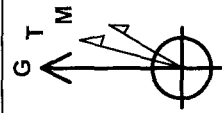


Project: Eddy County (NAD83)
 Site: Vaca
 Well: Vaca Key #1H
 Wellbore: Lateral
 Design: Plan #3
 Ground Elevation 3636.000
 Northing 575568.90
 Easting 469374.70

PROJECT DETAILS: Eddy County (NAD83)
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Eastern Zone
 System Datum: Mean Sea Level



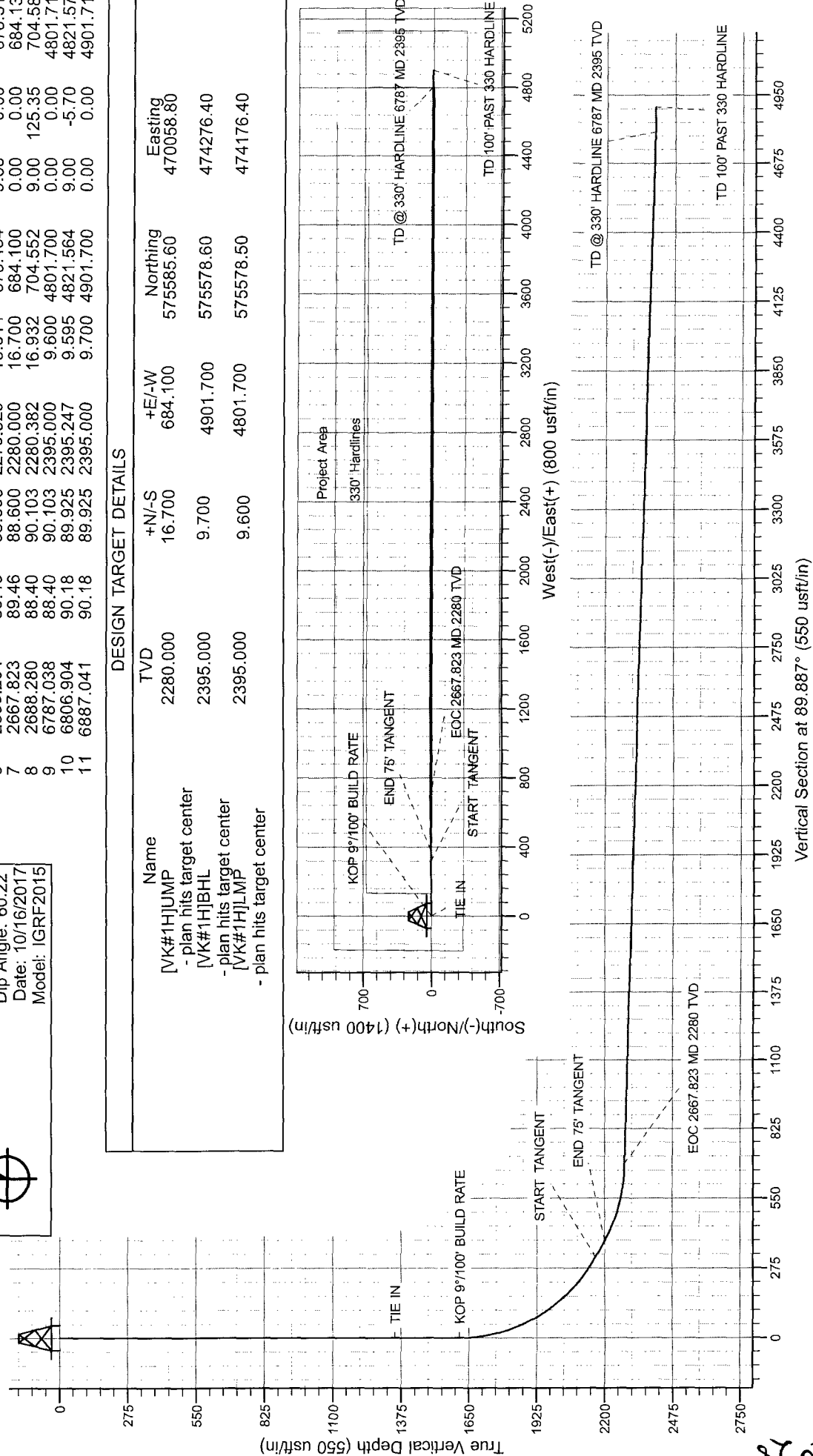
Azimuths to Grid North
 True North: 0.13°
 Magnetic North: 7.53°
 Magnetic Field
 Strength: 48006.4snT
 Dip Angle: 60.22°
 Date: 10/16/2017
 Model: IGRF2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect
1	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.00	0.000
2	1350.000	0.00	0.000	1350.000	0.000	0.000	0.00	0.00	0.000
3	1611.000	0.00	0.000	1611.000	0.000	0.000	0.00	0.00	0.000
4	2277.667	60.00	88.602	2162.329	7.766	318.215	9.00	88.60	318.230
5	2352.667	60.00	88.602	2199.829	9.351	383.148	0.00	0.00	383.165
6	2660.204	89.46	88.600	2279.929	16.514	676.484	9.58	0.00	676.515
7	2667.823	89.46	88.600	2280.000	16.700	684.100	0.00	0.00	684.132
8	2688.280	88.40	90.103	2280.382	16.932	704.552	9.00	125.35	704.584
9	6787.038	88.40	90.103	2395.000	9.600	4801.700	0.00	0.00	4801.710
10	6806.904	90.18	89.925	2395.247	9.595	4821.564	9.00	-5.70	4821.574
11	6887.041	90.18	89.925	2395.000	9.700	4901.700	0.00	0.00	4901.710

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
[VK#1H]JUMP - plan hits target center	2280.000	16.700	684.100	575585.60	470058.80
[VK#1H]BHL - plan hits target center	2395.000	9.700	4901.700	575578.60	474276.40
[VK#1H]JUMP - plan hits target center	2395.000	9.600	4801.700	575578.50	474176.40





NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 16 2017

RECEIVED

EOG Resources - Artesia

Eddy County (NAD83)

Vaca

Vaca Key #1H

Lateral

Plan: Plan #3

Standard Planning Report

15 November, 2017



Planning Report

Database: EDM 5000.14
Company: EOG Resources - Artesia
Project: Eddy County (NAD83)
Site: Vaca
Well: Vaca Key #1H
Wellbore: Lateral
Design: Plan #3

Local Co-ordinate Reference: Well Vaca Key #1H
TVD Reference: KB @ 3654.000usft (Training Rig)
MD Reference: KB @ 3654.000usft (Training Rig)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy County (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Vaca			
Site Position:		Northing:	575,568.90 usft	Latitude: 32.582
From:	Map	Easting:	469,374.70 usft	Longitude: -104.567
Position Uncertainty:	0.000 usft	Slot Radius:	13-3/16 "	Grid Convergence: -0.13 °

Well	Vaca Key #1H			
Well Position	+N/-S	0.000 usft	Northing:	575,568.90 usft
	+E/-W	0.000 usft	Easting:	469,374.70 usft
Position Uncertainty	0.000 usft	Wellhead Elevation:	3,654.000 usft	Ground Level: 3,636.000 usft

Wellbore	Lateral				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/16/2017	7.40	60.22	48,006.41060114

Design	Plan #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.000
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.000	0.000	0.000	89.887

Plan Survey Tool Program	Date	11/15/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1 0.000	6,887.040	Plan #3 (Lateral)	MWD	
			OWSG MWD - Standard	



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Survey Calculation Method: Minimum Curvature

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
0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	
1,350.000	0.00	0.000	1,350.000	0.000	0.000	0.00	0.00	0.00	0.00	
1,611.000	0.00	0.000	1,611.000	0.000	0.000	0.00	0.00	0.00	0.00	
2,277.667	60.00	88.602	2,162.329	7.766	318.215	9.00	9.00	0.00	88.60	
2,352.667	60.00	88.602	2,199.829	9.351	383.148	0.00	0.00	0.00	0.00	
2,660.204	89.46	88.600	2,279.928	16.514	676.484	9.58	9.58	0.00	0.00	
2,667.822	89.46	88.600	2,280.000	16.700	684.100	0.00	0.00	0.00	0.00	[VK#1H]JUMP
2,688.280	88.40	90.103	2,280.382	16.932	704.552	9.00	-5.21	7.34	125.35	
6,787.038	88.40	90.103	2,395.000	9.600	4,801.700	0.00	0.00	0.00	0.00	[VK#1H]LMP
6,806.904	90.18	89.925	2,395.247	9.595	4,821.564	9.00	8.96	-0.89	-5.70	
6,887.040	90.18	89.925	2,395.000	9.700	4,901.700	0.00	0.00	0.00	0.00	[VK#1H]BHL



Planning Report

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MD Reference: KB @ 3654.000usft (Training Rig)
North Reference: Grid
Survey Calculation Method: 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)
0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
100.000	0.00	0.000	100.000	0.000	0.000	0.000	0.00	0.00	0.00
200.000	0.00	0.000	200.000	0.000	0.000	0.000	0.00	0.00	0.00
300.000	0.00	0.000	300.000	0.000	0.000	0.000	0.00	0.00	0.00
400.000	0.00	0.000	400.000	0.000	0.000	0.000	0.00	0.00	0.00
500.000	0.00	0.000	500.000	0.000	0.000	0.000	0.00	0.00	0.00
600.000	0.00	0.000	600.000	0.000	0.000	0.000	0.00	0.00	0.00
700.000	0.00	0.000	700.000	0.000	0.000	0.000	0.00	0.00	0.00
800.000	0.00	0.000	800.000	0.000	0.000	0.000	0.00	0.00	0.00
900.000	0.00	0.000	900.000	0.000	0.000	0.000	0.00	0.00	0.00
1,000.000	0.00	0.000	1,000.000	0.000	0.000	0.000	0.00	0.00	0.00
1,100.000	0.00	0.000	1,100.000	0.000	0.000	0.000	0.00	0.00	0.00
1,200.000	0.00	0.000	1,200.000	0.000	0.000	0.000	0.00	0.00	0.00
1,300.000	0.00	0.000	1,300.000	0.000	0.000	0.000	0.00	0.00	0.00
1,350.000	0.00	0.000	1,350.000	0.000	0.000	0.000	0.00	0.00	0.00
1,400.000	0.00	0.000	1,400.000	0.000	0.000	0.000	0.00	0.00	0.00
1,500.000	0.00	0.000	1,500.000	0.000	0.000	0.000	0.00	0.00	0.00
1,600.000	0.00	0.000	1,600.000	0.000	0.000	0.000	0.00	0.00	0.00
1,611.000	0.00	0.000	1,611.000	0.000	0.000	0.000	0.00	0.00	0.00
1,650.000	3.51	88.602	1,649.976	0.029	1.194	1.194	9.00	9.00	0.00
1,700.000	8.01	88.602	1,699.710	0.152	6.209	6.209	9.00	9.00	0.00
1,750.000	12.51	88.602	1,748.898	0.369	15.110	15.111	9.00	9.00	0.00
1,800.000	17.01	88.602	1,797.236	0.679	27.841	27.843	9.00	9.00	0.00
1,850.000	21.51	88.602	1,844.425	1.082	44.325	44.327	9.00	9.00	0.00
1,900.000	26.01	88.602	1,890.176	1.573	64.459	64.462	9.00	9.00	0.00
1,950.000	30.51	88.602	1,934.205	2.151	88.120	88.124	9.00	9.00	0.00
2,000.000	35.01	88.602	1,976.241	2.810	115.161	115.166	9.00	9.00	0.00
2,050.000	39.51	88.602	2,016.026	3.549	145.416	145.422	9.00	9.00	0.00
2,100.000	44.01	88.602	2,053.313	4.361	178.698	178.706	9.00	9.00	0.00
2,150.000	48.51	88.602	2,087.874	5.242	214.802	214.812	9.00	9.00	0.00
2,200.000	53.01	88.602	2,119.494	6.187	253.506	253.517	9.00	9.00	0.00
2,250.000	57.51	88.602	2,147.979	7.189	294.570	294.584	9.00	9.00	0.00
2,277.667	60.00	88.602	2,162.329	7.766	318.215	318.230	9.00	9.00	0.00
2,300.000	60.00	88.602	2,173.495	8.238	337.551	337.566	0.00	0.00	0.00
2,352.667	60.00	88.602	2,199.829	9.351	383.148	383.165	0.00	0.00	0.00
2,400.000	64.53	88.602	2,221.849	10.373	425.020	425.040	9.58	9.58	0.00
2,450.000	69.32	88.601	2,241.437	11.495	470.994	471.016	9.58	9.58	0.00
2,500.000	74.11	88.601	2,257.116	12.653	518.443	518.467	9.58	9.58	0.00
2,550.000	78.90	88.601	2,268.776	13.840	567.035	567.061	9.58	9.58	0.00
2,600.000	83.69	88.601	2,276.337	15.047	616.431	616.459	9.58	9.58	0.00
2,650.000	88.48	88.600	2,279.746	16.265	666.285	666.316	9.58	9.58	0.00
2,660.204	89.46	88.600	2,279.928	16.514	676.484	676.515	9.58	9.58	0.00
2,667.822	89.46	88.600	2,280.000	16.700	684.100	684.132	0.00	0.00	0.00
2,688.280	88.40	90.103	2,280.382	16.932	704.552	704.584	9.00	-5.21	7.34
2,700.000	88.40	90.103	2,280.710	16.911	716.267	716.299	0.00	0.00	0.00
2,800.000	88.40	90.103	2,283.506	16.732	816.228	816.259	0.00	0.00	0.00
2,900.000	88.40	90.103	2,286.302	16.553	916.188	916.219	0.00	0.00	0.00
3,000.000	88.40	90.103	2,289.099	16.374	1,016.149	1,016.180	0.00	0.00	0.00
3,100.000	88.40	90.103	2,291.895	16.195	1,116.110	1,116.140	0.00	0.00	0.00
3,200.000	88.40	90.103	2,294.692	16.016	1,216.071	1,216.100	0.00	0.00	0.00
3,300.000	88.40	90.103	2,297.488	15.837	1,316.031	1,316.060	0.00	0.00	0.00
3,400.000	88.40	90.103	2,300.285	15.658	1,415.992	1,416.020	0.00	0.00	0.00
3,500.000	88.40	90.103	2,303.081	15.480	1,515.953	1,515.980	0.00	0.00	0.00
3,600.000	88.40	90.103	2,305.877	15.301	1,615.914	1,615.941	0.00	0.00	0.00



Planning Report

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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)
3,700.000	88.40	90.103	2,308.674	15.122	1,715.874	1,715.901	0.00	0.00	0.00
3,800.000	88.40	90.103	2,311.470	14.943	1,815.835	1,815.861	0.00	0.00	0.00
3,900.000	88.40	90.103	2,314.267	14.764	1,915.796	1,915.821	0.00	0.00	0.00
4,000.000	88.40	90.103	2,317.063	14.585	2,015.756	2,015.781	0.00	0.00	0.00
4,100.000	88.40	90.103	2,319.859	14.406	2,115.717	2,115.742	0.00	0.00	0.00
4,200.000	88.40	90.103	2,322.656	14.228	2,215.678	2,215.702	0.00	0.00	0.00
4,300.000	88.40	90.103	2,325.452	14.049	2,315.639	2,315.662	0.00	0.00	0.00
4,400.000	88.40	90.103	2,328.249	13.870	2,415.599	2,415.622	0.00	0.00	0.00
4,500.000	88.40	90.103	2,331.045	13.691	2,515.560	2,515.582	0.00	0.00	0.00
4,600.000	88.40	90.103	2,333.841	13.512	2,615.521	2,615.542	0.00	0.00	0.00
4,700.000	88.40	90.103	2,336.638	13.333	2,715.482	2,715.503	0.00	0.00	0.00
4,800.000	88.40	90.103	2,339.434	13.154	2,815.442	2,815.463	0.00	0.00	0.00
4,900.000	88.40	90.103	2,342.231	12.975	2,915.403	2,915.423	0.00	0.00	0.00
5,000.000	88.40	90.103	2,345.027	12.797	3,015.364	3,015.383	0.00	0.00	0.00
5,100.000	88.40	90.103	2,347.823	12.618	3,115.324	3,115.343	0.00	0.00	0.00
5,200.000	88.40	90.103	2,350.620	12.439	3,215.285	3,215.304	0.00	0.00	0.00
5,300.000	88.40	90.103	2,353.416	12.260	3,315.246	3,315.264	0.00	0.00	0.00
5,400.000	88.40	90.103	2,356.213	12.081	3,415.207	3,415.224	0.00	0.00	0.00
5,500.000	88.40	90.103	2,359.009	11.902	3,515.167	3,515.184	0.00	0.00	0.00
5,600.000	88.40	90.103	2,361.805	11.723	3,615.128	3,615.144	0.00	0.00	0.00
5,700.000	88.40	90.103	2,364.602	11.544	3,715.089	3,715.104	0.00	0.00	0.00
5,800.000	88.40	90.103	2,367.398	11.366	3,815.050	3,815.065	0.00	0.00	0.00
5,900.000	88.40	90.103	2,370.195	11.187	3,915.010	3,915.025	0.00	0.00	0.00
6,000.000	88.40	90.103	2,372.991	11.008	4,014.971	4,014.985	0.00	0.00	0.00
6,100.000	88.40	90.103	2,375.788	10.829	4,114.932	4,114.945	0.00	0.00	0.00
6,200.000	88.40	90.103	2,378.584	10.650	4,214.892	4,214.905	0.00	0.00	0.00
6,300.000	88.40	90.103	2,381.380	10.471	4,314.853	4,314.865	0.00	0.00	0.00
6,400.000	88.40	90.103	2,384.177	10.292	4,414.814	4,414.826	0.00	0.00	0.00
6,500.000	88.40	90.103	2,386.973	10.113	4,514.775	4,514.786	0.00	0.00	0.00
6,600.000	88.40	90.103	2,389.770	9.935	4,614.735	4,614.746	0.00	0.00	0.00
6,700.000	88.40	90.103	2,392.566	9.756	4,714.696	4,714.706	0.00	0.00	0.00
6,787.038	88.40	90.103	2,395.000	9.600	4,801.700	4,801.709	0.00	0.00	0.00
6,800.000	89.56	89.987	2,395.231	9.590	4,814.660	4,814.669	9.00	8.96	-0.89
6,806.904	90.18	89.925	2,395.247	9.595	4,821.564	4,821.573	9.00	8.96	-0.89
6,887.040	90.18	89.925	2,395.000	9.700	4,901.700	4,901.709	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 [VK#1H]UMP - plan hits target center - Point	0.00	0.000	2,280.000	16.700	684.100	575,585.60	470,058.80	32.582	-104.565
[VK#1H]BHL - plan hits target center - Point	0.00	0.000	2,395.000	9.700	4,901.700	575,578.60	474,276.40	32.582	-104.551
[VK#1H]LMP - plan hits target center - Point	0.00	0.000	2,395.000	9.600	4,801.700	575,578.50	474,176.40	32.582	-104.551



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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,350.000	1,350.000	0.000	0.000	TIE IN
1,611.000	1,611.000	0.000	0.000	KOP 9°/100' BUILD RATE
2,277.667	2,162.329	7.766	318.215	START TANGENT
2,352.667	2,199.829	9.351	383.148	END 75' TANGENT
2,667.823	2,280.000	16.700	684.100	EOC 2667.823 MD 2280 TVD
6,787.038	2,395.000	16.932	704.552	TD @ 330' HARDLINE 6787 MD 2395 TVD
6,887.041	2,395.000	9.600	4,801.700	TD 100' PAST 330 HARDLINE