



Project: Mesa County, CO  
 Site: Nichols 24-06A  
 Well: Nichols 0994-24-01W  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.264692  
 Longitude: -107.830583  
 Ground Level: 7137.0  
 well @ 7167.0usft (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 (N/E) Reference: Well Nichols 0994-24-01W, True North  
 Vertical (TVD) Reference: well @ 7167.0usft (H&P #522)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7167.0usft (H&P #522)  
 Calculation Method: Minimum Curvature

WELL DETAILS:

Nichols 0994-24-01W

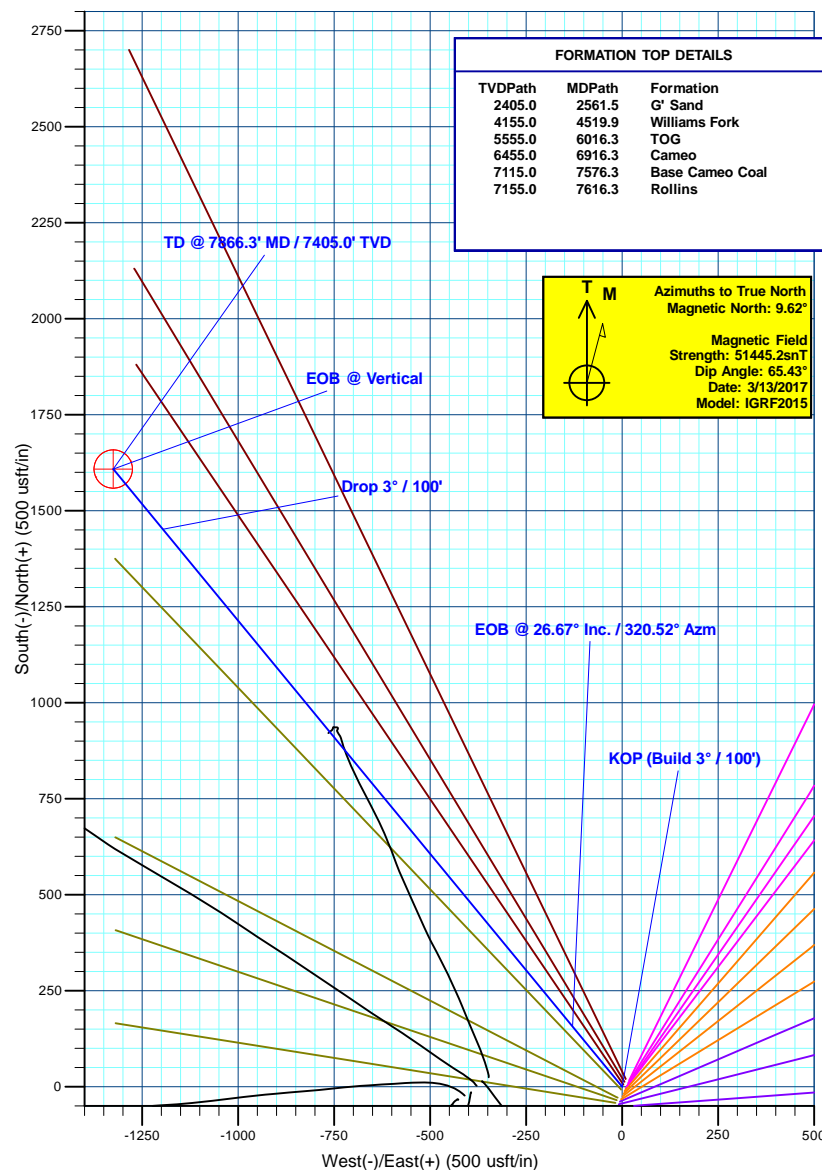
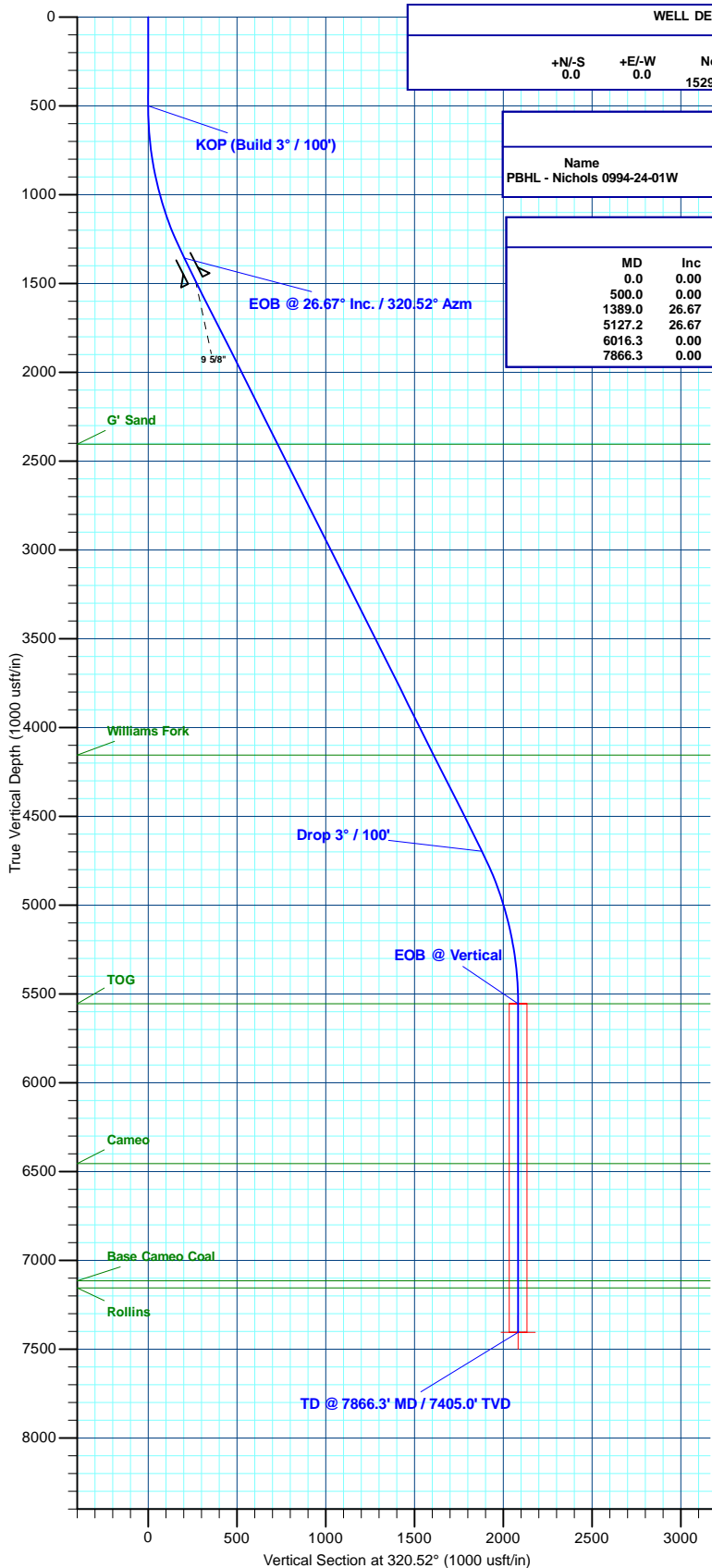
+N/-S	+E/-W	Northing	Ground Level: Easting	7137.0 Latitude	Longitude
0.0	0.0	1529761.41	2340219.42	39.264692	-107.830583

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Nichols 0994-24-01W	7405.0	1608.8	-1325.2	1531403.67	2338935.89	39.269109	-107.835264

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	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')
1389.0	26.67	320.52	1357.3	156.8	-129.2	3.00	320.52	203.2	EOB @ 26.67° Inc. / 320.52° Azm
5127.2	26.67	320.52	4697.7	1452.0	-1196.0	0.00	0.00	1881.1	Drop 3° / 100'
6016.3	0.00	0.00	5555.0	1608.8	-1325.2	3.00	180.00	2084.3	EOB @ Vertical
7866.3	0.00	0.00	7405.0	1608.8	-1325.2	0.00	0.00	2084.3	TD @ 7866.3' MD / 7405.0' TVD



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2405.0	2561.5	G' Sand
4155.0	4519.9	Williams Fork
5555.0	6016.3	TOG
6455.0	6916.3	Cameo
7115.0	7576.3	Base Cameo Coal
7155.0	7616.3	Rollins

Plan: Design #1 (Nichols 0994-24-01W/Wellbore #1)

Created By: Will Jircik Date: 16:03, March 13 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Nichols 24-06A**

**Nichols 0994-24-01W**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**13 March, 2017**





# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-01W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7167.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7167.0usft (H&P #522)
<b>Site:</b>	Nichols 24-06A	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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		Nichols 24-06A			
Site Position:		Northing:	1,529,702.08 usft	Latitude:	39.264528
From:	Lat/Long	Easting:	2,340,203.74 usft	Longitude:	-107.830633
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.47

Well	Nichols 0994-24-01W					
Well Position	+N/-S	59.7 usft	Northing:	1,529,761.42 usft	Latitude:	39.264692
	+E/-W	14.2 usft	Easting:	2,340,219.42 usft	Longitude:	-107.830583
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,137.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/13/2017	9.62	65.43	51,445

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	320.52

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	
1,389.0	26.67	320.52	1,357.3	156.8	-129.2	3.00	3.00	0.00	320.52	
5,127.2	26.67	320.52	4,697.7	1,452.0	-1,196.0	0.00	0.00	0.00	0.00	
6,016.3	0.00	0.00	5,555.0	1,608.8	-1,325.2	3.00	-3.00	0.00	180.00	
7,866.3	0.00	0.00	7,405.0	1,608.8	-1,325.2	0.00	0.00	0.00	0.00	PBHL - Nichols 0994-



# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-01W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7167.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7167.0usft (H&P #522)
<b>Site:</b>	Nichols 24-06A	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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
<b>KOP (Build 3° / 100')</b>									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	3.00	320.52	600.0	2.0	-1.7	2.6	3.00	3.00	0.00
700.0	6.00	320.52	699.6	8.1	-6.7	10.5	3.00	3.00	0.00
800.0	9.00	320.52	798.8	18.1	-15.0	23.5	3.00	3.00	0.00
900.0	12.00	320.52	897.1	32.2	-26.5	41.7	3.00	3.00	0.00
1,000.0	15.00	320.52	994.3	50.2	-41.4	65.1	3.00	3.00	0.00
1,100.0	18.00	320.52	1,090.2	72.1	-59.4	93.5	3.00	3.00	0.00
1,200.0	21.00	320.52	1,184.4	97.9	-80.7	126.9	3.00	3.00	0.00
1,300.0	24.00	320.52	1,276.8	127.4	-105.0	165.1	3.00	3.00	0.00
<b>EOB @ 26.67° Inc. / 320.52° Azm</b>									
1,389.0	26.67	320.52	1,357.3	156.8	-129.2	203.2	3.00	3.00	0.00
1,400.0	26.67	320.52	1,367.1	160.6	-132.3	208.1	0.00	0.00	0.00
1,500.0	26.67	320.52	1,456.4	195.3	-160.9	253.0	0.00	0.00	0.00
<b>9 5/8"</b>									
1,530.0	26.67	320.52	1,483.2	205.7	-169.4	266.5	0.00	0.00	0.00
1,600.0	26.67	320.52	1,545.8	229.9	-189.4	297.9	0.00	0.00	0.00
1,700.0	26.67	320.52	1,635.2	264.6	-217.9	342.8	0.00	0.00	0.00
1,800.0	26.67	320.52	1,724.5	299.2	-246.5	387.7	0.00	0.00	0.00
1,900.0	26.67	320.52	1,813.9	333.9	-275.0	432.6	0.00	0.00	0.00
2,000.0	26.67	320.52	1,903.2	368.5	-303.6	477.4	0.00	0.00	0.00
2,100.0	26.67	320.52	1,992.6	403.2	-332.1	522.3	0.00	0.00	0.00
2,200.0	26.67	320.52	2,082.0	437.8	-360.6	567.2	0.00	0.00	0.00
2,300.0	26.67	320.52	2,171.3	472.5	-389.2	612.1	0.00	0.00	0.00
2,400.0	26.67	320.52	2,260.7	507.1	-417.7	657.0	0.00	0.00	0.00
2,500.0	26.67	320.52	2,350.0	541.7	-446.3	701.9	0.00	0.00	0.00
<b>G' Sand</b>									
2,561.5	26.67	320.52	2,405.0	563.1	-463.8	729.5	0.00	0.00	0.00
2,600.0	26.67	320.52	2,439.4	576.4	-474.8	746.8	0.00	0.00	0.00
2,700.0	26.67	320.52	2,528.8	611.0	-503.3	791.7	0.00	0.00	0.00
2,800.0	26.67	320.52	2,618.1	645.7	-531.9	836.5	0.00	0.00	0.00
2,900.0	26.67	320.52	2,707.5	680.3	-560.4	881.4	0.00	0.00	0.00
3,000.0	26.67	320.52	2,796.8	715.0	-589.0	926.3	0.00	0.00	0.00
3,100.0	26.67	320.52	2,886.2	749.6	-617.5	971.2	0.00	0.00	0.00
3,200.0	26.67	320.52	2,975.6	784.3	-646.0	1,016.1	0.00	0.00	0.00
3,300.0	26.67	320.52	3,064.9	818.9	-674.6	1,061.0	0.00	0.00	0.00
3,400.0	26.67	320.52	3,154.3	853.5	-703.1	1,105.9	0.00	0.00	0.00
3,500.0	26.67	320.52	3,243.6	888.2	-731.6	1,150.7	0.00	0.00	0.00
3,600.0	26.67	320.52	3,333.0	922.8	-760.2	1,195.6	0.00	0.00	0.00
3,700.0	26.67	320.52	3,422.4	957.5	-788.7	1,240.5	0.00	0.00	0.00
3,800.0	26.67	320.52	3,511.7	992.1	-817.3	1,285.4	0.00	0.00	0.00
3,900.0	26.67	320.52	3,601.1	1,026.8	-845.8	1,330.3	0.00	0.00	0.00
4,000.0	26.67	320.52	3,690.4	1,061.4	-874.3	1,375.2	0.00	0.00	0.00
4,100.0	26.67	320.52	3,779.8	1,096.1	-902.9	1,420.1	0.00	0.00	0.00
4,200.0	26.67	320.52	3,869.2	1,130.7	-931.4	1,464.9	0.00	0.00	0.00
4,300.0	26.67	320.52	3,958.5	1,165.4	-960.0	1,509.8	0.00	0.00	0.00
4,400.0	26.67	320.52	4,047.9	1,200.0	-988.5	1,554.7	0.00	0.00	0.00
4,500.0	26.67	320.52	4,137.2	1,234.6	-1,017.0	1,599.6	0.00	0.00	0.00
<b>Williams Fork</b>									



# Well Planning Report



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<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7167.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7167.0usft (H&P #522)
<b>Site:</b>	Nichols 24-06A	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-01W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)	
4,519.9	26.67	320.52	4,155.0	1,241.5	-1,022.7	1,608.5	0.00	0.00	0.00	
4,600.0	26.67	320.52	4,226.6	1,269.3	-1,045.6	1,644.5	0.00	0.00	0.00	
4,700.0	26.67	320.52	4,316.0	1,303.9	-1,074.1	1,689.4	0.00	0.00	0.00	
4,800.0	26.67	320.52	4,405.3	1,338.6	-1,102.7	1,734.3	0.00	0.00	0.00	
4,900.0	26.67	320.52	4,494.7	1,373.2	-1,131.2	1,779.1	0.00	0.00	0.00	
5,000.0	26.67	320.52	4,584.0	1,407.9	-1,159.7	1,824.0	0.00	0.00	0.00	
5,100.0	26.67	320.52	4,673.4	1,442.5	-1,188.3	1,868.9	0.00	0.00	0.00	
Start Drop -3.00										
5,127.2	26.67	320.52	4,697.7	1,452.0	-1,196.0	1,881.1	0.00	0.00	0.00	
5,200.0	24.49	320.52	4,763.4	1,476.2	-1,216.0	1,912.6	3.00	-3.00	0.00	
5,300.0	21.49	320.52	4,855.4	1,506.3	-1,240.8	1,951.6	3.00	-3.00	0.00	
5,400.0	18.49	320.52	4,949.4	1,532.7	-1,262.6	1,985.8	3.00	-3.00	0.00	
5,500.0	15.49	320.52	5,045.0	1,555.3	-1,281.1	2,015.0	3.00	-3.00	0.00	
5,600.0	12.49	320.52	5,142.0	1,573.9	-1,296.5	2,039.2	3.00	-3.00	0.00	
5,700.0	9.49	320.52	5,240.2	1,588.6	-1,308.6	2,058.2	3.00	-3.00	0.00	
5,800.0	6.49	320.52	5,339.2	1,599.4	-1,317.5	2,072.1	3.00	-3.00	0.00	
5,900.0	3.49	320.52	5,438.8	1,606.1	-1,323.0	2,080.8	3.00	-3.00	0.00	
6,000.0	0.49	320.52	5,538.7	1,608.7	-1,325.2	2,084.3	3.00	-3.00	0.00	
EOB @ Vertical - TOG										
6,016.3	0.00	0.00	5,555.0	1,608.8	-1,325.2	2,084.3	3.00	-3.00	242.88	
6,100.0	0.00	0.00	5,638.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,200.0	0.00	0.00	5,738.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,300.0	0.00	0.00	5,838.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,400.0	0.00	0.00	5,938.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,038.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,138.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,238.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,338.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,438.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
Cameo										
6,916.3	0.00	0.00	6,455.0	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,000.0	0.00	0.00	6,538.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,100.0	0.00	0.00	6,638.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,200.0	0.00	0.00	6,738.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,300.0	0.00	0.00	6,838.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,400.0	0.00	0.00	6,938.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,038.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
Base Cameo Coal										
7,576.3	0.00	0.00	7,115.0	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,138.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
Rollins										
7,616.3	0.00	0.00	7,155.0	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,238.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,338.7	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	
TD @ 7866.3' MD / 7405.0' TVD										
7,866.3	0.00	0.00	7,405.0	1,608.8	-1,325.2	2,084.3	0.00	0.00	0.00	



# Well Planning Report



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<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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 - Nichols 0994-24	0.00	0.00	7,405.0	1,608.8	-1,325.2	1,531,403.68	2,338,935.89	39.269109	-107.835264
- plan hits target center									
- Circle (radius 50.0)									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,483.2	9 5/8"	9-5/8	12-1/4

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,561.5	2,405.0	G' Sand				
4,519.9	4,155.0	Williams Fork				
6,016.3	5,555.0	TOG				
6,916.3	6,455.0	Cameo				
7,576.3	7,115.0	Base Cameo Coal				
7,616.3	7,155.0	Rollins				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
500.0	500.0	0.0	0.0	KOP (Build 3° / 100')	
1,389.0	1,357.3	156.8	-129.2	EOB @ 26.67° Inc. / 320.52° Azm	
5,127.2	4,697.7	1,452.0	-1,196.0	Start Drop -3.00	
6,016.3	5,555.0	1,608.8	-1,325.2	EOB @ Vertical	
7,866.3	7,405.0	1,608.8	-1,325.2	TD @ 7866.3' MD / 7405.0' TVD	