



Vanguard Natural Resources

Garfield County, CO

MPD 25

Fed 33D-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 33D-33-691
Company:	Vanguard Natural Resources	TVD Reference:	Fed 33D-33-691 @ 6561.0usft (New KB)
Project:	Garfield County, CO	MD Reference:	Fed 33D-33-691 @ 6561.0usft (New KB)
Site:	MPD 25	North Reference:	Grid
Well:	Fed 33D-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 33D-33-691		
Well Position	+N/-S	46.4 usft	Northing:
	+E/-W	-112.8 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	6,561.0 usft
		Latitude:	39° 28' 45.686 N
		Longitude:	107° 33' 37.199 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
			(°)
			32.81

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,743.3	33.02	32.81	1,692.0	222.2	143.3	3.50	3.50	0.00	32.81	
4,424.7	33.02	32.81	3,940.3	1,450.1	935.0	0.00	0.00	0.00	0.00	
5,368.0	0.00	0.00	4,832.3	1,672.3	1,078.2	3.50	-3.50	0.00	180.00	33D-33-691 TGT
8,254.9	0.00	0.00	7,719.2	1,672.3	1,078.2	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 33D-33-691
Company:	Vanguard Natural Resources	TVD Reference:	Fed 33D-33-691 @ 6561.0usft (New KB)
Project:	Garfield County, CO	MD Reference:	Fed 33D-33-691 @ 6561.0usft (New KB)
Site:	MPD 25	North Reference:	Grid
Well:	Fed 33D-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
Start Build 3.50									
900.0	3.50	32.81	899.9	2.6	1.7	3.1	3.50	3.50	0.00
1,000.0	7.00	32.81	999.5	10.3	6.6	12.2	3.50	3.50	0.00
1,100.0	10.50	32.81	1,098.3	23.0	14.9	27.4	3.50	3.50	0.00
1,200.0	14.00	32.81	1,196.0	40.9	26.4	48.6	3.50	3.50	0.00
1,300.0	17.50	32.81	1,292.3	63.7	41.1	75.8	3.50	3.50	0.00
1,400.0	21.00	32.81	1,386.7	91.4	58.9	108.7	3.50	3.50	0.00
1,500.0	24.50	32.81	1,478.9	123.9	79.9	147.4	3.50	3.50	0.00
1,600.0	28.00	32.81	1,568.5	161.0	103.8	191.6	3.50	3.50	0.00
1,700.0	31.50	32.81	1,655.3	202.7	130.7	241.2	3.50	3.50	0.00
1,743.3	33.02	32.81	1,692.0	222.2	143.3	264.4	3.50	3.50	0.00
Start 2681.3 hold at 1743.3 MD									
1,800.0	33.02	32.81	1,739.5	248.1	160.0	295.2	0.00	0.00	0.00
1,900.0	33.02	32.81	1,823.4	293.9	189.5	349.7	0.00	0.00	0.00
2,000.0	33.02	32.81	1,907.2	339.7	219.0	404.2	0.00	0.00	0.00
2,100.0	33.02	32.81	1,991.1	385.5	248.6	458.7	0.00	0.00	0.00
2,200.0	33.02	32.81	2,074.9	431.3	278.1	513.2	0.00	0.00	0.00
2,300.0	33.02	32.81	2,158.8	477.1	307.6	567.7	0.00	0.00	0.00
2,400.0	33.02	32.81	2,242.6	522.9	337.2	622.2	0.00	0.00	0.00
2,500.0	33.02	32.81	2,326.5	568.7	366.7	676.7	0.00	0.00	0.00
2,600.0	33.02	32.81	2,410.3	614.5	396.2	731.1	0.00	0.00	0.00
2,700.0	33.02	32.81	2,494.2	660.3	425.7	785.6	0.00	0.00	0.00
2,800.0	33.02	32.81	2,578.0	706.1	455.3	840.1	0.00	0.00	0.00
2,900.0	33.02	32.81	2,661.9	751.9	484.8	894.6	0.00	0.00	0.00
3,000.0	33.02	32.81	2,745.7	797.7	514.3	949.1	0.00	0.00	0.00
3,100.0	33.02	32.81	2,829.6	843.5	543.8	1,003.6	0.00	0.00	0.00
3,200.0	33.02	32.81	2,913.4	889.3	573.4	1,058.1	0.00	0.00	0.00
3,300.0	33.02	32.81	2,997.3	935.1	602.9	1,112.6	0.00	0.00	0.00
3,400.0	33.02	32.81	3,081.1	980.8	632.4	1,167.1	0.00	0.00	0.00
3,500.0	33.02	32.81	3,165.0	1,026.6	662.0	1,221.5	0.00	0.00	0.00
3,600.0	33.02	32.81	3,248.8	1,072.4	691.5	1,276.0	0.00	0.00	0.00
3,700.0	33.02	32.81	3,332.7	1,118.2	721.0	1,330.5	0.00	0.00	0.00
3,800.0	33.02	32.81	3,416.5	1,164.0	750.5	1,385.0	0.00	0.00	0.00
3,900.0	33.02	32.81	3,500.4	1,209.8	780.1	1,439.5	0.00	0.00	0.00
4,000.0	33.02	32.81	3,584.2	1,255.6	809.6	1,494.0	0.00	0.00	0.00
4,100.0	33.02	32.81	3,668.1	1,301.4	839.1	1,548.5	0.00	0.00	0.00
4,200.0	33.02	32.81	3,751.9	1,347.2	868.6	1,603.0	0.00	0.00	0.00
4,300.0	33.02	32.81	3,835.8	1,393.0	898.2	1,657.5	0.00	0.00	0.00
4,400.0	33.02	32.81	3,919.6	1,438.8	927.7	1,711.9	0.00	0.00	0.00
4,424.7	33.02	32.81	3,940.3	1,450.1	935.0	1,725.4	0.00	0.00	0.00
Start Drop -3.50									
4,500.0	30.38	32.81	4,004.4	1,483.4	956.4	1,765.0	3.50	-3.50	0.00
4,600.0	26.88	32.81	4,092.2	1,523.6	982.4	1,812.9	3.50	-3.50	0.00
4,700.0	23.38	32.81	4,182.7	1,559.3	1,005.4	1,855.3	3.50	-3.50	0.00



Payzone Directional Planning Report



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Site:	MPD 25	North Reference:	Grid
Well:	Fed 33D-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	19.88	32.81	4,275.6	1,590.3	1,025.4	1,892.2	3.50	-3.50	0.00
4,900.0	16.38	32.81	4,370.6	1,616.4	1,042.2	1,923.3	3.50	-3.50	0.00
5,000.0	12.88	32.81	4,467.4	1,637.7	1,055.9	1,948.6	3.50	-3.50	0.00
5,100.0	9.38	32.81	4,565.5	1,653.9	1,066.4	1,967.9	3.50	-3.50	0.00
5,167.5	7.02	32.81	4,632.3	1,662.0	1,071.6	1,977.5	3.50	-3.50	0.00
Price Coal									
5,200.0	5.88	32.81	4,664.6	1,665.0	1,073.6	1,981.1	3.50	-3.50	0.00
5,300.0	2.38	32.81	4,764.3	1,671.1	1,077.5	1,988.3	3.50	-3.50	0.00
5,368.0	0.00	0.00	4,832.3	1,672.3	1,078.2	1,989.7	3.50	-3.50	0.00
Start 2886.9 hold at 5368.0 MD									
5,400.0	0.00	0.00	4,864.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
5,500.0	0.00	0.00	4,964.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
5,600.0	0.00	0.00	5,064.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
5,700.0	0.00	0.00	5,164.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
5,800.0	0.00	0.00	5,264.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
5,900.0	0.00	0.00	5,364.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
5,981.9	0.00	0.00	5,446.2	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
Top of Gas									
6,000.0	0.00	0.00	5,464.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,100.0	0.00	0.00	5,564.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,200.0	0.00	0.00	5,664.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,300.0	0.00	0.00	5,764.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,400.0	0.00	0.00	5,864.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,500.0	0.00	0.00	5,964.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,600.0	0.00	0.00	6,064.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,700.0	0.00	0.00	6,164.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,264.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
6,900.0	0.00	0.00	6,364.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,464.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,100.0	0.00	0.00	6,564.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,200.0	0.00	0.00	6,664.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,300.0	0.00	0.00	6,764.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,400.0	0.00	0.00	6,864.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,500.0	0.00	0.00	6,964.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,600.0	0.00	0.00	7,064.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,700.0	0.00	0.00	7,164.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,800.0	0.00	0.00	7,264.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
7,900.0	0.00	0.00	7,364.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
8,000.0	0.00	0.00	7,464.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
8,004.9	0.00	0.00	7,469.2	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
Rollins									
8,100.0	0.00	0.00	7,564.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
8,200.0	0.00	0.00	7,664.3	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
8,254.9	0.00	0.00	7,719.2	1,672.3	1,078.2	1,989.7	0.00	0.00	0.00
TD at 8254.9									

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Project:	Garfield County, CO	MD Reference:	Fed 33D-33-691 @ 6561.0usft (New KB)
Site:	MPD 25	North Reference:	Grid
Well:	Fed 33D-33-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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									
33D-33-691 TGT	0.00	0.00	4,832.3	1,672.3	1,078.2	1,607,751.60	2,419,563.60	39° 29' 2.451 N	107° 33' 23.934 W
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,886.9)									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
5,167.5	4,632.3	Price Coal		0.00		
5,981.9	5,446.2	Top of Gas		0.00		
8,004.9	7,469.2	Rollins		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
800.0	800.0	0.0	0.0	Start Build 3.50	
1,743.3	1,692.0	222.2	143.3	Start 2681.3 hold at 1743.3 MD	
4,424.7	3,940.3	1,450.1	935.0	Start Drop -3.50	
5,368.0	4,832.3	1,672.3	1,078.2	Start 2886.9 hold at 5368.0 MD	
8,254.9	7,719.2	1,672.3	1,078.2	TD at 8254.9	



Well Name: Fed 33D-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 1606079.40 2418485.40 39° 28' 45.686 N 107° 33' 37.199 W
New KB Fed 33D-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 33D-33-691
Design #1
12:11, October 17 2017

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
33D-33-691 TGT	4832.3	1672.3	1078.2	1607751.60	2419563.60	39° 29' 2.451 N	107° 33' 23.934 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	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1743.3	33.02	32.81	1692.0	222.2	143.3	3.50	32.81	264.4	
4	4424.7	33.02	32.81	3940.3	1450.1	935.0	0.00	0.00	1725.4	
5	5368.0	0.00	0.00	4832.3	1672.3	1078.2	3.50	180.00	1989.7	33D-33-691 TGT
6	8254.9	0.00	0.00	7719.2	1672.3	1078.2	0.00	0.00	1989.7	

ANNOTATIONS

TVD	MD	Annotation
800.0	800.0	Start Build 3.50
1692.0	1743.3	Start 2681.3 hold at 1743.3 MD
3940.3	4424.7	Start Drop -3.50
4832.3	5368.0	Start 2886.9 hold at 5368.0 MD
7719.2	8254.9	TD at 8254.9

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4632.3	5167.5	Price Coal
5446.2	5981.9	Top of Gas
7469.2	8004.9	Rollins

