



Project: Mesa County, CO  
 Site: Nichols 24-06A  
 Well: Nichols 0994-24-02E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.264661  
 Longitude: -107.830561  
 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 0994-24-02E, 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 0994-24-02E

+N/-S	+E/-W	North	Ground Level:	7137.0	Latitude	Longitude
0.0	0.0	1529749.97	Easting	2340225.36	39.264661	-107.830561

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

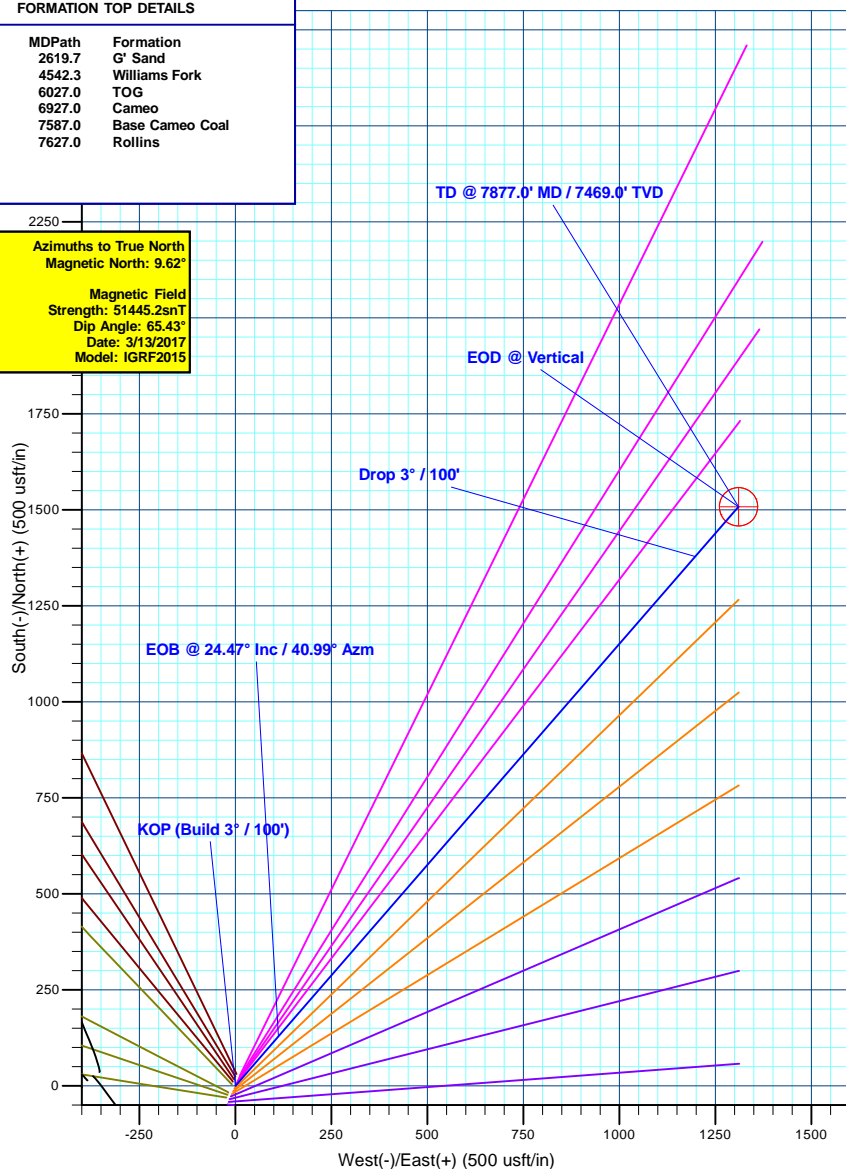
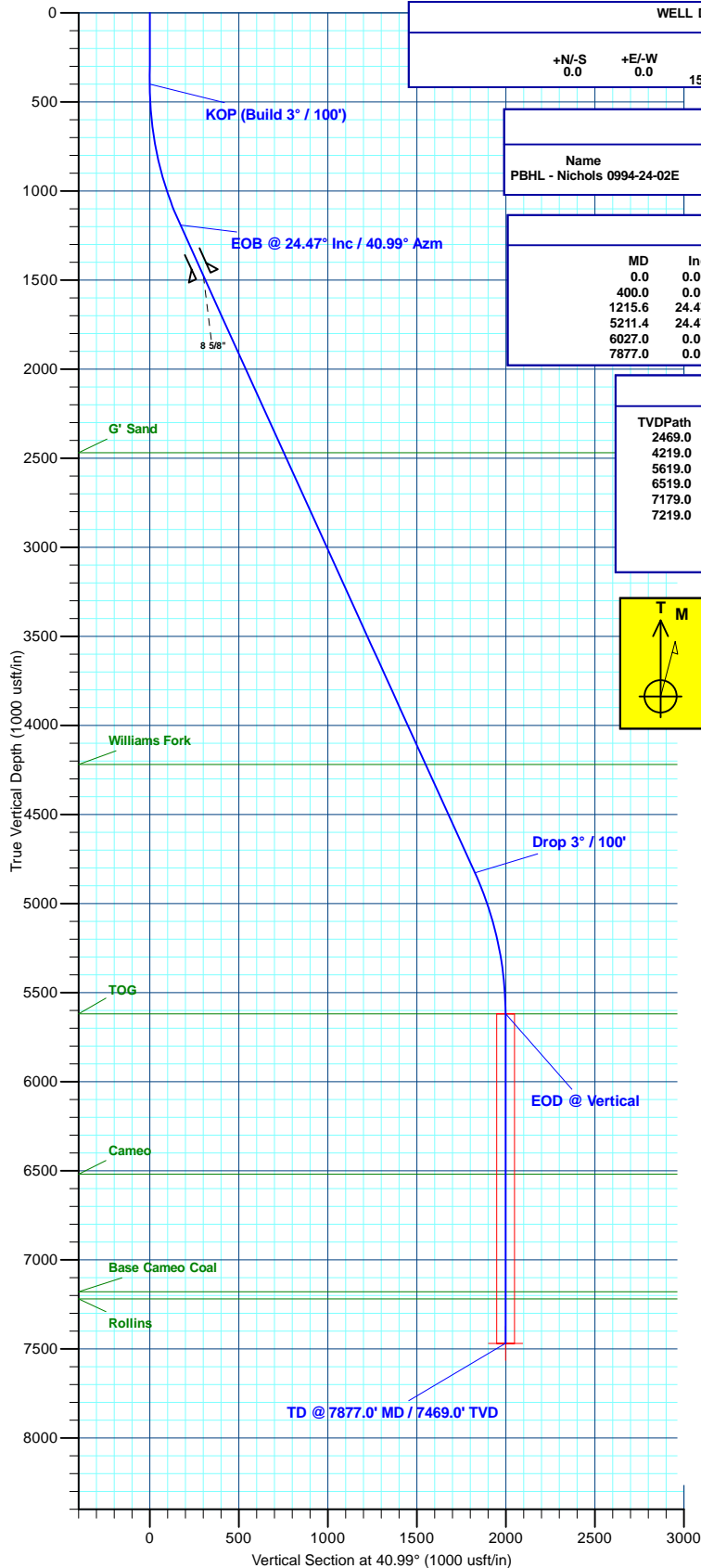
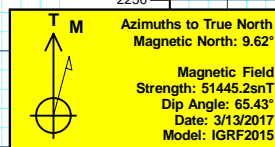
Name	TVD	+N/-S	+E/-W	North	Easting	Latitude	Longitude
PBHL - Nichols 0994-24-02E	7469.0	1508.3	1310.5	1531224.12	2341574.14	39.268802	-107.825932

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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1215.6	24.47	40.99	1191.1	129.5	112.5	3.00	40.99	171.5	EOB @ 24.47° Inc / 40.99° Azm
5211.4	24.47	40.99	4827.9	1378.8	1198.0	0.00	0.00	1826.6	Drop 3° / 100'
6027.0	0.00	0.00	5619.0	1508.3	1310.5	3.00	180.00	1998.1	EOD @ Vertical
7877.0	0.00	0.00	7469.0	1508.3	1310.5	0.00	0.00	1998.1	TD @ 7877.0' MD / 7469.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2469.0	2619.7	G' Sand
4219.0	4542.3	Williams Fork
5619.0	6027.0	TOG
6519.0	6927.0	Cameo
7179.0	7587.0	Base Cameo Coal
7219.0	7627.0	Rollins



Plan: Design #1 (Nichols 0994-24-02E/Wellbore #1)

Created By: Will Jircik Date: 18:34, March 13 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Nichols 24-06A**

**Nichols 0994-24-02E**

**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 0994-24-02E
<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 0994-24-02E	<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 0994-24-02E					
Well Position	+N/-S	48.4 usft	Northing:	1,529,749.97 usft	Latitude:	39.264661
	+E/-W	20.4 usft	Easting:	2,340,225.36 usft	Longitude:	-107.830561
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	40.99

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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,215.6	24.47	40.99	1,191.1	129.5	112.5	3.00	3.00	0.00	40.99	
5,211.4	24.47	40.99	4,827.9	1,378.8	1,198.0	0.00	0.00	0.00	0.00	
6,027.0	0.00	0.00	5,619.0	1,508.3	1,310.5	3.00	-3.00	0.00	180.00	
7,877.0	0.00	0.00	7,469.0	1,508.3	1,310.5	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 0994-24-02E
<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 0994-24-02E	<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
<b>KOP (Build 3° / 100')</b>									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	3.00	40.99	500.0	2.0	1.7	2.6	3.00	3.00	0.00
600.0	6.00	40.99	599.6	7.9	6.9	10.5	3.00	3.00	0.00
700.0	9.00	40.99	698.8	17.7	15.4	23.5	3.00	3.00	0.00
800.0	12.00	40.99	797.1	31.5	27.4	41.7	3.00	3.00	0.00
900.0	15.00	40.99	894.3	49.1	42.7	65.1	3.00	3.00	0.00
1,000.0	18.00	40.99	990.2	70.6	61.3	93.5	3.00	3.00	0.00
1,100.0	21.00	40.99	1,084.4	95.8	83.2	126.9	3.00	3.00	0.00
1,200.0	24.00	40.99	1,176.8	124.6	108.3	165.1	3.00	3.00	0.00
<b>EOB @ 24.47° Inc / 40.99° Azm</b>									
1,215.6	24.47	40.99	1,191.0	129.5	112.5	171.5	3.00	3.00	0.00
1,300.0	24.47	40.99	1,267.9	155.9	135.4	206.5	0.00	0.00	0.00
1,400.0	24.47	40.99	1,358.9	187.1	162.6	247.9	0.00	0.00	0.00
1,500.0	24.47	40.99	1,449.9	218.4	189.8	289.3	0.00	0.00	0.00
<b>8 5/8"</b>									
1,530.0	24.47	40.99	1,477.2	227.8	197.9	301.7	0.00	0.00	0.00
1,600.0	24.47	40.99	1,540.9	249.7	216.9	330.7	0.00	0.00	0.00
1,700.0	24.47	40.99	1,631.9	280.9	244.1	372.2	0.00	0.00	0.00
1,800.0	24.47	40.99	1,722.9	312.2	271.3	413.6	0.00	0.00	0.00
1,900.0	24.47	40.99	1,814.0	343.5	298.4	455.0	0.00	0.00	0.00
2,000.0	24.47	40.99	1,905.0	374.7	325.6	496.4	0.00	0.00	0.00
2,100.0	24.47	40.99	1,996.0	406.0	352.8	537.8	0.00	0.00	0.00
2,200.0	24.47	40.99	2,087.0	437.3	379.9	579.3	0.00	0.00	0.00
2,300.0	24.47	40.99	2,178.0	468.5	407.1	620.7	0.00	0.00	0.00
2,400.0	24.47	40.99	2,269.1	499.8	434.3	662.1	0.00	0.00	0.00
2,500.0	24.47	40.99	2,360.1	531.1	461.4	703.5	0.00	0.00	0.00
2,600.0	24.47	40.99	2,451.1	562.3	488.6	744.9	0.00	0.00	0.00
<b>G' Sand</b>									
2,619.7	24.47	40.99	2,469.0	568.5	493.9	753.1	0.00	0.00	0.00
2,700.0	24.47	40.99	2,542.1	593.6	515.8	786.4	0.00	0.00	0.00
2,800.0	24.47	40.99	2,633.1	624.8	542.9	827.8	0.00	0.00	0.00
2,900.0	24.47	40.99	2,724.2	656.1	570.1	869.2	0.00	0.00	0.00
3,000.0	24.47	40.99	2,815.2	687.4	597.3	910.6	0.00	0.00	0.00
3,100.0	24.47	40.99	2,906.2	718.6	624.4	952.0	0.00	0.00	0.00
3,200.0	24.47	40.99	2,997.2	749.9	651.6	993.5	0.00	0.00	0.00
3,300.0	24.47	40.99	3,088.2	781.2	678.8	1,034.9	0.00	0.00	0.00
3,400.0	24.47	40.99	3,179.2	812.4	705.9	1,076.3	0.00	0.00	0.00
3,500.0	24.47	40.99	3,270.3	843.7	733.1	1,117.7	0.00	0.00	0.00
3,600.0	24.47	40.99	3,361.3	875.0	760.3	1,159.1	0.00	0.00	0.00
3,700.0	24.47	40.99	3,452.3	906.2	787.4	1,200.5	0.00	0.00	0.00
3,800.0	24.47	40.99	3,543.3	937.5	814.6	1,242.0	0.00	0.00	0.00
3,900.0	24.47	40.99	3,634.3	968.8	841.8	1,283.4	0.00	0.00	0.00
4,000.0	24.47	40.99	3,725.4	1,000.0	868.9	1,324.8	0.00	0.00	0.00
4,100.0	24.47	40.99	3,816.4	1,031.3	896.1	1,366.2	0.00	0.00	0.00
4,200.0	24.47	40.99	3,907.4	1,062.6	923.3	1,407.6	0.00	0.00	0.00
4,300.0	24.47	40.99	3,998.4	1,093.8	950.4	1,449.1	0.00	0.00	0.00
4,400.0	24.47	40.99	4,089.4	1,125.1	977.6	1,490.5	0.00	0.00	0.00
4,500.0	24.47	40.99	4,180.5	1,156.4	1,004.8	1,531.9	0.00	0.00	0.00
<b>Williams Fork</b>									



# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-02E
<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 0994-24-02E	<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)
4,542.3	24.47	40.99	4,219.0	1,169.6	1,016.3	1,549.4	0.00	0.00	0.00
4,600.0	24.47	40.99	4,271.5	1,187.6	1,031.9	1,573.3	0.00	0.00	0.00
4,700.0	24.47	40.99	4,362.5	1,218.9	1,059.1	1,614.7	0.00	0.00	0.00
4,800.0	24.47	40.99	4,453.5	1,250.2	1,086.3	1,656.2	0.00	0.00	0.00
4,900.0	24.47	40.99	4,544.5	1,281.4	1,113.4	1,697.6	0.00	0.00	0.00
5,000.0	24.47	40.99	4,635.5	1,312.7	1,140.6	1,739.0	0.00	0.00	0.00
5,100.0	24.47	40.99	4,726.6	1,344.0	1,167.8	1,780.4	0.00	0.00	0.00
5,200.0	24.47	40.99	4,817.6	1,375.2	1,194.9	1,821.8	0.00	0.00	0.00
Drop 3° / 100'									
5,211.4	24.47	40.99	4,828.0	1,378.8	1,198.0	1,826.6	0.00	0.00	0.00
5,300.0	21.81	40.99	4,909.4	1,405.1	1,220.9	1,861.4	3.00	-3.00	0.00
5,400.0	18.81	40.99	5,003.2	1,431.3	1,243.6	1,896.1	3.00	-3.00	0.00
5,500.0	15.81	40.99	5,098.7	1,453.7	1,263.1	1,925.8	3.00	-3.00	0.00
5,600.0	12.81	40.99	5,195.5	1,472.4	1,279.3	1,950.6	3.00	-3.00	0.00
5,700.0	9.81	40.99	5,293.6	1,487.2	1,292.2	1,970.2	3.00	-3.00	0.00
5,800.0	6.81	40.99	5,392.5	1,498.1	1,301.7	1,984.6	3.00	-3.00	0.00
5,900.0	3.81	40.99	5,492.1	1,505.1	1,307.8	1,993.9	3.00	-3.00	0.00
6,000.0	0.81	40.99	5,592.0	1,508.1	1,310.4	1,997.9	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,027.0	0.00	0.00	5,619.0	1,508.3	1,310.5	1,998.1	3.00	-3.00	0.00
6,100.0	0.00	0.00	5,692.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,200.0	0.00	0.00	5,792.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,300.0	0.00	0.00	5,892.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,400.0	0.00	0.00	5,992.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,500.0	0.00	0.00	6,092.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,600.0	0.00	0.00	6,192.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,700.0	0.00	0.00	6,292.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,800.0	0.00	0.00	6,392.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
6,900.0	0.00	0.00	6,492.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
Cameo									
6,927.0	0.00	0.00	6,519.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,000.0	0.00	0.00	6,592.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,100.0	0.00	0.00	6,692.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,200.0	0.00	0.00	6,792.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,300.0	0.00	0.00	6,892.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,400.0	0.00	0.00	6,992.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,500.0	0.00	0.00	7,092.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
Base Cameo Coal									
7,587.0	0.00	0.00	7,179.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,600.0	0.00	0.00	7,192.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
Rollins									
7,627.0	0.00	0.00	7,219.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,700.0	0.00	0.00	7,292.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
7,800.0	0.00	0.00	7,392.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00
TD @ 7877.0' MD / 7469.0' TVD									
7,877.0	0.00	0.00	7,469.0	1,508.3	1,310.5	1,998.1	0.00	0.00	0.00



# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-02E
<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 0994-24-02E	<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	7,469.0	1,508.3	1,310.5	1,531,224.13	2,341,574.14	39.268802	-107.825932
- plan hits target center									
- Circle (radius 50.0)									

Casing Points				
Measured Depth	Vertical Depth		Casing Diameter	Hole Diameter
(usft)	(usft)	Name	(")	(")
1,530.0	1,477.2	8 5/8"	8-5/8	11

Formations					
Measured Depth	Vertical Depth			Dip	Dip Direction
(usft)	(usft)	Name	Lithology	(°)	(°)
2,619.7	2,469.0	G' Sand			
4,542.3	4,219.0	Williams Fork			
6,027.0	5,619.0	TOG			
6,927.0	6,519.0	Cameo			
7,587.0	7,179.0	Base Cameo Coal			
7,627.0	7,219.0	Rollins			

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		
(usft)	(usft)	+N/-S	+E/-W	Comment
(usft)	(usft)	(usft)	(usft)	
400.0	400.0	0.0	0.0	KOP (Build 3° / 100')
1,215.6	1,191.1	129.5	112.5	EOB @ 24.47° Inc / 40.99° Azm
5,211.4	4,828.0	1,378.8	1,198.0	Drop 3° / 100'
6,027.0	5,619.0	1,508.3	1,310.5	EOD @ Vertical
7,877.0	7,469.0	1,508.3	1,310.5	TD @ 7877.0' MD / 7469.0' TVD