



Project: Mesa County, CO
 Site: Bruton 30-03 Pad
 Well: Bruton 30-04W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.252692
 Longitude: -107.814294
 Ground Level: 7512.0
 well @ 7534.0ust (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 (NE) Reference: Well Bruton 30-04W, True North
 Vertical (TVD) Reference: well @ 7534.0ust (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7534.0ust (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 30-04W

Ground Level: 7512.0
 +N-S +E-W Northing Easting Latitude Longitude
 0.0 0.0 1525274.33 2344718.46 39.252692 -107.814294

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-04W	8352.0	89.2	-549.4	1525377.55	2344171.55	39.252937	-107.816234

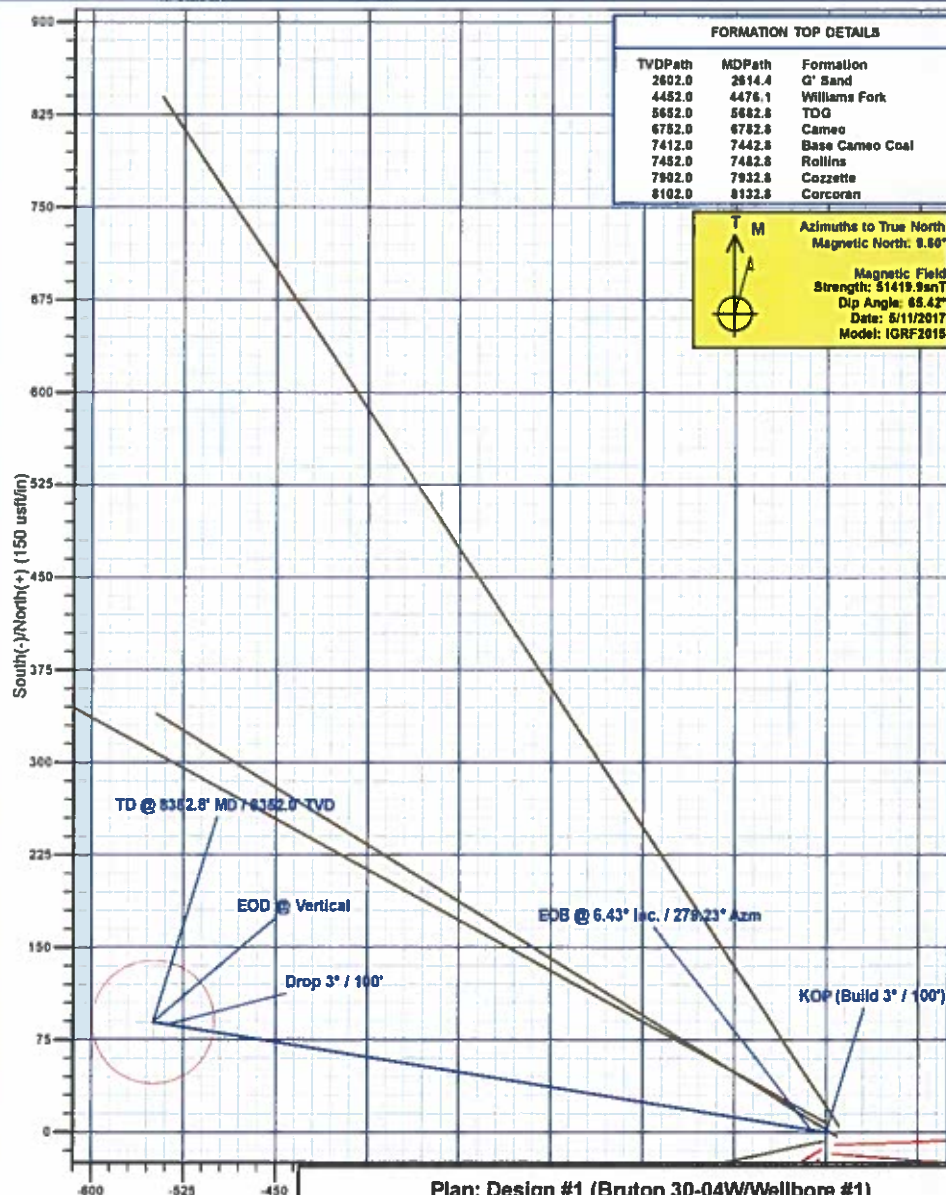
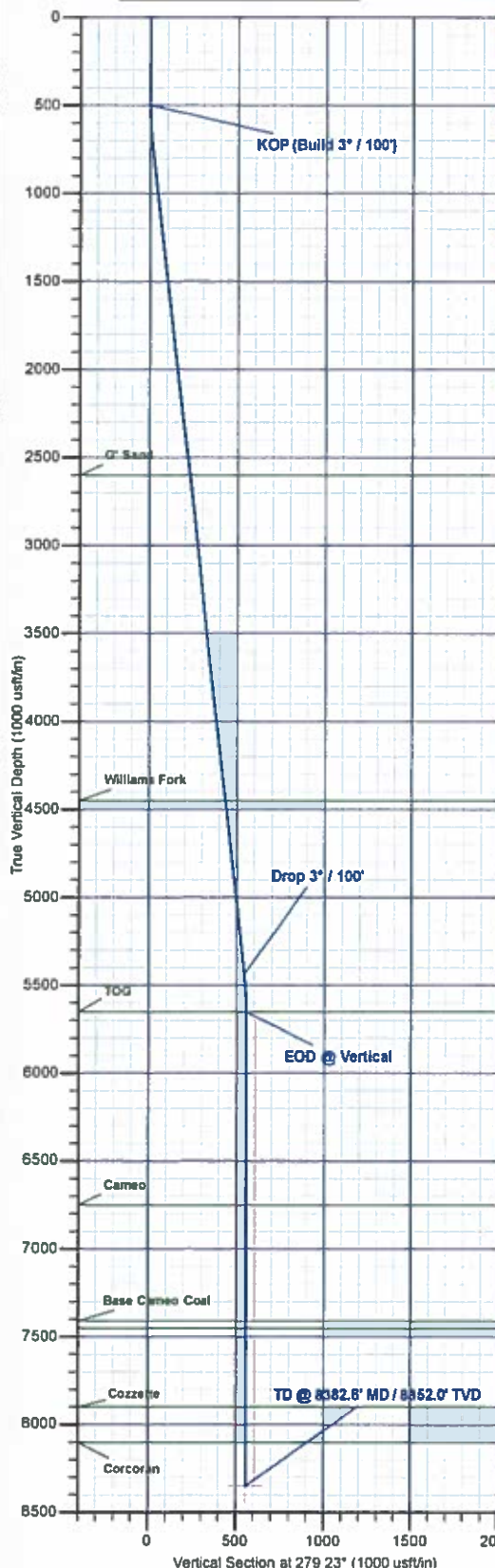
SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	V5ect	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')
714.4	6.43	279.23	713.9	1.9	-11.9	3.00	279.23	12.0	EOB @ 6.43° Inc. / 279.23° Azm
8488.4	6.43	279.23	8438.1	87.3	-537.5	0.00	0.00	844.5	Drop 3° / 100'
8682.8	0.00	0.00	8682.0	89.2	-549.4	3.00	180.00	856.6	EOD @ Vertical
8352.8	0.00	0.00	8352.0	89.2	-549.4	0.00	0.00	856.6	TD @ 8352.8' MD / 8352.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2802.0	2814.4	G' Sand
4452.0	4476.1	Williams Fork
5682.0	5682.8	TDG
6782.0	6782.8	Cameo
7412.0	7442.8	Base Cameo Coal
7482.0	7482.8	Rollins
7982.0	7932.8	Cozette
8102.0	8132.8	Corcoran

Azimuths to True North
 Magnetic North: 9.60°
 Magnetic Field
 Strength: 51419.9nT
 Dip Angle: 65.42°
 Date: 5/11/2017
 Model: IGRF2015



Created By: Will Jirclik Date: 11:01, May 15 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-03 Pad

Bruton 30-04W

Wellbore #1

Plan: Design #1

QES Well Planning Report

12 May, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-04W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534.0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-04W	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 30-03 Pad				
Site Position:		Northing:	1,525,281.27 usft	Latitude:	39.252711
From:	Lat/Long	Easting:	2,344,720.08 usft	Longitude:	-107.814289
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-1.46

Well	Bruton 30-04W					
Well Position	+N/-S	-7.0 usft	Northing:	1,525,274.34 usft	Latitude:	39.252692
	+E/-W	-1.4 usft	Easting:	2,344,718.46 usft	Longitude:	-107.814294
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,512.0 usft

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/11/2017	9.60	65.42	51,420

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	279.23

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	
714.4	6.43	279.23	713.9	1.9	-11.9	3.00	3.00	0.00	279.23	
5,488.4	6.43	279.23	5,438.1	87.3	-537.5	0.00	0.00	0.00	0.00	
5,682.8	0.00	0.00	5,652.0	89.2	-549.4	3.00	-3.00	0.00	180.00	
8,382.8	0.00	0.00	8,352.0	89.2	-549.4	0.00	0.00	0.00	0.00	PBHL - Bruton 30-04W



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-04W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534.0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-04W	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	279.23	600.0	0.4	-2.6	2.6	3.00	3.00	0.00
700.0	6.00	279.23	699.6	1.7	-10.3	10.5	3.00	3.00	0.00
EOB @ 6.43° Inc. / 279.23° Azm									
714.4	6.43	279.23	713.9	1.9	-11.9	12.0	3.00	3.00	0.00
800.0	6.43	279.23	799.0	3.5	-21.3	21.6	0.00	0.00	0.00
900.0	6.43	279.23	898.4	5.3	-32.4	32.8	0.00	0.00	0.00
1,000.0	6.43	279.23	997.8	7.1	-43.4	44.0	0.00	0.00	0.00
1,100.0	6.43	279.23	1,097.1	8.9	-54.5	55.2	0.00	0.00	0.00
1,200.0	6.43	279.23	1,196.5	10.7	-65.6	66.4	0.00	0.00	0.00
1,300.0	6.43	279.23	1,295.9	12.4	-76.6	77.6	0.00	0.00	0.00
1,400.0	6.43	279.23	1,395.2	14.2	-87.7	88.8	0.00	0.00	0.00
1,500.0	6.43	279.23	1,494.6	16.0	-98.7	100.0	0.00	0.00	0.00
8 5/8"									
1,522.0	6.43	279.23	1,516.5	16.4	-101.2	102.5	0.00	0.00	0.00
1,600.0	6.43	279.23	1,594.0	17.8	-109.8	111.2	0.00	0.00	0.00
1,700.0	6.43	279.23	1,693.3	19.6	-120.8	122.4	0.00	0.00	0.00
1,800.0	6.43	279.23	1,792.7	21.4	-131.9	133.6	0.00	0.00	0.00
1,900.0	6.43	279.23	1,892.1	23.2	-143.0	144.8	0.00	0.00	0.00
2,000.0	6.43	279.23	1,991.5	25.0	-154.0	156.0	0.00	0.00	0.00
2,100.0	6.43	279.23	2,090.8	26.8	-165.1	167.2	0.00	0.00	0.00
2,200.0	6.43	279.23	2,190.2	28.6	-176.1	178.4	0.00	0.00	0.00
2,300.0	6.43	279.23	2,289.6	30.4	-187.2	189.6	0.00	0.00	0.00
2,400.0	6.43	279.23	2,388.9	32.2	-198.2	200.8	0.00	0.00	0.00
2,500.0	6.43	279.23	2,488.3	34.0	-209.3	212.0	0.00	0.00	0.00
2,600.0	6.43	279.23	2,587.7	35.8	-220.3	223.2	0.00	0.00	0.00
G ⁺ Sand									
2,614.4	6.43	279.23	2,602.0	36.1	-221.9	224.8	0.00	0.00	0.00
2,700.0	6.43	279.23	2,687.1	37.6	-231.4	234.4	0.00	0.00	0.00
2,800.0	6.43	279.23	2,786.4	39.4	-242.5	245.6	0.00	0.00	0.00
2,900.0	6.43	279.23	2,885.8	41.2	-253.5	256.8	0.00	0.00	0.00
3,000.0	6.43	279.23	2,985.2	43.0	-264.6	268.0	0.00	0.00	0.00
3,100.0	6.43	279.23	3,084.5	44.8	-275.6	279.2	0.00	0.00	0.00
3,200.0	6.43	279.23	3,183.9	46.6	-286.7	290.4	0.00	0.00	0.00
3,300.0	6.43	279.23	3,283.3	48.4	-297.7	301.6	0.00	0.00	0.00
3,400.0	6.43	279.23	3,382.6	50.2	-308.8	312.8	0.00	0.00	0.00
3,500.0	6.43	279.23	3,482.0	52.0	-319.9	324.0	0.00	0.00	0.00
3,600.0	6.43	279.23	3,581.4	53.8	-330.9	335.3	0.00	0.00	0.00
3,700.0	6.43	279.23	3,680.8	55.6	-342.0	346.5	0.00	0.00	0.00
3,800.0	6.43	279.23	3,780.1	57.4	-353.0	357.7	0.00	0.00	0.00
3,900.0	6.43	279.23	3,879.5	59.1	-364.1	368.9	0.00	0.00	0.00
4,000.0	6.43	279.23	3,978.9	60.9	-375.1	380.1	0.00	0.00	0.00
4,100.0	6.43	279.23	4,078.2	62.7	-386.2	391.3	0.00	0.00	0.00
4,200.0	6.43	279.23	4,177.6	64.5	-397.3	402.5	0.00	0.00	0.00
4,300.0	6.43	279.23	4,277.0	66.3	-408.3	413.7	0.00	0.00	0.00
4,400.0	6.43	279.23	4,376.4	68.1	-419.4	424.9	0.00	0.00	0.00
Williams Fork									
4,476.1	6.43	279.23	4,452.0	69.5	-427.8	433.4	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-04W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534 0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-04W	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	6.43	279.23	4,475.7	69.9	-430.4	436.1	0.00	0.00	0.00
4,600.0	6.43	279.23	4,575.1	71.7	-441.5	447.3	0.00	0.00	0.00
4,700.0	6.43	279.23	4,674.5	73.5	-452.5	458.5	0.00	0.00	0.00
4,800.0	6.43	279.23	4,773.8	75.3	-463.6	469.7	0.00	0.00	0.00
4,900.0	6.43	279.23	4,873.2	77.1	-474.6	480.9	0.00	0.00	0.00
5,000.0	6.43	279.23	4,972.6	78.9	-485.7	492.1	0.00	0.00	0.00
5,100.0	6.43	279.23	5,071.9	80.7	-496.8	503.3	0.00	0.00	0.00
5,200.0	6.43	279.23	5,171.3	82.5	-507.8	514.5	0.00	0.00	0.00
5,300.0	6.43	279.23	5,270.7	84.3	-518.9	525.7	0.00	0.00	0.00
5,400.0	6.43	279.23	5,370.1	86.1	-529.9	536.9	0.00	0.00	0.00
Drop 3" / 100'									
5,468.4	6.43	279.23	5,438.1	87.3	-537.5	544.5	0.00	0.00	0.00
5,500.0	5.48	279.23	5,469.5	87.8	-540.7	547.8	3.00	-3.00	0.00
5,600.0	2.48	279.23	5,569.2	89.0	-547.6	554.8	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,682.8	0.00	0.00	5,652.0	89.2	-549.4	556.6	3.00	-3.00	0.00
5,700.0	0.00	0.00	5,669.2	89.2	-549.4	556.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,769.2	89.2	-549.4	556.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,869.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,969.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,100.0	0.00	0.00	6,069.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,169.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,269.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,369.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,469.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,569.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,669.2	89.2	-549.4	556.6	0.00	0.00	0.00
Cameo									
6,782.8	0.00	0.00	6,752.0	89.2	-549.4	556.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,769.2	89.2	-549.4	556.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,869.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,969.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,100.0	0.00	0.00	7,069.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,169.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,300.0	0.00	0.00	7,269.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,369.2	89.2	-549.4	556.6	0.00	0.00	0.00
Base Cameo Coal									
7,442.8	0.00	0.00	7,412.0	89.2	-549.4	556.6	0.00	0.00	0.00
Rollins									
7,482.8	0.00	0.00	7,452.0	89.2	-549.4	556.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,469.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,569.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,669.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,769.2	89.2	-549.4	556.6	0.00	0.00	0.00
7,900.0	0.00	0.00	7,869.2	89.2	-549.4	556.6	0.00	0.00	0.00
Cozzetta									
7,932.8	0.00	0.00	7,902.0	89.2	-549.4	556.6	0.00	0.00	0.00
8,000.0	0.00	0.00	7,969.2	89.2	-549.4	556.6	0.00	0.00	0.00
8,100.0	0.00	0.00	8,069.2	89.2	-549.4	556.6	0.00	0.00	0.00
Corcoran									
8,132.8	0.00	0.00	8,102.0	89.2	-549.4	556.6	0.00	0.00	0.00
8,200.0	0.00	0.00	8,169.2	89.2	-549.4	556.6	0.00	0.00	0.00
8,300.0	0.00	0.00	8,269.2	89.2	-549.4	556.6	0.00	0.00	0.00



Well Planning Report



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Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534.0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-04W	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)
TD @ 8382.8' MD / 8352.0' TVD									
8,382.8	0.00	0.00	8,352.0	89.2	-549.4	556.6	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 30-04W	0.00	0.00	8,352.0	89.2	-549.4	1,525,377.55	2,344,171.55	39.252937	-107.816234
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,516.5	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,614.4	2,602.0	G' Sand			
4,476.1	4,452.0	Williams Fork			
5,682.8	5,652.0	TOG			
6,782.8	6,752.0	Cameo			
7,442.8	7,412.0	Base Cameo Coal			
7,482.8	7,452.0	Rollins			
7,932.8	7,902.0	Cozzette			
8,132.8	8,102.0	Corcoran			

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°)
714.4	713.9	1.9	-11.9	EOB @ 6.43° Inc. / 279.23° Azm
5,468.4	5,438.1	87.3	-537.5	Drop 3° / 100°
5,682.8	5,652.0	89.2	-549.4	EOD @ Vertical
8,382.8	8,352.0	89.2	-549.4	TD @ 8382.8' MD / 8352.0' TVD