



Vanguard Natural Resources

Garfield County, CO

MPD 25

Fed 34B-33-691

Wellbore #1

Plan: Design #1

Standard Planning Report

17 October, 2017



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Fed 34B-33-691
Company:	Vanguard Natural Resources	TVD Reference:	Fed 34B-33-691 @ 6561.0usft (New KB)
Project:	Garfield County, CO	MD Reference:	Fed 34B-33-691 @ 6561.0usft (New KB)
Site:	MPD 25	North Reference:	Grid
Well:	Fed 34B-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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		Using geodetic scale factor

Site	MPD 25		
Site Position:		Northing:	1,606,032.98 usft
From:	Lat/Long	Easting:	2,418,598.16 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	39° 28' 45.253 N
		Longitude:	107° 33' 35.748 W
		Grid Convergence:	-1.30 °

Well	Fed 34B-33-691		
Well Position	+N/-S	32.1 usft	Northing:
	+E/-W	-44.3 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	6,561.0 usft
		Latitude:	39° 28' 45.560 N
		Longitude:	107° 33' 36.322 W
		Ground Level:	6,540.4 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	10/17/2017	9.47
			Dip Angle (°)
			65.64
			Field Strength (nT)
			51,533

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction (°)
			106.47

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,508.7	17.81	106.47	1,500.6	-22.2	75.2	3.50	3.50	0.00	106.47	
4,382.7	17.81	106.47	4,236.9	-271.4	917.9	0.00	0.00	0.00	0.00	
4,891.5	0.00	0.00	4,737.5	-293.6	993.1	3.50	-3.50	0.00	180.00	34B-33-691 TGT
7,807.5	0.00	0.00	7,653.5	-293.6	993.1	0.00	0.00	0.00	0.00	



Payzone Directional Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Fed 34B-33-691
Company:	Vanguard Natural Resources	TVD Reference:	Fed 34B-33-691 @ 6561.0usft (New KB)
Project:	Garfield County, CO	MD Reference:	Fed 34B-33-691 @ 6561.0usft (New KB)
Site:	MPD 25	North Reference:	Grid
Well:	Fed 34B-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 3.50									
1,100.0	3.50	106.47	1,099.9	-0.9	2.9	3.1	3.50	3.50	0.00
1,200.0	7.00	106.47	1,199.5	-3.5	11.7	12.2	3.50	3.50	0.00
1,300.0	10.50	106.47	1,298.3	-7.8	26.3	27.4	3.50	3.50	0.00
1,400.0	14.00	106.47	1,396.0	-13.8	46.6	48.6	3.50	3.50	0.00
1,508.7	17.81	106.47	1,500.6	-22.2	75.2	78.4	3.50	3.50	0.00
Start 2874.0 hold at 1508.7 MD									
1,600.0	17.81	106.47	1,587.5	-30.1	102.0	106.3	0.00	0.00	0.00
1,700.0	17.81	106.47	1,682.7	-38.8	131.3	136.9	0.00	0.00	0.00
1,800.0	17.81	106.47	1,777.9	-47.5	160.6	167.5	0.00	0.00	0.00
1,900.0	17.81	106.47	1,873.1	-56.2	189.9	198.1	0.00	0.00	0.00
2,000.0	17.81	106.47	1,968.3	-64.8	219.3	228.6	0.00	0.00	0.00
2,100.0	17.81	106.47	2,063.5	-73.5	248.6	259.2	0.00	0.00	0.00
2,200.0	17.81	106.47	2,158.7	-82.2	277.9	289.8	0.00	0.00	0.00
2,300.0	17.81	106.47	2,254.0	-90.8	307.2	320.4	0.00	0.00	0.00
2,400.0	17.81	106.47	2,349.2	-99.5	336.5	350.9	0.00	0.00	0.00
2,500.0	17.81	106.47	2,444.4	-108.2	365.9	381.5	0.00	0.00	0.00
2,600.0	17.81	106.47	2,539.6	-116.8	395.2	412.1	0.00	0.00	0.00
2,700.0	17.81	106.47	2,634.8	-125.5	424.5	442.7	0.00	0.00	0.00
2,800.0	17.81	106.47	2,730.0	-134.2	453.8	473.3	0.00	0.00	0.00
2,900.0	17.81	106.47	2,825.2	-142.8	483.2	503.8	0.00	0.00	0.00
3,000.0	17.81	106.47	2,920.4	-151.5	512.5	534.4	0.00	0.00	0.00
3,100.0	17.81	106.47	3,015.6	-160.2	541.8	565.0	0.00	0.00	0.00
3,200.0	17.81	106.47	3,110.8	-168.8	571.1	595.6	0.00	0.00	0.00
3,300.0	17.81	106.47	3,206.1	-177.5	600.5	626.1	0.00	0.00	0.00
3,400.0	17.81	106.47	3,301.3	-186.2	629.8	656.7	0.00	0.00	0.00
3,500.0	17.81	106.47	3,396.5	-194.9	659.1	687.3	0.00	0.00	0.00
3,600.0	17.81	106.47	3,491.7	-203.5	688.4	717.9	0.00	0.00	0.00
3,700.0	17.81	106.47	3,586.9	-212.2	717.7	748.5	0.00	0.00	0.00
3,800.0	17.81	106.47	3,682.1	-220.9	747.1	779.0	0.00	0.00	0.00
3,900.0	17.81	106.47	3,777.3	-229.5	776.4	809.6	0.00	0.00	0.00
4,000.0	17.81	106.47	3,872.5	-238.2	805.7	840.2	0.00	0.00	0.00
4,100.0	17.81	106.47	3,967.7	-246.9	835.0	870.8	0.00	0.00	0.00
4,200.0	17.81	106.47	4,062.9	-255.5	864.4	901.3	0.00	0.00	0.00
4,300.0	17.81	106.47	4,158.2	-264.2	893.7	931.9	0.00	0.00	0.00
4,382.7	17.81	106.47	4,236.9	-271.4	917.9	957.2	0.00	0.00	0.00
Start Drop -3.50									
4,400.0	17.20	106.47	4,253.4	-272.9	922.9	962.4	3.50	-3.50	0.00
4,500.0	13.70	106.47	4,349.8	-280.4	948.5	989.1	3.50	-3.50	0.00
4,600.0	10.20	106.47	4,447.6	-286.3	968.3	1,009.8	3.50	-3.50	0.00
4,691.0	7.02	106.47	4,537.5	-290.1	981.4	1,023.4	3.50	-3.50	0.00
Price Coal									
4,700.0	6.70	106.47	4,546.5	-290.4	982.4	1,024.5	3.50	-3.50	0.00

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Site:	MPD 25	North Reference:	Grid
Well:	Fed 34B-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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)
4,800.0	3.20	106.47	4,646.1	-292.9	990.7	1,033.1	3.50	-3.50	0.00
4,891.5	0.00	0.00	4,737.5	-293.6	993.1	1,035.6	3.50	-3.50	0.00
Start 2916.0 hold at 4891.5 MD									
4,900.0	0.00	0.00	4,746.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,000.0	0.00	0.00	4,846.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,100.0	0.00	0.00	4,946.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,200.0	0.00	0.00	5,046.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,300.0	0.00	0.00	5,146.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,400.0	0.00	0.00	5,246.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,414.8	0.00	0.00	5,260.8	-293.6	993.1	1,035.6	0.00	0.00	0.00
Top of Gas									
5,500.0	0.00	0.00	5,346.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,446.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,546.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,646.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,746.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,846.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,946.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,046.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,146.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,246.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,346.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,446.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,546.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,646.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,746.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,846.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,946.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,046.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,300.0	0.00	0.00	7,146.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,246.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,346.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,557.5	0.00	0.00	7,403.5	-293.6	993.1	1,035.6	0.00	0.00	0.00
Rollins									
7,600.0	0.00	0.00	7,446.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,546.0	-293.6	993.1	1,035.6	0.00	0.00	0.00
7,807.5	0.00	0.00	7,653.5	-293.6	993.1	1,035.6	0.00	0.00	0.00
TD at 7807.5									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
34B-33-691 TGT	0.00	360.00	4,737.5	-293.6	993.1	1,605,771.50	2,419,547.00	39° 28' 42.882 N	107° 33' 23.574 W
- hit/miss target									
- Shape									
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,916.0)									



Payzone Directional Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Fed 34B-33-691
Company:	Vanguard Natural Resources	TVD Reference:	Fed 34B-33-691 @ 6561.0usft (New KB)
Project:	Garfield County, CO	MD Reference:	Fed 34B-33-691 @ 6561.0usft (New KB)
Site:	MPD 25	North Reference:	Grid
Well:	Fed 34B-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,691.0	4,537.5	Price Coal		0.00	
5,414.8	5,260.8	Top of Gas		0.00	
7,557.5	7,403.5	Rollins		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,000.0	1,000.0	0.0	0.0	Start Build 3.50	
1,508.7	1,500.6	-22.2	75.2	Start 2874.0 hold at 1508.7 MD	
4,382.7	4,236.9	-271.4	917.9	Start Drop -3.50	
4,891.5	4,737.5	-293.6	993.1	Start 2916.0 hold at 4891.5 MD	
7,807.5	7,653.5	-293.6	993.1	TD at 7807.5	



Well Name: Fed 34B-33-691
Surface Location: MPD 25
North American Datum 1983, US State Plane 1983, Colorado Central Zone
Ground Elevation: 6540.4
+N/-S +E/-W Northing Easting Latitude Longitude
0.0 0.0 1606065.10 2418553.90 39° 28' 42.882 N 107° 33' 23.574 W
New KB Fed 34B-33-691 @ 6561.0usft (New KB)

Slot



Azimuths to Grid North
True North: 1.30°
Magnetic North: 10.76°
Magnetic Field
Strength: 51533.1snT
Dip Angle: 65.64°
Date: 10/17/2017
Model: IGRF2015

MPD 25
Fed 34B-33-691
Design #1
12:22, October 17 2017

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
34B-33-691 TGT	4737.5	-293.6	993.1	1605771.50	2419547.00	39° 28' 42.882 N	107° 33' 23.574 W	Rectangle (Sides: L40.0 W100.0)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1508.7	17.81	106.47	1500.6	-22.2	75.2	3.50	106.47	78.4	
4	4382.7	17.81	106.47	4236.9	-271.4	917.9	0.00	0.00	957.2	
5	4891.5	0.00	0.00	4737.5	-293.6	993.1	3.50	180.00	1035.6	34B-33-691 TGT
6	7807.5	0.00	0.00	7653.5	-293.6	993.1	0.00	0.00	1035.6	

ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	Start Build 3.50
1500.6	1508.7	Start 2874.0 hold at 1508.7 MD
4236.9	4382.7	Start Drop -3.50
4737.5	4891.5	Start 2916.0 hold at 4891.5 MD
7653.5	7807.5	TD at 7807.5

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4537.5	4691.0	Price Coal
5260.8	5414.8	Top of Gas
7403.5	7557.5	Rollins

