



Project: Garfield County, CO
 Site: CC 604-12-13 Pad
 Well: CC Federal 0697-04-05W
 Wellbore: B-10
 Design: Design #1
 Latitude: 39.553323
 Longitude: -108.233283
 Ground Level: 8529.0
 WELL @ 8559.0usft (H&P #522)



SECTION DETAILS										
MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFaca	VSect	Annotation	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3' / 100')	
225.0	0.00	0.00	225.0	0.0	0.0	0.00	0.00	0.0	EOB @ 22.18° Inc. / 24.93° Azm	
944.2	22.18	24.93	945.9	128.1	59.6	3.00	24.93	141.3	Drop 3' / 100'	
6944.8	22.18	24.93	6484.1	2175.1	1011.2	0.00	0.00	2398.6	EOD @ Vertical	
7684.0	0.00	0.00	7205.0	2303.2	1070.8	3.00	180.00	2539.9	TD @ 9934.0' MD / 9455.0' TVD	
9934.0	0.00	0.00	9455.0	2303.2	1070.8	0.00	0.00	2539.9		

DESIGN TARGET DETAILS							
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - CC Federal 0697-04-05W	9455.0	2303.2	1070.8	1640289.42	2230550.35	39.559646	-108.229485

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 0697-04-05W

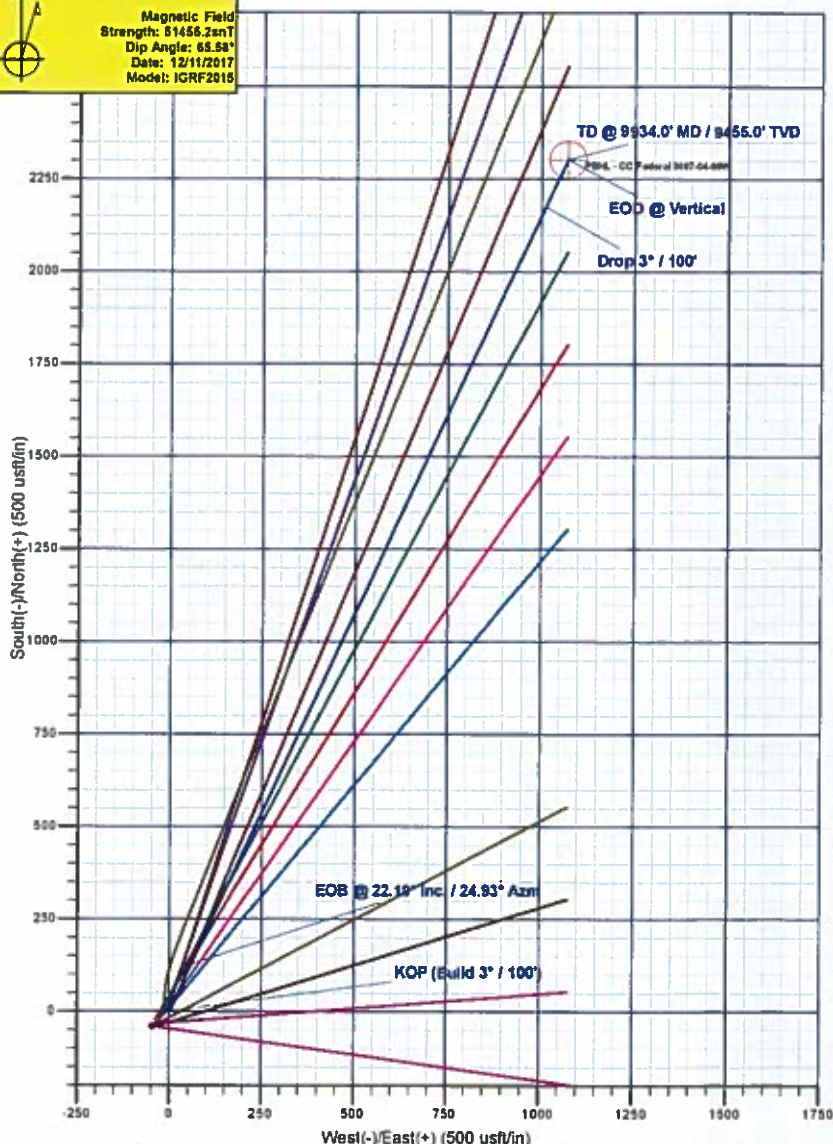
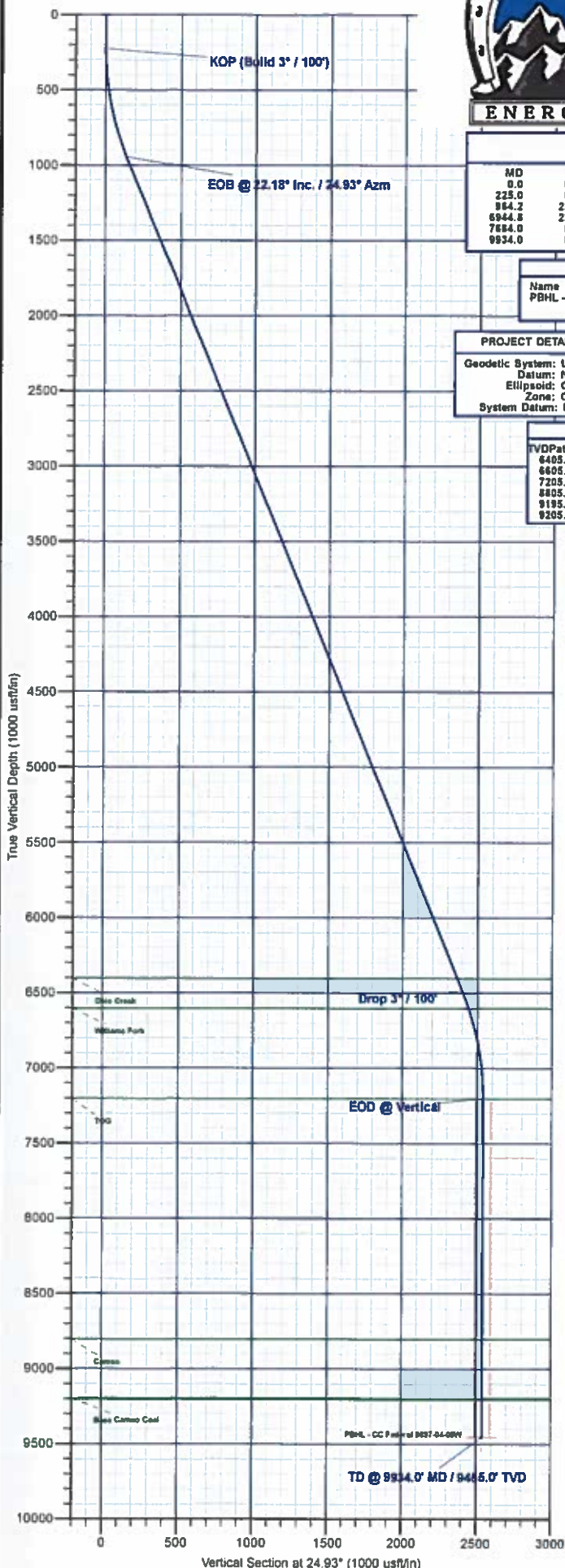
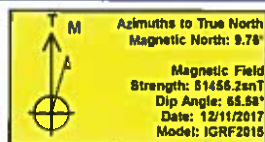
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1638019.81	2229410.76	39.553323	-108.233283

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6405.0	6459.4	Ohio Creek
6405.0	7073.7	Williams Fork
7205.0	7684.0	TOG
8805.0	9284.0	Cameo
9195.0	9674.0	Base Cameo Coal
9205.0	9684.0	Rollins

REFERENCE INFORMATION

Co-ordinate (NE) Reference: Well CC Federal 0697-04-05W, True North
 Vertical (TVD) Reference: WELL @ 8559.0usft (H&P #522)
 Section (VS) Reference: S101 - (6.0N, 0.0E)
 Measured Depth Reference: WELL @ 8559.0usft (H&P #522)
 Calculation Method: Minimum Curvature



Plan: Design #1 (CC Federal 0697-04-05W/B-10)

Created By: Will Jircik Date: 15:53, December 13 2017



Laramie Energy, LLC

Garfield County, CO

CC 604-12-13 Pad

CC Federal 0697-04-05W

B-10

Plan: Design #1

QES Well Planning Report

14 December, 2017





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-04-05W
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8559.0usft (H&P #522)
Project:	Garfield County, CO	MD Reference:	WELL @ 8559.0usft (H&P #522)
Site:	CC 604-12-13 Pad	North Reference:	True
Well:	CC Federal 0697-04-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-10		
Design:	Design #1		

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 604-12-13 Pad			
Site Position:		Northing:	1,638,031.56 usft	Latitude: 39.553356
From:	Lat/Long	Easting:	2,229,410.52 usft	Longitude: -108.233285
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.72 "

Well	CC Federal 0697-04-05W			
Well Position	+N/-S	-12.0 usft	Northing:	1,638,019.51 usft
	+E/-W	0.6 usft	Easting:	2,229,410.76 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	
			Ground Level:	8,529.0 usft

Wellbore	B-10				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/11/2017	9.76	65.58	51,455.24966574

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	24.93

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	
225.0	0.00	0.00	225.0	0.0	0.0	0.00	0.00	0.00	0.00	
964.2	22.18	24.93	945.9	128.1	59.6	3.00	3.00	0.00	24.93	
6,944.8	22.18	24.93	6,484.1	2,175.1	1,011.2	0.00	0.00	0.00	0.00	
7,684.0	0.00	0.00	7,205.0	2,303.2	1,070.8	3.00	-3.00	0.00	180.00	
9,934.0	0.00	0.00	9,455.0	2,303.2	1,070.8	0.00	0.00	0.00	0.00	PBHL - CC Federal 0697-04-05W



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-04-05W
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8559.0usft (H&P #522)
Project:	Garfield County, CO	MD Reference:	WELL @ 8559.0usft (H&P #522)
Site:	CC 804-12-13 Pad	North Reference:	True
Well:	CC Federal 0697-04-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-10		
Design:	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
KOP (Build 3° / 100')									
225.0	0.00	0.00	225.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	2.25	24.93	300.0	1.3	0.6	1.5	3.00	3.00	0.00
400.0	5.25	24.93	399.8	7.3	3.4	8.0	3.00	3.00	0.00
500.0	8.25	24.93	499.1	17.9	8.3	19.8	3.00	3.00	0.00
600.0	11.25	24.93	597.6	33.3	15.5	36.7	3.00	3.00	0.00
700.0	14.25	24.93	695.1	53.3	24.8	58.8	3.00	3.00	0.00
800.0	17.25	24.93	791.4	77.9	36.2	85.9	3.00	3.00	0.00
900.0	20.25	24.93	886.0	107.0	49.8	118.0	3.00	3.00	0.00
EOB @ 22.18° Inc. / 24.93° Azm									
964.2	22.18	24.93	945.9	128.1	59.6	141.3	3.00	3.00	0.00
1,000.0	22.18	24.93	979.0	140.4	65.3	154.8	0.00	0.00	0.00
1,100.0	22.18	24.93	1,071.6	174.6	81.2	192.5	0.00	0.00	0.00
1,200.0	22.18	24.93	1,164.2	208.8	97.1	230.3	0.00	0.00	0.00
1,300.0	22.18	24.93	1,256.8	243.0	113.0	268.0	0.00	0.00	0.00
1,400.0	22.18	24.93	1,349.4	277.3	128.9	305.8	0.00	0.00	0.00
1,500.0	22.18	24.93	1,442.0	311.5	144.8	343.5	0.00	0.00	0.00
1,600.0	22.18	24.93	1,534.7	345.7	160.7	381.3	0.00	0.00	0.00
1,700.0	22.18	24.93	1,627.3	379.9	176.6	419.0	0.00	0.00	0.00
1,800.0	22.18	24.93	1,719.9	414.2	192.6	456.7	0.00	0.00	0.00
1,900.0	22.18	24.93	1,812.5	448.4	208.5	494.5	0.00	0.00	0.00
2,000.0	22.18	24.93	1,905.1	482.6	224.4	532.2	0.00	0.00	0.00
2,100.0	22.18	24.93	1,997.7	516.9	240.3	570.0	0.00	0.00	0.00
2,200.0	22.18	24.93	2,090.3	551.1	256.2	607.7	0.00	0.00	0.00
2,300.0	22.18	24.93	2,182.9	585.3	272.1	645.5	0.00	0.00	0.00
2,400.0	22.18	24.93	2,275.5	619.5	288.0	683.2	0.00	0.00	0.00
2,500.0	22.18	24.93	2,368.1	653.8	303.9	721.0	0.00	0.00	0.00
9 5/8"									
2,530.0	22.18	24.93	2,395.9	664.0	308.7	732.3	0.00	0.00	0.00
2,600.0	22.18	24.93	2,460.7	688.0	319.9	758.7	0.00	0.00	0.00
2,700.0	22.18	24.93	2,553.3	722.2	335.8	796.4	0.00	0.00	0.00
2,800.0	22.18	24.93	2,645.9	756.4	351.7	834.2	0.00	0.00	0.00
2,900.0	22.18	24.93	2,738.5	790.7	367.6	871.9	0.00	0.00	0.00
3,000.0	22.18	24.93	2,831.1	824.9	383.5	909.7	0.00	0.00	0.00
3,100.0	22.18	24.93	2,923.7	859.1	399.4	947.4	0.00	0.00	0.00
3,200.0	22.18	24.93	3,016.3	893.3	415.3	985.2	0.00	0.00	0.00
3,300.0	22.18	24.93	3,108.9	927.6	431.2	1,022.9	0.00	0.00	0.00
3,400.0	22.18	24.93	3,201.5	961.8	447.2	1,060.7	0.00	0.00	0.00
3,500.0	22.18	24.93	3,294.1	996.0	463.1	1,098.4	0.00	0.00	0.00
3,600.0	22.18	24.93	3,386.7	1,030.2	479.0	1,136.1	0.00	0.00	0.00
3,700.0	22.18	24.93	3,479.3	1,064.5	494.9	1,173.9	0.00	0.00	0.00
3,800.0	22.18	24.93	3,571.9	1,098.7	510.8	1,211.6	0.00	0.00	0.00
3,900.0	22.18	24.93	3,664.5	1,132.9	526.7	1,249.4	0.00	0.00	0.00
4,000.0	22.18	24.93	3,757.1	1,167.2	542.6	1,287.1	0.00	0.00	0.00
4,100.0	22.18	24.93	3,849.7	1,201.4	558.5	1,324.9	0.00	0.00	0.00
4,200.0	22.18	24.93	3,942.3	1,235.6	574.5	1,362.6	0.00	0.00	0.00
4,300.0	22.18	24.93	4,034.9	1,269.8	590.4	1,400.4	0.00	0.00	0.00
4,400.0	22.18	24.93	4,127.5	1,304.1	606.3	1,438.1	0.00	0.00	0.00
4,500.0	22.18	24.93	4,220.1	1,338.3	622.2	1,475.9	0.00	0.00	0.00
4,600.0	22.18	24.93	4,312.7	1,372.5	638.1	1,513.6	0.00	0.00	0.00



Well Planning Report



Database: EDM 5000.1 Single User Db
Company: Laramie Energy, LLC
Project: Garfield County, CO
Site: CC 604-12-13 Pad
Well: CC Federal 0697-04-05W
Wellbore: B-10
Design: Design #1

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

Well CC Federal 0697-04-05W
 WELL @ 8559.0usft (H&P #522)
 WELL @ 8559.0usft (H&P #522)
 True
 Minimum Curvature

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)
4,700.0	22.18	24.93	4,405.3	1,406.7	654.0	1,551.3	0.00	0.00	0.00
4,800.0	22.18	24.93	4,498.0	1,441.0	669.9	1,589.1	0.00	0.00	0.00
4,900.0	22.18	24.93	4,590.6	1,475.2	685.8	1,626.8	0.00	0.00	0.00
5,000.0	22.18	24.93	4,683.2	1,509.4	701.8	1,664.6	0.00	0.00	0.00
5,100.0	22.18	24.93	4,775.8	1,543.6	717.7	1,702.3	0.00	0.00	0.00
5,200.0	22.18	24.93	4,868.4	1,577.9	733.6	1,740.1	0.00	0.00	0.00
5,300.0	22.18	24.93	4,961.0	1,612.1	749.5	1,777.8	0.00	0.00	0.00
5,400.0	22.18	24.93	5,053.6	1,646.3	765.4	1,815.6	0.00	0.00	0.00
5,500.0	22.18	24.93	5,146.2	1,680.5	781.3	1,853.3	0.00	0.00	0.00
5,600.0	22.18	24.93	5,238.8	1,714.8	797.2	1,891.0	0.00	0.00	0.00
5,700.0	22.18	24.93	5,331.4	1,749.0	813.1	1,928.8	0.00	0.00	0.00
5,800.0	22.18	24.93	5,424.0	1,783.2	829.1	1,966.5	0.00	0.00	0.00
5,900.0	22.18	24.93	5,516.6	1,817.5	845.0	2,004.3	0.00	0.00	0.00
6,000.0	22.18	24.93	5,609.2	1,851.7	860.9	2,042.0	0.00	0.00	0.00
6,100.0	22.18	24.93	5,701.8	1,885.9	876.8	2,079.8	0.00	0.00	0.00
6,200.0	22.18	24.93	5,794.4	1,920.1	892.7	2,117.5	0.00	0.00	0.00
6,300.0	22.18	24.93	5,887.0	1,954.4	908.6	2,155.3	0.00	0.00	0.00
6,400.0	22.18	24.93	5,979.6	1,988.6	924.5	2,193.0	0.00	0.00	0.00
6,500.0	22.18	24.93	6,072.2	2,022.8	940.5	2,230.7	0.00	0.00	0.00
6,600.0	22.18	24.93	6,164.8	2,057.0	956.4	2,268.5	0.00	0.00	0.00
6,700.0	22.18	24.93	6,257.4	2,091.3	972.3	2,306.2	0.00	0.00	0.00
6,800.0	22.18	24.93	6,350.0	2,125.5	988.2	2,344.0	0.00	0.00	0.00
Ohio Creek									
6,859.4	22.18	24.93	6,405.0	2,145.8	997.6	2,366.4	0.00	0.00	0.00
6,900.0	22.18	24.93	6,442.6	2,159.7	1,004.1	2,381.7	0.00	0.00	0.00
Drop 3° / 100'									
6,944.8	22.18	24.93	6,484.1	2,175.1	1,011.2	2,398.6	0.00	0.00	0.00
7,000.0	20.52	24.93	6,535.5	2,193.3	1,019.7	2,418.7	3.00	-3.00	0.00
Williams Fork									
7,073.7	18.31	24.93	6,605.0	2,215.5	1,030.0	2,443.2	3.00	-3.00	0.00
7,100.0	17.52	24.93	6,630.0	2,222.8	1,033.4	2,451.3	3.00	-3.00	0.00
7,200.0	14.52	24.93	6,726.1	2,247.8	1,045.1	2,478.9	3.00	-3.00	0.00
7,300.0	11.52	24.93	6,823.6	2,268.3	1,054.6	2,501.4	3.00	-3.00	0.00
7,400.0	8.52	24.93	6,922.0	2,284.1	1,061.9	2,518.8	3.00	-3.00	0.00
7,500.0	5.52	24.93	7,021.3	2,295.1	1,067.1	2,531.1	3.00	-3.00	0.00
7,600.0	2.52	24.93	7,121.0	2,301.5	1,070.0	2,538.1	3.00	-3.00	0.00
EOD @ Vertical - TOG									
7,684.0	0.00	0.00	7,205.0	2,303.2	1,070.8	2,539.9	3.00	-3.00	0.00
7,700.0	0.00	0.00	7,221.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
7,800.0	0.00	0.00	7,321.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
7,900.0	0.00	0.00	7,421.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,000.0	0.00	0.00	7,521.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,100.0	0.00	0.00	7,621.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,200.0	0.00	0.00	7,721.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,300.0	0.00	0.00	7,821.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,400.0	0.00	0.00	7,921.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,500.0	0.00	0.00	8,021.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,600.0	0.00	0.00	8,121.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,700.0	0.00	0.00	8,221.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,800.0	0.00	0.00	8,321.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
8,900.0	0.00	0.00	8,421.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,000.0	0.00	0.00	8,521.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,100.0	0.00	0.00	8,621.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,200.0	0.00	0.00	8,721.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00



Well Planning Report



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Project:	Garfield County, CO	MD Reference:	WELL @ 8559.0usft (H&P #522)
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Well:	CC Federal 0697-04-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-10		
Design:	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)
Cameo									
9,284.0	0.00	0.00	8,805.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,300.0	0.00	0.00	8,821.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,400.0	0.00	0.00	8,921.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,500.0	0.00	0.00	9,021.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,600.0	0.00	0.00	9,121.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
Base Cameo Coal									
9,674.0	0.00	0.00	9,195.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
Rollins									
9,684.0	0.00	0.00	9,205.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,700.0	0.00	0.00	9,221.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,800.0	0.00	0.00	9,321.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
9,900.0	0.00	0.00	9,421.0	2,303.2	1,070.8	2,539.9	0.00	0.00	0.00
TD @ 9934.0' MD / 9455.0' TVD									
9,934.0	0.00	0.00	9,455.0	2,303.2	1,070.8	2,539.9	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
- hit/miss target									
- Shape									
PBHL - CC Federal 0697; - plan hits target center - Circle (radius 50.0)	0.00	0.00	9,455.0	2,303.2	1,070.8	1,640,289.42	2,230,550.35	39.559646	-108.229485

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,530.0	2,395.9	9 5/8"	9-5/8	14-3/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,859.4	6,405.0	Ohio Creek			
7,073.7	6,605.0	Williams Fork			
7,684.0	7,205.0	TOG			
9,284.0	8,805.0	Cameo			
9,674.0	9,195.0	Base Cameo Coal			
9,684.0	9,205.0	Rollins			



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-04-05W
Company:	Laramie Energy, LLC	TVD Reference:	WELL @ 8559.0usft (H&P #522)
Project:	Garfield County, CO	MD Reference:	WELL @ 8559.0usft (H&P #522)
Site:	CC 604-12-13 Pad	North Reference:	True
Well:	CC Federal 0697-04-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-10		
Design:	Design #1		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
225.0	225.0	0.0	0.0	KOP (Build 3" / 100')
964.2	945.9	128.1	59.6	EOB @ 22.18° Inc. / 24.93° Azm
6,944.8	6,484.1	2,175.1	1,011.2	Drop 3" / 100'
7,684.0	7,205.0	2,303.2	1,070.8	EOD @ Vertical
9,934.0	9,455.0	2,303.2	1,070.8	TD @ 9934.0' MD / 9455.0' TVD