

PROJECT DETAILS: Garfield 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

WELL DETAILS: CC Federal 0697-03-05W

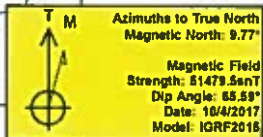
+N/S 0.0 +E/W 0.0 Northing 1639449.38 Easting 2233553.24 Ground Level: 8609.0 Latitude 39.557588 Longitude -108.218750

Project: Garfield County, CO
Site: CC 604-41-32 Pad
Well: CC Federal 0697-03-05W
Wellbore: Wellbore #1
Design: Design #3
Latitude: 39.557588
Longitude: -108.218750
Ground Level: 8609.0
Well @ 8639.0usft (RKB 30')



REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC Federal 0697-03-05W, True North
Vertical (TVD) Reference: Well @ 8639.0usft (RKB 30')
Section (VS) Reference: Slot @ 0.0N, 0.0E
Measured Depth Reference: Well @ 8639.0usft (RKB 30')
Calculation Method: Minimum Curvature



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
606.0	606.4	Mahogany
4864.0	5291.8	Wasatch 'G' Sand
6864.0	7128.4	Ohio Creek
6814.0	7299.5	Williams Fork
7814.0	8115.1	TOO
9264.0	9765.1	Cameo
9494.0	9995.1	Base Cameo Coal
9514.0	10015.1	Rollins

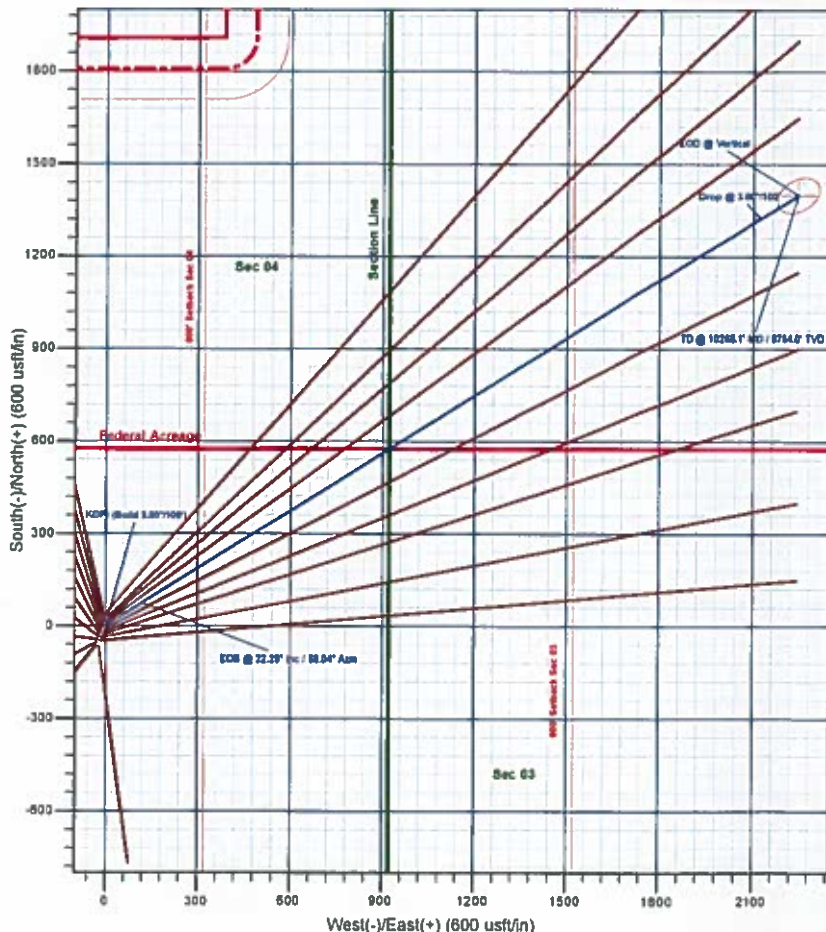
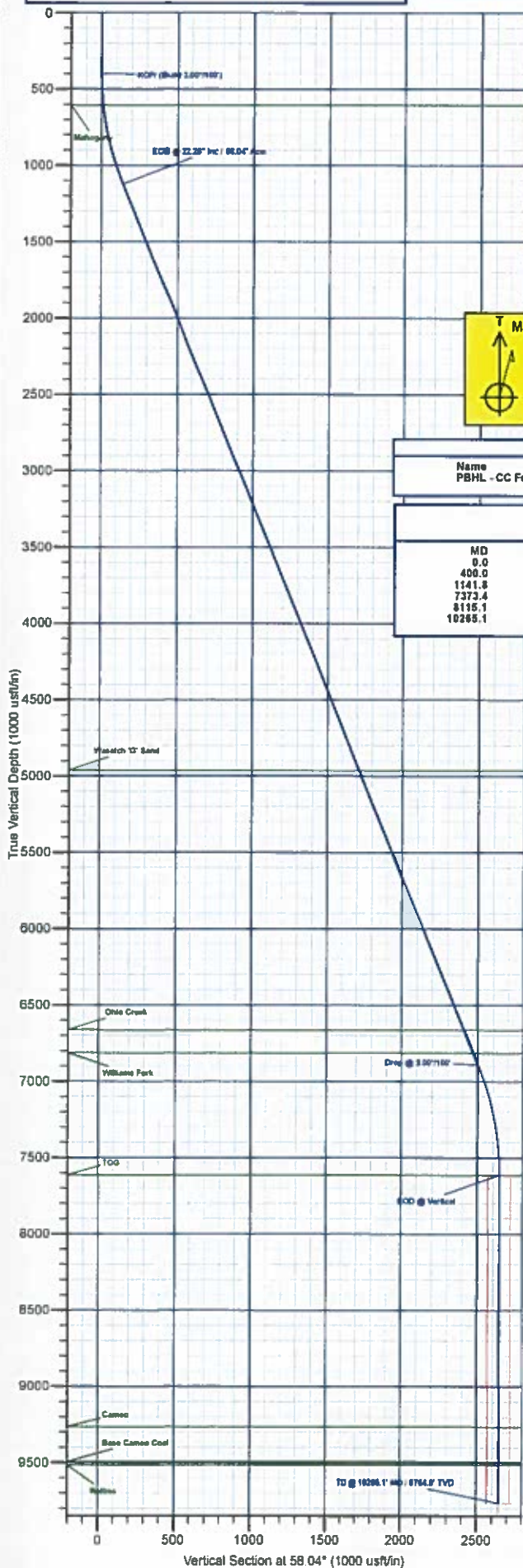


DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude
PBHL - CC Federal 0697-03-05W	9764.0	1399.6	2243.7	1640781.17	2235837.78	39.561430	-108.210782

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	KOP/ (Build 3.00"/100')
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	EOB @ 22.25" Inc / 58.04' Azm
1141.8	22.25	58.04	1123.3	75.3	120.7	3.00	58.04	142.2	Drop @ 3.00"/100'
7373.4	22.25	58.04	6890.7	1324.3	2123.0	0.00	0.00	2502.1	EOD @ Vertical
8115.1	0.00	0.00	7614.0	1399.6	2243.7	3.00	180.00	2644.4	TD @ 10265.1' MD / 9764.0' TVD
10265.1	0.00	0.00	9764.0	1399.6	2243.7	0.00	0.00	2644.4	



Plan: Design #3 (CC Federal 0697-03-05W/Wellbore #1)

Created By: Will Jircik Date: 16:06, February 04 2019



Laramie Energy, LLC

Garfield County, CO

CC 604-41-32 Pad

CC Federal 0697-03-05W

Wellbore #1

Plan: Design #3

QES Well Planning Report

04 February, 2019





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-05W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639.0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8839.0usft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Project	Garfield 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	CC 604-41-32 Pad				
Site Position:		Northing:	1,639,464.67 usft	Latitude:	39.557630
From:	Lat/Long	Easting:	2,233,548.14 usft	Longitude:	-108.218770
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.71 "

Well	CC Federal 0697-03-05W				
Well Position	+N/-S	-15.1 usft	Northing:	1,639,449.37 usft	Latitude: 39.557588
	+E/-W	5.6 usft	Easting:	2,233,553.24 usft	Longitude: -108.218750
Position Uncertainty	0.0 usft		Wellhead Elevation:		Ground Level: 8,609.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/4/2017	9.77	65.59	51,479.54204930

Design	Design #3			
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	58.04

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	
1,141.8	22.25	58.04	1,123.3	75.3	120.7	3.00	3.00	0.00	58.04	
7,373.4	22.25	58.04	6,890.7	1,324.3	2,123.0	0.00	0.00	0.00	0.00	
8,115.1	0.00	0.00	7,614.0	1,399.6	2,243.7	3.00	-3.00	0.00	180.00	
10,265.1	0.00	0.00	9,764.0	1,399.6	2,243.7	0.00	0.00	0.00	0.00	PBHL - CC Federal 06



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-05W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639.0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639.0usft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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
KOP/ (Build 3.00°/100')									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	3.00	58.04	500.0	1.4	2.2	2.6	3.00	3.00	0.00
600.0	6.00	58.04	599.6	5.5	8.9	10.5	3.00	3.00	0.00
Mahogany									
606.4	6.19	58.04	606.0	5.9	9.5	11.1	3.00	3.00	0.00
700.0	9.00	58.04	698.8	12.4	20.0	23.5	3.00	3.00	0.00
800.0	12.00	58.04	797.1	22.1	35.4	41.7	3.00	3.00	0.00
900.0	15.00	58.04	894.3	34.4	55.2	65.1	3.00	3.00	0.00
1,000.0	18.00	58.04	990.2	49.5	79.3	93.5	3.00	3.00	0.00
1,100.0	21.00	58.04	1,084.4	67.1	107.6	126.9	3.00	3.00	0.00
EOB @ 22.25° Inc / 58.04° Azm									
1,141.8	22.25	58.04	1,123.3	75.3	120.7	142.2	3.00	3.00	0.00
1,200.0	22.25	58.04	1,177.2	87.0	139.4	164.3	0.00	0.00	0.00
1,300.0	22.25	58.04	1,269.7	107.0	171.5	202.2	0.00	0.00	0.00
1,400.0	22.25	58.04	1,362.3	127.0	203.7	240.0	0.00	0.00	0.00
1,500.0	22.25	58.04	1,454.8	147.1	235.8	277.9	0.00	0.00	0.00
1,600.0	22.25	58.04	1,547.4	167.1	267.9	315.8	0.00	0.00	0.00
1,700.0	22.25	58.04	1,639.9	187.2	300.1	353.8	0.00	0.00	0.00
1,800.0	22.25	58.04	1,732.5	207.2	332.2	391.5	0.00	0.00	0.00
1,900.0	22.25	58.04	1,825.0	227.3	364.3	429.4	0.00	0.00	0.00
2,000.0	22.25	58.04	1,917.6	247.3	396.4	467.3	0.00	0.00	0.00
2,100.0	22.25	58.04	2,010.1	267.3	428.6	505.1	0.00	0.00	0.00
2,200.0	22.25	58.04	2,102.7	287.4	460.7	543.0	0.00	0.00	0.00
2,300.0	22.25	58.04	2,195.2	307.4	492.8	580.9	0.00	0.00	0.00
2,400.0	22.25	58.04	2,287.8	327.5	525.0	618.7	0.00	0.00	0.00
2,500.0	22.25	58.04	2,380.3	347.5	557.1	656.6	0.00	0.00	0.00
2,600.0	22.25	58.04	2,472.9	367.6	589.2	694.5	0.00	0.00	0.00
2,700.0	22.25	58.04	2,565.4	387.6	621.4	732.3	0.00	0.00	0.00
2,800.0	22.25	58.04	2,658.0	407.6	653.5	770.2	0.00	0.00	0.00
2,900.0	22.25	58.04	2,750.5	427.7	685.6	808.1	0.00	0.00	0.00
3,000.0	22.25	58.04	2,843.1	447.7	717.8	846.0	0.00	0.00	0.00
3,100.0	22.25	58.04	2,935.6	467.8	749.9	883.8	0.00	0.00	0.00
3,200.0	22.25	58.04	3,028.2	487.8	782.0	921.7	0.00	0.00	0.00
3,300.0	22.25	58.04	3,120.7	507.9	814.2	959.6	0.00	0.00	0.00
3,400.0	22.25	58.04	3,213.3	527.9	846.3	997.4	0.00	0.00	0.00
3,500.0	22.25	58.04	3,305.9	547.9	878.4	1,035.3	0.00	0.00	0.00
3,600.0	22.25	58.04	3,398.4	568.0	910.5	1,073.2	0.00	0.00	0.00
3,700.0	22.25	58.04	3,491.0	588.0	942.7	1,111.0	0.00	0.00	0.00
3,800.0	22.25	58.04	3,583.5	608.1	974.8	1,148.9	0.00	0.00	0.00
3,900.0	22.25	58.04	3,676.1	628.1	1,006.9	1,186.8	0.00	0.00	0.00
4,000.0	22.25	58.04	3,768.6	648.2	1,039.1	1,224.7	0.00	0.00	0.00
4,100.0	22.25	58.04	3,861.2	668.2	1,071.2	1,262.5	0.00	0.00	0.00
4,200.0	22.25	58.04	3,953.7	688.2	1,103.3	1,300.4	0.00	0.00	0.00
4,300.0	22.25	58.04	4,046.3	708.3	1,135.5	1,338.3	0.00	0.00	0.00
4,400.0	22.25	58.04	4,138.8	728.3	1,167.6	1,376.1	0.00	0.00	0.00
4,500.0	22.25	58.04	4,231.4	748.4	1,199.7	1,414.0	0.00	0.00	0.00
4,600.0	22.25	58.04	4,323.9	768.4	1,231.9	1,451.9	0.00	0.00	0.00
4,700.0	22.25	58.04	4,416.5	788.5	1,264.0	1,489.7	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-05W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639 0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639 0usft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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)
4,800.0	22.25	58.04	4,509.0	808.5	1,296.1	1,527.6	0.00	0.00	0.00
4,900.0	22.25	58.04	4,601.6	828.5	1,328.3	1,565.5	0.00	0.00	0.00
5,000.0	22.25	58.04	4,694.1	848.6	1,360.4	1,603.3	0.00	0.00	0.00
5,100.0	22.25	58.04	4,786.7	868.6	1,392.5	1,641.2	0.00	0.00	0.00
5,200.0	22.25	58.04	4,879.2	888.7	1,424.6	1,679.1	0.00	0.00	0.00
Wasatch 'G' Sand									
5,291.6	22.25	58.04	4,964.0	907.0	1,454.1	1,713.8	0.00	0.00	0.00
5,300.0	22.25	58.04	4,971.8	908.7	1,456.8	1,717.0	0.00	0.00	0.00
5,400.0	22.25	58.04	5,064.3	928.7	1,488.9	1,754.8	0.00	0.00	0.00
5,500.0	22.25	58.04	5,156.9	948.8	1,521.0	1,792.7	0.00	0.00	0.00
5,600.0	22.25	58.04	5,249.4	968.8	1,553.2	1,830.6	0.00	0.00	0.00
5,700.0	22.25	58.04	5,342.0	988.9	1,585.3	1,868.4	0.00	0.00	0.00
5,800.0	22.25	58.04	5,434.5	1,008.9	1,617.4	1,906.3	0.00	0.00	0.00
5,900.0	22.25	58.04	5,527.1	1,029.0	1,649.6	1,944.2	0.00	0.00	0.00
6,000.0	22.25	58.04	5,619.7	1,049.0	1,681.7	1,982.0	0.00	0.00	0.00
6,100.0	22.25	58.04	5,712.2	1,069.0	1,713.8	2,019.9	0.00	0.00	0.00
6,200.0	22.25	58.04	5,804.8	1,089.1	1,746.0	2,057.8	0.00	0.00	0.00
6,300.0	22.25	58.04	5,897.3	1,109.1	1,778.1	2,095.7	0.00	0.00	0.00
6,400.0	22.25	58.04	5,989.9	1,129.2	1,810.2	2,133.5	0.00	0.00	0.00
6,500.0	22.25	58.04	6,082.4	1,149.2	1,842.3	2,171.4	0.00	0.00	0.00
6,600.0	22.25	58.04	6,175.0	1,169.3	1,874.5	2,209.3	0.00	0.00	0.00
6,700.0	22.25	58.04	6,267.5	1,189.3	1,906.6	2,247.1	0.00	0.00	0.00
6,800.0	22.25	58.04	6,360.1	1,209.3	1,938.7	2,285.0	0.00	0.00	0.00
6,900.0	22.25	58.04	6,452.6	1,229.4	1,970.9	2,322.9	0.00	0.00	0.00
7,000.0	22.25	58.04	6,545.2	1,249.4	2,003.0	2,360.7	0.00	0.00	0.00
7,100.0	22.25	58.04	6,637.7	1,269.5	2,035.1	2,398.6	0.00	0.00	0.00
Ohio Creek									
7,128.4	22.25	58.04	6,664.0	1,275.2	2,044.3	2,409.4	0.00	0.00	0.00
7,200.0	22.25	58.04	6,730.3	1,289.5	2,067.3	2,436.5	0.00	0.00	0.00
Williams Fork									
7,290.5	22.25	58.04	6,814.0	1,307.6	2,096.3	2,470.7	0.00	0.00	0.00
7,300.0	22.25	58.04	6,822.8	1,309.6	2,099.4	2,474.4	0.00	0.00	0.00
Drop @ 3.00°/100'									
7,373.4	22.25	58.04	6,890.7	1,324.3	2,123.0	2,502.1	0.00	0.00	0.00
7,400.0	21.45	58.04	6,915.5	1,329.5	2,131.4	2,512.0	3.00	-3.00	0.00
7,500.0	18.45	58.04	7,009.4	1,347.6	2,160.3	2,546.2	3.00	-3.00	0.00
7,600.0	15.45	58.04	7,105.1	1,363.0	2,185.1	2,575.3	3.00	-3.00	0.00
7,700.0	12.45	58.04	7,202.1	1,375.8	2,205.5	2,599.4	3.00	-3.00	0.00
7,800.0	9.45	58.04	7,300.3	1,385.8	2,221.7	2,618.4	3.00	-3.00	0.00
7,900.0	6.45	58.04	7,399.3	1,393.1	2,233.4	2,632.3	3.00	-3.00	0.00
8,000.0	3.45	58.04	7,498.9	1,397.7	2,240.7	2,640.9	3.00	-3.00	0.00
8,100.0	0.45	58.04	7,598.9	1,399.5	2,243.6	2,644.3	3.00	-3.00	0.00
EOD @ Vertical - TOG									
8,115.1	0.00	0.00	7,614.0	1,399.6	2,243.7	2,644.4	3.00	-3.00	0.00
8,200.0	0.00	0.00	7,698.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
8,300.0	0.00	0.00	7,798.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
8,400.0	0.00	0.00	7,898.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
8,500.0	0.00	0.00	7,998.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
8,600.0	0.00	0.00	8,098.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
8,700.0	0.00	0.00	8,198.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
8,800.0	0.00	0.00	8,298.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
8,900.0	0.00	0.00	8,398.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,000.0	0.00	0.00	8,498.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,100.0	0.00	0.00	8,598.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00



Well Planning Report



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Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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)
9,200.0	0.00	0.00	8,698.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,300.0	0.00	0.00	8,798.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,400.0	0.00	0.00	8,898.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,500.0	0.00	0.00	8,998.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,600.0	0.00	0.00	9,098.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,700.0	0.00	0.00	9,198.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
Cameo									
9,765.1	0.00	0.00	9,264.0	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,800.0	0.00	0.00	9,298.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
9,900.0	0.00	0.00	9,398.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
Base Cameo Coal									
9,995.1	0.00	0.00	9,494.0	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
10,000.0	0.00	0.00	9,498.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
Rollins									
10,015.1	0.00	0.00	9,514.0	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
10,100.0	0.00	0.00	9,598.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
10,200.0	0.00	0.00	9,698.9	1,399.6	2,243.7	2,644.4	0.00	0.00	0.00
TD @ 10265.1' MD / 9764.0' TVD									
10,265.1	0.00	0.00	9,764.0	1,399.6	2,243.7	2,644.4	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 - CC Federal 0697	0.00	0.00	9,764.0	1,399.6	2,243.7	1,640,781.16	2,235,837.78	39.561430	-108.210792
- plan hits target center									
- Ellipse (radii L50.0 W75.0 on 150.00 azi)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,530.0	2,408.1	9 5/8"	9-5/8	14-3/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
606.4	606.0	Mahogany			
5,291.6	4,964.0	Wasatch 'G' Sand			
7,128.4	6,664.0	Ohio Creek			
7,290.5	6,814.0	Williams Fork			
8,115.1	7,614.0	TOG			
9,765.1	9,264.0	Cameo			
9,995.1	9,494.0	Base Cameo Coal			
10,015.1	9,514.0	Rollins			



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-05W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639.0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639.0usft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
400.0	400.0	0.0	0.0	KOP/ (Build 3.00"/100')
1,141.8	1,123.3	75.3	120.7	EOB @ 22.25° Inc / 58.04° Azm
7,373.4	6,890.7	1,324.3	2,123.0	Drop @ 3.00"/100'
8,115.1	7,614.0	1,399.6	2,243.7	EOD @ Vertical
10,265.1	9,764.0	1,399.6	2,243.7	TD @ 10265.1' MD / 9764.0' TVD