

WELL DETAILS: CC 0697-04-06E							
+N/-S	+E/-W	North	Ground Level:	8609.0	Latitude	Longitude	
0.0	0.0	1639424.62	Easting	2233532.61	39.557519	-108.218817	

Project: Garfield County, CO
 Site: CC 604-41-32 Pad
 Well: CC 0697-04-06E
 Wellbore: Wellbore #1
 Design: Design #3
 Latitude: 39.557519
 Longitude: -108.218817
 Ground Level: 8609.0
 Well @ 8639.0usft (RKB 30')

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



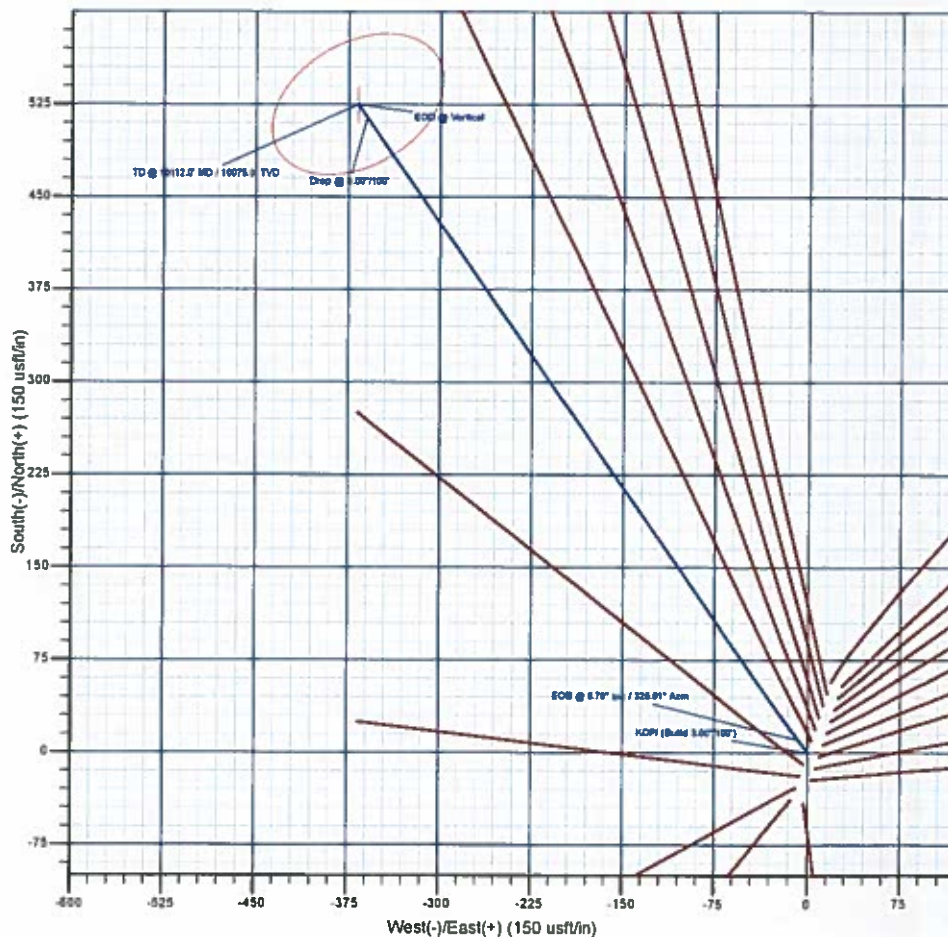
FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
606.0	606.4	Mahogany
4764.0	4793.0	Wasatch 'G' Sand
6464.0	6501.0	Ohio Creek
6814.0	6851.0	Williams Fork
7414.0	7451.0	TCG
8064.0	8101.0	Cameo
9294.0	9331.0	Base Cameo Coal
9828.0	9851.0	Rollins
9889.0	9899.0	Cozzetta
	9862.0	Corcoran



REFERENCE INFORMATION
 Co-ordinate (N/E) Reference: Well CC 0697-04-06E, 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

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	North	Easting	Latitude	Longitude
PBHL - CC 0697-04-06E	10075.0	524.9	-367.4	1639960.48	2233182.10	39.558960	-108.220120

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 3.00°/100')
623.4	6.70	325.01	622.9	10.7	-7.5	3.00	325.01	13.1	EOB @ 6.70° Inc / 325.01° Azm
5888.8	6.70	325.01	5892.1	514.2	-359.9	0.00	0.00	627.6	Drop @ 3.00°/100'
6112.0	0.00	0.00	6075.0	524.9	-367.4	3.00	180.00	640.7	EOB @ Vertical
10112.0	0.00	0.00	10075.0	524.9	-367.4	0.00	0.00	640.7	TD @ 10112.0' MD / 10075.0' TVD





Laramie Energy, LLC

Garfield County, CO

CC 604-41-32 Pad

CC 0697-04-06E

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 0697-04-06E
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 0697-04-06E	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 0697-04-06E			
Well Position	+N/-S	-40.3 usft	Northing:	1,639,424.82 usft
	+E/-W	-13.3 usft	Easting:	2,233,533.61 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	51,479.49639685

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	325.01

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	
623.4	6.70	325.01	622.9	10.7	-7.5	3.00	3.00	0.00	325.01	
5,888.6	6.70	325.01	5,852.1	514.2	-359.9	0.00	0.00	0.00	0.00	
6,112.0	0.00	0.00	6,075.0	524.9	-367.4	3.00	-3.00	0.00	180.00	
10,112.0	0.00	0.00	10,075.0	524.9	-367.4	0.00	0.00	0.00	0.00	PBHL - CC 0697-04-C



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-06E
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 0697-04-06E	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	325.01	500.0	2.1	-1.5	2.6	3.00	3.00	0.00
600.0	6.00	325.01	599.6	8.6	-6.0	10.5	3.00	3.00	0.00
Mahogany									
606.4	6.19	325.01	606.0	9.1	-6.4	11.1	3.00	3.00	0.00
EOB @ 6.70° Inc / 325.01° Azm									
623.4	6.70	325.01	622.9	10.7	-7.5	13.1	3.00	3.00	0.00
700.0	6.70	325.01	699.0	18.0	-12.6	22.0	0.00	0.00	0.00
800.0	6.70	325.01	798.3	27.6	-19.3	33.7	0.00	0.00	0.00
900.0	6.70	325.01	897.6	37.1	-26.0	45.3	0.00	0.00	0.00
1,000.0	6.70	325.01	996.9	46.7	-32.7	57.0	0.00	0.00	0.00
1,100.0	6.70	325.01	1,096.2	56.3	-39.4	68.7	0.00	0.00	0.00
1,200.0	6.70	325.01	1,195.5	65.8	-46.1	80.4	0.00	0.00	0.00
1,300.0	6.70	325.01	1,294.9	75.4	-52.8	92.0	0.00	0.00	0.00
1,400.0	6.70	325.01	1,394.2	85.0	-59.5	103.7	0.00	0.00	0.00
1,500.0	6.70	325.01	1,493.5	94.5	-66.2	115.4	0.00	0.00	0.00
1,600.0	6.70	325.01	1,592.8	104.1	-72.8	127.0	0.00	0.00	0.00
1,700.0	6.70	325.01	1,692.1	113.6	-79.5	138.7	0.00	0.00	0.00
1,800.0	6.70	325.01	1,791.4	123.2	-86.2	150.4	0.00	0.00	0.00
1,900.0	6.70	325.01	1,890.8	132.8	-92.9	162.1	0.00	0.00	0.00
2,000.0	6.70	325.01	1,990.1	142.3	-99.6	173.7	0.00	0.00	0.00
2,100.0	6.70	325.01	2,089.4	151.9	-106.3	185.4	0.00	0.00	0.00
2,200.0	6.70	325.01	2,188.7	161.5	-113.0	197.1	0.00	0.00	0.00
2,300.0	6.70	325.01	2,288.0	171.0	-119.7	208.8	0.00	0.00	0.00
2,400.0	6.70	325.01	2,387.3	180.6	-126.4	220.4	0.00	0.00	0.00
2,500.0	6.70	325.01	2,486.7	190.2	-133.1	232.1	0.00	0.00	0.00
2,600.0	6.70	325.01	2,586.0	199.7	-139.8	243.8	0.00	0.00	0.00
2,700.0	6.70	325.01	2,685.3	209.3	-146.5	255.4	0.00	0.00	0.00
2,800.0	6.70	325.01	2,784.6	218.8	-153.2	267.1	0.00	0.00	0.00
2,900.0	6.70	325.01	2,883.9	228.4	-159.9	278.8	0.00	0.00	0.00
3,000.0	6.70	325.01	2,983.2	238.0	-166.6	290.5	0.00	0.00	0.00
3,100.0	6.70	325.01	3,082.6	247.5	-173.2	302.1	0.00	0.00	0.00
3,200.0	6.70	325.01	3,181.9	257.1	-179.9	313.8	0.00	0.00	0.00
3,300.0	6.70	325.01	3,281.2	266.7	-186.6	325.5	0.00	0.00	0.00
3,400.0	6.70	325.01	3,380.5	276.2	-193.3	337.2	0.00	0.00	0.00
3,500.0	6.70	325.01	3,479.8	285.8	-200.0	348.8	0.00	0.00	0.00
3,600.0	6.70	325.01	3,579.1	295.3	-206.7	360.5	0.00	0.00	0.00
3,700.0	6.70	325.01	3,678.5	304.9	-213.4	372.2	0.00	0.00	0.00
3,800.0	6.70	325.01	3,777.8	314.5	-220.1	383.8	0.00	0.00	0.00
3,900.0	6.70	325.01	3,877.1	324.0	-226.8	395.5	0.00	0.00	0.00
4,000.0	6.70	325.01	3,976.4	333.6	-233.5	407.2	0.00	0.00	0.00
4,100.0	6.70	325.01	4,075.7	343.2	-240.2	418.9	0.00	0.00	0.00
4,200.0	6.70	325.01	4,175.0	352.7	-246.9	430.5	0.00	0.00	0.00
4,300.0	6.70	325.01	4,274.4	362.3	-253.6	442.2	0.00	0.00	0.00
4,400.0	6.70	325.01	4,373.7	371.9	-260.3	453.9	0.00	0.00	0.00
4,500.0	6.70	325.01	4,473.0	381.4	-267.0	465.6	0.00	0.00	0.00
4,600.0	6.70	325.01	4,572.3	391.0	-273.6	477.2	0.00	0.00	0.00
4,700.0	6.70	325.01	4,671.6	400.5	-280.3	488.9	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-06E
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 0697-04-06E	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)
Wasatch 'G' Sand									
4,793.0	6.70	325.01	4,764.0	409.4	-286.6	499.8	0.00	0.00	0.00
4,800.0	6.70	325.01	4,770.9	410.1	-287.0	500.6	0.00	0.00	0.00
4,900.0	6.70	325.01	4,870.3	419.7	-293.7	512.2	0.00	0.00	0.00
5,000.0	6.70	325.01	4,969.6	429.2	-300.4	523.9	0.00	0.00	0.00
5,100.0	6.70	325.01	5,068.9	438.8	-307.1	535.6	0.00	0.00	0.00
5,200.0	6.70	325.01	5,168.2	448.4	-313.8	547.3	0.00	0.00	0.00
5,300.0	6.70	325.01	5,267.5	457.9	-320.5	558.9	0.00	0.00	0.00
5,400.0	6.70	325.01	5,366.8	467.5	-327.2	570.6	0.00	0.00	0.00
5,500.0	6.70	325.01	5,466.2	477.0	-333.9	582.3	0.00	0.00	0.00
5,600.0	6.70	325.01	5,565.5	486.6	-340.6	594.0	0.00	0.00	0.00
5,700.0	6.70	325.01	5,664.8	496.2	-347.3	605.6	0.00	0.00	0.00
5,800.0	6.70	325.01	5,764.1	505.7	-354.0	617.3	0.00	0.00	0.00
Drop @ 3.00°/100'									
5,888.6	6.70	325.01	5,852.1	514.2	-359.9	627.6	0.00	0.00	0.00
5,900.0	6.36	325.01	5,863.4	515.3	-360.6	628.9	3.00	-3.00	0.00
6,000.0	3.36	325.01	5,963.1	522.2	-365.5	637.4	3.00	-3.00	0.00
6,100.0	0.36	325.01	6,063.0	524.9	-367.4	640.7	3.00	-3.00	0.00
EOD @ Vertical									
6,112.0	0.00	0.00	6,075.0	524.9	-367.4	640.7	3.00	-3.00	0.00
6,200.0	0.00	0.00	6,163.0	524.9	-367.4	640.7	0.00	0.00	0.00
6,300.0	0.00	0.00	6,263.0	524.9	-367.4	640.7	0.00	0.00	0.00
6,400.0	0.00	0.00	6,363.0	524.9	-367.4	640.7	0.00	0.00	0.00
6,500.0	0.00	0.00	6,463.0	524.9	-367.4	640.7	0.00	0.00	0.00
Ohio Creek									
6,501.0	0.00	0.00	6,464.0	524.9	-367.4	640.7	0.00	0.00	0.00
6,600.0	0.00	0.00	6,563.0	524.9	-367.4	640.7	0.00	0.00	0.00
Williams Fork									
6,651.0	0.00	0.00	6,614.0	524.9	-367.4	640.7	0.00	0.00	0.00
6,700.0	0.00	0.00	6,663.0	524.9	-367.4	640.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,763.0	524.9	-367.4	640.7	0.00	0.00	0.00
6,900.0	0.00	0.00	6,863.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,963.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,100.0	0.00	0.00	7,063.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,200.0	0.00	0.00	7,163.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,300.0	0.00	0.00	7,263.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,400.0	0.00	0.00	7,363.0	524.9	-367.4	640.7	0.00	0.00	0.00
TOG									
7,451.0	0.00	0.00	7,414.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,500.0	0.00	0.00	7,463.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,600.0	0.00	0.00	7,563.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,700.0	0.00	0.00	7,663.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,800.0	0.00	0.00	7,763.0	524.9	-367.4	640.7	0.00	0.00	0.00
7,900.0	0.00	0.00	7,863.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,000.0	0.00	0.00	7,963.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,100.0	0.00	0.00	8,063.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,200.0	0.00	0.00	8,163.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,300.0	0.00	0.00	8,263.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,400.0	0.00	0.00	8,363.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,500.0	0.00	0.00	8,463.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,600.0	0.00	0.00	8,563.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,700.0	0.00	0.00	8,663.0	524.9	-367.4	640.7	0.00	0.00	0.00
8,800.0	0.00	0.00	8,763.0	524.9	-367.4	640.7	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-06E
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
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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)
8,900.0	0.00	0.00	8,863.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,000.0	0.00	0.00	8,963.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,100.0	0.00	0.00	9,063.0	524.9	-367.4	640.7	0.00	0.00	0.00
Cameo									
9,101.0	0.00	0.00	9,064.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,200.0	0.00	0.00	9,163.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,300.0	0.00	0.00	9,263.0	524.9	-367.4	640.7	0.00	0.00	0.00
Base Cameo Coal									
9,331.0	0.00	0.00	9,294.0	524.9	-367.4	640.7	0.00	0.00	0.00
Rollins									
9,351.0	0.00	0.00	9,314.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,400.0	0.00	0.00	9,363.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,500.0	0.00	0.00	9,463.0	524.9	-367.4	640.7	0.00	0.00	0.00
Cozzette									
9,589.0	0.00	0.00	9,552.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,600.0	0.00	0.00	9,563.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,700.0	0.00	0.00	9,663.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,800.0	0.00	0.00	9,763.0	524.9	-367.4	640.7	0.00	0.00	0.00
Corcoran									
9,862.0	0.00	0.00	9,825.0	524.9	-367.4	640.7	0.00	0.00	0.00
9,900.0	0.00	0.00	9,863.0	524.9	-367.4	640.7	0.00	0.00	0.00
10,000.0	0.00	0.00	9,963.0	524.9	-367.4	640.7	0.00	0.00	0.00
10,100.0	0.00	0.00	10,063.0	524.9	-367.4	640.7	0.00	0.00	0.00
TD @ 10112.0' MD / 10075.0' TVD									
10,112.0	0.00	0.00	10,075.0	524.9	-367.4	640.7	0.00	0.00	0.00

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
PBHL - CC 0697-04-06E	0.00	0.00	10,075.0	524.9	-367.4	1,639,960.48	2,233,182.10	39.558960	-108.220120
- 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	2,516.5	9 5/8"	9-5/8	14-3/4



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-04-08E
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 0697-04-06E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
606.4	606.0	Mahogany			
4,793.0	4,764.0	Wasatch 'G' Sand			
6,501.0	6,464.0	Ohio Creek			
6,651.0	6,614.0	Williams Fork			
7,451.0	7,414.0	TOG			
9,101.0	9,064.0	Cameo			
9,331.0	9,294.0	Base Cameo Coal			
9,351.0	9,314.0	Rollins			
9,589.0	9,552.0	Cozzette			
9,862.0	9,825.0	Corcoran			

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')
623.4	622.9	10.7	-7.5	EOB @ 6.70° Inc / 325.01° Azm
5,888.6	5,852.1	514.2	-359.9	Drop @ 3.00"/100'
6,112.0	6,075.0	524.9	-367.4	EOD @ Vertical
10,112.0	10,075.0	524.9	-367.4	TD @ 10112.0' MD / 10075.0' TVD