



# **Laramie Energy, LLC**

**Garfield County, CO  
CC 603-23-32 Pad  
CC 0697-03-22E - Slot B-10**

**Wellbore #1**

**Plan: Design #2**

## **QES Well Planning Report**

**09 November, 2020**





# Well Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CC 0697-03-22E - Slot B-10
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Project:</b>	Garfield County, CO	<b>MD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Site:</b>	CC 603-23-32 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 0697-03-22E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

<b>Project</b>	Garfield County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

<b>Site</b>	CC 603-23-32 Pad				
<b>Site Position:</b>		<b>Northing:</b>	1,636,290.15 usft	<b>Latitude:</b>	39.549111
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,235,900.36 usft	<b>Longitude:</b>	-108.210095
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-1.71 °

<b>Well</b>	CC 0697-03-22E - Slot B-10					
<b>Well Position</b>	<b>+N/-S</b>	-20.7 usft	<b>Northing:</b>	1,636,269.73 usft	<b>Latitude:</b>	39.549054
	<b>+E/-W</b>	-8.5 usft	<b>Easting:</b>	2,235,891.29 usft	<b>Longitude:</b>	-108.210125
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	8,613.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM2020	10/30/2020	9.43	65.75	51,296.70000000

<b>Design</b>	Design #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	86.41

<b>Plan Sections</b>										
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	
350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,473.4	28.09	86.41	1,429.0	16.9	269.3	2.50	2.50	0.00	86.41	
6,885.8	28.09	86.41	6,204.0	176.3	2,812.5	0.00	0.00	0.00	0.00	
8,009.2	0.00	0.00	7,283.0	193.2	3,081.8	2.50	-2.50	0.00	180.00	
10,959.2	0.00	0.00	10,233.0	193.2	3,081.8	0.00	0.00	0.00	0.00	03-22E - PBHL



# Well Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CC 0697-03-22E - Slot B-10
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Project:</b>	Garfield County, CO	<b>MD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Site:</b>	CC 603-23-32 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 0697-03-22E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

## 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 2.5° / 100)</b>									
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	1.25	86.41	400.0	0.0	0.5	0.5	2.50	2.50	0.00
500.0	3.75	86.41	499.9	0.3	4.9	4.9	2.50	2.50	0.00
600.0	6.25	86.41	599.5	0.9	13.6	13.6	2.50	2.50	0.00
700.0	8.75	86.41	698.6	1.7	26.6	26.7	2.50	2.50	0.00
800.0	11.25	86.41	797.1	2.8	44.0	44.0	2.50	2.50	0.00
900.0	13.75	86.41	894.7	4.1	65.6	65.7	2.50	2.50	0.00
1,000.0	16.25	86.41	991.3	5.7	91.4	91.6	2.50	2.50	0.00
1,100.0	18.75	86.41	1,086.7	7.6	121.4	121.6	2.50	2.50	0.00
<b>Mahogany</b>									
1,149.1	19.98	86.41	1,133.0	8.6	137.6	137.9	2.50	2.50	0.00
1,200.0	21.25	86.41	1,180.6	9.7	155.5	155.8	2.50	2.50	0.00
1,300.0	23.75	86.41	1,273.0	12.1	193.7	194.1	2.50	2.50	0.00
1,400.0	26.25	86.41	1,363.7	14.8	235.9	236.4	2.50	2.50	0.00
<b>EOB @ 28.08° Inc. / 86.41° Azm</b>									
1,473.4	28.09	86.41	1,429.0	16.9	269.3	269.9	2.50	2.50	0.00
1,500.0	28.09	86.41	1,452.4	17.7	281.8	282.4	0.00	0.00	0.00
1,600.0	28.09	86.41	1,540.6	20.6	328.8	329.5	0.00	0.00	0.00
1,700.0	28.09	86.41	1,628.9	23.6	375.8	376.5	0.00	0.00	0.00
1,800.0	28.09	86.41	1,717.1	26.5	422.8	423.6	0.00	0.00	0.00
1,900.0	28.09	86.41	1,805.3	29.4	469.8	470.7	0.00	0.00	0.00
2,000.0	28.09	86.41	1,893.5	32.4	516.8	517.8	0.00	0.00	0.00
2,100.0	28.09	86.41	1,981.8	35.3	563.8	564.9	0.00	0.00	0.00
2,200.0	28.09	86.41	2,070.0	38.3	610.7	611.9	0.00	0.00	0.00
2,300.0	28.09	86.41	2,158.2	41.2	657.7	659.0	0.00	0.00	0.00
2,400.0	28.09	86.41	2,246.4	44.2	704.7	706.1	0.00	0.00	0.00
2,500.0	28.09	86.41	2,334.7	47.1	751.7	753.2	0.00	0.00	0.00
<b>9 5/8"</b>									
2,530.0	28.09	86.41	2,361.1	48.0	765.8	767.3	0.00	0.00	0.00
2,600.0	28.09	86.41	2,422.9	50.1	798.7	800.3	0.00	0.00	0.00
2,700.0	28.09	86.41	2,511.1	53.0	845.7	847.3	0.00	0.00	0.00
2,800.0	28.09	86.41	2,599.3	55.9	892.7	894.4	0.00	0.00	0.00
2,900.0	28.09	86.41	2,687.6	58.9	939.7	941.5	0.00	0.00	0.00
3,000.0	28.09	86.41	2,775.8	61.8	986.6	988.6	0.00	0.00	0.00
3,100.0	28.09	86.41	2,864.0	64.8	1,033.6	1,035.7	0.00	0.00	0.00
3,200.0	28.09	86.41	2,952.2	67.7	1,080.6	1,082.7	0.00	0.00	0.00
3,300.0	28.09	86.41	3,040.5	70.7	1,127.6	1,129.8	0.00	0.00	0.00
<b>Wasatch</b>									
3,348.2	28.09	86.41	3,083.0	72.1	1,150.3	1,152.5	0.00	0.00	0.00
3,400.0	28.09	86.41	3,128.7	73.6	1,174.6	1,176.9	0.00	0.00	0.00
3,500.0	28.09	86.41	3,216.9	76.6	1,221.6	1,224.0	0.00	0.00	0.00
3,600.0	28.09	86.41	3,305.1	79.5	1,268.6	1,271.1	0.00	0.00	0.00
3,700.0	28.09	86.41	3,393.4	82.5	1,315.5	1,318.1	0.00	0.00	0.00
3,800.0	28.09	86.41	3,481.6	85.4	1,362.5	1,365.2	0.00	0.00	0.00
3,900.0	28.09	86.41	3,569.8	88.3	1,409.5	1,412.3	0.00	0.00	0.00
4,000.0	28.09	86.41	3,658.0	91.3	1,456.5	1,459.4	0.00	0.00	0.00
4,100.0	28.09	86.41	3,746.3	94.2	1,503.5	1,506.4	0.00	0.00	0.00
4,200.0	28.09	86.41	3,834.5	97.2	1,550.5	1,553.5	0.00	0.00	0.00
4,300.0	28.09	86.41	3,922.7	100.1	1,597.5	1,600.6	0.00	0.00	0.00



# Well Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CC 0697-03-22E - Slot B-10
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Project:</b>	Garfield County, CO	<b>MD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Site:</b>	CC 603-23-32 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 0697-03-22E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

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)
4,400.0	28.09	86.41	4,010.9	103.1	1,644.5	1,647.7	0.00	0.00	0.00
4,500.0	28.09	86.41	4,099.1	106.0	1,691.4	1,694.8	0.00	0.00	0.00
4,600.0	28.09	86.41	4,187.4	109.0	1,738.4	1,741.8	0.00	0.00	0.00
4,700.0	28.09	86.41	4,275.6	111.9	1,785.4	1,788.9	0.00	0.00	0.00
4,800.0	28.09	86.41	4,363.8	114.8	1,832.4	1,836.0	0.00	0.00	0.00
4,900.0	28.09	86.41	4,452.0	117.8	1,879.4	1,883.1	0.00	0.00	0.00
5,000.0	28.09	86.41	4,540.3	120.7	1,926.4	1,930.2	0.00	0.00	0.00
5,100.0	28.09	86.41	4,628.5	123.7	1,973.4	1,977.2	0.00	0.00	0.00
5,200.0	28.09	86.41	4,716.7	126.6	2,020.4	2,024.3	0.00	0.00	0.00
5,300.0	28.09	86.41	4,804.9	129.6	2,067.3	2,071.4	0.00	0.00	0.00
<b>Wasatch 'G' Sand</b>									
5,331.8	28.09	86.41	4,833.0	130.5	2,082.3	2,086.4	0.00	0.00	0.00
5,400.0	28.09	86.41	4,893.2	132.5	2,114.3	2,118.5	0.00	0.00	0.00
5,500.0	28.09	86.41	4,981.4	135.5	2,161.3	2,165.6	0.00	0.00	0.00
<b>Fort Union</b>									
5,569.8	28.09	86.41	5,043.0	137.5	2,194.1	2,198.4	0.00	0.00	0.00
5,600.0	28.09	86.41	5,069.6	138.4	2,208.3	2,212.6	0.00	0.00	0.00
5,700.0	28.09	86.41	5,157.8	141.4	2,255.3	2,259.7	0.00	0.00	0.00
5,800.0	28.09	86.41	5,246.1	144.3	2,302.3	2,306.8	0.00	0.00	0.00
5,900.0	28.09	86.41	5,334.3	147.2	2,349.3	2,353.9	0.00	0.00	0.00
6,000.0	28.09	86.41	5,422.5	150.2	2,396.3	2,401.0	0.00	0.00	0.00
6,100.0	28.09	86.41	5,510.7	153.1	2,443.2	2,448.0	0.00	0.00	0.00
6,200.0	28.09	86.41	5,599.0	156.1	2,490.2	2,495.1	0.00	0.00	0.00
6,300.0	28.09	86.41	5,687.2	159.0	2,537.2	2,542.2	0.00	0.00	0.00
6,400.0	28.09	86.41	5,775.4	162.0	2,584.2	2,589.3	0.00	0.00	0.00
6,500.0	28.09	86.41	5,863.6	164.9	2,631.2	2,636.4	0.00	0.00	0.00
6,600.0	28.09	86.41	5,951.9	167.9	2,678.2	2,683.4	0.00	0.00	0.00
6,700.0	28.09	86.41	6,040.1	170.8	2,725.2	2,730.5	0.00	0.00	0.00
6,800.0	28.09	86.41	6,128.3	173.7	2,772.1	2,777.6	0.00	0.00	0.00
<b>Drop 2.5° /100'</b>									
6,885.8	28.09	86.41	6,204.0	176.3	2,812.5	2,818.0	0.00	0.00	0.00
6,900.0	27.73	86.41	6,216.6	176.7	2,819.1	2,824.6	2.50	-2.50	0.00
7,000.0	25.23	86.41	6,306.1	179.5	2,863.6	2,869.2	2.50	-2.50	0.00
7,100.0	22.73	86.41	6,397.4	182.0	2,904.2	2,909.9	2.50	-2.50	0.00
7,200.0	20.23	86.41	6,490.5	184.3	2,940.7	2,946.5	2.50	-2.50	0.00
<b>Ohio Creek</b>									
7,297.9	17.78	86.41	6,583.0	186.3	2,972.5	2,978.3	2.50	-2.50	0.00
7,300.0	17.73	86.41	6,585.0	186.3	2,973.2	2,979.0	2.50	-2.50	0.00
7,400.0	15.23	86.41	6,680.9	188.1	3,001.5	3,007.4	2.50	-2.50	0.00
7,500.0	12.73	86.41	6,777.9	189.6	3,025.6	3,031.5	2.50	-2.50	0.00
7,600.0	10.23	86.41	6,875.9	190.9	3,045.4	3,051.4	2.50	-2.50	0.00
<b>Williams Fork</b>									
7,607.2	10.05	86.41	6,883.0	191.0	3,046.7	3,052.7	2.50	-2.50	0.00
7,700.0	7.73	86.41	6,974.7	191.9	3,061.0	3,067.0	2.50	-2.50	0.00
7,800.0	5.23	86.41	7,074.0	192.6	3,072.3	3,078.3	2.50	-2.50	0.00
7,900.0	2.73	86.41	7,173.8	193.0	3,079.2	3,085.3	2.50	-2.50	0.00
<b>EOD @ Vertical - TOG</b>									
8,009.2	0.00	0.00	7,283.0	193.2	3,081.8	3,087.9	2.50	-2.50	-79.10
8,100.0	0.00	0.00	7,373.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
8,200.0	0.00	0.00	7,473.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
8,300.0	0.00	0.00	7,573.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
8,400.0	0.00	0.00	7,673.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
8,500.0	0.00	0.00	7,773.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00



# Well Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CC 0697-03-22E - Slot B-10
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Project:</b>	Garfield County, CO	<b>MD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Site:</b>	CC 603-23-32 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 0697-03-22E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

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)
8,600.0	0.00	0.00	7,873.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
8,700.0	0.00	0.00	7,973.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
8,800.0	0.00	0.00	8,073.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
8,900.0	0.00	0.00	8,173.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,000.0	0.00	0.00	8,273.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,100.0	0.00	0.00	8,373.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,200.0	0.00	0.00	8,473.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,300.0	0.00	0.00	8,573.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,400.0	0.00	0.00	8,673.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,500.0	0.00	0.00	8,773.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,600.0	0.00	0.00	8,873.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,700.0	0.00	0.00	8,973.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
<b>Cameo</b>									
9,799.2	0.00	0.00	9,073.0	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,800.0	0.00	0.00	9,073.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
9,900.0	0.00	0.00	9,173.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,000.0	0.00	0.00	9,273.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,100.0	0.00	0.00	9,373.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
10,194.2	0.00	0.00	9,468.0	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,200.0	0.00	0.00	9,473.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
<b>Rollins</b>									
10,209.2	0.00	0.00	9,483.0	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,300.0	0.00	0.00	9,573.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,400.0	0.00	0.00	9,673.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
<b>Cozzette</b>									
10,409.2	0.00	0.00	9,683.0	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,500.0	0.00	0.00	9,773.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,600.0	0.00	0.00	9,873.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
<b>Corcoran</b>									
10,684.2	0.00	0.00	9,958.0	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,700.0	0.00	0.00	9,973.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,800.0	0.00	0.00	10,073.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
10,900.0	0.00	0.00	10,173.8	193.2	3,081.8	3,087.9	0.00	0.00	0.00
<b>TD @ 10959.2' MD / 10233.0' TVD</b>									
10,959.2	0.00	0.00	10,233.0	193.2	3,081.8	3,087.9	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
03-22E - PBHL	0.00	0.00	10,233.0	193.2	3,081.8	1,636,370.87	2,238,977.50	39.549584	-108.199196
- hit/miss target									
- plan hits target center									
- Ellipse (radii L50.0 W75.0 on 150.00 azi)									



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CC 0697-03-22E - Slot B-10
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Project:</b>	Garfield County, CO	<b>MD Reference:</b>	RKB @ 8643.0usft (H&P #522)
<b>Site:</b>	CC 603-23-32 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 0697-03-22E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,530.0	2,361.1	9 5/8"	9-5/8	14-1/2

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,149.1	1,133.0	Mahogany			
3,348.2	3,083.0	Wasatch			
5,331.8	4,833.0	Wasatch 'G' Sand			
5,569.8	5,043.0	Fort Union			
7,297.9	6,583.0	Ohio Creek			
7,607.2	6,883.0	Williams Fork			
8,009.2	7,283.0	TOG			
9,799.2	9,073.0	Cameo			
10,194.2	9,468.0	Base Cameo Coal			
10,209.2	9,483.0	Rollins			
10,409.2	9,683.0	Cozzette			
10,684.2	9,958.0	Corcoran			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
350.0	350.0	0.0	0.0	KOP @ (Build 2.5° / 100)
1,473.4	1,429.0	16.9	269.3	EOB @ 28.08° Inc. / 86.41° Azm
6,885.8	6,204.0	176.3	2,812.5	Drop 2.5° /100'
8,009.2	7,283.0	193.2	3,081.8	EOD @ Vertical
10,959.2	10,233.0	193.2	3,081.8	TD @ 10959.2' MD / 10233.0' TVD