



Project: Mesa County, CO  
 Site: Nichols 24-06A  
 Well: Nichols 0994-24-09E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.264528  
 Longitude: -107.830633  
 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 0994-24-09E, 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 0994-24-09E

+N/-S	+E/-W	Northings	Ground Level: Easting	7137.0 Latitude	Longitude
0.0	0.0	1529702.07	2340203.74	39.264528	-107.830633

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

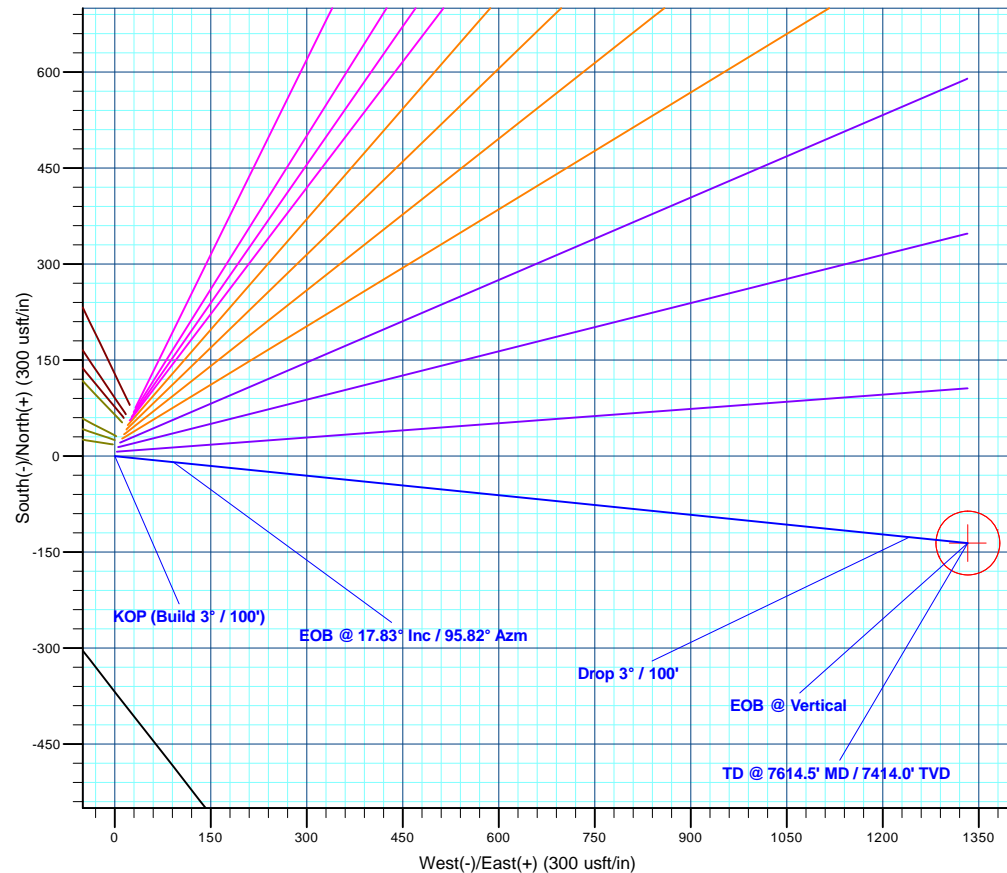
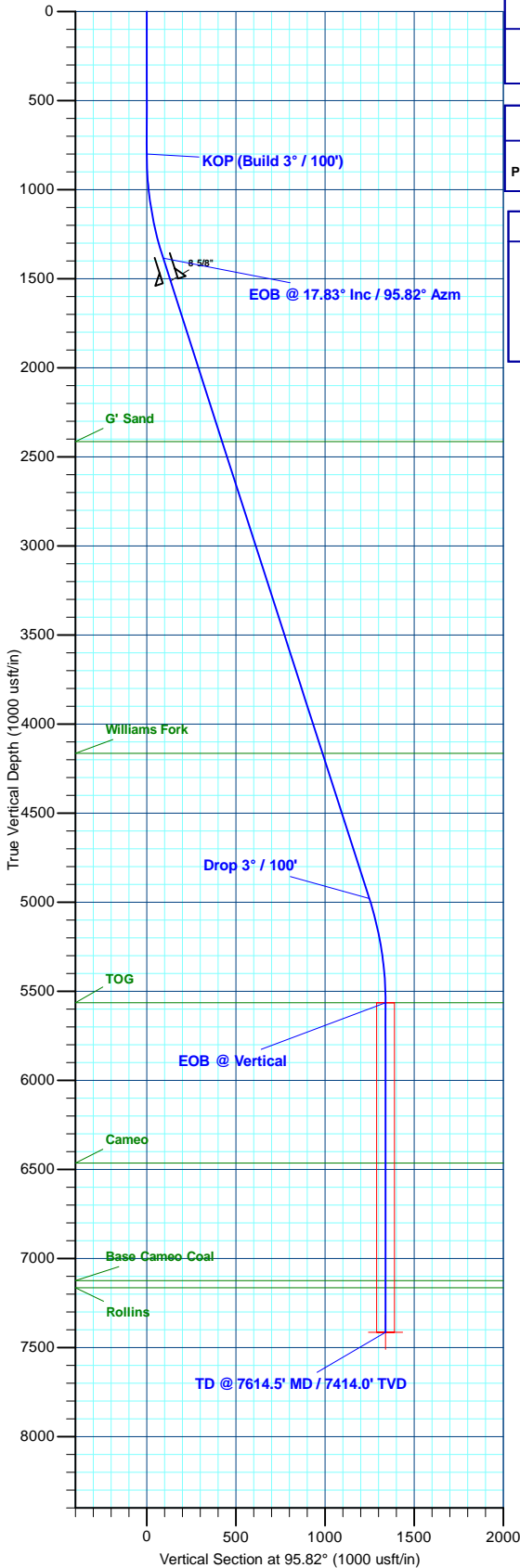
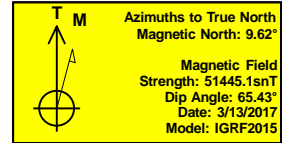
Name	TVD	+N/-S	+E/-W	Northings	Easting	Latitude	Longitude
PBHL - Nichols 0994-24-09E	7414.0	-135.8	1333.0	1529532.11	2341532.79	39.264155	-107.825925

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	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1394.5	17.83	95.82	1384.9	-9.3	91.3	3.00	95.82	91.8	EOB @ 17.83° Inc / 95.82° Azm
5170.1	17.83	95.82	4979.1	-126.5	1241.7	0.00	0.00	1248.1	Drop 3° / 100'
5764.5	0.00	0.00	5564.0	-135.8	1333.0	3.00	180.00	1339.9	EOB @ Vertical
7614.5	0.00	0.00	7414.0	-135.8	1333.0	0.00	0.00	1339.9	TD @ 7614.5' MD / 7414.0' TVD

FORMATION TOP DETAILS

TVDPth	MDPath	Formation
2414.0	2475.5	G' Sand
4164.0	4313.8	Williams Fork
5564.0	5764.5	TOG
6464.0	6664.5	Cameo
7124.0	7324.5	Base Cameo Coal
7164.0	7364.5	Rollins



Plan: Design #1 (Nichols 0994-24-09E/Wellbore #1)

Created By: Will Jircik Date: 18:52, March 13 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Nichols 24-06A**

**Nichols 0994-24-09E**

**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 0994-24-09E
<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 0994-24-09E	<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° 15' 52.301 N
From:	Lat/Long	Easting:	2,340,203.74 usft	Longitude:	107° 49' 50.279 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.47 °

Well	Nichols 0994-24-09E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,702.07 usft	Latitude:	39° 15' 52.301 N
	+E/-W	0.0 usft	Easting:	2,340,203.74 usft	Longitude:	107° 49' 50.279 W
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	95.82

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	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,394.5	17.83	95.82	1,384.9	-9.3	91.3	3.00	3.00	0.00	95.82	
5,170.1	17.83	95.82	4,979.1	-126.5	1,241.7	0.00	0.00	0.00	0.00	
5,764.5	0.00	0.00	5,564.0	-135.8	1,333.0	3.00	-3.00	0.00	180.00	
7,614.5	0.00	0.00	7,414.0	-135.8	1,333.0	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 0994-24-09E
<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 0994-24-09E	<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
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
<b>KOP (Build 3° / 100')</b>									
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	3.00	95.82	900.0	-0.3	2.6	2.6	3.00	3.00	0.00
1,000.0	6.00	95.82	999.6	-1.1	10.4	10.5	3.00	3.00	0.00
1,100.0	9.00	95.82	1,098.8	-2.4	23.4	23.5	3.00	3.00	0.00
1,200.0	12.00	95.82	1,197.1	-4.2	41.5	41.7	3.00	3.00	0.00
1,300.0	15.00	95.82	1,294.3	-6.6	64.7	65.1	3.00	3.00	0.00
<b>EOB @ 17.83° Inc / 95.82° Azm</b>									
1,394.5	17.83	95.82	1,384.9	-9.3	91.3	91.8	3.00	3.00	0.00
1,400.0	17.83	95.82	1,390.2	-9.5	93.0	93.5	0.00	0.00	0.00
1,500.0	17.83	95.82	1,485.4	-12.6	123.5	124.1	0.00	0.00	0.00
<b>8 5/8"</b>									
1,530.0	17.83	95.82	1,513.9	-13.5	132.6	133.3	0.00	0.00	0.00
1,600.0	17.83	95.82	1,580.6	-15.7	153.9	154.7	0.00	0.00	0.00
1,700.0	17.83	95.82	1,675.8	-18.8	184.4	185.3	0.00	0.00	0.00
1,800.0	17.83	95.82	1,771.0	-21.9	214.9	216.0	0.00	0.00	0.00
1,900.0	17.83	95.82	1,866.2	-25.0	245.3	246.6	0.00	0.00	0.00
2,000.0	17.83	95.82	1,961.3	-28.1	275.8	277.2	0.00	0.00	0.00
2,100.0	17.83	95.82	2,056.5	-31.2	306.3	307.9	0.00	0.00	0.00
2,200.0	17.83	95.82	2,151.7	-34.3	336.7	338.5	0.00	0.00	0.00
2,300.0	17.83	95.82	2,246.9	-37.4	367.2	369.1	0.00	0.00	0.00
2,400.0	17.83	95.82	2,342.1	-40.5	397.7	399.7	0.00	0.00	0.00
<b>G' Sand</b>									
2,475.5	17.83	95.82	2,414.0	-42.9	420.7	422.9	0.00	0.00	0.00
2,500.0	17.83	95.82	2,437.3	-43.6	428.1	430.4	0.00	0.00	0.00
2,600.0	17.83	95.82	2,532.5	-46.7	458.6	461.0	0.00	0.00	0.00
2,700.0	17.83	95.82	2,627.7	-49.8	489.1	491.6	0.00	0.00	0.00
2,800.0	17.83	95.82	2,722.9	-52.9	519.5	522.2	0.00	0.00	0.00
2,900.0	17.83	95.82	2,818.1	-56.0	550.0	552.9	0.00	0.00	0.00
3,000.0	17.83	95.82	2,913.3	-59.1	580.5	583.5	0.00	0.00	0.00
3,100.0	17.83	95.82	3,008.5	-62.2	611.0	614.1	0.00	0.00	0.00
3,200.0	17.83	95.82	3,103.7	-65.4	641.4	644.7	0.00	0.00	0.00
3,300.0	17.83	95.82	3,198.9	-68.5	671.9	675.4	0.00	0.00	0.00
3,400.0	17.83	95.82	3,294.1	-71.6	702.4	706.0	0.00	0.00	0.00
3,500.0	17.83	95.82	3,389.3	-74.7	732.8	736.6	0.00	0.00	0.00
3,600.0	17.83	95.82	3,484.5	-77.8	763.3	767.2	0.00	0.00	0.00
3,700.0	17.83	95.82	3,579.7	-80.9	793.8	797.9	0.00	0.00	0.00
3,800.0	17.83	95.82	3,674.9	-84.0	824.2	828.5	0.00	0.00	0.00
3,900.0	17.83	95.82	3,770.0	-87.1	854.7	859.1	0.00	0.00	0.00
4,000.0	17.83	95.82	3,865.2	-90.2	885.2	889.8	0.00	0.00	0.00
4,100.0	17.83	95.82	3,960.4	-93.3	915.6	920.4	0.00	0.00	0.00
4,200.0	17.83	95.82	4,055.6	-96.4	946.1	951.0	0.00	0.00	0.00
4,300.0	17.83	95.82	4,150.8	-99.5	976.6	981.6	0.00	0.00	0.00
<b>Williams Fork</b>									
4,313.8	17.83	95.82	4,164.0	-99.9	980.8	985.9	0.00	0.00	0.00
4,400.0	17.83	95.82	4,246.0	-102.6	1,007.0	1,012.3	0.00	0.00	0.00



# 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 0994-24-09E	<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)
4,500.0	17.83	95.82	4,341.2	-105.7	1,037.5	1,042.9	0.00	0.00	0.00
4,600.0	17.83	95.82	4,436.4	-108.8	1,068.0	1,073.5	0.00	0.00	0.00
4,700.0	17.83	95.82	4,531.6	-111.9	1,098.5	1,104.1	0.00	0.00	0.00
4,800.0	17.83	95.82	4,626.8	-115.0	1,128.9	1,134.8	0.00	0.00	0.00
4,900.0	17.83	95.82	4,722.0	-118.1	1,159.4	1,165.4	0.00	0.00	0.00
5,000.0	17.83	95.82	4,817.2	-121.2	1,189.9	1,196.0	0.00	0.00	0.00
5,100.0	17.83	95.82	4,912.4	-124.3	1,220.3	1,226.6	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,170.1	17.83	95.82	4,979.1	-126.5	1,241.7	1,248.1	0.00	0.00	0.00
5,200.0	16.94	95.82	5,007.6	-127.4	1,250.6	1,257.0	3.00	-3.00	0.00
5,300.0	13.94	95.82	5,104.0	-130.1	1,277.0	1,283.7	3.00	-3.00	0.00
5,400.0	10.94	95.82	5,201.7	-132.3	1,298.5	1,305.2	3.00	-3.00	0.00
5,500.0	7.94	95.82	5,300.3	-134.0	1,314.8	1,321.6	3.00	-3.00	0.00
5,600.0	4.94	95.82	5,399.7	-135.1	1,325.9	1,332.8	3.00	-3.00	0.00
5,700.0	1.94	95.82	5,499.5	-135.7	1,331.9	1,338.8	3.00	-3.00	0.00
<b>EOB @ Vertical - TOG</b>									
5,764.5	0.00	0.00	5,564.0	-135.8	1,333.0	1,339.9	3.00	-3.00	-148.47
5,800.0	0.00	0.00	5,599.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
5,900.0	0.00	0.00	5,699.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,000.0	0.00	0.00	5,799.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,100.0	0.00	0.00	5,899.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,200.0	0.00	0.00	5,999.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,300.0	0.00	0.00	6,099.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,400.0	0.00	0.00	6,199.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,500.0	0.00	0.00	6,299.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,600.0	0.00	0.00	6,399.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
<b>Cameo</b>									
6,664.5	0.00	0.00	6,464.0	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,700.0	0.00	0.00	6,499.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,800.0	0.00	0.00	6,599.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
6,900.0	0.00	0.00	6,699.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
7,000.0	0.00	0.00	6,799.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
7,100.0	0.00	0.00	6,899.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
7,200.0	0.00	0.00	6,999.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
7,300.0	0.00	0.00	7,099.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
7,324.5	0.00	0.00	7,124.0	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
<b>Rollins</b>									
7,364.5	0.00	0.00	7,164.0	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
7,400.0	0.00	0.00	7,199.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
7,500.0	0.00	0.00	7,299.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
7,600.0	0.00	0.00	7,399.5	-135.8	1,333.0	1,339.9	0.00	0.00	0.00
<b>TD @ 7614.5' MD / 7414.0' TVD</b>									
7,614.5	0.00	0.00	7,414.0	-135.8	1,333.0	1,339.9	0.00	0.00	0.00



# 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 0994-24-09E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
PBHL - Nichols 0994-24	0.00	0.00	7,414.0	-135.8	1,333.0	1,529,532.11	2,341,532.79	39° 15' 50.958 N	107° 49' 33.330 W
- plan hits target center									
- Circle (radius 50.0)									

Casing Points				
Measured Depth	Vertical Depth		Casing Diameter	Hole Diameter
(usft)	(usft)	Name	(")	(")
1,530.0	1,513.9	8 5/8"	8-5/8	11

Formations					
Measured Depth	Vertical Depth			Dip	Dip Direction
(usft)	(usft)	Name	Lithology	(°)	(°)
2,475.5	2,414.0	G' Sand			
4,313.8	4,164.0	Williams Fork			
5,764.5	5,564.0	TOG			
6,664.5	6,464.0	Cameo			
7,324.5	7,124.0	Base Cameo Coal			
7,364.5	7,164.0	Rollins			

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W	Comment	
(usft)	(usft)	(usft)	(usft)		
800.0	800.0	0.0	0.0	KOP (Build 3° / 100')	
1,394.5	1,384.9	-9.3	91.3	EOB @ 17.83° Inc / 95.82° Azm	
5,170.1	4,979.1	-126.5	1,241.7	Drop 3° / 100'	
5,764.5	5,564.0	-135.8	1,333.0	EOB @ Vertical	
7,614.5	7,414.0	-135.8	1,333.0	TD @ 7614.5' MD / 7414.0' TVD	