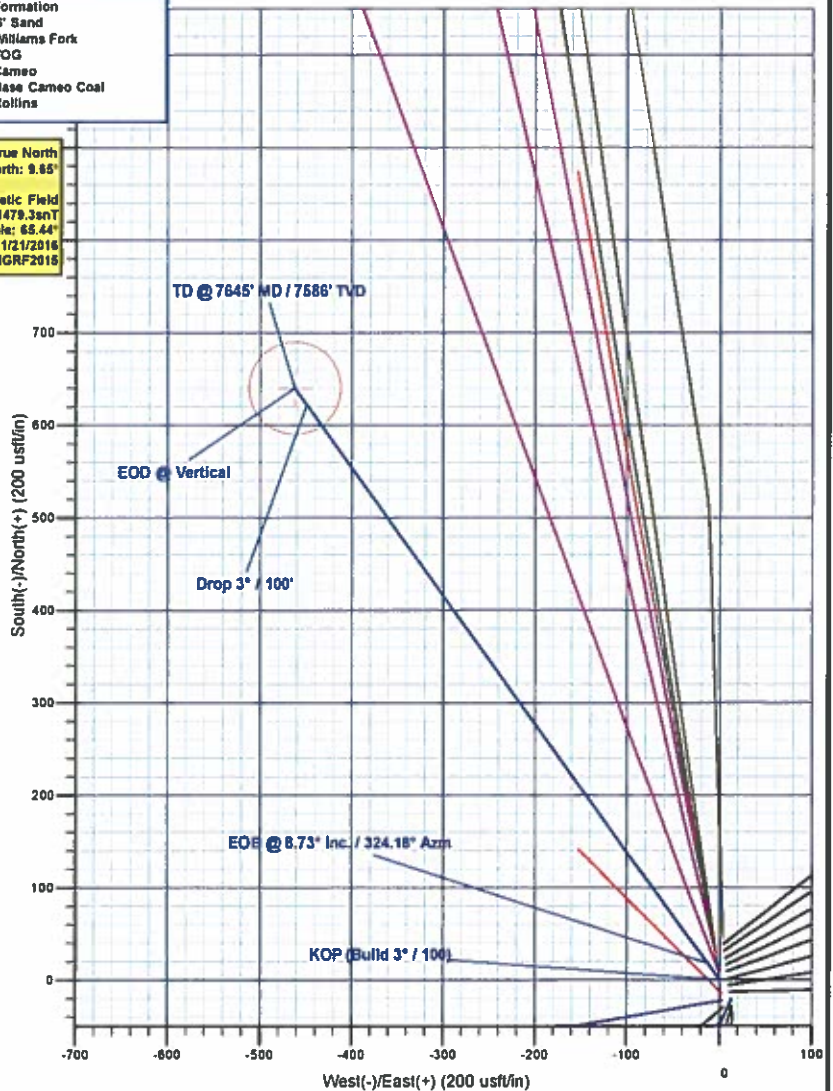
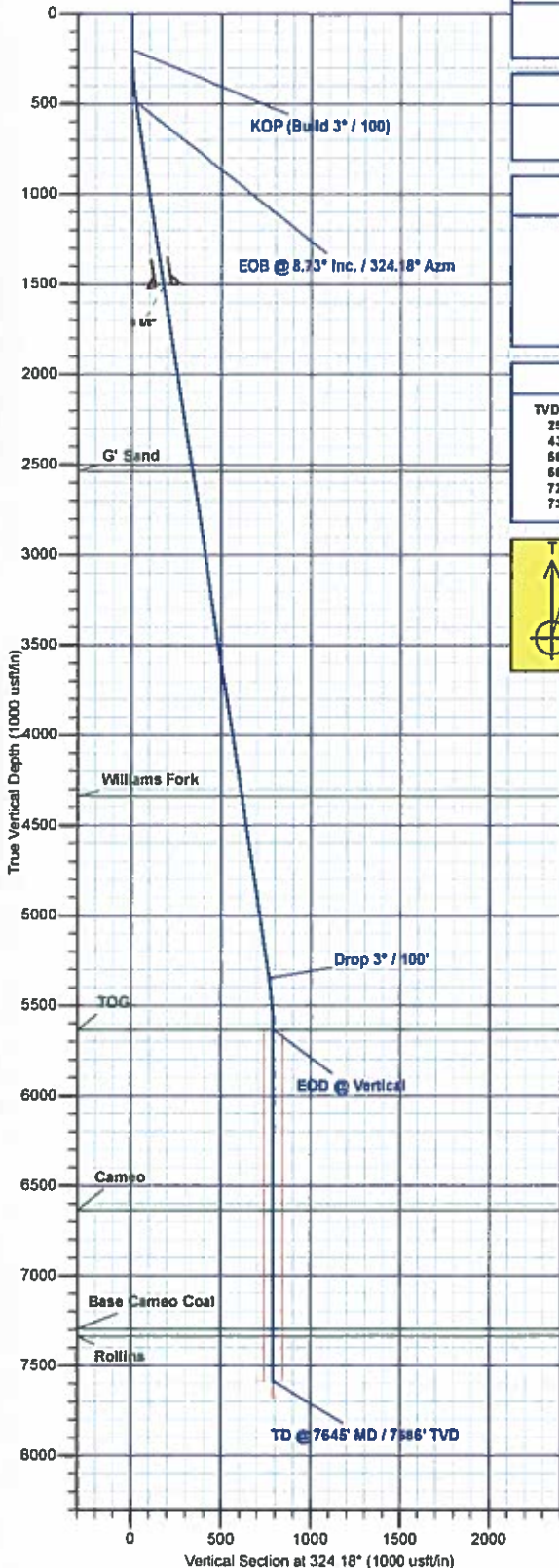
**SECTION DETAILS**

MD	Inc	Azi	TVD	+N-S	+E-W	Dip	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)
480.9	8.73	324.18	489.7	17.9	-12.9	3.00	324.18	22.1	EOB @ 8.73° Inc. / 324.18° Azm
5404.3	8.73	324.18	5346.3	622.4	-449.1	0.00	0.00	0.00	Drop 3° / 100'
5685.1	0.00	0.00	5636.0	640.3	-462.1	3.00	180.00	789.6	EOD @ Vertical
7645.1	0.00	0.00	7586.0	640.3	-462.1	0.00	0.00	789.6	TD @ 7645' MD / 7586' TVD

**FORMATION TOP DETAILS**

TVDPath	MDPath	Formation
2536.0	2561.1	G' Sand
4336.0	4382.2	Williams Fork
5636.0	5685.1	TOG
6636.0	6695.1	Cameo
7296.0	7355.1	Base Cameo Coal
7336.0	7395.1	Rollins

**T M**  
 Azimuths to True North  
 Magnetic North: 9.65°  
 Magnetic Field  
 Strength: 51479.3nT  
 Dip Angle: 65.44°  
 Data: 11/21/2016  
 Model: IGRF2016



Plan: Design #2 (Bruton 19-08W/Wellbore #1)

Created By: Will Jircik Date: 11:44, March 01 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 19-06 Pad**

**Bruton 19-08W**

**Wellbore #1**

**Plan: Design #2**

## **QES Well Planning Report**

**01 March, 2017**





Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-08W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Site:</b>	Bruton 19-06 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-08W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

<b>Project</b>	Mesa County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

<b>Site</b>	Bruton 19-06 Pad				
<b>Site Position:</b>	<b>Northing:</b>	1,528,940.55 usft	<b>Latitude:</b>	39.262756	
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,344,737.10 usft	<b>Longitude:</b>	-107.814558
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-1.46 *

<b>Well</b>	Bruton 19-08W					
<b>Well Position</b>	<b>+N/-S</b>	42.2 usft	<b>Northing:</b>	1,528,986.40 usft	<b>Latitude:</b>	39.262872
	<b>+E/-W</b>	-142.4 usft	<b>Easting:</b>	2,344,595.81 usft	<b>Longitude:</b>	-107.815061
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	0.0 usft	<b>Ground Level:</b>	7,262.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
	IGRF2015	11/21/2016	(°)	(°)	(nT)
			9.65	65.44	51,479

<b>Design</b>	Design #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	324.18

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFD (°)	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	
490.9	8.73	324.18	489.7	17.9	-12.9	3.00	3.00	0.00	324.18	
5,404.3	8.73	324.18	5,346.3	622.4	-449.1	0.00	0.00	0.00	0.00	
5,695.1	0.00	0.00	5,636.0	640.3	-462.1	3.00	-3.00	0.00	180.00	
7,645.1	0.00	0.00	7,586.0	640.3	-462.1	0.00	0.00	0.00	0.00	PBHL - Bruton 19-08W



Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-08W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7286 0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7286 0usft (H&P #290)
<b>Site:</b>	Bruton 19-08 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-08W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

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
<b>KOP (Build 3° / 100)</b>									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	324.18	300.0	2.1	-1.5	2.6	3.00	3.00	0.00
400.0	6.00	324.18	399.6	8.5	-6.1	10.5	3.00	3.00	0.00
<b>EOB @ 8.73° Inc. / 324.18° Azm</b>									
490.9	8.73	324.18	489.8	17.9	-12.9	22.1	3.00	3.00	0.00
500.0	8.73	324.18	498.8	19.0	-13.7	23.5	0.00	0.00	0.00
600.0	8.73	324.18	597.6	31.4	-22.6	38.7	0.00	0.00	0.00
700.0	8.73	324.18	696.5	43.7	-31.5	53.8	0.00	0.00	0.00
800.0	8.73	324.18	795.3	56.0	-40.4	69.0	0.00	0.00	0.00
900.0	8.73	324.18	894.1	68.3	-49.3	84.2	0.00	0.00	0.00
1,000.0	8.73	324.18	993.0	80.6	-58.1	99.3	0.00	0.00	0.00
1,100.0	8.73	324.18	1,091.8	92.9	-67.0	114.5	0.00	0.00	0.00
1,200.0	8.73	324.18	1,190.7	105.2	-75.9	129.7	0.00	0.00	0.00
1,300.0	8.73	324.18	1,289.5	117.5	-84.8	144.9	0.00	0.00	0.00
1,400.0	8.73	324.18	1,388.4	129.8	-93.6	160.0	0.00	0.00	0.00
1,500.0	8.73	324.18	1,487.2	142.1	-102.5	175.2	0.00	0.00	0.00
<b>8 5/8"</b>									
1,524.0	8.73	324.18	1,510.9	145.0	-104.7	178.8	0.00	0.00	0.00
1,600.0	8.73	324.18	1,586.0	154.4	-111.4	190.4	0.00	0.00	0.00
1,700.0	8.73	324.18	1,684.9	166.7	-120.3	205.5	0.00	0.00	0.00
1,800.0	8.73	324.18	1,783.7	179.0	-129.2	220.7	0.00	0.00	0.00
1,900.0	8.73	324.18	1,882.6	191.3	-138.0	235.9	0.00	0.00	0.00
2,000.0	8.73	324.18	1,981.4	203.6	-146.9	251.1	0.00	0.00	0.00
2,100.0	8.73	324.18	2,080.3	215.9	-155.8	266.2	0.00	0.00	0.00
2,200.0	8.73	324.18	2,179.1	228.2	-164.7	281.4	0.00	0.00	0.00
2,300.0	8.73	324.18	2,277.9	240.5	-173.5	296.6	0.00	0.00	0.00
2,400.0	8.73	324.18	2,376.8	252.8	-182.4	311.7	0.00	0.00	0.00
2,500.0	8.73	324.18	2,475.6	265.1	-191.3	326.9	0.00	0.00	0.00
<b>G' Sand</b>									
2,561.1	8.73	324.18	2,536.0	272.6	-196.7	336.2	0.00	0.00	0.00
2,600.0	8.73	324.18	2,574.5	277.4	-200.2	342.1	0.00	0.00	0.00
2,700.0	8.73	324.18	2,673.3	289.7	-209.1	357.3	0.00	0.00	0.00
2,800.0	8.73	324.18	2,772.1	302.0	-217.9	372.4	0.00	0.00	0.00
2,900.0	8.73	324.18	2,871.0	314.3	-226.8	387.6	0.00	0.00	0.00
3,000.0	8.73	324.18	2,969.8	326.6	-235.7	402.8	0.00	0.00	0.00
3,100.0	8.73	324.18	3,068.7	338.9	-244.6	417.9	0.00	0.00	0.00
3,200.0	8.73	324.18	3,167.5	351.2	-253.4	433.1	0.00	0.00	0.00
3,300.0	8.73	324.18	3,266.4	363.5	-262.3	448.3	0.00	0.00	0.00
3,400.0	8.73	324.18	3,365.2	375.8	-271.2	463.4	0.00	0.00	0.00
3,500.0	8.73	324.18	3,464.0	388.1	-280.1	478.6	0.00	0.00	0.00
3,600.0	8.73	324.18	3,562.9	400.4	-289.0	493.8	0.00	0.00	0.00
3,700.0	8.73	324.18	3,661.7	412.7	-297.8	509.0	0.00	0.00	0.00
3,800.0	8.73	324.18	3,760.6	425.0	-306.7	524.1	0.00	0.00	0.00
3,900.0	8.73	324.18	3,859.4	437.3	-315.6	539.3	0.00	0.00	0.00
4,000.0	8.73	324.18	3,958.3	449.6	-324.5	554.5	0.00	0.00	0.00
4,100.0	8.73	324.18	4,057.1	461.9	-333.3	569.6	0.00	0.00	0.00
4,200.0	8.73	324.18	4,155.9	474.2	-342.2	584.8	0.00	0.00	0.00
4,300.0	8.73	324.18	4,254.8	486.5	-351.1	600.0	0.00	0.00	0.00
<b>Williams Fork</b>									
4,382.2	8.73	324.18	4,336.0	496.6	-358.4	612.5	0.00	0.00	0.00
4,400.0	8.73	324.18	4,353.6	498.8	-360.0	615.2	0.00	0.00	0.00



Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-08W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Site:</b>	Bruton 19-06 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-08W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

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	8.73	324.18	4,452.5	511.1	-368.9	630.3	0.00	0.00	0.00	
4,600.0	8.73	324.18	4,551.3	523.4	-377.7	645.5	0.00	0.00	0.00	
4,700.0	8.73	324.18	4,650.2	535.7	-386.6	660.7	0.00	0.00	0.00	
4,800.0	8.73	324.18	4,749.0	548.0	-395.5	675.8	0.00	0.00	0.00	
4,900.0	8.73	324.18	4,847.8	560.3	-404.4	691.0	0.00	0.00	0.00	
5,000.0	8.73	324.18	4,946.7	572.7	-413.2	706.2	0.00	0.00	0.00	
5,100.0	8.73	324.18	5,045.5	585.0	-422.1	721.4	0.00	0.00	0.00	
5,200.0	8.73	324.18	5,144.4	597.3	-431.0	736.5	0.00	0.00	0.00	
5,300.0	8.73	324.18	5,243.2	609.6	-439.9	751.7	0.00	0.00	0.00	
5,400.0	8.73	324.18	5,342.1	621.9	-448.8	766.9	0.00	0.00	0.00	
<b>Drop 3" / 100'</b>										
5,404.3	8.73	324.18	5,346.3	622.4	-449.1	767.5	0.00	0.00	0.00	
5,500.0	5.85	324.18	5,441.2	632.2	-456.2	779.7	3.00	-3.00	0.00	
5,600.0	2.85	324.18	5,540.9	638.4	-460.7	787.3	3.00	-3.00	0.00	
<b>EOD @ Vertical - TOG</b>										
5,695.1	0.00	0.00	5,636.0	640.3	-462.1	789.6	3.00	-3.00	0.00	
5,700.0	0.00	0.00	5,640.9	640.3	-462.1	789.6	0.00	0.00	0.00	
5,800.0	0.00	0.00	5,740.9	640.3	-462.1	789.6	0.00	0.00	0.00	
5,900.0	0.00	0.00	5,840.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,000.0	0.00	0.00	5,940.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,100.0	0.00	0.00	6,040.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,200.0	0.00	0.00	6,140.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,300.0	0.00	0.00	6,240.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,340.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,440.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,540.9	640.3	-462.1	789.6	0.00	0.00	0.00	
<b>Cameo</b>										
6,695.1	0.00	0.00	6,636.0	640.3	-462.1	789.6	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,640.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,740.9	640.3	-462.1	789.6	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,840.9	640.3	-462.1	789.6	0.00	0.00	0.00	
7,000.0	0.00	0.00	6,940.9	640.3	-462.1	789.6	0.00	0.00	0.00	
7,100.0	0.00	0.00	7,040.9	640.3	-462.1	789.6	0.00	0.00	0.00	
7,200.0	0.00	0.00	7,140.9	640.3	-462.1	789.6	0.00	0.00	0.00	
7,300.0	0.00	0.00	7,240.9	640.3	-462.1	789.6	0.00	0.00	0.00	
<b>Base Cameo Coal</b>										
7,355.1	0.00	0.00	7,296.0	640.3	-462.1	789.6	0.00	0.00	0.00	
<b>Rollins</b>										
7,395.1	0.00	0.00	7,336.0	640.3	-462.1	789.6	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,340.9	640.3	-462.1	789.6	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,440.9	640.3	-462.1	789.6	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,540.9	640.3	-462.1	789.6	0.00	0.00	0.00	
<b>TD @ 7645' MD / 7586' TVD</b>										
7,645.1	0.00	0.00	7,586.0	640.3	-462.1	789.6	0.00	0.00	0.00	



Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-08W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Site:</b>	Bruton 19-06 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-08W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PBHL - Bruton 19-08W - plan hits target center - Circle (radius 50 0)	0.00	0.00	7,586.0	640.3	-462.1	1,529,638.28	2,344,150.21	39.264630	-107.816693

Casing Points					
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter	
(usft)	(usft)		(")	(")	
1,524.0	1,510.9	8 5/8"	8-5/8	11	

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
2,561.1	2,536.0	G' Sand				
4,382.2	4,336.0	Williams Fork				
5,695.1	5,636.0	TOG				
6,695.1	6,636.0	Cameo				
7,355.1	7,296.0	Base Cameo Coal				
7,395.1	7,336.0	Rollins				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
200.0	200.0	0.0	0.0	KOP (Build 3" / 100)	
490.9	489.8	17.9	-12.9	EOB @ 8.73° Inc. / 324 18° Azm	
5,404.3	5,346.3	622.4	-449.1	Drop 3" / 100'	
5,695.1	5,636.0	640.3	-462.1	EOD @ Vertical	
7,645.1	7,586.0	640.3	-462.1	TD @ 7645' MD / 7586' TVD	