



Project: Mesa County, CO  
 Site: Nichols 24-07 Pad  
 Well: Nichols 0994-24-16E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.263283  
 Longitude: -107.830839  
 Ground Level: 7212.0  
 well @ 7242.0usft (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 0994-24-16E, True North  
 Vertical (TVD) Reference: well @ 7242.0usft (H&P #522)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7242.0usft (H&P #522)  
 Calculation Method: Minimum Curvature

**WELL DETAILS: Nichols 0994-24-16E**

+N/-S	+E/-W	Northing	Ground Level: Easting	7212.0 Latitude	Longitude
0.0	0.0	1529250.25	2340133.80	39.263283	-107.830839

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

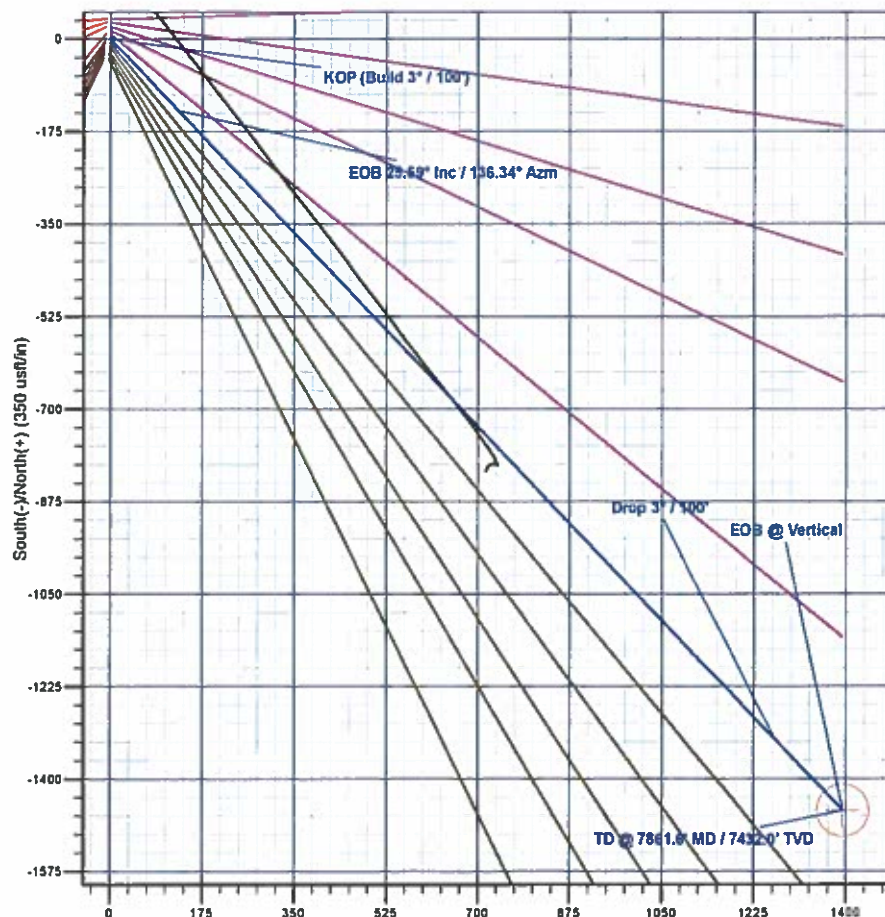
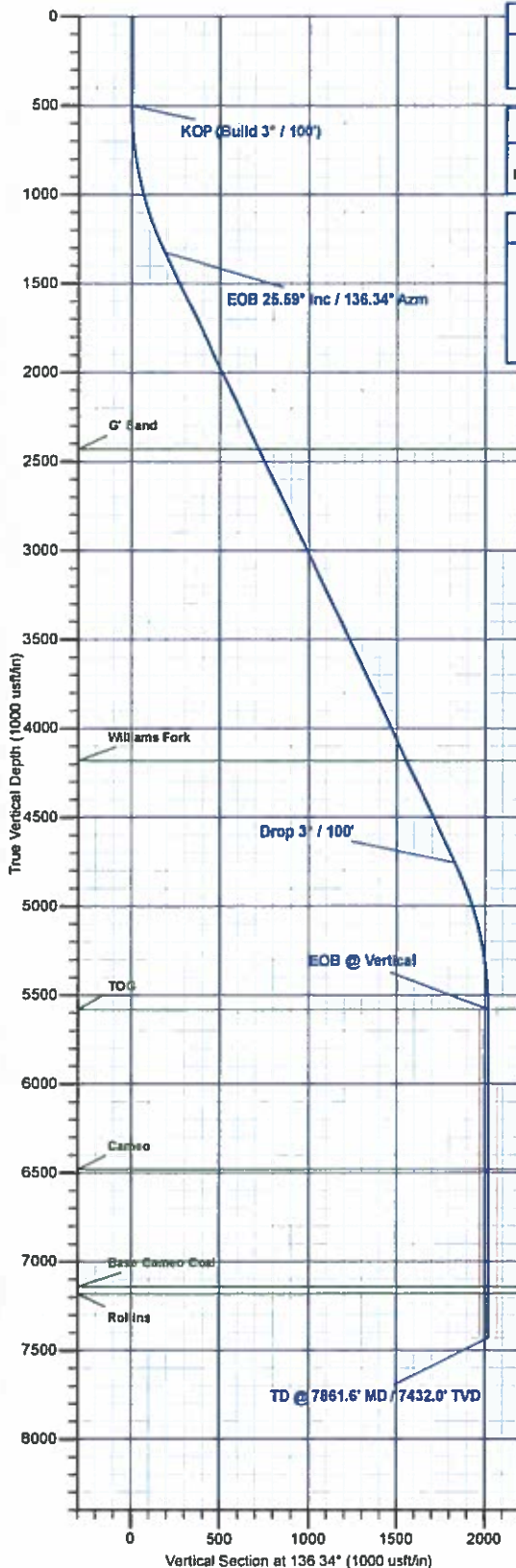
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Nichols 0994-24-16E	7432.0	-1460.5	1393.7	1527754.52	2341489.54	39.259273	-107.825917

**SECTION DETAILS**

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSecl	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')
1353.2	25.59	136.34	1325.1	-135.6	129.4	3.00	136.34	187.4	EOB 25.59° Inc / 136.34° Azm
6158.4	25.59	136.34	4756.9	-1324.9	1264.3	0.00	0.00	1831.3	Drop 3° / 100'
6011.6	0.00	0.00	5582.0	-1460.5	1393.7	3.00	180.00	2018.7	EOB @ Vertical
7861.6	0.00	0.00	7432.0	-1460.5	1393.7	0.00	0.00	2018.7	TD @ 7861.6' MD / 7432.0' TVD

**FORMATION TOP DETAILS**

TVDPath	MDPath	Formation
2432.0	2550.5	G' Sand
4162.0	4520.9	Williams Fork
5582.0	6011.6	TOG
6482.0	6911.6	Cameo
7142.0	7571.6	Base Cameo Coal
7182.0	7611.6	Rollins



Plan: Design #1 (Nichols 0994-24-16E/Wellbore #1)

Created By: Will Jircik Date: 16:15, March 10 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Nichols 24-07 Pad**

**Nichols 0994-24-16E**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**10 March, 2017**





# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-16E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-16E	<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 24-07 Pad			
Site Position:		Northing:		1,529,213.07 usft	
From:		Easting:		2,340,128.94 usft	
Position Uncertainty:		Slot Radius:		13-3/16 "	
Lat/Long				Latitude:	
				Longitude:	
				Grid Convergence:	
				39.263181	
				-107.830853	
				-1.47	

Well	Nichols 0994-24-16E					
Well Position	+N-S	37.3 usft	Northing:	1,529,250.26 usft	Latitude:	39.263283
	+E-W	3.9 usft	Easting:	2,340,133.80 usft	Longitude:	-107.830839
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,212.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/9/2017	9.63	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	136.34

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	
1,353.2	25.59	136.34	1,325.1	-135.6	129.4	3.00	3.00	0.00	136.34	
5,158.4	25.59	136.34	4,756.9	-1,324.9	1,264.3	0.00	0.00	0.00	0.00	
6,011.6	0.00	0.00	5,582.0	-1,460.5	1,393.7	3.00	-3.00	0.00	180.00	
7,861.6	0.00	0.00	7,432.0	-1,460.5	1,393.7	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 0994-24-16E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-16E	<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	136.34	600.0	-1.9	1.8	2.6	3.00	3.00	0.00
700.0	6.00	136.34	699.6	-7.6	7.2	10.5	3.00	3.00	0.00
800.0	9.00	136.34	798.8	-17.0	16.2	23.5	3.00	3.00	0.00
900.0	12.00	136.34	897.1	-30.2	28.8	41.7	3.00	3.00	0.00
1,000.0	15.00	136.34	994.3	-47.1	44.9	65.1	3.00	3.00	0.00
1,100.0	18.00	136.34	1,090.2	-67.6	64.5	93.5	3.00	3.00	0.00
1,200.0	21.00	136.34	1,184.4	-91.8	87.6	126.9	3.00	3.00	0.00
1,300.0	24.00	136.34	1,276.8	-119.5	114.0	165.1	3.00	3.00	0.00
<b>EOB 25.59° Inc / 136.34° Azm</b>									
1,353.2	25.59	136.34	1,325.1	-135.6	129.4	187.4	3.00	3.00	0.00
1,400.0	25.59	136.34	1,367.3	-150.2	143.4	207.6	0.00	0.00	0.00
1,500.0	25.59	136.34	1,457.5	-181.5	173.2	250.8	0.00	0.00	0.00
<b>8 5/8"</b>									
1,530.0	25.59	136.34	1,484.6	-190.9	182.1	263.8	0.00	0.00	0.00
1,600.0	25.59	136.34	1,547.7	-212.7	203.0	294.0	0.00	0.00	0.00
1,700.0	25.59	136.34	1,637.9	-244.0	232.8	337.2	0.00	0.00	0.00
1,800.0	25.59	136.34	1,728.1	-275.2	262.6	380.4	0.00	0.00	0.00
1,900.0	25.59	136.34	1,818.2	-306.5	292.5	423.6	0.00	0.00	0.00
2,000.0	25.59	136.34	1,908.4	-337.7	322.3	466.8	0.00	0.00	0.00
2,100.0	25.59	136.34	1,998.6	-369.0	352.1	510.1	0.00	0.00	0.00
2,200.0	25.59	136.34	2,088.8	-400.3	381.9	553.3	0.00	0.00	0.00
2,300.0	25.59	136.34	2,179.0	-431.5	411.8	596.5	0.00	0.00	0.00
2,400.0	25.59	136.34	2,269.2	-462.8	441.6	639.7	0.00	0.00	0.00
2,500.0	25.59	136.34	2,359.4	-494.0	471.4	682.9	0.00	0.00	0.00
<b>G' Sand</b>									
2,580.5	25.59	136.34	2,432.0	-519.2	495.4	717.6	0.00	0.00	0.00
2,600.0	25.59	136.34	2,449.6	-525.3	501.2	726.1	0.00	0.00	0.00
2,700.0	25.59	136.34	2,539.7	-556.5	531.1	769.3	0.00	0.00	0.00
2,800.0	25.59	136.34	2,629.9	-587.8	560.9	812.5	0.00	0.00	0.00
2,900.0	25.59	136.34	2,720.1	-619.0	590.7	855.7	0.00	0.00	0.00
3,000.0	25.59	136.34	2,810.3	-650.3	620.5	898.9	0.00	0.00	0.00
3,100.0	25.59	136.34	2,900.5	-681.5	650.4	942.1	0.00	0.00	0.00
3,200.0	25.59	136.34	2,990.7	-712.8	680.2	985.3	0.00	0.00	0.00
3,300.0	25.59	136.34	3,080.9	-744.0	710.0	1,028.5	0.00	0.00	0.00
3,400.0	25.59	136.34	3,171.1	-775.3	739.8	1,071.7	0.00	0.00	0.00
3,500.0	25.59	136.34	3,261.2	-806.6	769.7	1,114.9	0.00	0.00	0.00
3,600.0	25.59	136.34	3,351.4	-837.8	799.5	1,158.1	0.00	0.00	0.00
3,700.0	25.59	136.34	3,441.6	-869.1	829.3	1,201.3	0.00	0.00	0.00
3,800.0	25.59	136.34	3,531.8	-900.3	859.1	1,244.5	0.00	0.00	0.00
3,900.0	25.59	136.34	3,622.0	-931.6	889.0	1,287.7	0.00	0.00	0.00
4,000.0	25.59	136.34	3,712.2	-962.8	918.8	1,330.9	0.00	0.00	0.00
4,100.0	25.59	136.34	3,802.4	-994.1	948.6	1,374.1	0.00	0.00	0.00
4,200.0	25.59	136.34	3,892.5	-1,025.3	978.4	1,417.3	0.00	0.00	0.00
4,300.0	25.59	136.34	3,982.7	-1,056.6	1,008.3	1,460.5	0.00	0.00	0.00
4,400.0	25.59	136.34	4,072.9	-1,087.8	1,038.1	1,503.7	0.00	0.00	0.00
4,500.0	25.59	136.34	4,163.1	-1,119.1	1,067.9	1,546.9	0.00	0.00	0.00

Williams Fork



# Well Planning Report



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<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0894-24-16E	<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)
4,520.9	25.59	136.34	4,182.0	-1,125.6	1,074.2	1,555.9	0.00	0.00	0.00
4,600.0	25.59	136.34	4,253.3	-1,150.3	1,097.7	1,590.1	0.00	0.00	0.00
4,700.0	25.59	136.34	4,343.5	-1,181.6	1,127.6	1,633.3	0.00	0.00	0.00
4,800.0	25.59	136.34	4,433.7	-1,212.9	1,157.4	1,676.5	0.00	0.00	0.00
4,900.0	25.59	136.34	4,523.9	-1,244.1	1,187.2	1,719.7	0.00	0.00	0.00
5,000.0	25.59	136.34	4,614.0	-1,275.4	1,217.0	1,762.9	0.00	0.00	0.00
5,100.0	25.59	136.34	4,704.2	-1,306.6	1,246.9	1,806.1	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,158.4	25.59	136.34	4,756.9	-1,324.9	1,264.3	1,831.3	0.00	0.00	0.00
5,200.0	24.35	136.34	4,794.6	-1,337.6	1,276.4	1,848.9	3.00	-3.00	0.00
5,300.0	21.35	136.34	4,886.8	-1,365.7	1,303.2	1,887.7	3.00	-3.00	0.00
5,400.0	18.35	136.34	4,980.8	-1,390.2	1,326.6	1,921.6	3.00	-3.00	0.00
5,500.0	15.35	136.34	5,076.5	-1,411.2	1,346.6	1,950.6	3.00	-3.00	0.00
5,600.0	12.35	136.34	5,173.6	-1,428.5	1,363.2	1,974.5	3.00	-3.00	0.00
5,700.0	9.35	136.34	5,271.8	-1,442.1	1,376.2	1,993.4	3.00	-3.00	0.00
5,800.0	6.35	136.34	5,370.8	-1,452.0	1,385.6	2,007.0	3.00	-3.00	0.00
5,900.0	3.35	136.34	5,470.5	-1,458.1	1,391.4	2,015.5	3.00	-3.00	0.00
6,000.0	0.35	136.34	5,570.4	-1,460.4	1,393.6	2,018.7	3.00	-3.00	0.00
<b>EOB @ Vertical - TOG</b>									
6,011.6	0.00	0.00	5,582.0	-1,460.5	1,393.7	2,018.7	3.00	-3.00	-1,175.84
6,100.0	0.00	0.00	5,670.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,200.0	0.00	0.00	5,770.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,300.0	0.00	0.00	5,870.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,400.0	0.00	0.00	5,970.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,500.0	0.00	0.00	6,070.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,600.0	0.00	0.00	6,170.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,700.0	0.00	0.00	6,270.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,370.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
6,900.0	0.00	0.00	6,470.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
<b>Cameo</b>									
6,911.6	0.00	0.00	6,482.0	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,570.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,100.0	0.00	0.00	6,670.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,200.0	0.00	0.00	6,770.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,300.0	0.00	0.00	6,870.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,400.0	0.00	0.00	6,970.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,500.0	0.00	0.00	7,070.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
7,571.6	0.00	0.00	7,142.0	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,600.0	0.00	0.00	7,170.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
<b>Rollins</b>									
7,611.6	0.00	0.00	7,182.0	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,700.0	0.00	0.00	7,270.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
7,800.0	0.00	0.00	7,370.4	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00
<b>TD @ 7861.6' MD / 7432.0' TVD</b>									
7,861.6	0.00	0.00	7,432.0	-1,460.5	1,393.7	2,018.7	0.00	0.00	0.00



# Well Planning Report



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<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-16E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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 - Nichols 0994-24 - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,432.0	-1,460.5	1,393.7	1,527,754.52	2,341,489.54	39.259273	-107.825917

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,484.6	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,580.5	2,432.0	G' Sand			
4,520.9	4,182.0	Williams Fork			
6,011.6	5,582.0	TOG			
6,911.6	6,482.0	Cameo			
7,571.6	7,142.0	Base Cameo Coal			
7,611.6	7,182.0	Rollins			

## 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')
1,353.2	1,325.1	-135.6	129.4	EOB 25.59° Inc / 136.34° Azm
5,158.4	4,756.9	-1,324.9	1,264.3	Drop 3" / 100'
6,011.6	5,582.0	-1,460.5	1,393.7	EOB @ Vertical
7,661.6	7,432.0	-1,460.5	1,393.7	TD @ 7661.6' MD / 7432.0' TVD