



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton 30-17E
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248119
 Longitude: -107.808856
 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 30-17E, 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 30-17E

+N/-S	+E/-W	Northing	Ground Level: 7643.0	Eastng	Latitude	Longitude
0.0	0.0	1523570.12		2346215.54	39.248119	-107.808856

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Eastng	Latitude	Longitude
PBHL - Bruton 30-17E	8365.0	-1525.0	521.7	1522032.40	2346698.30	39.243922	-107.807014

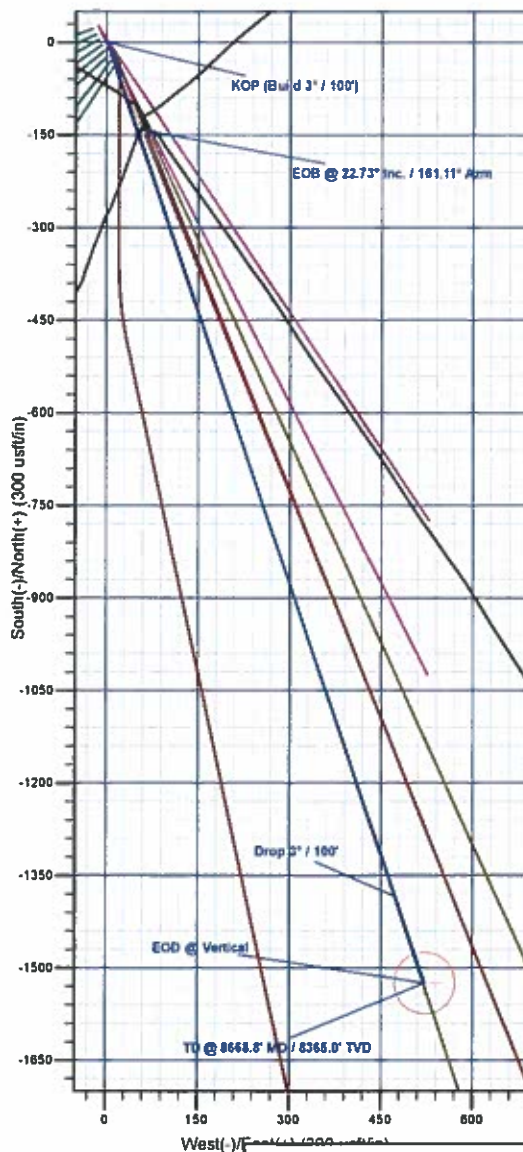
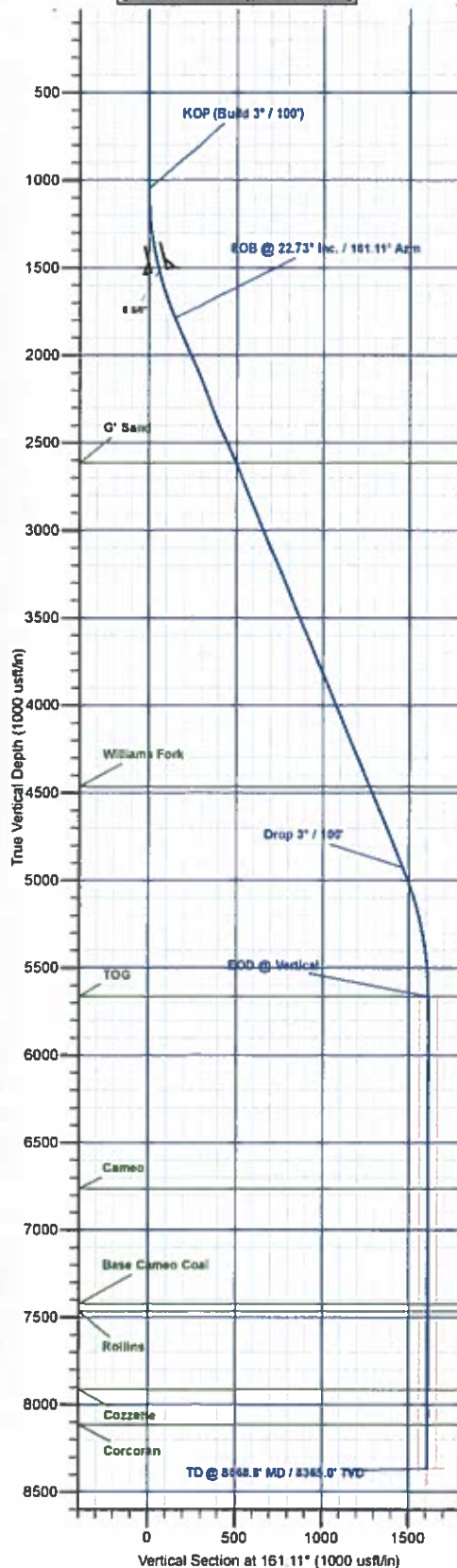
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
1050.0	0.00	0.00	1050.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1807.7	22.73	161.11	1788.0	-140.3	48.0	3.00	161.11	148.3	EOB @ 22.73° Inc. / 161.11° Azm
5211.1	22.73	161.11	4927.0	-1384.6	473.7	0.00	0.00	1463.4	Drop 3° / 100'
5968.8	0.00	0.00	5665.0	-1525.0	521.7	3.00	180.00	1611.7	EOD @ Vertical
8668.8	0.00	0.00	8365.0	-1525.0	521.7	0.00	0.00	1611.7	TD @ 8668.8' MD / 8365.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2618.0	2704.4	G' Sand
4465.0	4710.1	Williams Fork
5655.0	5968.8	TOG
6765.0	7068.8	Cameo
7425.0	7728.8	Base Cameo Coal
7465.0	7768.8	Rollins
7915.0	8218.8	Cozzette
8115.0	8418.8	Corcoran

Asimuths to True North
 Magnetic North: 9.58°
 Magnetic Field
 Strength: 51397.5nT
 Dip Angle: 55.42°
 Date: 7/14/2017
 Model: IGRF2015



Plan: Design #1 (Bruton 30-17E/Wellbore #1)

Created By: Will Jircik Date: 8:51, July 17 2017



Laramie Energy, LLC

**Mesa County, CO
Bruton 30-10 Pad
Bruton 30-17E**

Wellbore #1

Plan: Design #1

QES Well Planning Report

17 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-17E
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 30-17E	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 30-17E			
Well Position	+N-S	143.6 usft	Northing:	1,523,570.13 usft
	+E-W	-79.9 usft	Easting:	2,346,215.54 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	161.11

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	
1,050.0	0.00	0.00	1,050.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,807.7	22.73	161.11	1,788.0	-140.3	48.0	3.00	3.00	0.00	161.11	
5,211.1	22.73	161.11	4,927.0	-1,384.6	473.7	0.00	0.00	0.00	0.00	
5,968.8	0.00	0.00	5,665.0	-1,525.0	521.7	3.00	-3.00	0.00	180.00	
8,668.8	0.00	0.00	8,365.0	-1,525.0	521.7	0.00	0.00	0.00	0.00	PBHL - Bruton 30-17E



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-17E
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 30-17E	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')									
1,050.0	0.00	0.00	1,050.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	1.50	161.11	1,100.0	-0.6	0.2	0.7	3.00	3.00	0.00
1,200.0	4.50	161.11	1,199.8	-5.6	1.9	5.9	3.00	3.00	0.00
1,300.0	7.50	161.11	1,299.3	-15.5	5.3	16.3	3.00	3.00	0.00
1,400.0	10.50	161.11	1,398.0	-30.3	10.4	32.0	3.00	3.00	0.00
1,500.0	13.50	161.11	1,495.8	-49.9	17.1	52.8	3.00	3.00	0.00
8 5/8"									
1,522.0	14.16	161.11	1,517.2	-54.9	18.8	58.0	3.00	3.00	0.00
1,600.0	16.50	161.11	1,592.4	-74.4	25.5	78.6	3.00	3.00	0.00
1,700.0	19.50	161.11	1,687.5	-103.6	35.5	109.5	3.00	3.00	0.00
1,800.0	22.50	161.11	1,780.9	-137.6	47.1	145.4	3.00	3.00	0.00
EOB @ 22.73° Inc. / 161.11° Azm									
1,807.7	22.73	161.11	1,788.0	-140.3	48.0	148.3	3.00	3.00	0.00
1,900.0	22.73	161.11	1,873.1	-174.1	59.6	184.0	0.00	0.00	0.00
2,000.0	22.73	161.11	1,965.3	-210.7	72.1	222.6	0.00	0.00	0.00
2,100.0	22.73	161.11	2,057.6	-247.2	84.6	261.3	0.00	0.00	0.00
2,200.0	22.73	161.11	2,149.8	-283.8	97.1	299.9	0.00	0.00	0.00
2,300.0	22.73	161.11	2,242.0	-320.3	109.6	338.6	0.00	0.00	0.00
2,400.0	22.73	161.11	2,334.3	-356.9	122.1	377.2	0.00	0.00	0.00
2,500.0	22.73	161.11	2,426.5	-393.5	134.6	415.8	0.00	0.00	0.00
2,600.0	22.73	161.11	2,518.7	-430.0	147.1	454.5	0.00	0.00	0.00
2,700.0	22.73	161.11	2,611.0	-466.6	159.6	493.1	0.00	0.00	0.00
G' Sand									
2,704.4	22.73	161.11	2,615.0	-468.2	160.2	494.8	0.00	0.00	0.00
2,800.0	22.73	161.11	2,703.2	-503.1	172.1	531.8	0.00	0.00	0.00
2,900.0	22.73	161.11	2,795.4	-539.7	184.6	570.4	0.00	0.00	0.00
3,000.0	22.73	161.11	2,887.7	-576.3	197.1	609.0	0.00	0.00	0.00
3,100.0	22.73	161.11	2,979.9	-612.8	209.6	647.7	0.00	0.00	0.00
3,200.0	22.73	161.11	3,072.1	-649.4	222.1	686.3	0.00	0.00	0.00
3,300.0	22.73	161.11	3,164.4	-685.9	234.7	725.0	0.00	0.00	0.00
3,400.0	22.73	161.11	3,256.6	-722.5	247.2	763.6	0.00	0.00	0.00
3,500.0	22.73	161.11	3,348.8	-759.0	259.7	802.2	0.00	0.00	0.00
3,600.0	22.73	161.11	3,441.1	-795.6	272.2	840.9	0.00	0.00	0.00
3,700.0	22.73	161.11	3,533.3	-832.2	284.7	879.5	0.00	0.00	0.00
3,800.0	22.73	161.11	3,625.5	-868.7	297.2	918.2	0.00	0.00	0.00
3,900.0	22.73	161.11	3,717.8	-905.3	309.7	956.8	0.00	0.00	0.00
4,000.0	22.73	161.11	3,810.0	-941.8	322.2	995.4	0.00	0.00	0.00
4,100.0	22.73	161.11	3,902.2	-978.4	334.7	1,034.1	0.00	0.00	0.00
4,200.0	22.73	161.11	3,994.5	-1,015.0	347.2	1,072.7	0.00	0.00	0.00
4,300.0	22.73	161.11	4,086.7	-1,051.5	359.7	1,111.3	0.00	0.00	0.00
4,400.0	22.73	161.11	4,178.9	-1,088.1	372.2	1,150.0	0.00	0.00	0.00
4,500.0	22.73	161.11	4,271.2	-1,124.6	384.7	1,188.6	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 30-17E	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)
4,600.0	22.73	161.11	4,363.4	-1,161.2	397.2	1,227.3	0.00	0.00	0.00
4,700.0	22.73	161.11	4,455.6	-1,197.8	409.7	1,265.9	0.00	0.00	0.00
Williams Fork									
4,710.1	22.73	161.11	4,465.0	-1,201.5	411.0	1,269.8	0.00	0.00	0.00
4,800.0	22.73	161.11	4,547.9	-1,234.3	422.3	1,304.5	0.00	0.00	0.00
4,900.0	22.73	161.11	4,640.1	-1,270.9	434.8	1,343.2	0.00	0.00	0.00
5,000.0	22.73	161.11	4,732.3	-1,307.4	447.3	1,381.8	0.00	0.00	0.00
5,100.0	22.73	161.11	4,824.6	-1,344.0	459.8	1,420.5	0.00	0.00	0.00
5,200.0	22.73	161.11	4,916.8	-1,380.6	472.3	1,459.1	0.00	0.00	0.00
Drop 3° / 100'									
5,211.1	22.73	161.11	4,927.0	-1,384.6	473.7	1,463.4	0.00	0.00	0.00
5,300.0	20.06	161.11	5,009.8	-1,415.3	484.2	1,495.8	3.00	-3.00	0.00
5,400.0	17.06	161.11	5,104.6	-1,445.4	494.5	1,527.7	3.00	-3.00	0.00
5,500.0	14.06	161.11	5,200.9	-1,470.8	503.1	1,554.5	3.00	-3.00	0.00
5,600.0	11.06	161.11	5,298.5	-1,491.4	510.2	1,576.2	3.00	-3.00	0.00
5,700.0	8.06	161.11	5,397.1	-1,507.1	515.6	1,592.8	3.00	-3.00	0.00
5,800.0	5.06	161.11	5,496.5	-1,517.9	519.3	1,604.3	3.00	-3.00	0.00
5,900.0	2.06	161.11	5,596.2	-1,523.8	521.3	1,610.5	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,968.8	0.00	0.00	5,665.0	-1,525.0	521.7	1,611.7	3.00	-3.00	0.00
6,000.0	0.00	0.00	5,696.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,100.0	0.00	0.00	5,796.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,200.0	0.00	0.00	5,896.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,300.0	0.00	0.00	5,996.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,400.0	0.00	0.00	6,096.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,500.0	0.00	0.00	6,196.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,600.0	0.00	0.00	6,296.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,700.0	0.00	0.00	6,396.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,496.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
6,900.0	0.00	0.00	6,596.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,696.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
Cameo									
7,068.8	0.00	0.00	6,765.0	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,100.0	0.00	0.00	6,796.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,200.0	0.00	0.00	6,896.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,300.0	0.00	0.00	6,996.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,400.0	0.00	0.00	7,096.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,500.0	0.00	0.00	7,196.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,600.0	0.00	0.00	7,296.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,700.0	0.00	0.00	7,396.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
Base Cameo Coal									
7,728.8	0.00	0.00	7,425.0	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
Rollins									
7,768.8	0.00	0.00	7,465.0	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,800.0	0.00	0.00	7,496.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
7,900.0	0.00	0.00	7,596.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
8,000.0	0.00	0.00	7,696.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
8,100.0	0.00	0.00	7,796.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
8,200.0	0.00	0.00	7,896.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
Cozzette									
8,218.8	0.00	0.00	7,915.0	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
8,300.0	0.00	0.00	7,996.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
8,400.0	0.00	0.00	8,096.2	-1,525.0	521.7	1,611.7	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 30-17E	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)
Corcoran									
8,418.8	0.00	0.00	8,115.0	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
8,500.0	0.00	0.00	8,196.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
8,600.0	0.00	0.00	8,296.2	-1,525.0	521.7	1,611.7	0.00	0.00	0.00
TD @ 8668.8' MD / 8365.0' TVD									
8,668.8	0.00	0.00	8,365.0	-1,525.0	521.7	1,611.7	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 30-17E	0.00	0.00	8,365.0	-1,525.0	521.7	1,522,032.41	2,346,698.30	39.243932	-107.807014
- plan hits target center									
- Circle (radius 50.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,517.2	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,704.4	2,615.0	G' Sand			
4,710.1	4,465.0	Williams Fork			
5,968.8	5,665.0	TOG			
7,068.8	6,765.0	Cameo			
7,728.8	7,425.0	Base Cameo Coal			
7,768.8	7,465.0	Rollins			
8,218.8	7,915.0	Cozzette			
8,418.8	8,115.0	Corcoran			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,050.0	1,050.0	0.0	0.0	KOP (Build 3" / 100')
1,807.7	1,788.0	-140.3	48.0	EOB @ 22.73° Inc. / 161.11° Azm
5,211.1	4,927.0	-1,384.6	473.7	Drop 3" / 100'
5,968.8	5,665.0	-1,525.0	521.7	EOD @ Vertical
8,668.8	8,365.0	-1,525.0	521.7	TD @ 8668.8' MD / 8365.0' TVD