





Laramie Energy, LLC

Garfield County, CO

CC 604-41-32 Pad

CC Federal 0697-03-02W

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 0697-03-02W
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 0697-03-02W	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:	1,639,464.87 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 0697-03-02W			
Well Position	+N/-S	13.6 usft	Northing:	1,639,477.86 usft
	+E/-W	14.9 usft	Easting:	2,233,563.40 usft
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	51,479.58871776

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	46.50

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,034.2	25.03	46.50	1,007.9	123.4	130.1	3.00	3.00	0.00	46.50	
7,469.5	25.03	46.50	6,839.1	1,997.3	2,104.8	0.00	0.00	0.00	0.00	
8,303.7	0.00	0.00	7,647.0	2,120.8	2,234.9	3.00	-3.00	0.00	180.00	
10,964.7	0.00	0.00	10,308.0	2,120.8	2,234.9	0.00	0.00	0.00	0.00	PBHL - CC Federal 01



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Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-02W	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	
KOP/ (Build 3.00°/100')										
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00	
300.0	3.00	46.50	300.0	1.8	1.9	2.6	3.00	3.00	0.00	
400.0	6.00	46.50	399.6	7.2	7.6	10.5	3.00	3.00	0.00	
500.0	9.00	46.50	498.8	16.2	17.1	23.5	3.00	3.00	0.00	
600.0	12.00	46.50	597.1	28.7	30.3	41.7	3.00	3.00	0.00	
Mahogany										
609.1	12.27	46.50	606.0	30.0	31.7	43.7	3.00	3.00	0.00	
700.0	15.00	46.50	694.3	44.8	47.2	65.1	3.00	3.00	0.00	
800.0	18.00	46.50	790.2	64.3	67.8	93.5	3.00	3.00	0.00	
900.0	21.00	46.50	884.4	87.3	92.0	126.9	3.00	3.00	0.00	
1,000.0	24.00	46.50	976.8	113.7	119.8	165.1	3.00	3.00	0.00	
EOB @ 25.03° Inc / 46.50° Azm										
1,034.2	25.03	46.50	1,007.9	123.4	130.1	179.3	3.00	3.00	0.00	
1,100.0	25.03	46.50	1,067.5	142.6	150.3	207.1	0.00	0.00	0.00	
1,200.0	25.03	46.50	1,158.2	171.7	180.9	249.4	0.00	0.00	0.00	
1,300.0	25.03	46.50	1,248.8	200.8	211.6	291.7	0.00	0.00	0.00	
1,400.0	25.03	46.50	1,339.4	229.9	242.3	334.0	0.00	0.00	0.00	
1,500.0	25.03	46.50	1,430.0	259.1	273.0	376.4	0.00	0.00	0.00	
1,600.0	25.03	46.50	1,520.6	288.2	303.7	418.7	0.00	0.00	0.00	
1,700.0	25.03	46.50	1,611.2	317.3	334.4	461.0	0.00	0.00	0.00	
1,800.0	25.03	46.50	1,701.8	346.4	365.1	503.3	0.00	0.00	0.00	
1,900.0	25.03	46.50	1,792.4	375.5	395.7	545.6	0.00	0.00	0.00	
2,000.0	25.03	46.50	1,883.1	404.7	426.4	587.9	0.00	0.00	0.00	
2,100.0	25.03	46.50	1,973.7	433.8	457.1	630.2	0.00	0.00	0.00	
2,200.0	25.03	46.50	2,064.3	462.9	487.8	672.5	0.00	0.00	0.00	
2,300.0	25.03	46.50	2,154.9	492.0	518.5	714.8	0.00	0.00	0.00	
2,400.0	25.03	46.50	2,245.5	521.1	549.2	757.1	0.00	0.00	0.00	
2,500.0	25.03	46.50	2,336.1	550.3	579.9	799.4	0.00	0.00	0.00	
2,600.0	25.03	46.50	2,426.7	579.4	610.5	841.7	0.00	0.00	0.00	
2,700.0	25.03	46.50	2,517.3	608.5	641.2	884.0	0.00	0.00	0.00	
2,800.0	25.03	46.50	2,607.9	637.6	671.9	926.3	0.00	0.00	0.00	
2,900.0	25.03	46.50	2,698.6	666.7	702.6	968.6	0.00	0.00	0.00	
3,000.0	25.03	46.50	2,789.2	695.8	733.3	1,010.9	0.00	0.00	0.00	
3,100.0	25.03	46.50	2,879.8	725.0	764.0	1,053.2	0.00	0.00	0.00	
3,200.0	25.03	46.50	2,970.4	754.1	794.7	1,095.5	0.00	0.00	0.00	
3,300.0	25.03	46.50	3,061.0	783.2	825.3	1,137.8	0.00	0.00	0.00	
3,400.0	25.03	46.50	3,151.6	812.3	856.0	1,180.1	0.00	0.00	0.00	
3,500.0	25.03	46.50	3,242.2	841.4	886.7	1,222.4	0.00	0.00	0.00	
3,600.0	25.03	46.50	3,332.8	870.6	917.4	1,264.7	0.00	0.00	0.00	
3,700.0	25.03	46.50	3,423.5	899.7	948.1	1,307.0	0.00	0.00	0.00	
3,800.0	25.03	46.50	3,514.1	928.8	978.8	1,349.3	0.00	0.00	0.00	
3,900.0	25.03	46.50	3,604.7	957.9	1,009.5	1,391.6	0.00	0.00	0.00	
4,000.0	25.03	46.50	3,695.3	987.0	1,040.1	1,433.9	0.00	0.00	0.00	
4,100.0	25.03	46.50	3,785.9	1,016.2	1,070.8	1,476.2	0.00	0.00	0.00	
4,200.0	25.03	46.50	3,876.5	1,045.3	1,101.5	1,518.5	0.00	0.00	0.00	
4,300.0	25.03	46.50	3,967.1	1,074.4	1,132.2	1,560.8	0.00	0.00	0.00	
4,400.0	25.03	46.50	4,057.7	1,103.5	1,162.9	1,603.1	0.00	0.00	0.00	
4,500.0	25.03	46.50	4,148.3	1,132.6	1,193.6	1,645.4	0.00	0.00	0.00	
4,600.0	25.03	46.50	4,238.9	1,161.8	1,224.3	1,687.7	0.00	0.00	0.00	
4,700.0	25.03	46.50	4,329.6	1,190.9	1,254.9	1,730.0	0.00	0.00	0.00	



Well Planning Report



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Well:	CC Federal 0697-03-02W	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	25.03	46.50	4,420.2	1,220.0	1,285.6	1,772.4	0.00	0.00	0.00
4,900.0	25.03	46.50	4,510.8	1,249.1	1,316.3	1,814.7	0.00	0.00	0.00
5,000.0	25.03	46.50	4,601.4	1,278.2	1,347.0	1,857.0	0.00	0.00	0.00
5,100.0	25.03	46.50	4,692.0	1,307.4	1,377.7	1,899.3	0.00	0.00	0.00
5,200.0	25.03	46.50	4,782.6	1,336.5	1,408.4	1,941.6	0.00	0.00	0.00
5,300.0	25.03	46.50	4,873.2	1,365.6	1,439.1	1,983.9	0.00	0.00	0.00
5,400.0	25.03	46.50	4,963.8	1,394.7	1,469.7	2,026.2	0.00	0.00	0.00
Wasatch 'G' Sand									
5,436.6	25.03	46.50	4,997.0	1,405.4	1,481.0	2,041.6	0.00	0.00	0.00
5,500.0	25.03	46.50	5,054.5	1,423.8	1,500.4	2,068.5	0.00	0.00	0.00
5,600.0	25.03	46.50	5,145.1	1,452.9	1,531.1	2,110.8	0.00	0.00	0.00
5,700.0	25.03	46.50	5,235.7	1,482.1	1,561.8	2,153.1	0.00	0.00	0.00
5,800.0	25.03	46.50	5,326.3	1,511.2	1,592.5	2,195.4	0.00	0.00	0.00
5,900.0	25.03	46.50	5,416.9	1,540.3	1,623.2	2,237.7	0.00	0.00	0.00
6,000.0	25.03	46.50	5,507.5	1,569.4	1,653.9	2,280.0	0.00	0.00	0.00
6,100.0	25.03	46.50	5,598.1	1,598.5	1,684.5	2,322.3	0.00	0.00	0.00
6,200.0	25.03	46.50	5,688.7	1,627.7	1,715.2	2,364.6	0.00	0.00	0.00
6,300.0	25.03	46.50	5,779.4	1,656.8	1,745.9	2,406.9	0.00	0.00	0.00
6,400.0	25.03	46.50	5,870.0	1,685.9	1,776.6	2,449.2	0.00	0.00	0.00
6,500.0	25.03	46.50	5,960.6	1,715.0	1,807.3	2,491.5	0.00	0.00	0.00
6,600.0	25.03	46.50	6,051.2	1,744.1	1,838.0	2,533.8	0.00	0.00	0.00
6,700.0	25.03	46.50	6,141.8	1,773.3	1,868.7	2,576.1	0.00	0.00	0.00
6,800.0	25.03	46.50	6,232.4	1,802.4	1,899.3	2,618.4	0.00	0.00	0.00
6,900.0	25.03	46.50	6,323.0	1,831.5	1,930.0	2,660.7	0.00	0.00	0.00
7,000.0	25.03	46.50	6,413.6	1,860.6	1,960.7	2,703.0	0.00	0.00	0.00
7,100.0	25.03	46.50	6,504.2	1,889.7	1,991.4	2,745.3	0.00	0.00	0.00
7,200.0	25.03	46.50	6,594.9	1,918.9	2,022.1	2,787.6	0.00	0.00	0.00
7,300.0	25.03	46.50	6,685.5	1,948.0	2,052.8	2,829.9	0.00	0.00	0.00
Ohio Creek									
7,312.7	25.03	46.50	6,697.0	1,951.7	2,056.7	2,835.3	0.00	0.00	0.00
7,400.0	25.03	46.50	6,776.1	1,977.1	2,083.5	2,872.2	0.00	0.00	0.00
Drop @ 3.00°/100'									
7,469.5	25.03	46.50	6,839.1	1,997.3	2,104.8	2,901.6	0.00	0.00	0.00
Williams Fork									
7,478.3	24.76	46.50	6,847.0	1,999.9	2,107.5	2,905.3	3.00	-3.00	0.00
7,500.0	24.11	46.50	6,866.8	2,006.1	2,114.0	2,914.3	3.00	-3.00	0.00
7,600.0	21.11	46.50	6,959.1	2,032.5	2,141.9	2,952.8	3.00	-3.00	0.00
7,700.0	18.11	46.50	7,053.3	2,055.6	2,166.2	2,986.3	3.00	-3.00	0.00
7,800.0	15.11	46.50	7,149.1	2,075.3	2,187.0	3,014.9	3.00	-3.00	0.00
7,900.0	12.11	46.50	7,246.3	2,091.5	2,204.0	3,036.4	3.00	-3.00	0.00
8,000.0	9.11	46.50	7,344.6	2,104.2	2,217.4	3,056.8	3.00	-3.00	0.00
8,100.0	6.11	46.50	7,443.7	2,113.3	2,227.0	3,070.1	3.00	-3.00	0.00
8,200.0	3.11	46.50	7,543.3	2,118.8	2,232.8	3,078.1	3.00	-3.00	0.00
8,300.0	0.11	46.50	7,643.3	2,120.8	2,234.9	3,080.9	3.00	-3.00	0.00
EOD @ Vertical - TOG									
8,303.7	0.00	0.00	7,647.0	2,120.8	2,234.9	3,080.9	3.00	-3.00	0.00
8,400.0	0.00	0.00	7,743.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00
8,500.0	0.00	0.00	7,843.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00
8,600.0	0.00	0.00	7,943.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00
8,700.0	0.00	0.00	8,043.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00
8,800.0	0.00	0.00	8,143.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00
8,900.0	0.00	0.00	8,243.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00
9,000.0	0.00	0.00	8,343.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00
9,100.0	0.00	0.00	8,443.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00



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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	8,543.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
9,300.0	0.00	0.00	8,643.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
9,400.0	0.00	0.00	8,743.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
9,500.0	0.00	0.00	8,843.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
9,600.0	0.00	0.00	8,943.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
9,700.0	0.00	0.00	9,043.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
9,800.0	0.00	0.00	9,143.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
9,900.0	0.00	0.00	9,243.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
Cameo										
9,953.7	0.00	0.00	9,297.0	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,000.0	0.00	0.00	9,343.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,100.0	0.00	0.00	9,443.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
Base Cameo Coal										
10,183.7	0.00	0.00	9,527.0	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,200.0	0.00	0.00	9,543.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
Rollins										
10,203.7	0.00	0.00	9,547.0	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,300.0	0.00	0.00	9,643.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,400.0	0.00	0.00	9,743.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
Cozzette										
10,441.7	0.00	0.00	9,785.0	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,500.0	0.00	0.00	9,843.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,600.0	0.00	0.00	9,943.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,700.0	0.00	0.00	10,043.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
Corcoran										
10,714.7	0.00	0.00	10,058.0	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,800.0	0.00	0.00	10,143.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
10,900.0	0.00	0.00	10,243.3	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	
TD @ 10964.7' MD / 10308.0' TVD										
10,964.7	0.00	0.00	10,308.0	2,120.8	2,234.9	3,080.9	0.00	0.00	0.00	

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PBHL - CC Federal 069; - plan hits target center - Ellipse (rad= L50.0 W75.0 on 150.00 azi)	0.00	0.00	10,308.0	2,120.8	2,234.9	1,641,530.80	2,235,860.72	39.563489	-108.210790

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
2,530.0	2,383.3	9 5/8"		9-5/8	14-3/4



Well Planning Report



Database: EDM 5000 1 Single User Db
Company: Laramie Energy, LLC
Project: Garfield County, CO
Site: CC 604-41-32 Pad
Well: CC Federal 0697-03-02W
Wellbore: Wellbore #1
Design: Design #3

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well CC Federal 0697-03-02W
Well @ 8639.0usft (RKB 30')
Well @ 8639.0usft (RKB 30')
True
Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
609.1	606.0	Mahogany			
5,436.6	4,997.0	Wasatch 'G' Sand			
7,312.7	6,697.0	Ohio Creek			
7,478.3	6,847.0	Williams Fork			
8,303.7	7,647.0	TOG			
9,953.7	9,297.0	Cameo			
10,183.7	9,527.0	Base Cameo Coal			
10,203.7	9,547.0	Rollins			
10,441.7	9,785.0	Cozzette			
10,714.7	10,058.0	Corcoran			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	200.0	0.0	0.0	KOP / (Build 3.00"/100')
1,034.2	1,007.9	123.4	130.1	EOB @ 25.03° Inc / 46.50° Azm
7,469.5	6,839.1	1,997.3	2,104.8	Drop @ 3.00"/100'
8,303.7	7,647.0	2,120.8	2,234.9	EOD @ Vertical
10,964.7	10,308.0	2,120.8	2,234.9	TD @ 10964.7' MD / 10308.0' TVD