



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton 30-14W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248178
 Longitude: -107.808939
 Ground Level: 7643.0
 well @ 7665.0usft (22' KB)



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 30-14W, True North
 Vertical (TVD) Reference: well @ 7665.0usft (22' KB)
 Section (V/S) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7665.0usft (22' KB)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 30-14W

Ground Level: 7643.0
 +N-S +E-W Northing Easting Latitude Longitude
 0.0 0.0 1523592.13 2346192.62 39.248178 -107.808939

DESIGN TARGET DETAILS

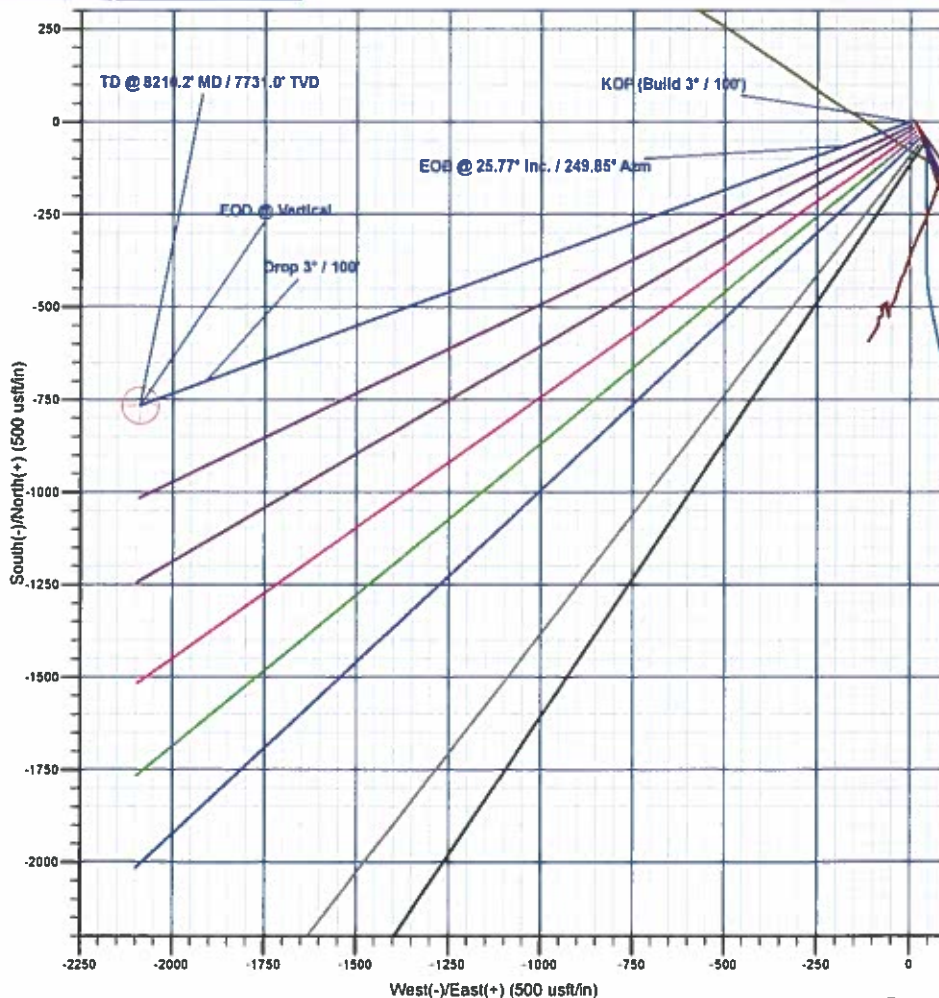
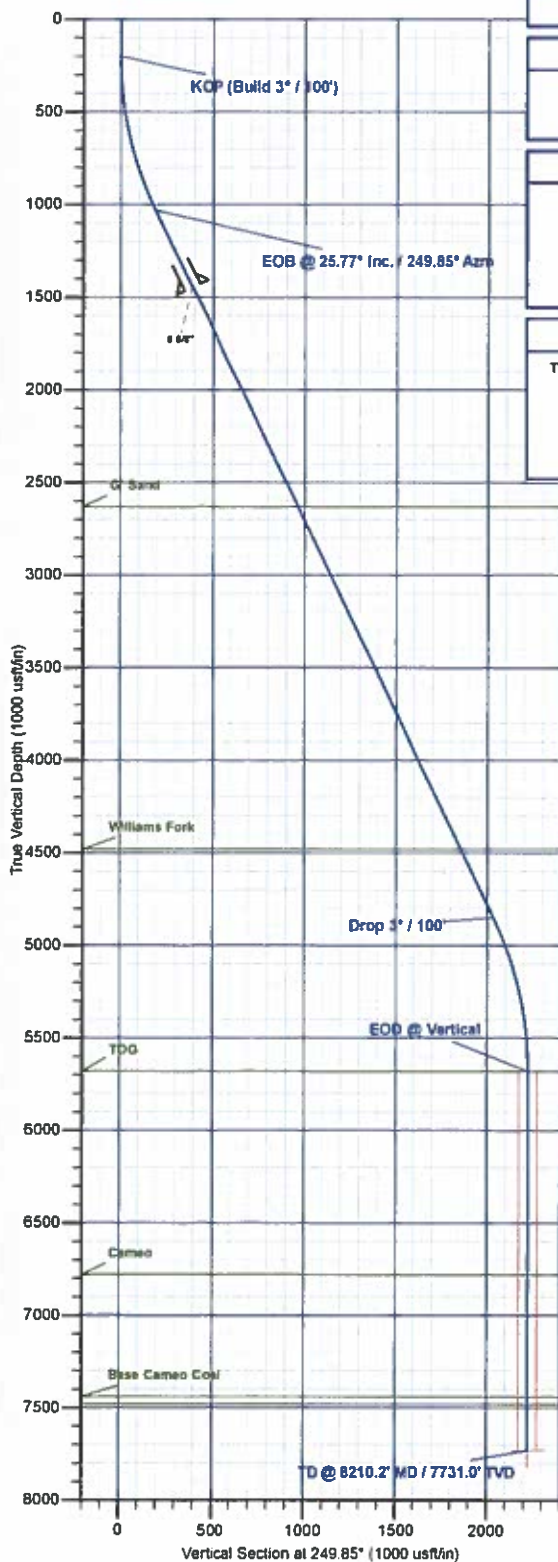
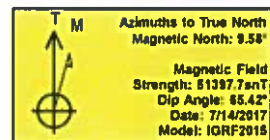
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-14W	7731.0	-766.1	-2088.1	1522879.30	2344085.74	39.248074	-107.816312

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VFace	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	EOB @ 25.77° Inc. / 249.85° Azm
1059.0	25.77	249.85	1030.3	-85.4	-178.3	3.00	249.85	189.9	KOP (Build 3° / 100')
5301.2	25.77	249.85	4850.7	-700.7	-1909.8	0.00	0.00	2034.3	EOB @ 25.77° Inc. / 249.85° Azm
6160.2	0.00	0.00	5681.0	-766.1	-2088.1	3.00	180.00	2224.2	Drop 3° / 100'
8210.2	0.00	0.00	7731.0	-766.1	-2088.1	0.00	0.00	2224.2	TD @ Vertical
									TD @ 8210.2' MD / 7731.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2631.0	2836.4	G' Sand
4481.0	4890.7	Williams Fork
5681.0	6160.2	TOG
6781.0	7260.2	Cameo
7441.0	7920.2	Base Cameo Coal
7481.0	7960.2	Rollins



Plan: Design #1 (Bruton 30-14W/Wellbore #1)

Created By: Will Jircik Date: 16:09, July 14 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton 30-14W

Wellbore #1

Plan: Design #1

QES Well Planning Report

14 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-14W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665.0usft (22' KB)
Project:	Mesa County, CO	MD Reference:	well @ 7665.0usft (22' KB)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-14W	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 30-14W			
Well Position	+N-S	165.0 usft	Northing:	1,523,592.13 usft
	+E-W	-103.4 usft	Easting:	2,346,192.62 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	249.85

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,059.0	25.77	249.85	1,030.3	-65.4	-178.3	3.00	3.00	0.00	249.85	
5,301.2	25.77	249.85	4,850.7	-700.7	-1,909.8	0.00	0.00	0.00	0.00	
6,160.2	0.00	0.00	5,681.0	-766.1	-2,088.1	3.00	-3.00	0.00	180.00	
8,210.2	0.00	0.00	7,731.0	-766.1	-2,088.1	0.00	0.00	0.00	0.00	PBHL - Bruton 30-14W



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-14W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665 0usft (22' KB)
Project:	Mesa County, CO	MD Reference:	well @ 7665 0usft (22' KB)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-14W	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
KOP (Build 3° / 100')									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	249.85	300.0	-0.9	-2.5	2.6	3.00	3.00	0.00
400.0	6.00	249.85	399.6	-3.6	-9.8	10.5	3.00	3.00	0.00
500.0	9.00	249.85	498.8	-8.1	-22.1	23.5	3.00	3.00	0.00
600.0	12.00	249.85	597.1	-14.4	-39.2	41.7	3.00	3.00	0.00
700.0	15.00	249.85	694.3	-22.4	-61.1	65.1	3.00	3.00	0.00
800.0	18.00	249.85	790.2	-32.2	-87.8	93.5	3.00	3.00	0.00
900.0	21.00	249.85	884.4	-43.7	-119.1	126.9	3.00	3.00	0.00
1,000.0	24.00	249.85	976.8	-56.9	-155.0	165.1	3.00	3.00	0.00
EOB @ 25.77° Inc. / 249.85° Azm									
1,059.0	25.77	249.85	1,030.3	-65.4	-178.3	189.9	3.00	3.00	0.00
1,100.0	25.77	249.85	1,067.3	-71.6	-195.1	207.8	0.00	0.00	0.00
1,200.0	25.77	249.85	1,157.3	-86.5	-235.9	251.2	0.00	0.00	0.00
1,300.0	25.77	249.85	1,247.4	-101.5	-276.7	294.7	0.00	0.00	0.00
1,400.0	25.77	249.85	1,337.4	-116.5	-317.5	338.2	0.00	0.00	0.00
1,500.0	25.77	249.85	1,427.5	-131.5	-358.3	381.7	0.00	0.00	0.00
8 5/8"									
1,522.0	25.77	249.85	1,447.3	-134.8	-367.3	391.2	0.00	0.00	0.00
1,600.0	25.77	249.85	1,517.5	-146.4	-399.1	425.1	0.00	0.00	0.00
1,700.0	25.77	249.85	1,607.6	-161.4	-439.9	468.6	0.00	0.00	0.00
1,800.0	25.77	249.85	1,697.6	-176.4	-480.8	512.1	0.00	0.00	0.00
1,900.0	25.77	249.85	1,787.7	-191.4	-521.6	555.6	0.00	0.00	0.00
2,000.0	25.77	249.85	1,877.7	-206.3	-562.4	599.0	0.00	0.00	0.00
2,100.0	25.77	249.85	1,967.8	-221.3	-603.2	642.5	0.00	0.00	0.00
2,200.0	25.77	249.85	2,057.9	-236.3	-644.0	686.0	0.00	0.00	0.00
2,300.0	25.77	249.85	2,147.9	-251.3	-684.8	729.5	0.00	0.00	0.00
2,400.0	25.77	249.85	2,238.0	-266.2	-725.6	772.9	0.00	0.00	0.00
2,500.0	25.77	249.85	2,328.0	-281.2	-766.5	816.4	0.00	0.00	0.00
2,600.0	25.77	249.85	2,418.1	-296.2	-807.3	859.9	0.00	0.00	0.00
2,700.0	25.77	249.85	2,508.1	-311.2	-848.1	903.4	0.00	0.00	0.00
2,800.0	25.77	249.85	2,598.2	-326.1	-888.9	946.8	0.00	0.00	0.00
G' Sand									
2,836.4	25.77	249.85	2,631.0	-331.6	-903.8	982.7	0.00	0.00	0.00
2,900.0	25.77	249.85	2,688.2	-341.1	-929.7	990.3	0.00	0.00	0.00
3,000.0	25.77	249.85	2,778.3	-356.1	-970.5	1,033.8	0.00	0.00	0.00
3,100.0	25.77	249.85	2,868.4	-371.1	-1,011.3	1,077.3	0.00	0.00	0.00
3,200.0	25.77	249.85	2,958.4	-386.0	-1,052.2	1,120.7	0.00	0.00	0.00
3,300.0	25.77	249.85	3,048.5	-401.0	-1,093.0	1,164.2	0.00	0.00	0.00
3,400.0	25.77	249.85	3,138.5	-416.0	-1,133.8	1,207.7	0.00	0.00	0.00
3,500.0	25.77	249.85	3,228.6	-431.0	-1,174.6	1,251.2	0.00	0.00	0.00
3,600.0	25.77	249.85	3,318.6	-445.9	-1,215.4	1,294.6	0.00	0.00	0.00
3,700.0	25.77	249.85	3,408.7	-460.9	-1,256.2	1,338.1	0.00	0.00	0.00
3,800.0	25.77	249.85	3,498.7	-475.9	-1,297.0	1,381.6	0.00	0.00	0.00
3,900.0	25.77	249.85	3,588.8	-490.9	-1,337.9	1,425.1	0.00	0.00	0.00
4,000.0	25.77	249.85	3,678.8	-505.8	-1,378.7	1,468.5	0.00	0.00	0.00
4,100.0	25.77	249.85	3,768.9	-520.8	-1,419.5	1,512.0	0.00	0.00	0.00
4,200.0	25.77	249.85	3,859.0	-535.8	-1,460.3	1,555.5	0.00	0.00	0.00
4,300.0	25.77	249.85	3,949.0	-550.8	-1,501.1	1,599.0	0.00	0.00	0.00
4,400.0	25.77	249.85	4,039.1	-565.7	-1,541.9	1,642.4	0.00	0.00	0.00
4,500.0	25.77	249.85	4,129.1	-580.7	-1,582.7	1,685.9	0.00	0.00	0.00
4,600.0	25.77	249.85	4,219.2	-595.7	-1,623.6	1,729.4	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-14W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665 0usft (22' KB)
Project:	Mesa County, CO	MD Reference:	well @ 7665 0usft (22' KB)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-14W	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	25.77	249.85	4,309.2	-610.7	-1,664.4	1,772.9	0.00	0.00	0.00
4,800.0	25.77	249.85	4,399.3	-625.7	-1,705.2	1,816.3	0.00	0.00	0.00
Williams Fork									
4,890.7	25.77	249.85	4,481.0	-639.2	-1,742.2	1,855.8	0.00	0.00	0.00
4,900.0	25.77	249.85	4,489.3	-640.6	-1,746.0	1,859.8	0.00	0.00	0.00
5,000.0	25.77	249.85	4,579.4	-655.6	-1,786.8	1,903.3	0.00	0.00	0.00
5,100.0	25.77	249.85	4,669.5	-670.6	-1,827.6	1,946.8	0.00	0.00	0.00
5,200.0	25.77	249.85	4,759.5	-685.6	-1,868.4	1,990.2	0.00	0.00	0.00
5,300.0	25.77	249.85	4,849.6	-700.5	-1,909.3	2,033.7	0.00	0.00	0.00
Drop 3° / 100'									
5,301.2	25.77	249.85	4,850.7	-700.7	-1,909.8	2,034.3	0.00	0.00	0.00
5,400.0	22.81	249.85	4,940.7	-714.7	-1,947.9	2,074.9	3.00	-3.00	0.00
5,500.0	19.81	249.85	5,033.8	-727.2	-1,982.0	2,111.2	3.00	-3.00	0.00
5,600.0	16.81	249.85	5,128.8	-738.0	-2,011.5	2,142.6	3.00	-3.00	0.00
5,700.0	13.81	249.85	5,225.2	-747.1	-2,036.3	2,169.0	3.00	-3.00	0.00
5,800.0	10.81	249.85	5,322.9	-754.5	-2,056.3	2,190.3	3.00	-3.00	0.00
5,900.0	7.81	249.85	5,421.6	-760.0	-2,071.5	2,206.5	3.00	-3.00	0.00
6,000.0	4.81	249.85	5,521.0	-763.8	-2,081.8	2,217.5	3.00	-3.00	0.00
6,100.0	1.81	249.85	5,620.8	-765.8	-2,087.2	2,223.2	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,160.2	0.00	0.00	5,681.0	-766.1	-2,088.1	2,224.2	3.00	-3.00	182.89
6,200.0	0.00	0.00	5,720.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
6,300.0	0.00	0.00	5,820.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
6,400.0	0.00	0.00	5,920.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
6,500.0	0.00	0.00	6,020.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
6,600.0	0.00	0.00	6,120.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
6,700.0	0.00	0.00	6,220.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
6,800.0	0.00	0.00	6,320.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
6,900.0	0.00	0.00	6,420.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,000.0	0.00	0.00	6,520.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,100.0	0.00	0.00	6,620.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,200.0	0.00	0.00	6,720.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
Cameo									
7,260.2	0.00	0.00	6,781.0	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,300.0	0.00	0.00	6,820.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,400.0	0.00	0.00	6,920.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,500.0	0.00	0.00	7,020.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,600.0	0.00	0.00	7,120.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,700.0	0.00	0.00	7,220.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,800.0	0.00	0.00	7,320.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
7,900.0	0.00	0.00	7,420.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
Base Cameo Coal									
7,920.2	0.00	0.00	7,441.0	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
Rollins									
7,960.2	0.00	0.00	7,481.0	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
8,000.0	0.00	0.00	7,520.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
8,100.0	0.00	0.00	7,620.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
8,200.0	0.00	0.00	7,720.8	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00
TD @ 8210.2' MD / 7731.0' TVD									
8,210.2	0.00	0.00	7,731.0	-766.1	-2,088.1	2,224.2	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-14W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665.0usft (22' KB)
Project:	Mesa County, CO	MD Reference:	well @ 7665.0usft (22' KB)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-14W	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
PBHL - Bruton 30-14W - plan hits target center - Point	0.00	0.00	7,731.0	-766.1	-2,088.1	1,522,879.31	2,344,085.74	39.246074	-107.816312

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,447.3	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,836.4	2,631.0	G' Sand			
4,890.7	4,481.0	Williams Fork			
6,160.2	5,681.0	TOG			
7,260.2	6,781.0	Cameo			
7,920.2	7,441.0	Base Cameo Coal			
7,960.2	7,481.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	200.0	0.0	0.0	KOP (Build 3" / 100')
1,059.0	1,030.3	-65.4	-178.3	EOB @ 25.77° Inc. / 249.85° Azm
5,301.2	4,850.7	-700.7	-1,909.8	Drop 3" / 100'
6,160.2	5,681.0	-766.1	-2,088.1	EOD @ Vertical
8,210.2	7,731.0	-766.1	-2,088.1	TD @ 8210.2' MD / 7731.0' TVD