



Build & Lateral

16191562

MD

Well Site Information

Crestone Peak Resources

S33-T3N-R67W

Herren 1C-33H-H367

API	05-123-47733
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Field	DJ BASIN
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State	CO
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Country	USA
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Surface Coordinates

Horizontal

Latitude	40° 10' 59.7468 N
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Longitude	104° 53' 13.5276 W
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N / S Coordinates	1,310,199.85 us/ft
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E / W Coordinates	3,171,252.33 us/ft
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Azimuth Reference	True North
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MWD Engineers

Lead Hand	Deric Group
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Second Hand Jerry Shannahan

4,847.00 ft

$$= 4,870.00 \text{ ft}$$

Dec/11/2018

12,302.44 ft

Bore Hole Record

To

2,008.00 f

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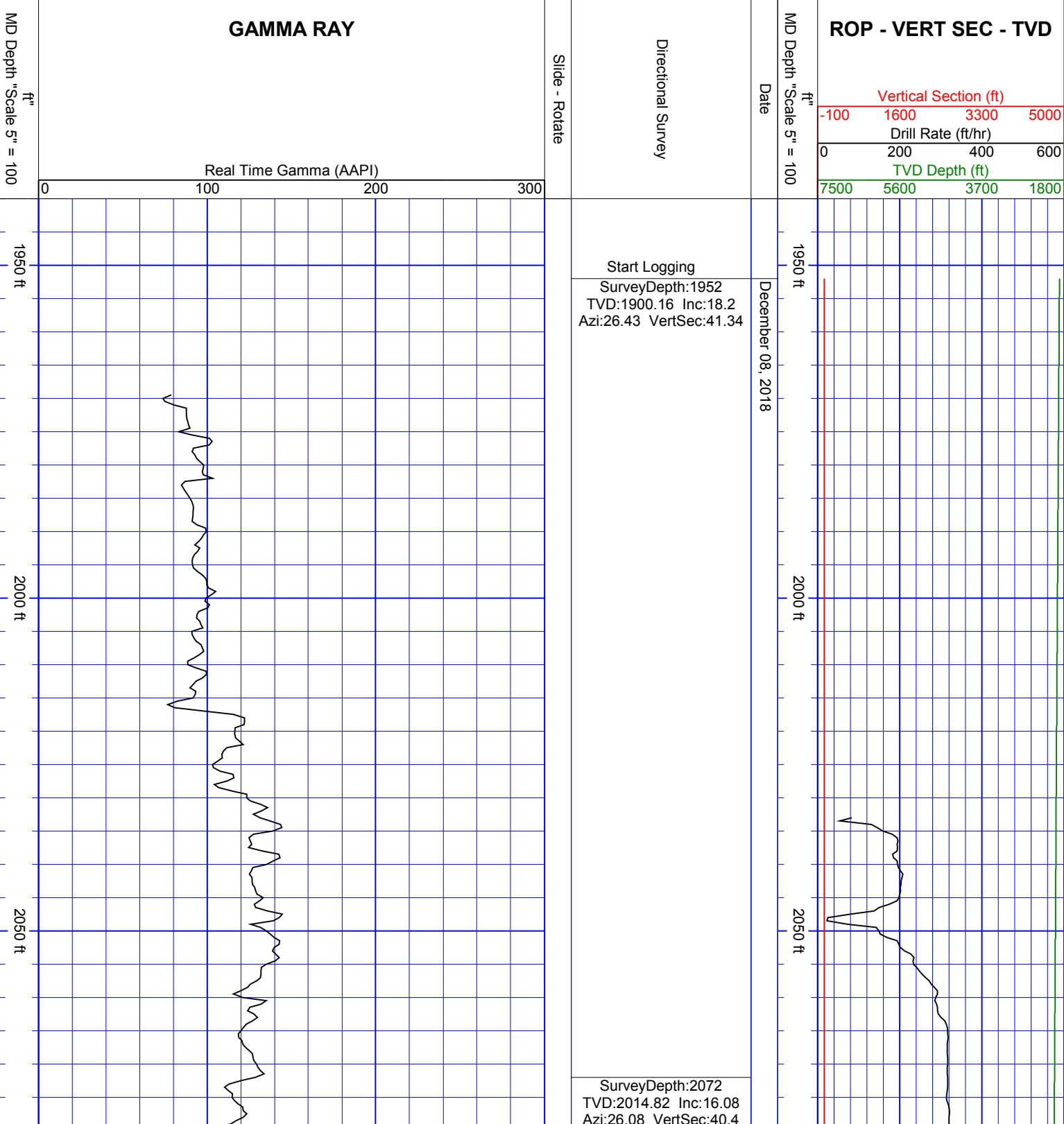
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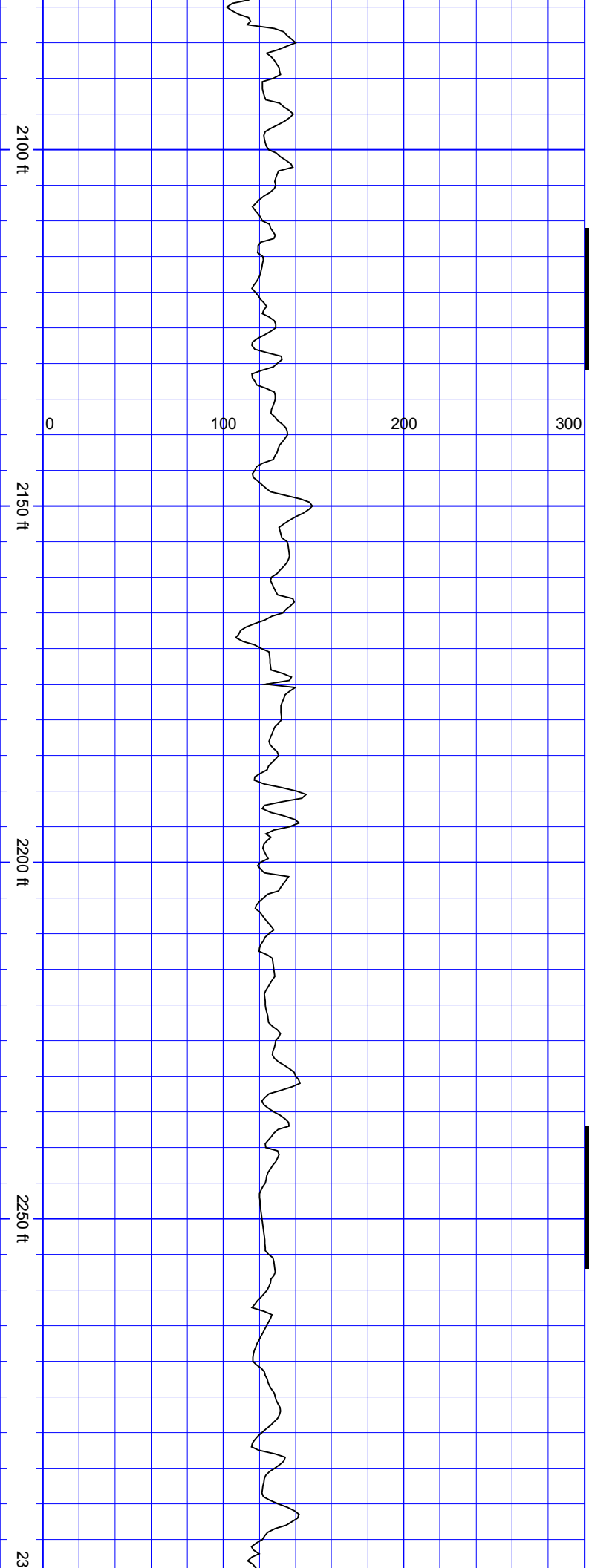
Run Data

Run Data					
Bit Run Number	1	2			
Start Date & Time	Dec/07/2018 21:30:00	Dec/10/2018 00:30:00			
End Date & Time	Dec/09/2018 23:30:00	Dec/11/2018 14:30:00			
Run Hours	50.00	38.00			
Depth In	2,023.00 ft	7,789.00 ft			
Depth Out	7,789.00 ft	12,301.00 ft			
Total Gamma Correction	6.02	6.02			
Gamma to Bit	63.87 ft	64.29 ft			
Resistivity to Bit	-	-			
Mud Type	OBM	OBM			
Density	9.90 ppg	10.00 ppg			
Viscosity	46.00 sec/qt	45.00 sec/qt			
PH	-	-			
Fluid Loss	-	-			
K+ ppm	-	-			
CL- ppm	243,712.00 ppm	222,043.00 ppm			
Max Mud Temp	190.00 °F	255.00 °F			
Mud Report Depth	7,759.00 ft	9,647.00 ft			

Remarks

Interpretations of this data by Cathedral Energy Services will be of best judgment as to correctness. Cathedral Energy Services cannot and does not guarantee the accuracy or correctness of interpretations or any surveys derived therefrom. Cathedral Energy Services makes no warranties of performance, results, fitness or suitability for any particular purposes with respect to the goods being furnished under the terms and conditions. Cathedral Energy Services warrants that the equipment furnished will conform to Cathedral Energy Services published specifications in effect at the time and be in good working order.



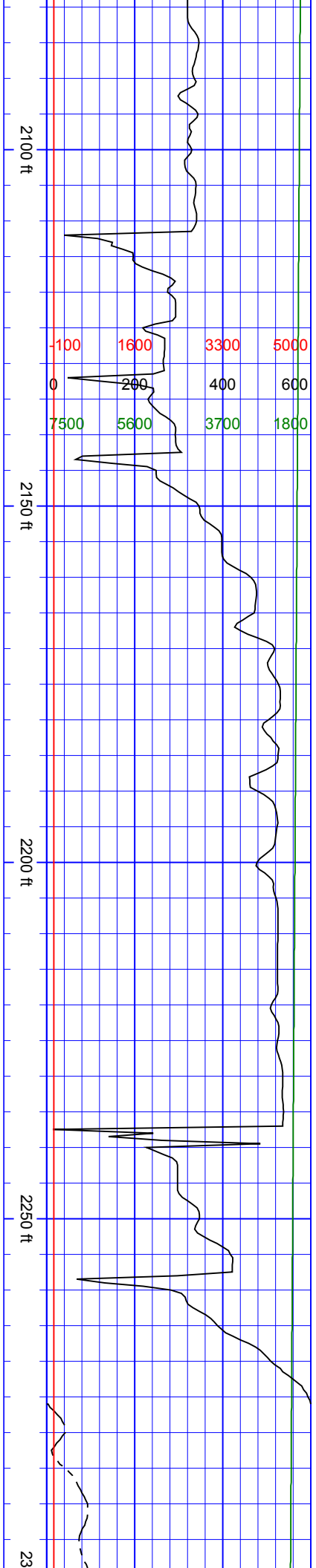


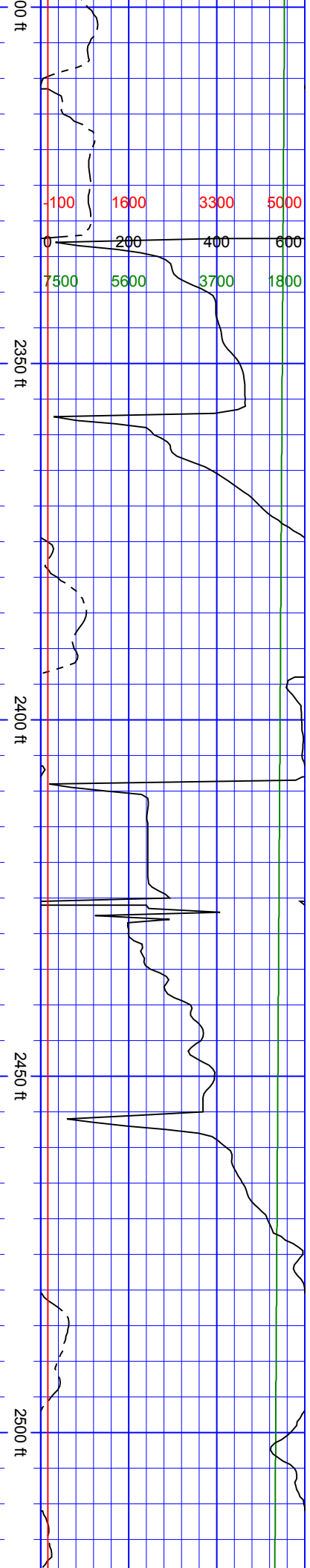
SSSSSSSSSS

SSSSSSSSSS

SurveyDepth:2167
TVD:2105.9 Inc:16.96
Azi:22.74 VertSec:40.58

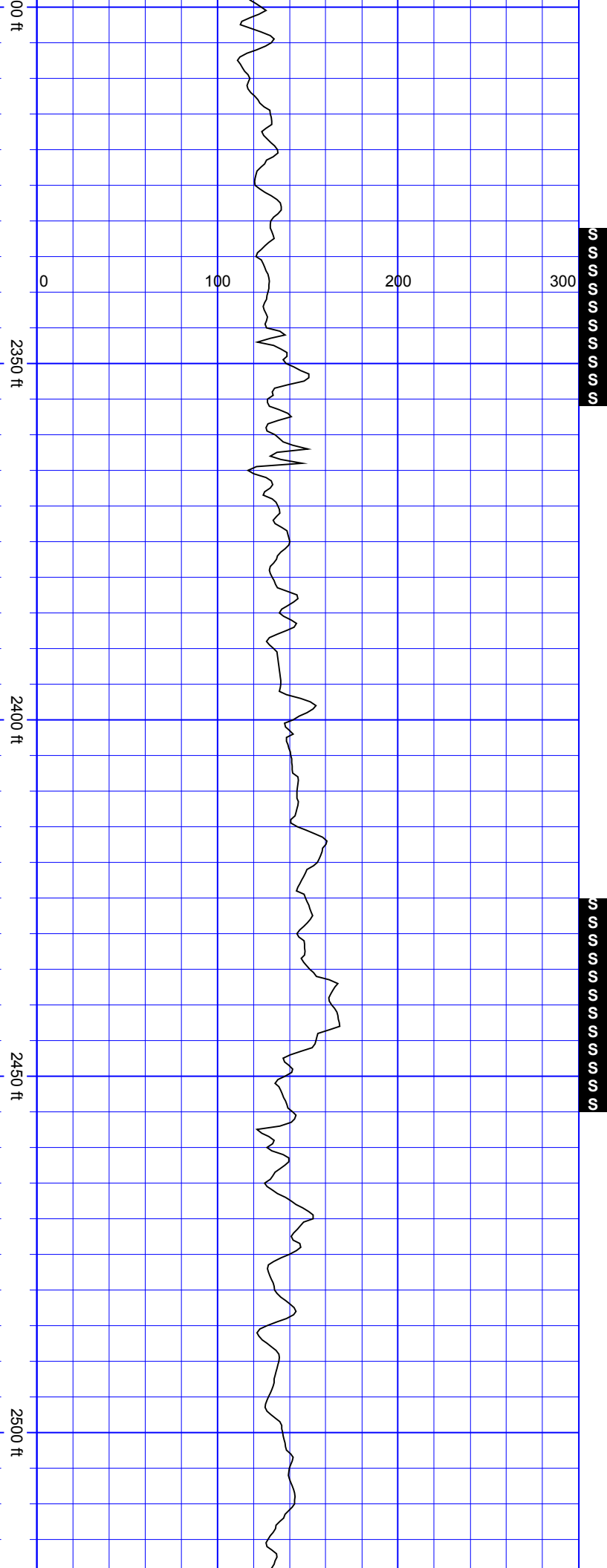
SurveyDepth:2261
TVD:2195.79 Inc:17.05
Azi:23.18 VertSec:41.44

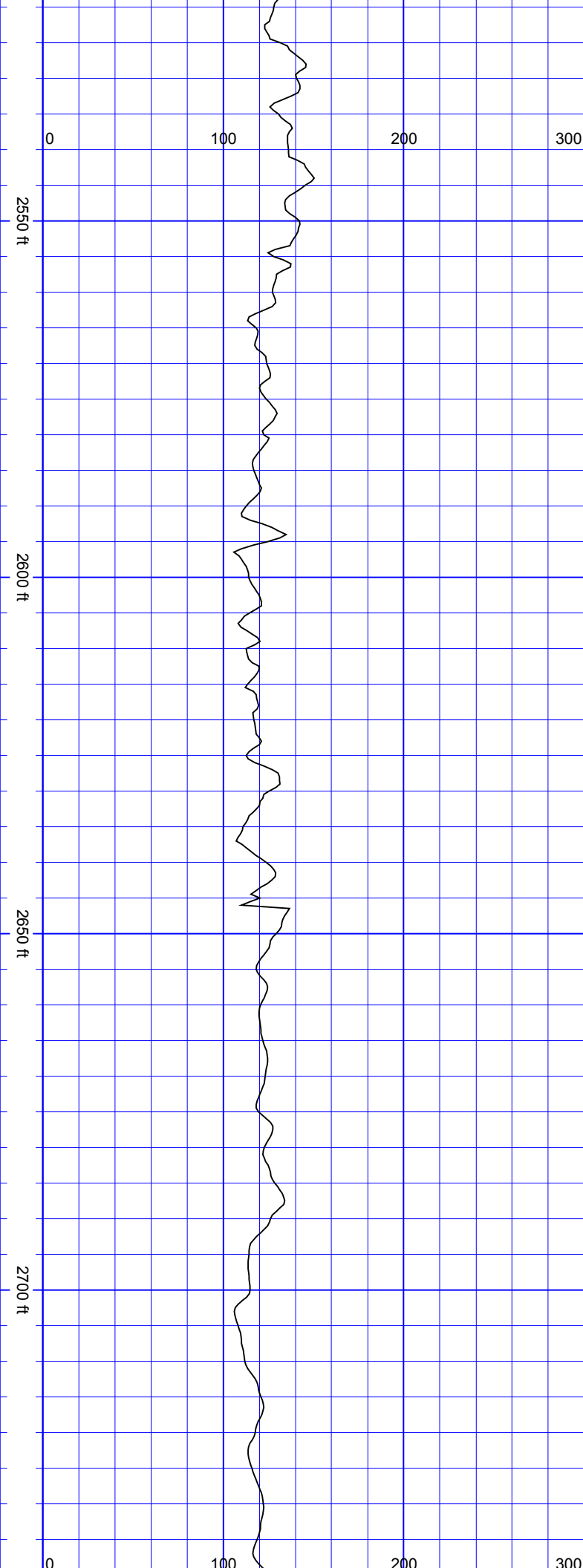




SurveyDepth:2355
TVD:2285.59 Inc:17.36
Azi:20.89 VertSec:42.76

SurveyDepth:2449
TVD:2374.65 Inc:19.91
Azi:20.63 VertSec:44.86

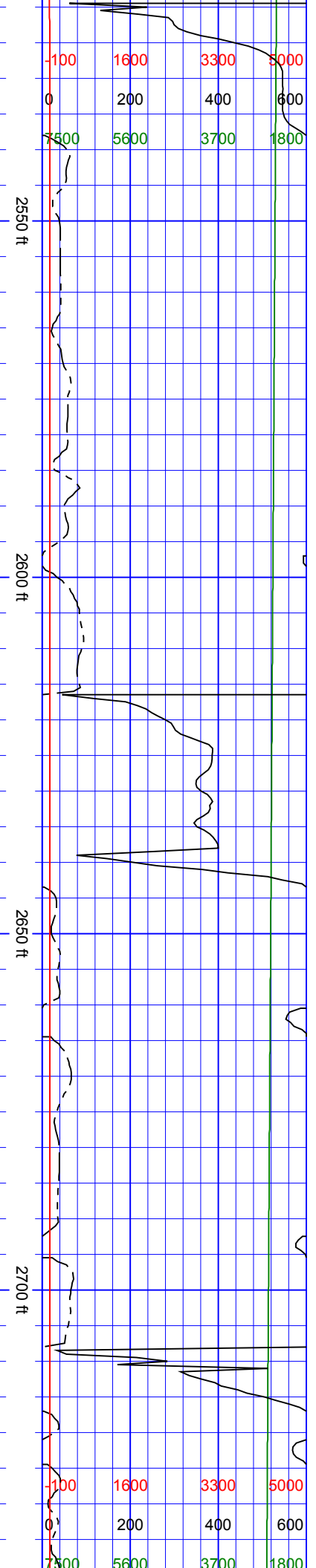




SurveyDepth:2543
TVD:2463.54 Inc:18.06
Azi:18.25 VertSec:47.66

SurveyDepth:2638
TVD:2553.31 Inc:20.13
Azi:18.34 VertSec:51.15

SurveyDepth:2733
TVD:2642.83 Inc:18.98
Azi:18.41 VertSec:55.23

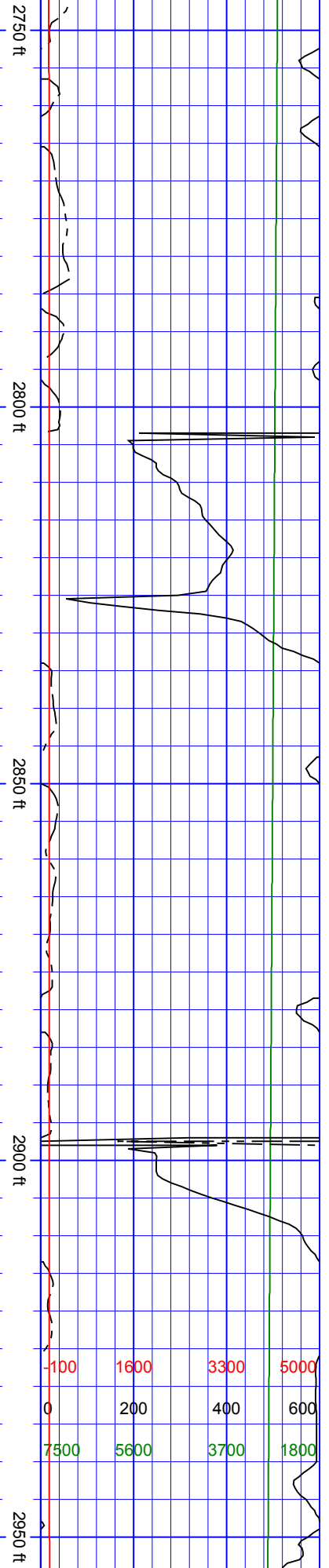
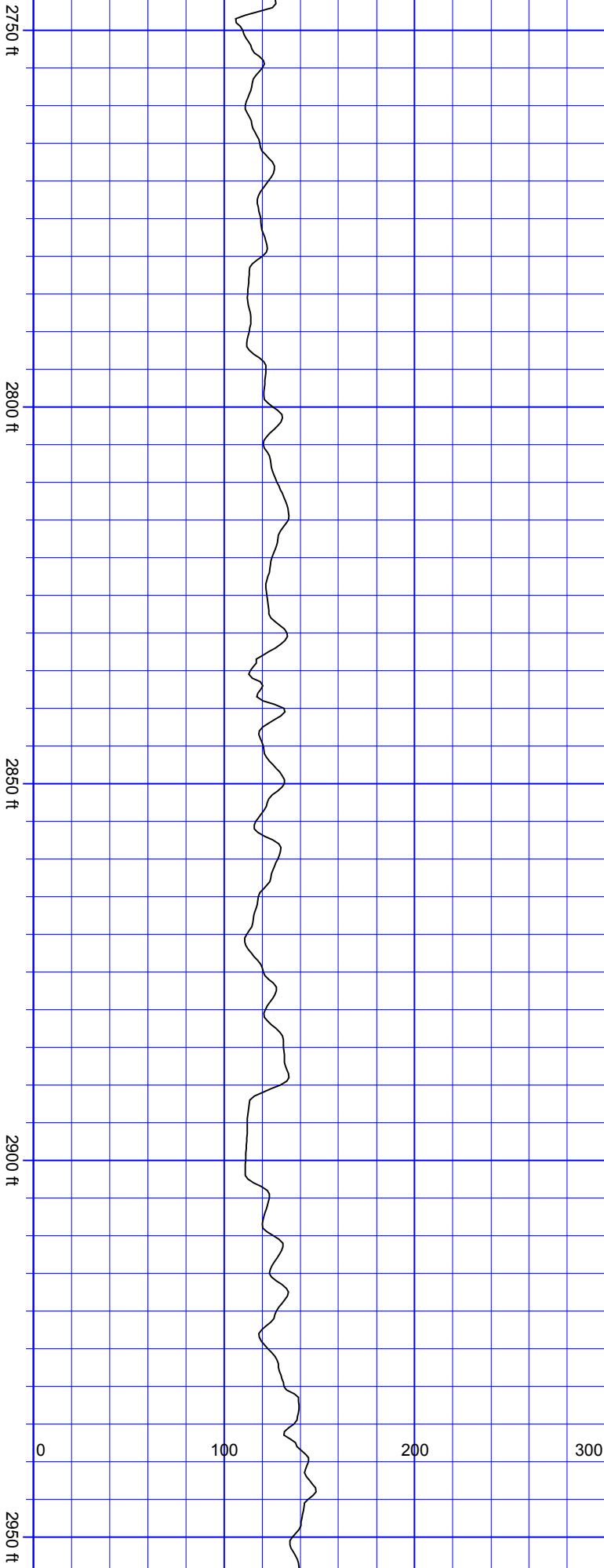


Azi:16.41 VertSec:55.22

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SurveyDepth:2827
TVD:2731.37 Inc:20.26
Azi:18.08 VertSec:59.33

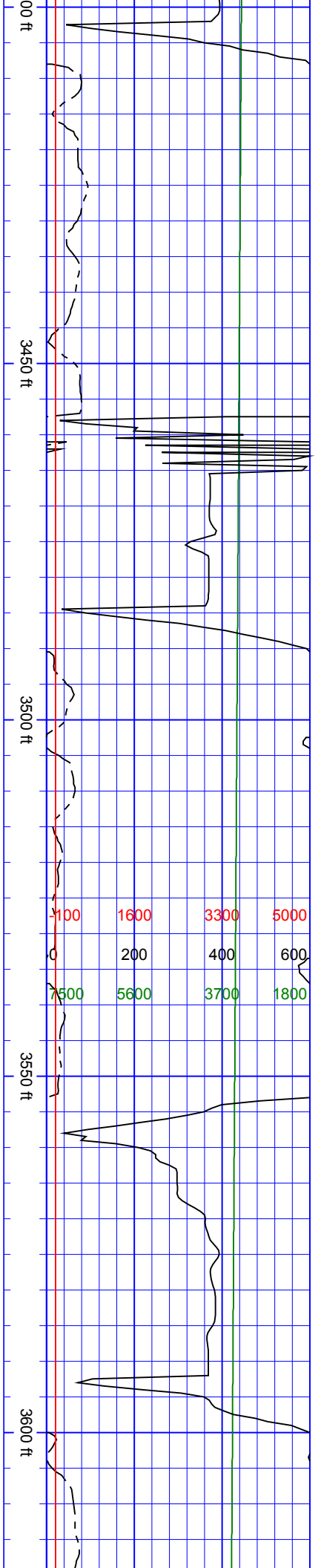
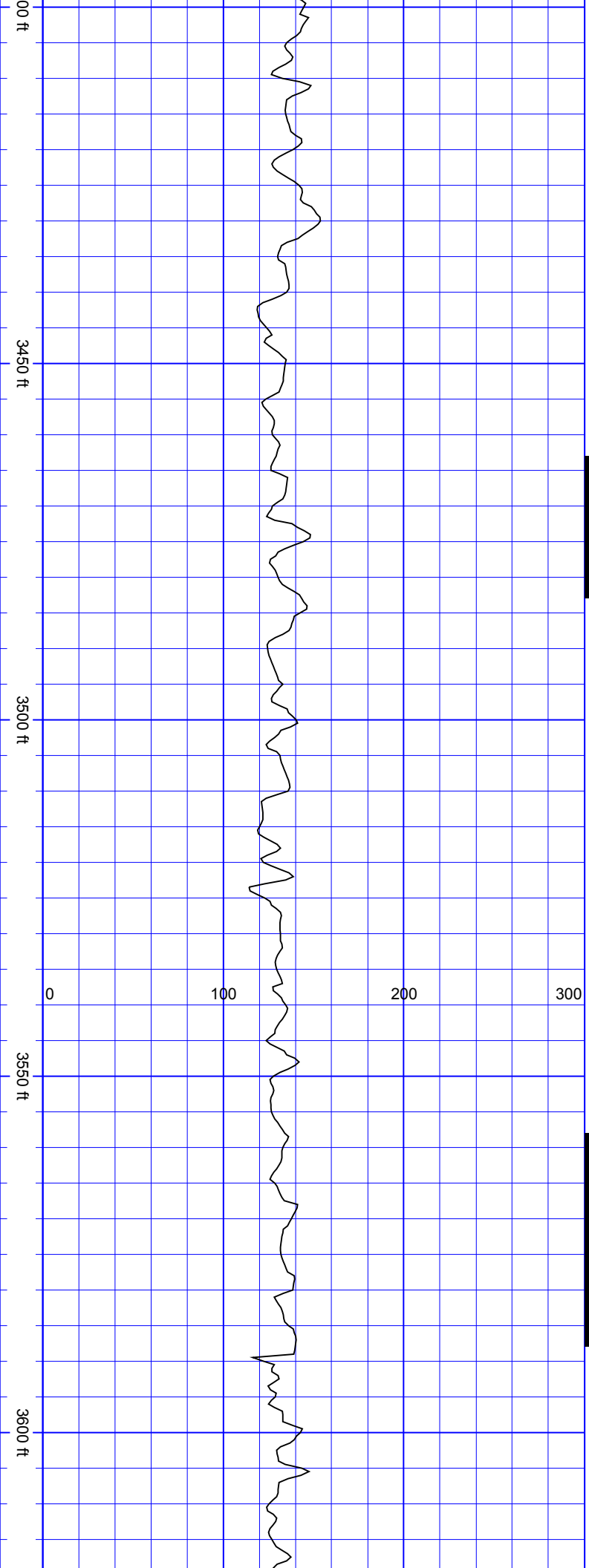
SurveyDepth:2921
TVD:2819.83 Inc:19.29
Azi:14.65 VertSec:63.94

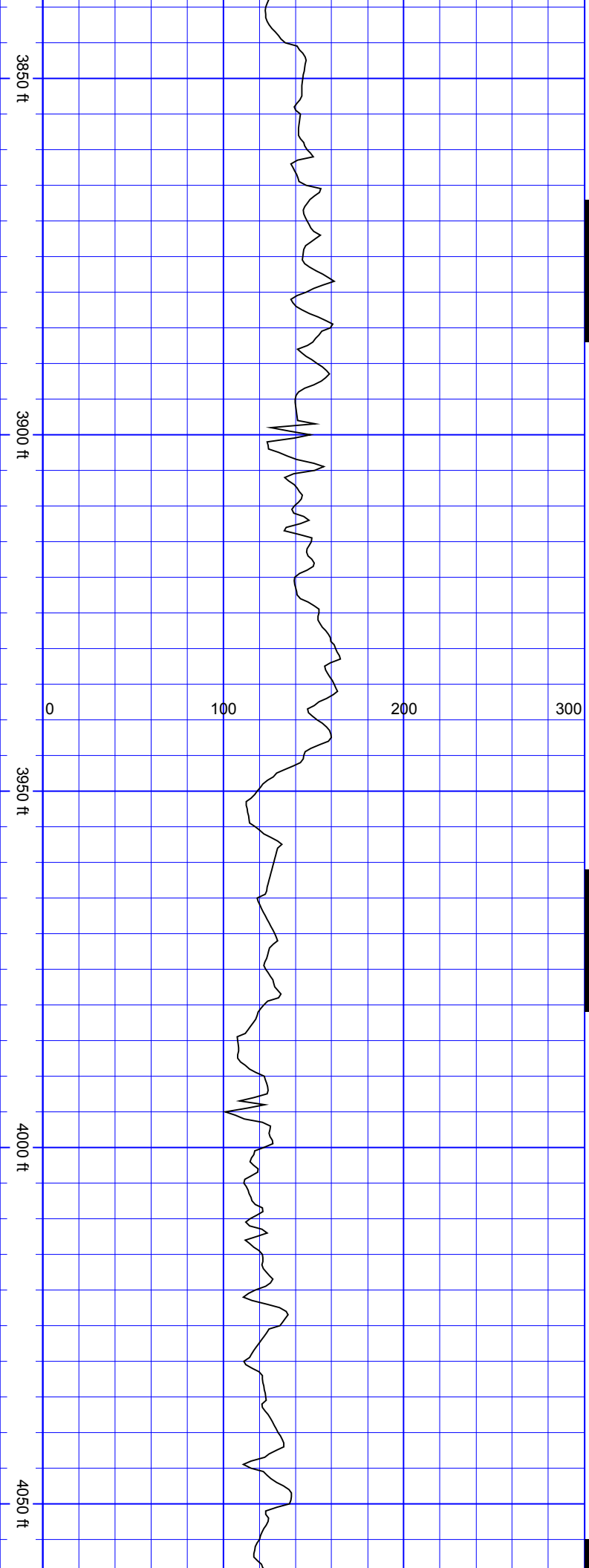


Azi:22.39 VertSec:75

SurveyDepth:3488
TVD:3361.78 Inc:13.89
Azi:22.65 VertSec:75.93

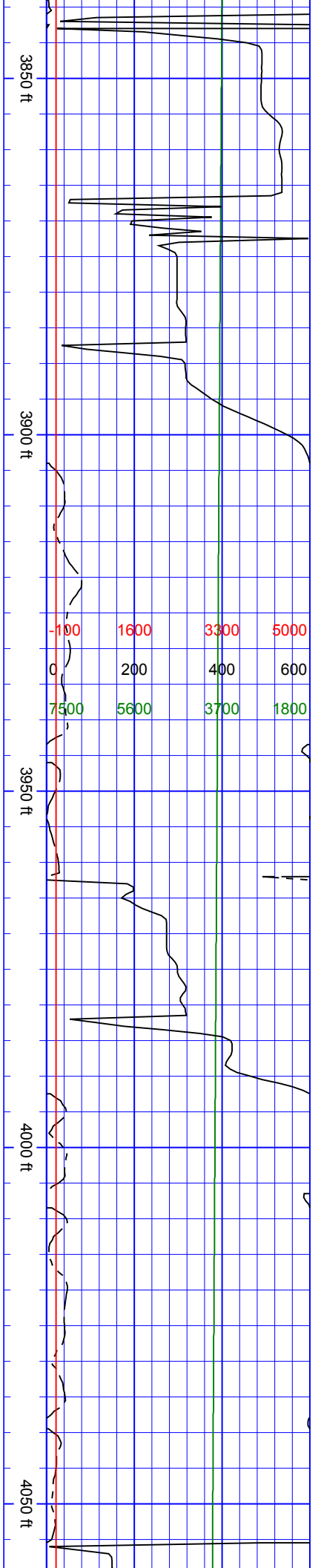
SurveyDepth:3582
TVD:3453 Inc:14.06
Azi:16.32 VertSec:78.02





SurveyDepth:3891
TVD:3747.65 Inc:19.69
Azi:21.77 VertSec:84.85

SurveyDepth:3985
TVD:3836.11 Inc:19.86
Azi:21.24 VertSec:86.65



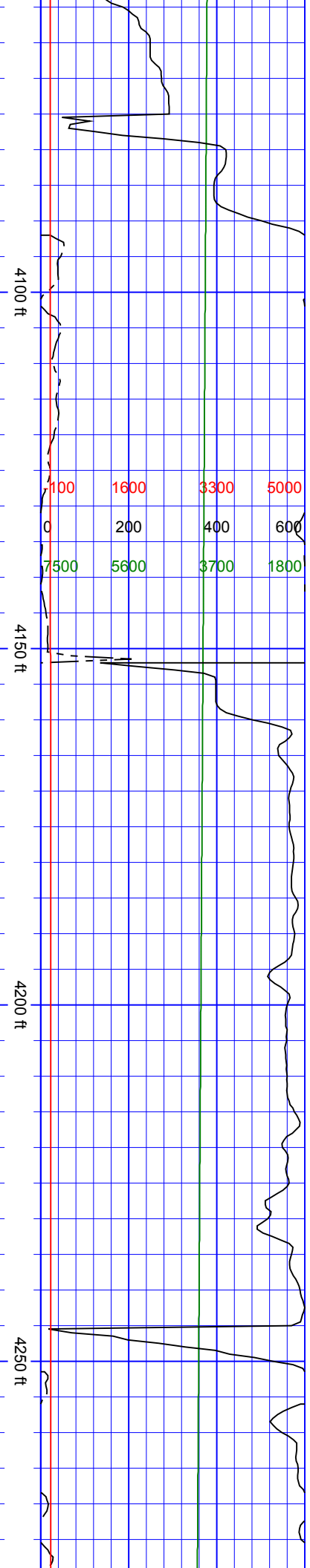
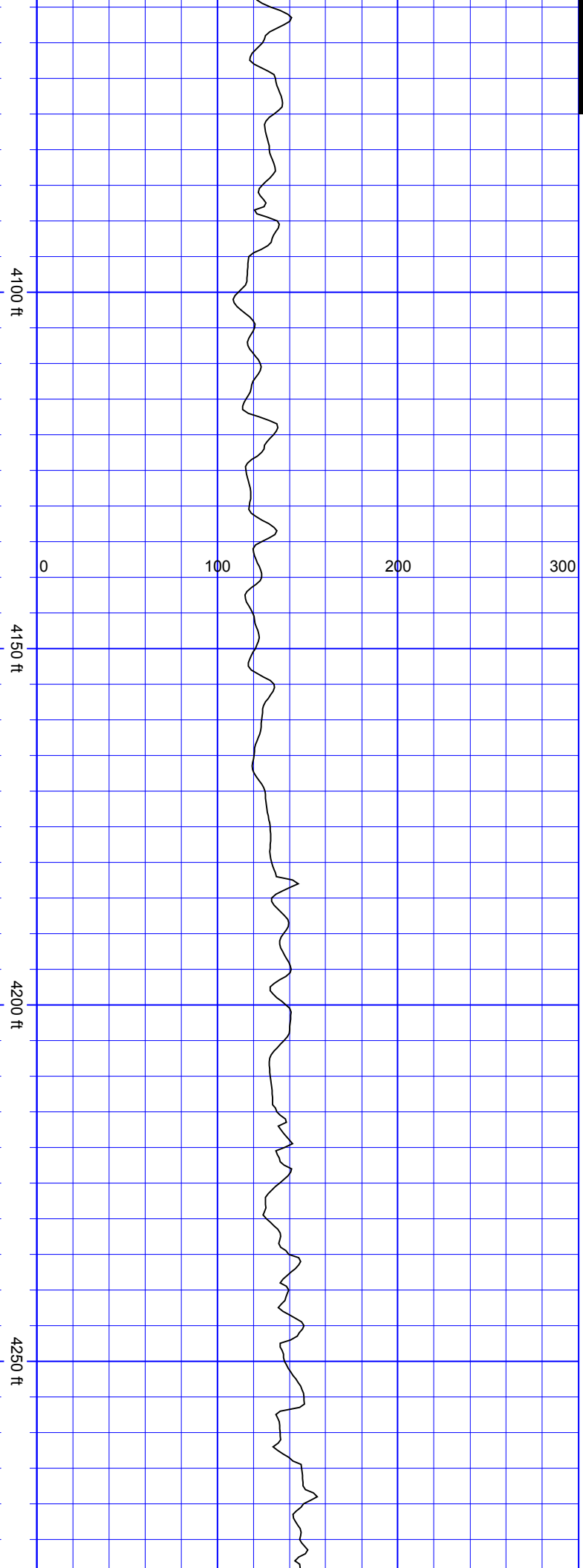
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0	200	400	600
7500	5600	3700	1800

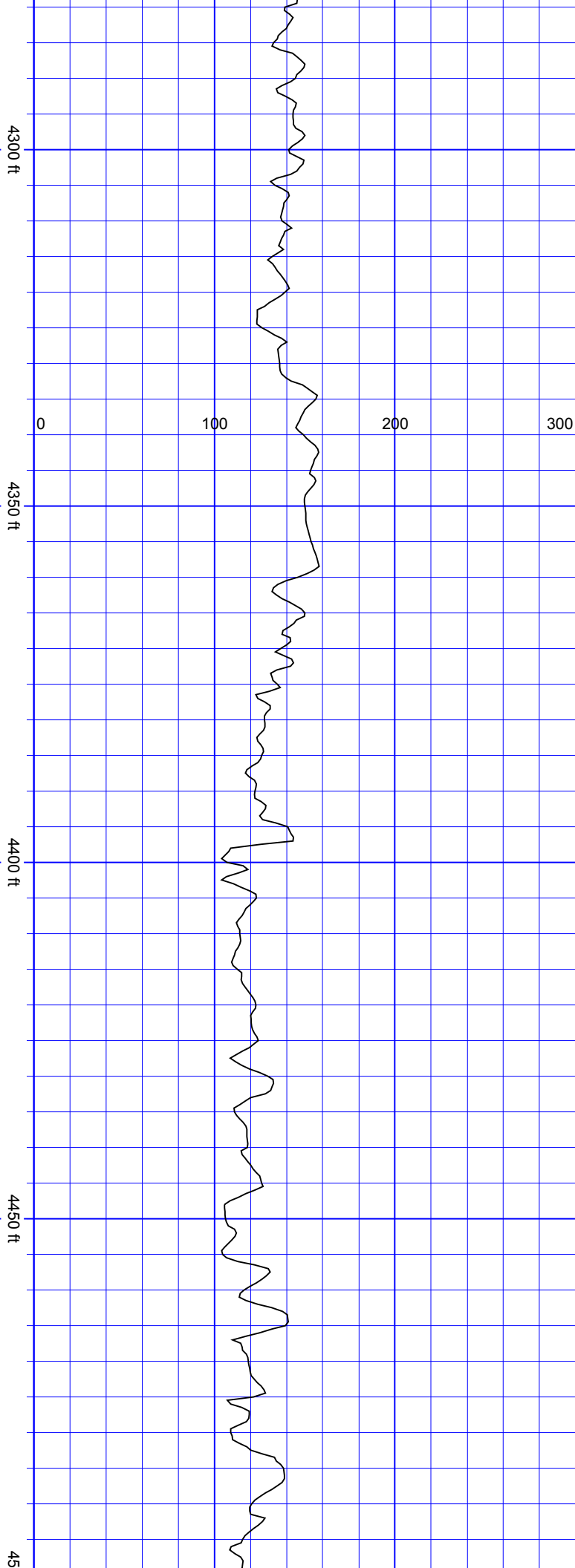
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SurveyDepth:4080
TVD:3925.05 Inc:21.27
Azi:17.81 VertSec:89.72

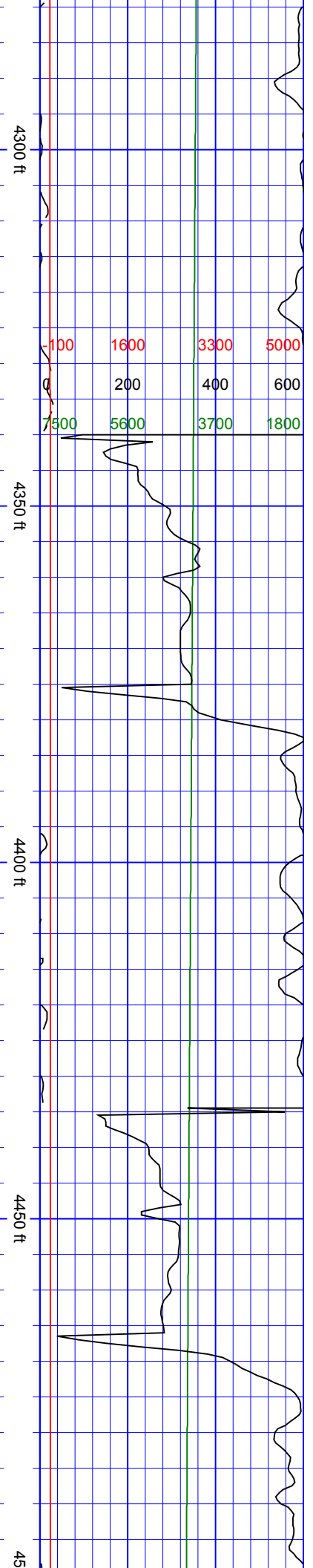
SurveyDepth:4175
TVD:4014.16 Inc:19.29
Azi:16.41 VertSec:94.08

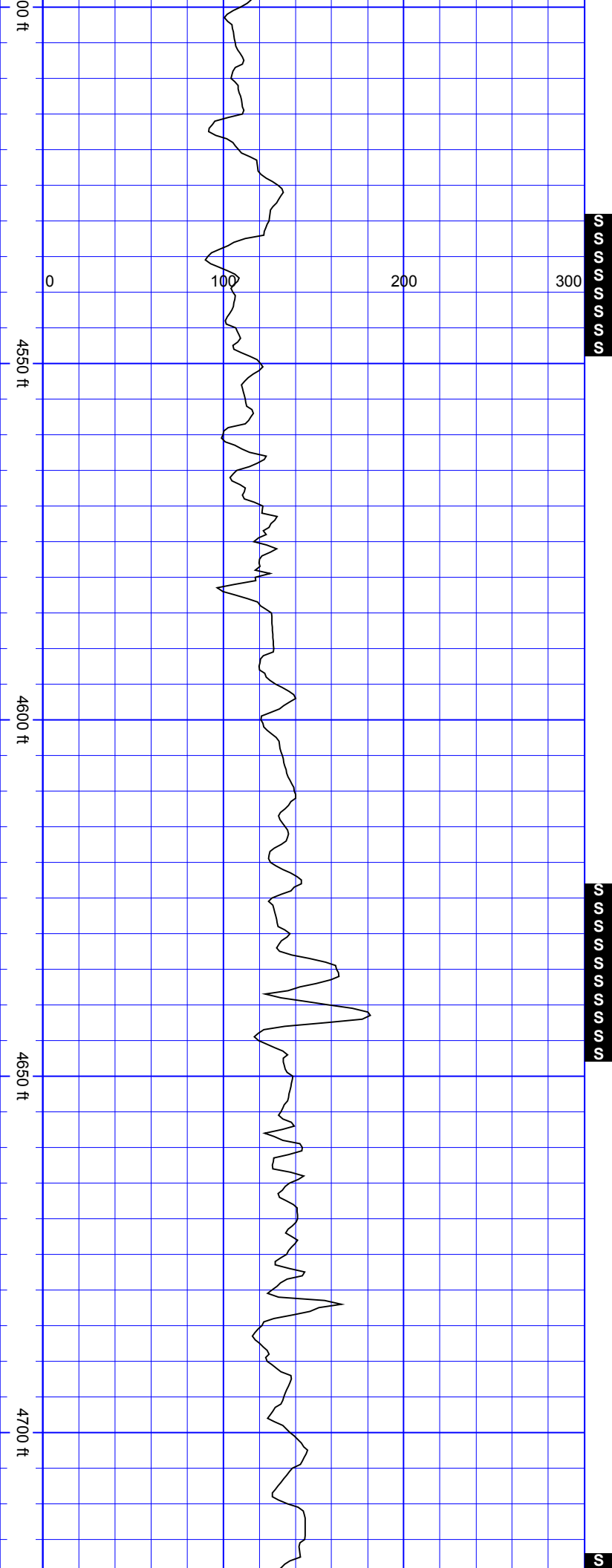
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TVD:4103.86 Inc:15.47
Azi:13.6 VertSec:98.76



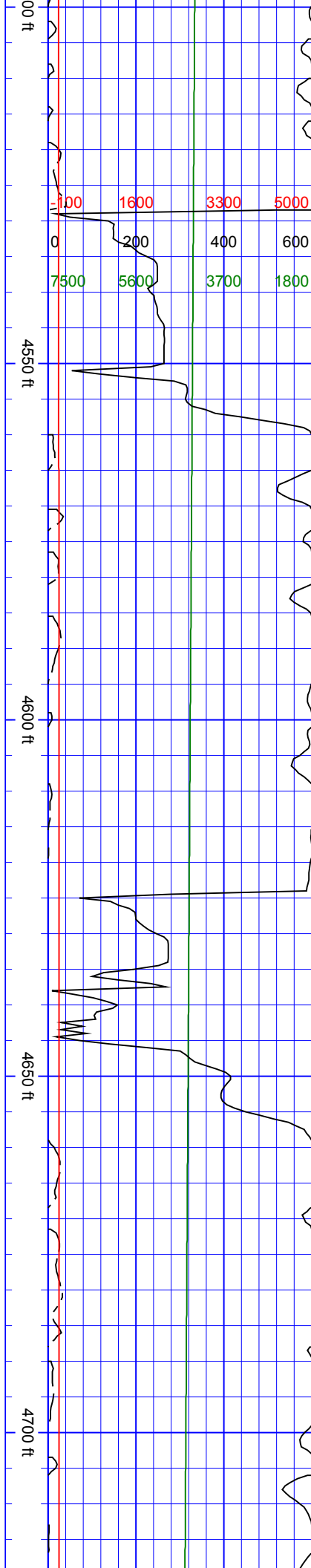


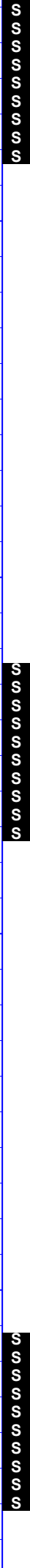
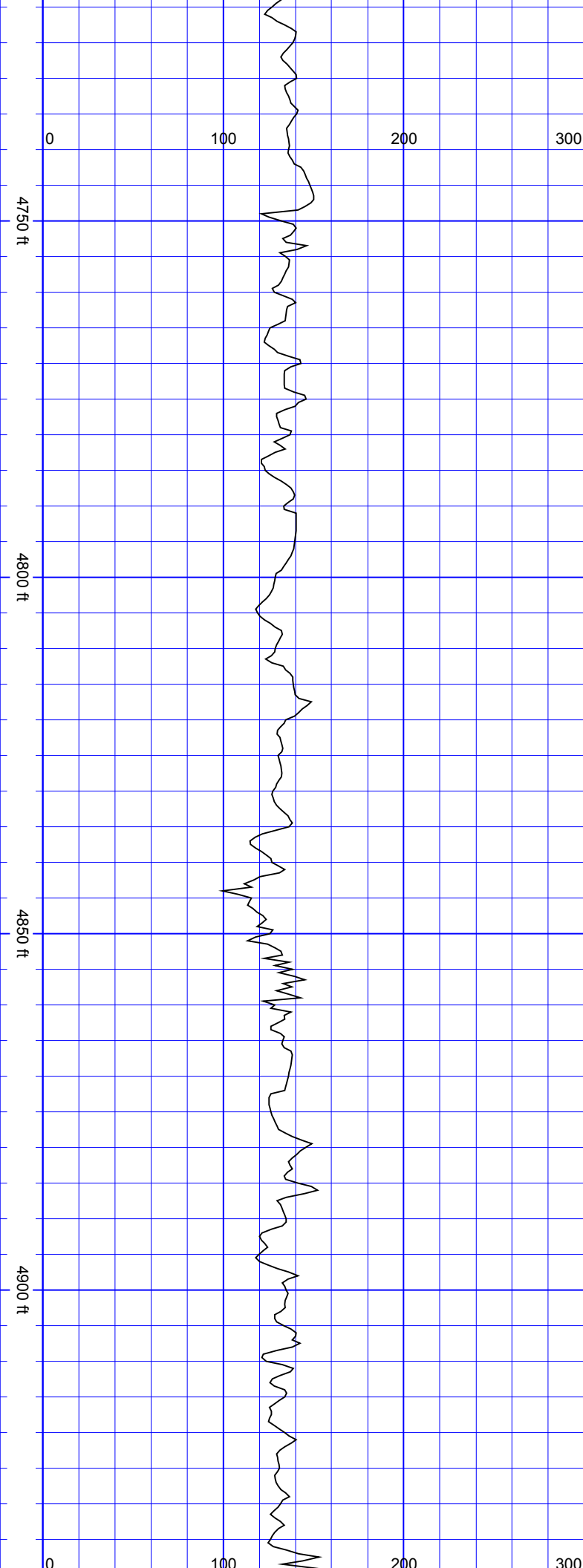
SurveyDepth:4364
TVD:4195.42 Inc:15.43
Azi:13.07
VertSec:103.77





SurveyDepth:4553
TVD:4376.1 Inc:18.68
Azi:17.9 VertSec:111.04

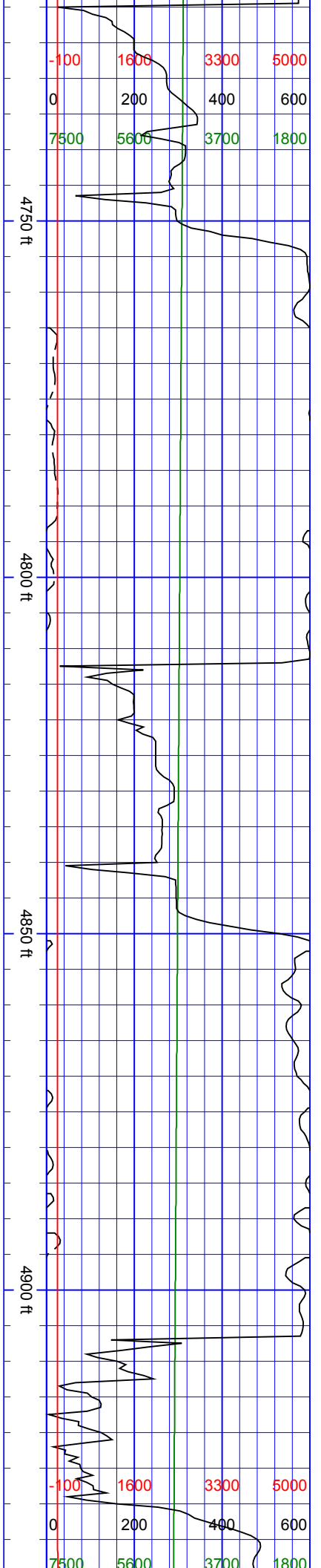


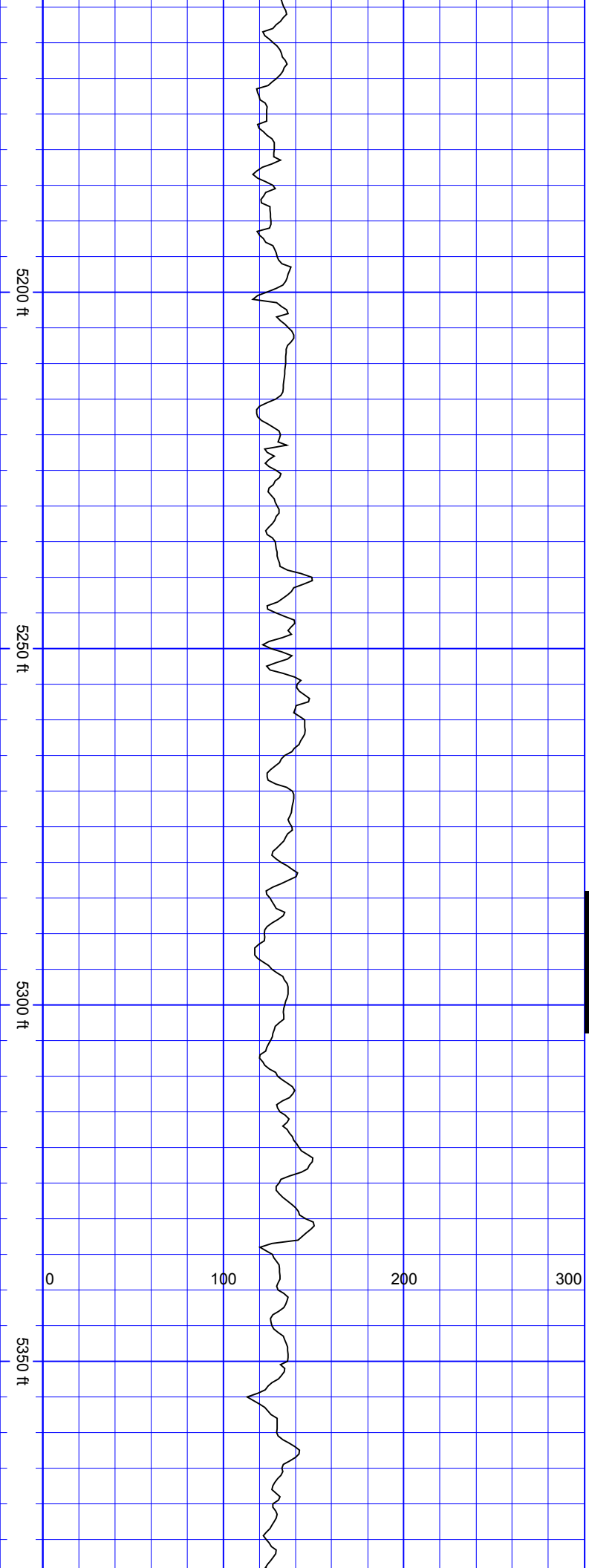


SurveyDepth:4742
TVD:4556.68 Inc:17.1
Azi:22.91
VertSec:114.68

SurveyDepth:4836
TVD:4646.34 Inc:17.84
Azi:18.96
VertSec:116.58

SurveyDepth:4931
TVD:4737.12 Inc:16.44
Azi:15.18

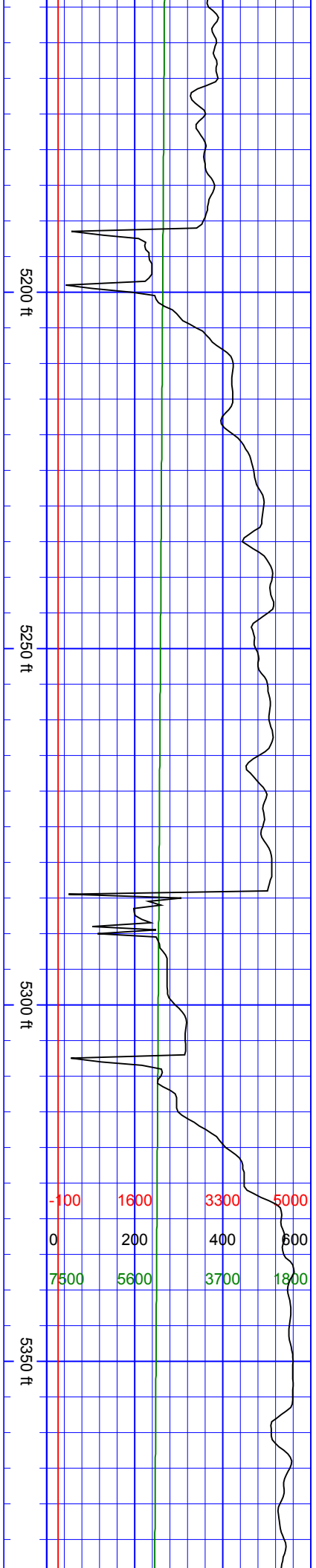


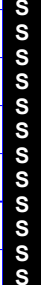
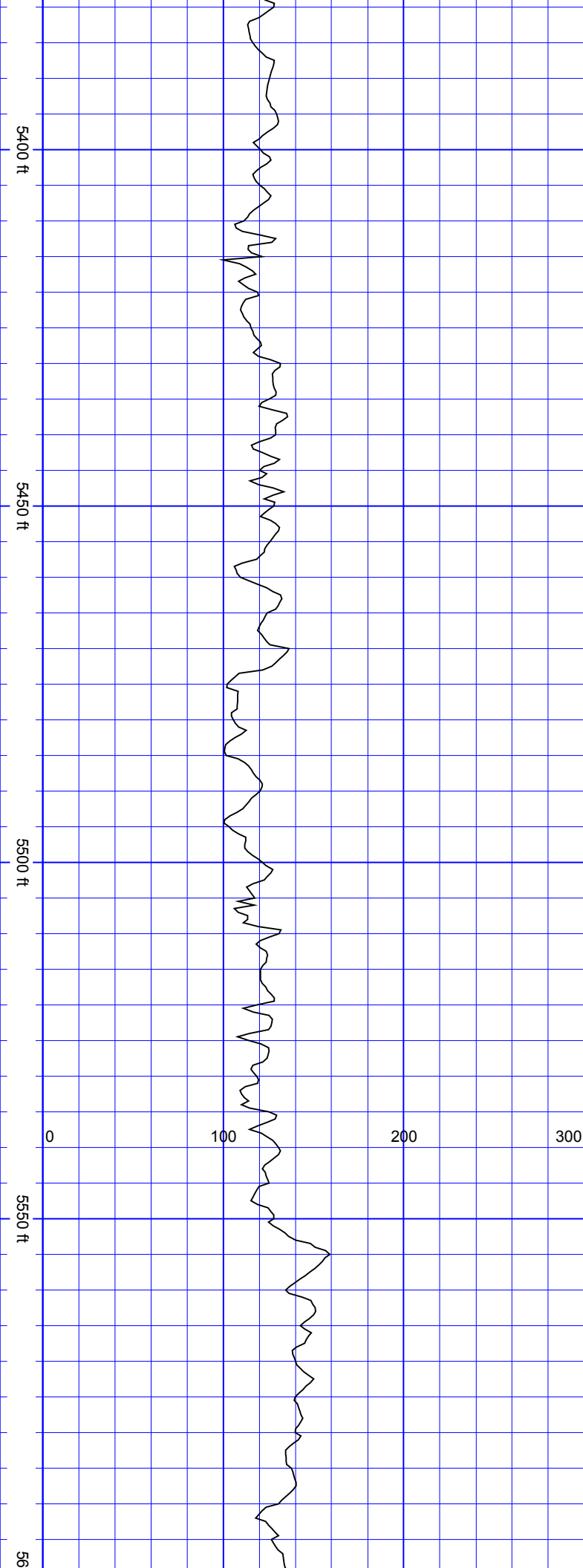


SurveyDepth:5214
TVD:5005.06 Inc:17.4
Azi:24.67
VertSec:126.03

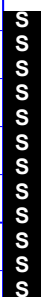
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SurveyDepth:5309
TVD:5096.13 Inc:15.65
Azi:22.82
VertSec:126.48

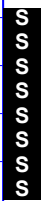




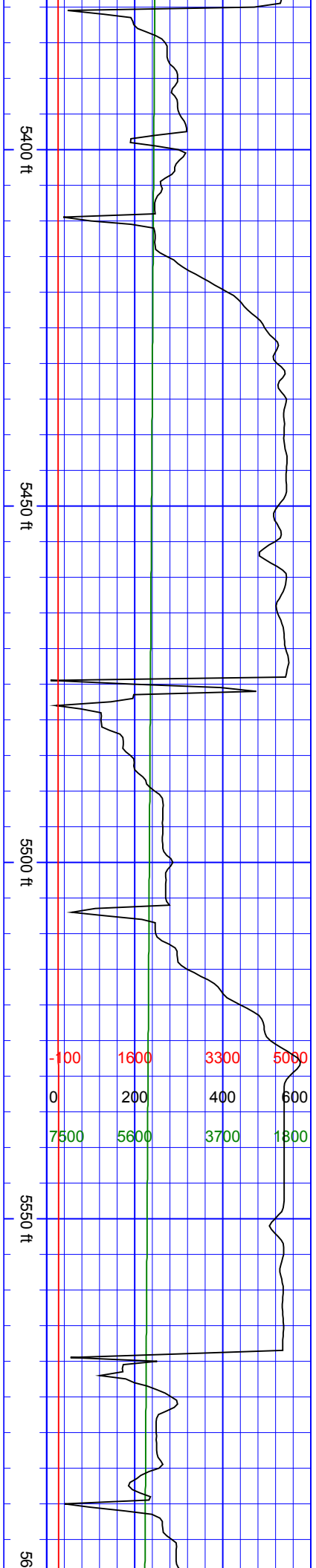
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TVD:5187.5 Inc:16.13
Azi:24.67
VertSec:126.93

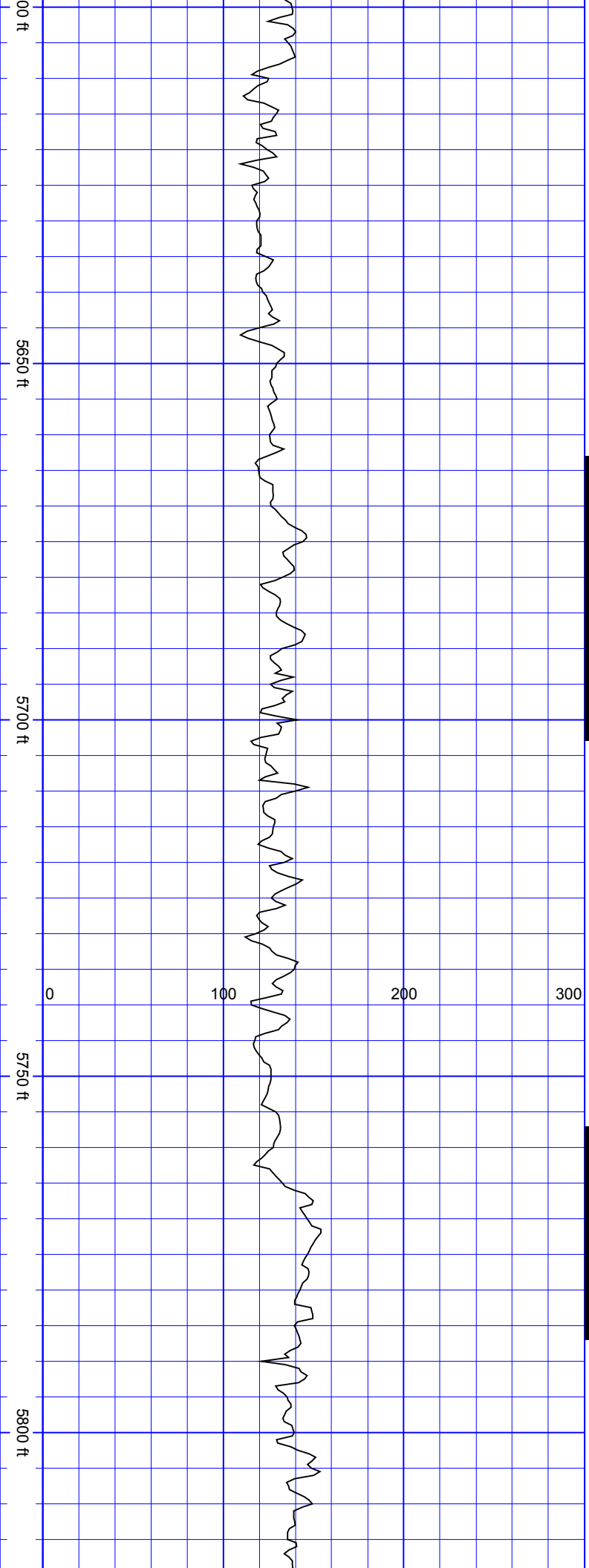


SurveyDepth:5499
TVD:5278.53 Inc:17.14
Azi:17.2 VertSec:128.79



SurveyDepth:5593
TVD:5369.05 Inc:14.11
Azi:19.34

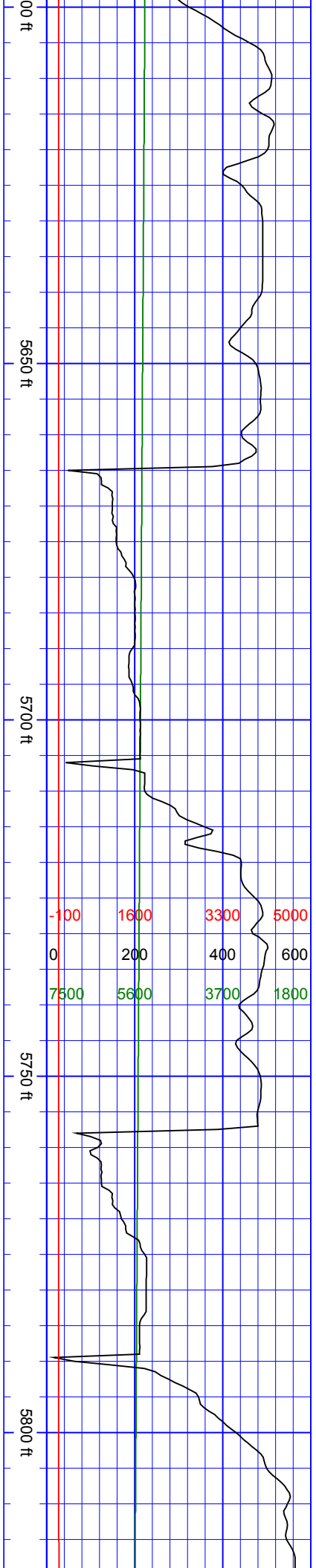


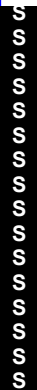
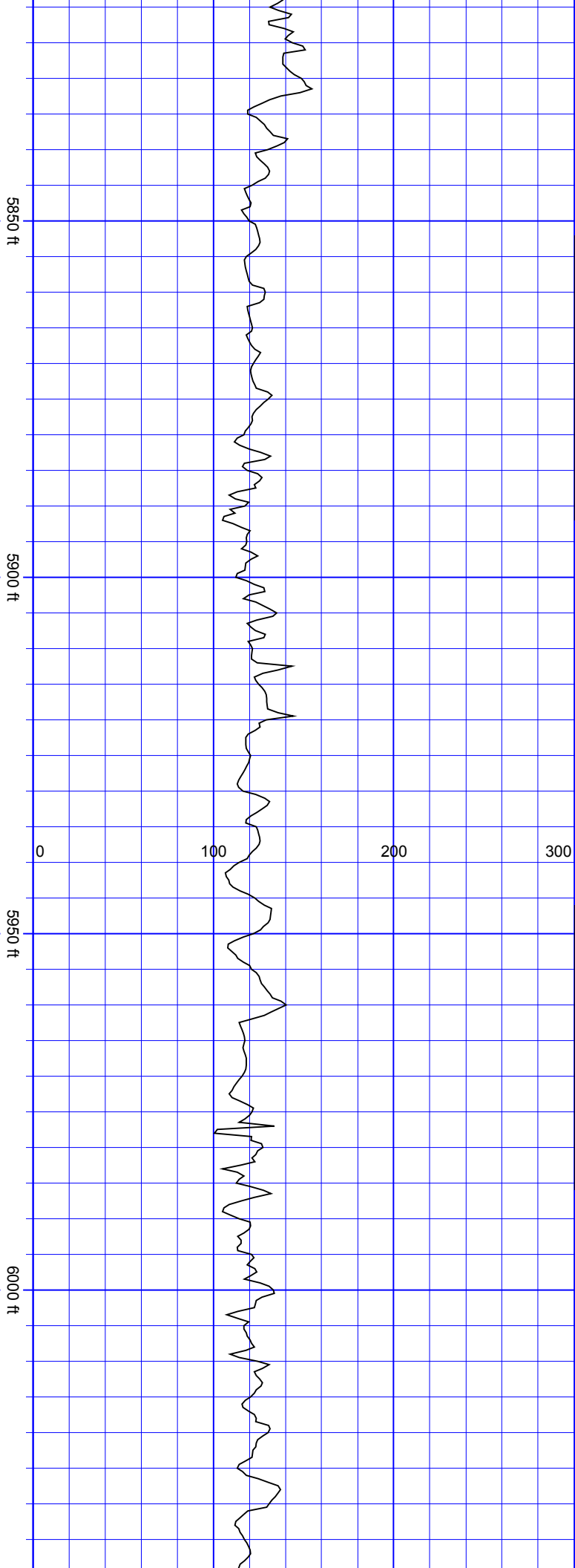


Azi:18.61
VertSec:131.83

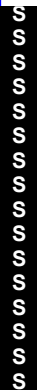
SurveyDepth:5687
TVD:5459.88 Inc:15.69
Azi:16.94
VertSec:134.79

SurveyDepth:5782
TVD:5551.21 Inc:16.3
Azi:18.96
VertSec:137.88

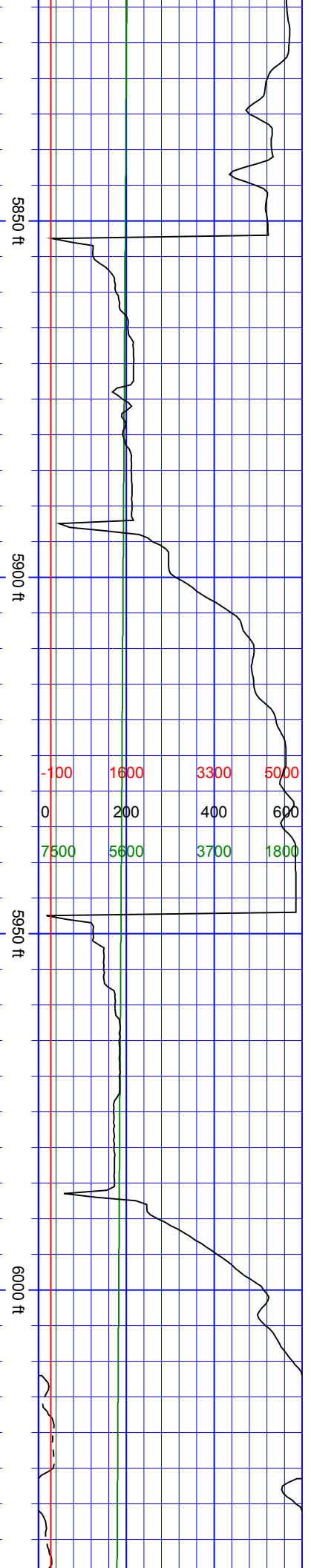


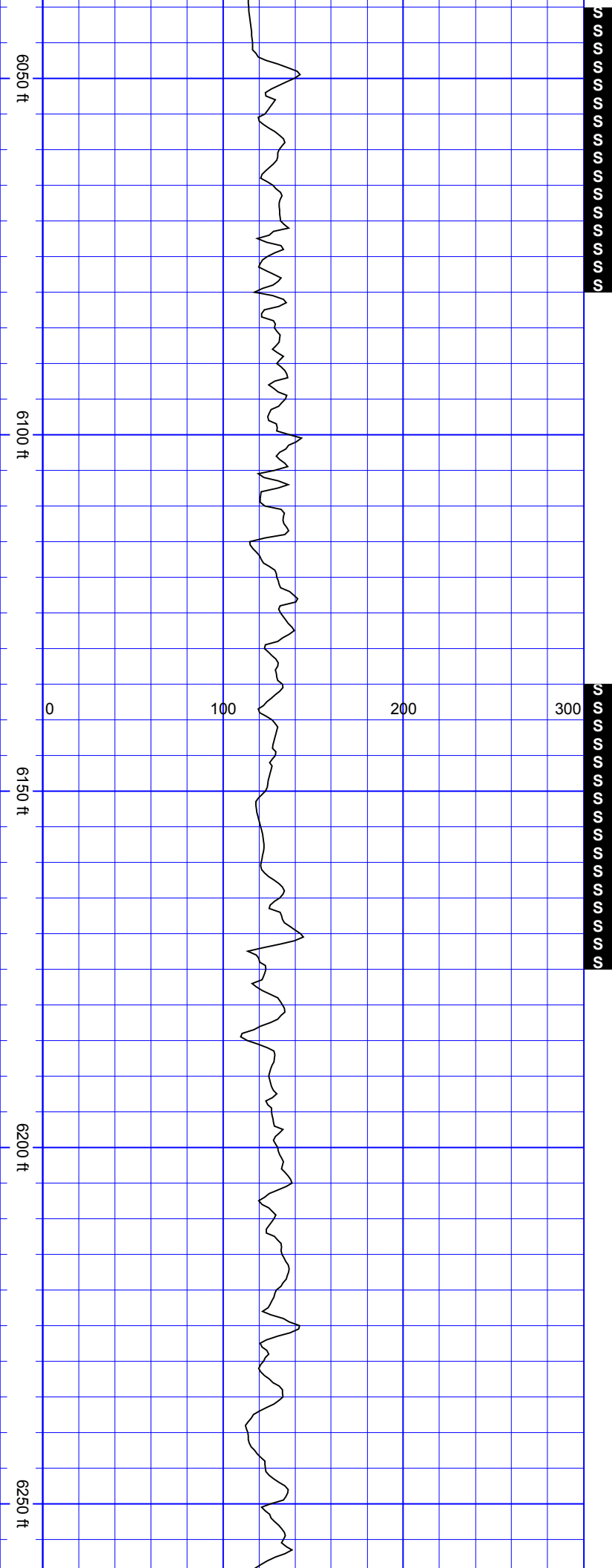


SurveyDepth:5876
TVD:5641.31 Inc:16.83
Azi:17.99
VertSec:140.81



SurveyDepth:5970
TVD:5731.09 Inc:17.62
Azi:23.18 VertSec:142.8

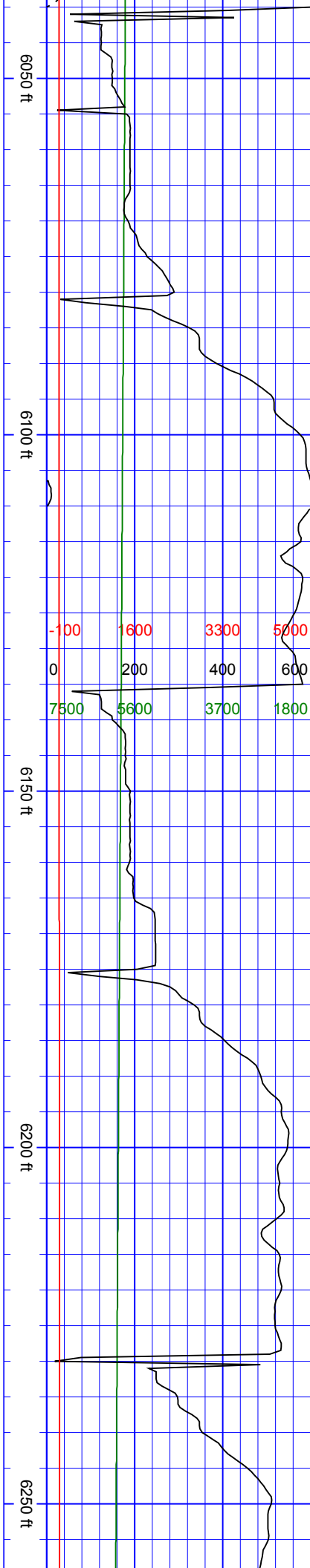




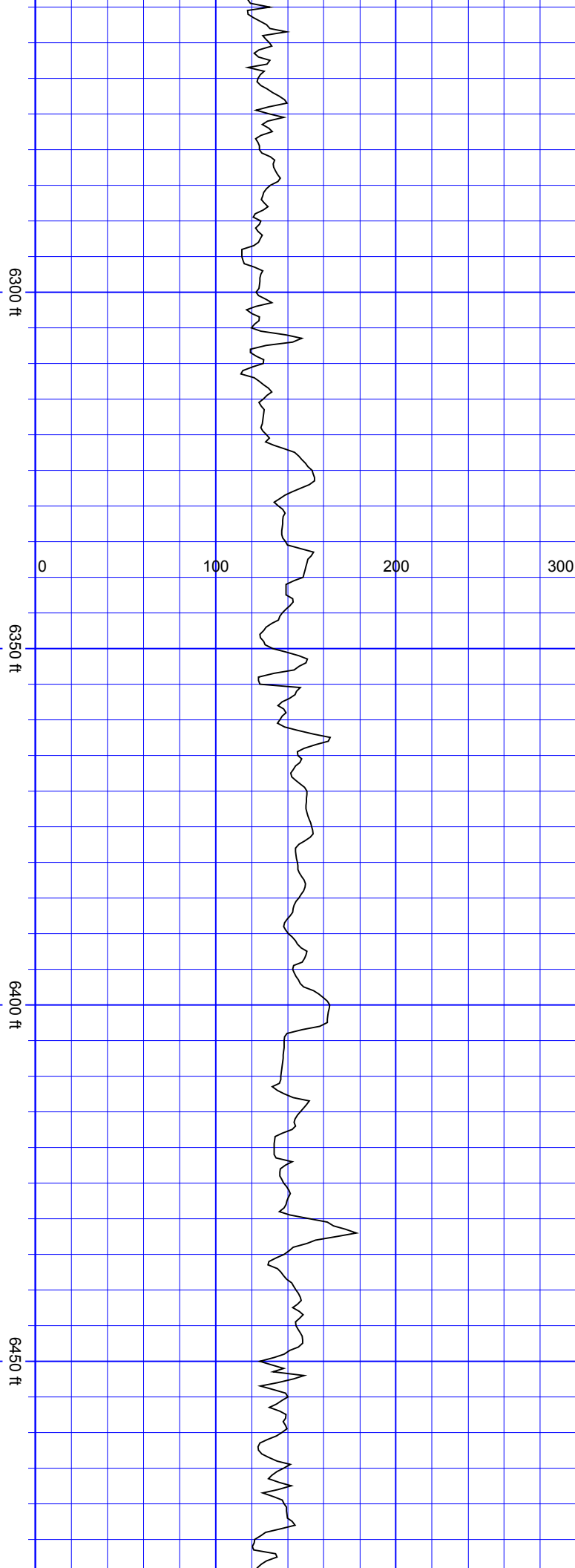
SurveyDepth:6065
TVD:5821.21 Inc:19.29
Azi:18.17
VertSec:144.99

SurveyDepth:6159
TVD:5909.6 Inc:20.52
Azi:20.89
VertSec:147.88

SurveyDepth:6253
TVD:5998.4 Inc:17.71
Azi:20.94

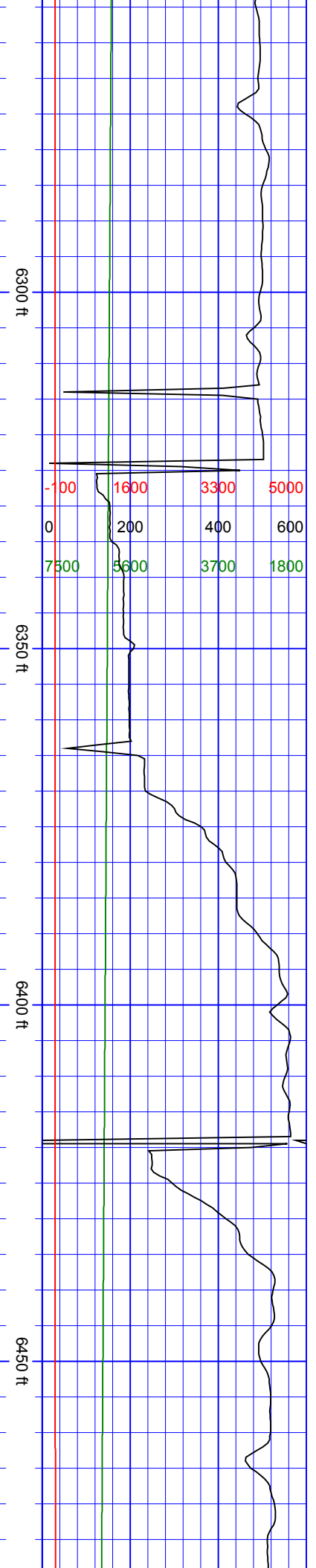


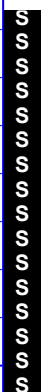
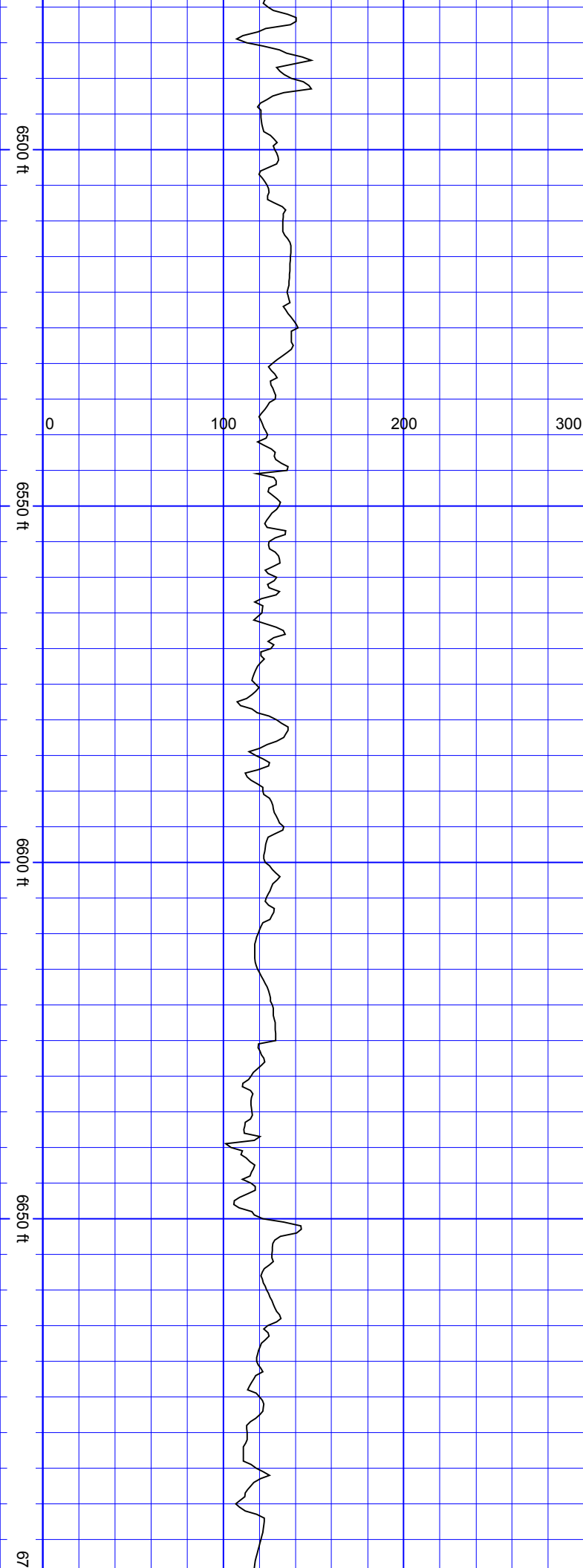
AZI:20.01
VertSec:150.17



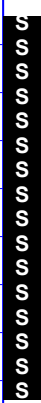
SurveyDepth:6348
TVD:6088.64 Inc:18.72
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SurveyDepth:6443
TVD:6179.12 Inc:16.79
Azi:16.23
VertSec:156.48

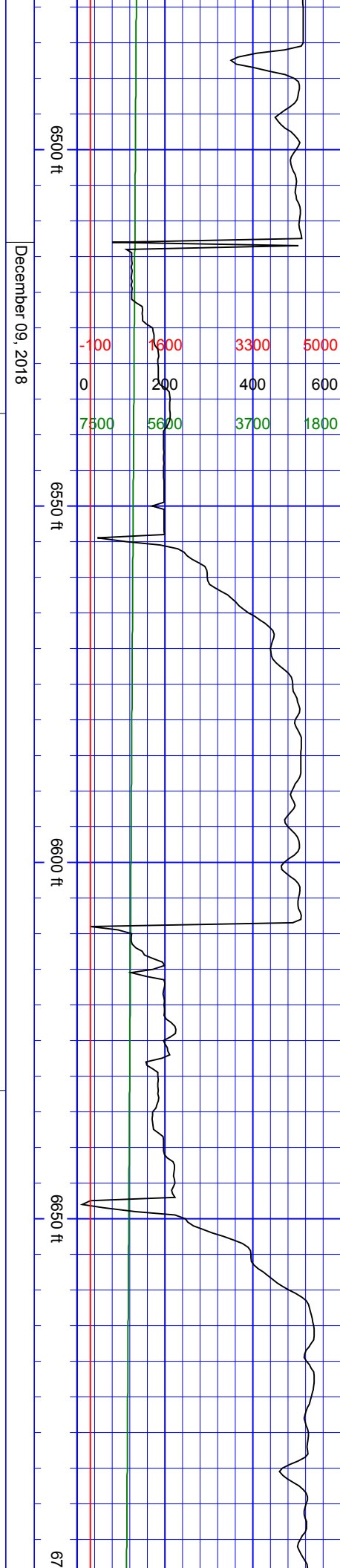


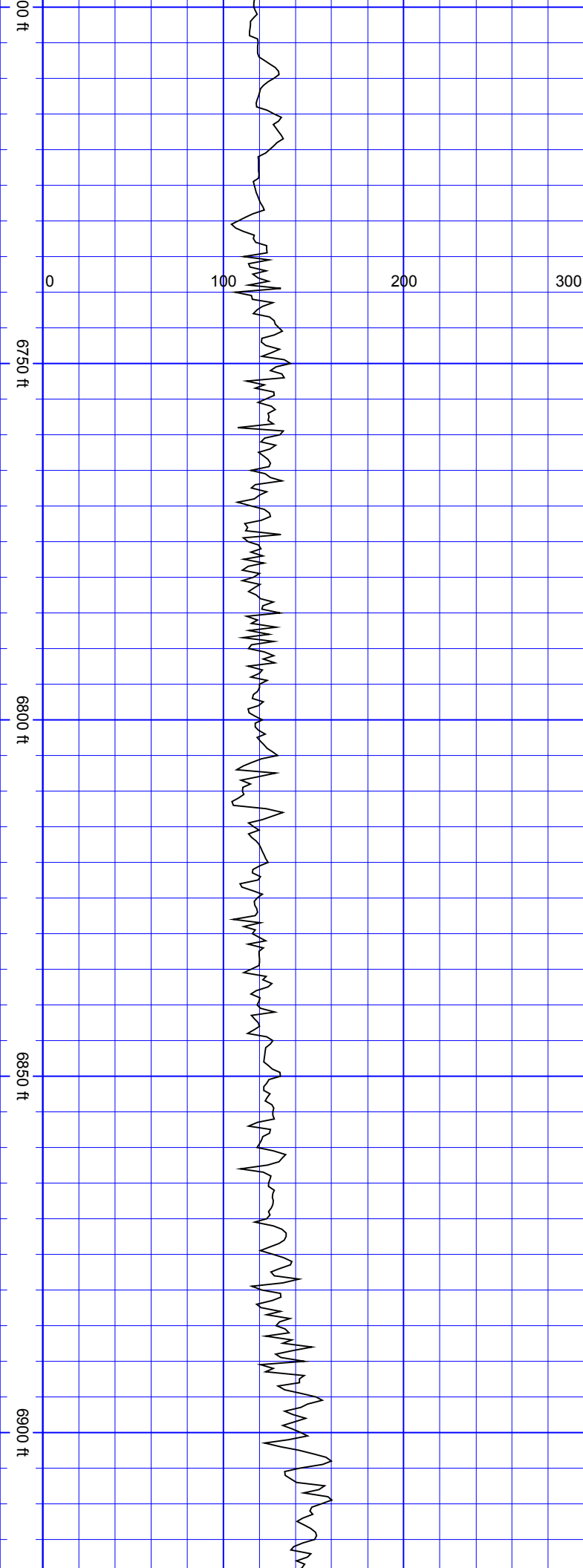


SurveyDepth:6537
TVD:6268.95 Inc:17.45
Azi:16.5 VertSec:160.51



SurveyDepth:6632
TVD:6359.75 Inc:16.88
Azi:28.27
VertSec:161.71



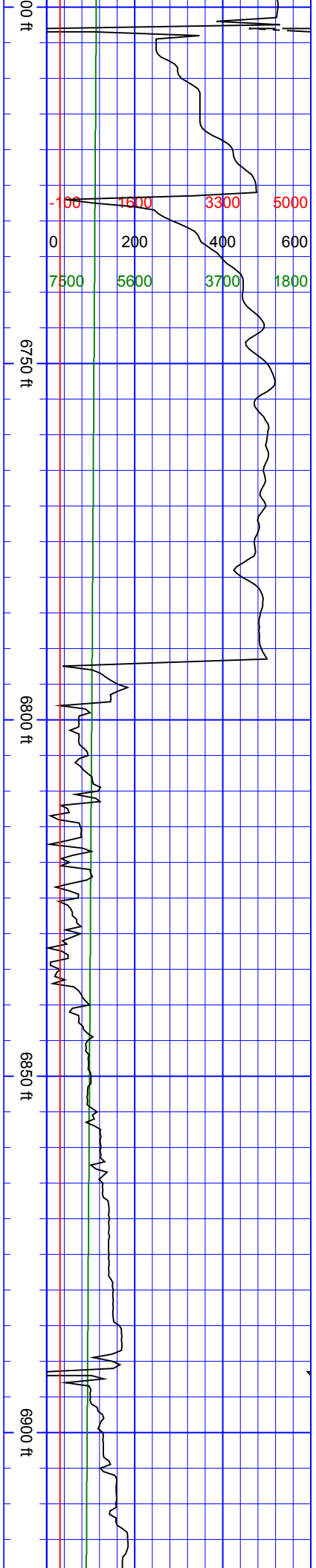


SurveyDepth:6726
TVD:6450.39 Inc:13.8
Azi:29.42
VertSec:159.96

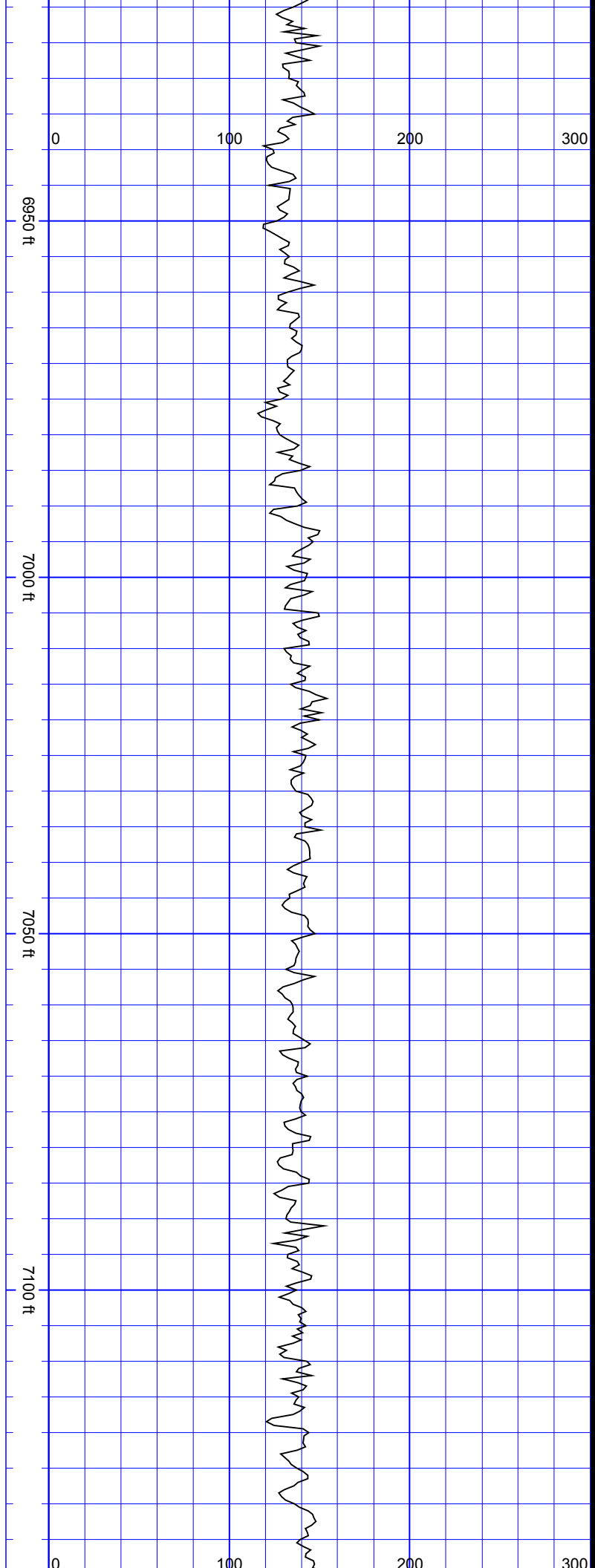
SurveyDepth:6821
TVD:6543.28 Inc:10.28
Azi:27.66 VertSec:158.6

SurveyDepth:6868
TVD:6589.37 Inc:12.52
Azi:5.95 VertSec:160.03

SurveyDepth:6916



-100 1600 3300 5000
0 200 400 600
7500 5600 3700 1800



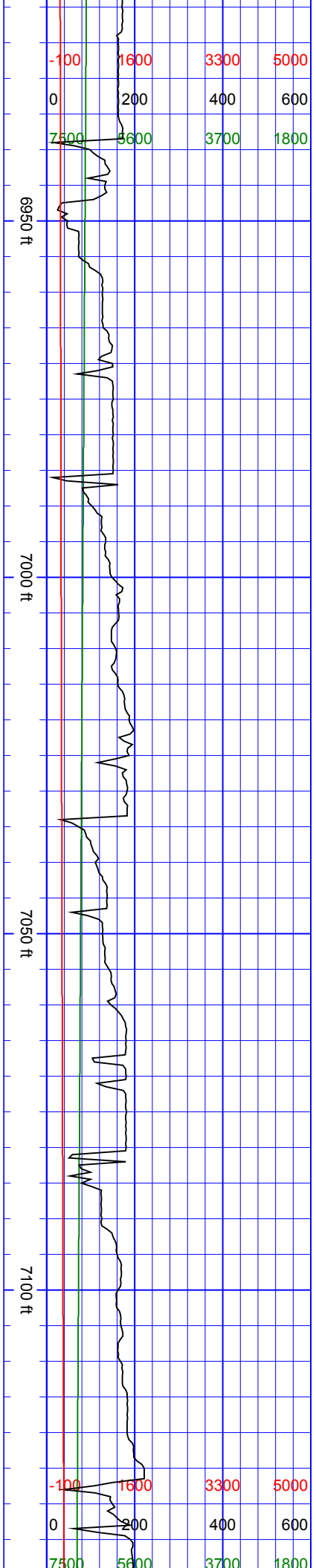
TVD:6635.94 Inc:15.65
Azi:349.69
VertSec:165.43

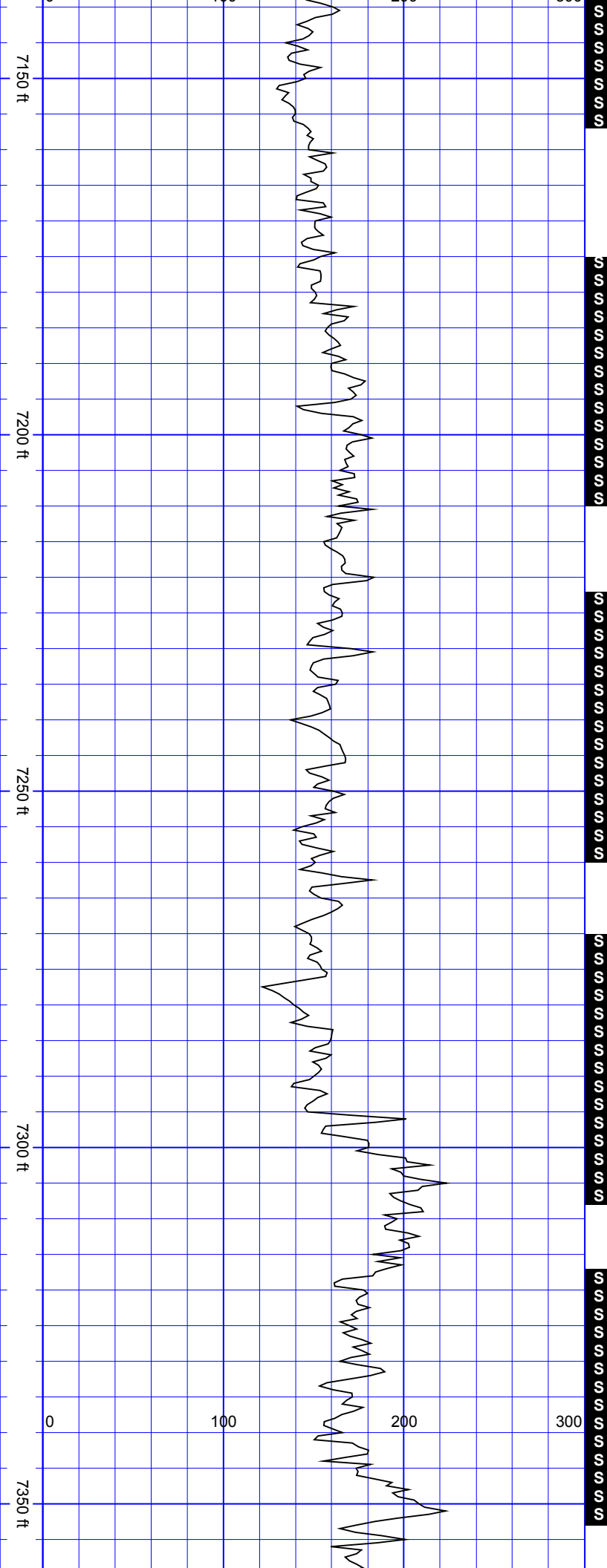
SurveyDepth:6963
TVD:6680.97 Inc:17.75
Azi:336.95
VertSec:174.38

SurveyDepth:7010
TVD:6725.52 Inc:19.64
Azi:321.48
VertSec:186.76

SurveyDepth:7057
TVD:6769.29 Inc:23.12
Azi:312.07
VertSec:202.63

SurveyDepth:7105
TVD:6812.87 Inc:26.46
Azi:303.64
VertSec:222.2





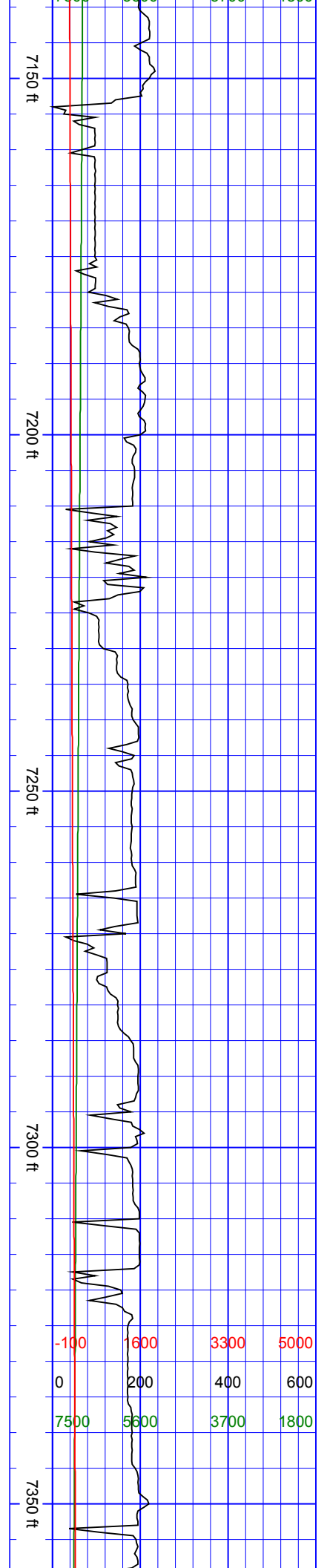
SurveyDepth:7152
TVD:6854.68 Inc:27.95
Azi:308.29
VertSec:243.26

SurveyDepth:7200
TVD:6896.96 Inc:28.61
Azi:302.49
VertSec:265.59

SurveyDepth:7247
TVD:6938.05 Inc:29.53
Azi:293.88
VertSec:288.33

SurveyDepth:7294
TVD:6978.39 Inc:32.26
Azi:289.22
VertSec:312.4

SurveyDepth:7341
TVD:7017.35 Inc:35.73
Azi:287.29
VertSec:338.5



7400 ft

7450 ft

7500 ft

7550 ft

0 100 200 300

SurveyDepth:7388
TVD:7055.1 Inc:37.4
Azi:283.07
VertSec:366.1

SurveyDepth:7435
TVD:7091.55 Inc:40.91
Azi:278.41
VertSec:394.86

SurveyDepth:7483
TVD:7126.87 Inc:44.34
Azi:276.56
VertSec:425.89

SurveyDepth:7530
TVD:7159.16 Inc:48.82
Azi:277.44
VertSec:458.39

SurveyDepth:7578

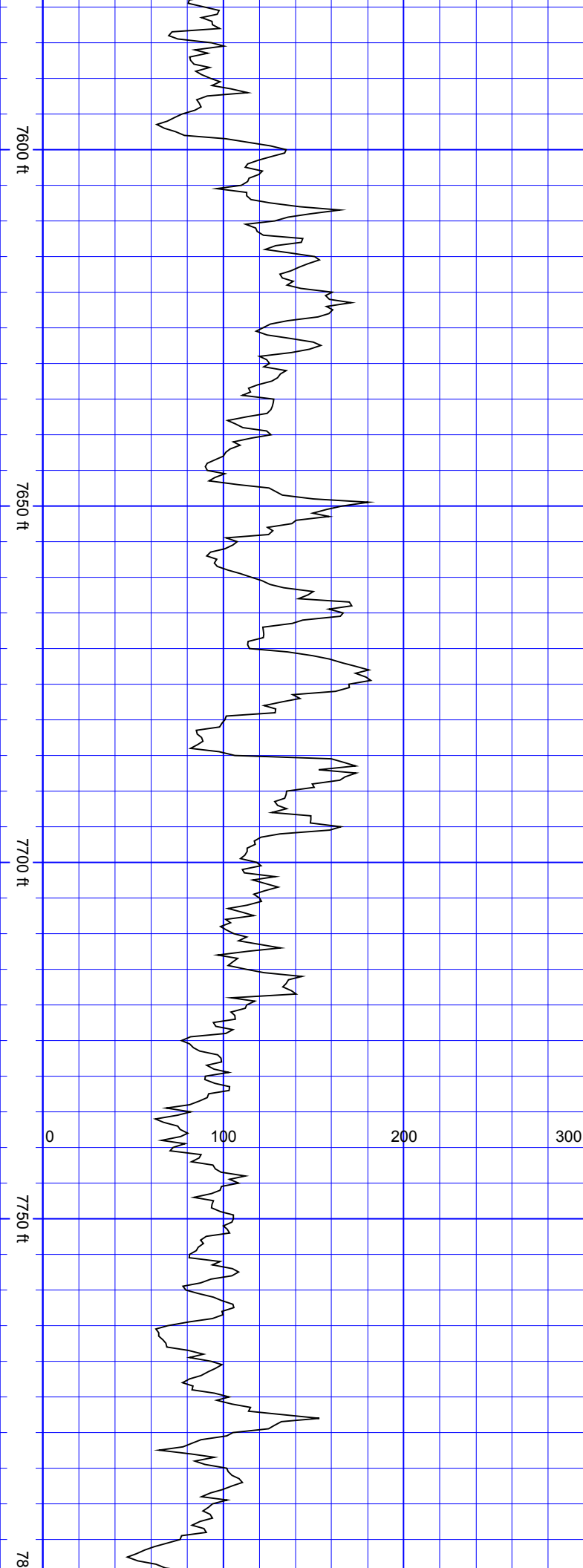
7400 ft

7450 ft

7500 ft

7550 ft

-100	1600	3300	5000
0	200	400	600
7500	5600	3700	1800



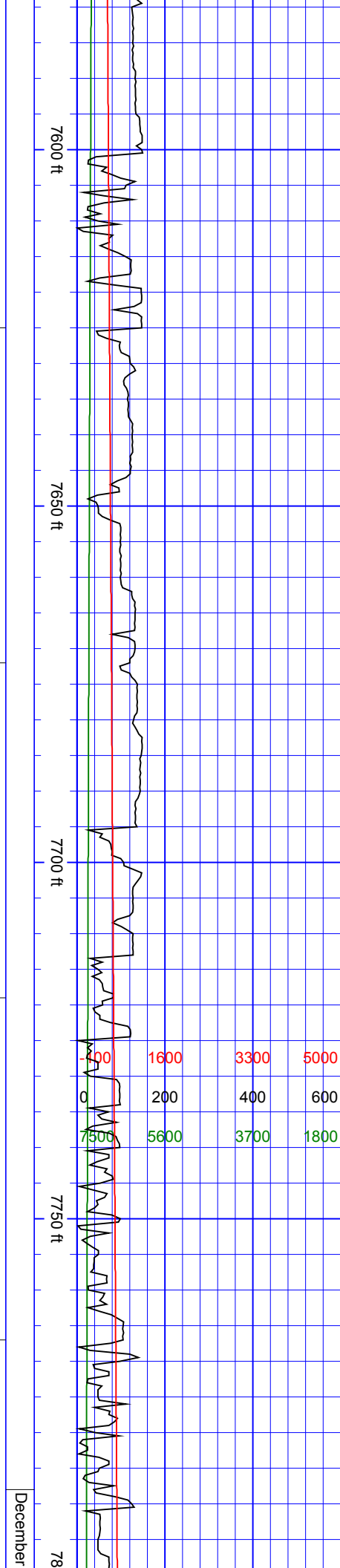
SurveyDepth:7578
TVD:7189.22 Inc:53.61
Azi:277.62
VertSec:494.12

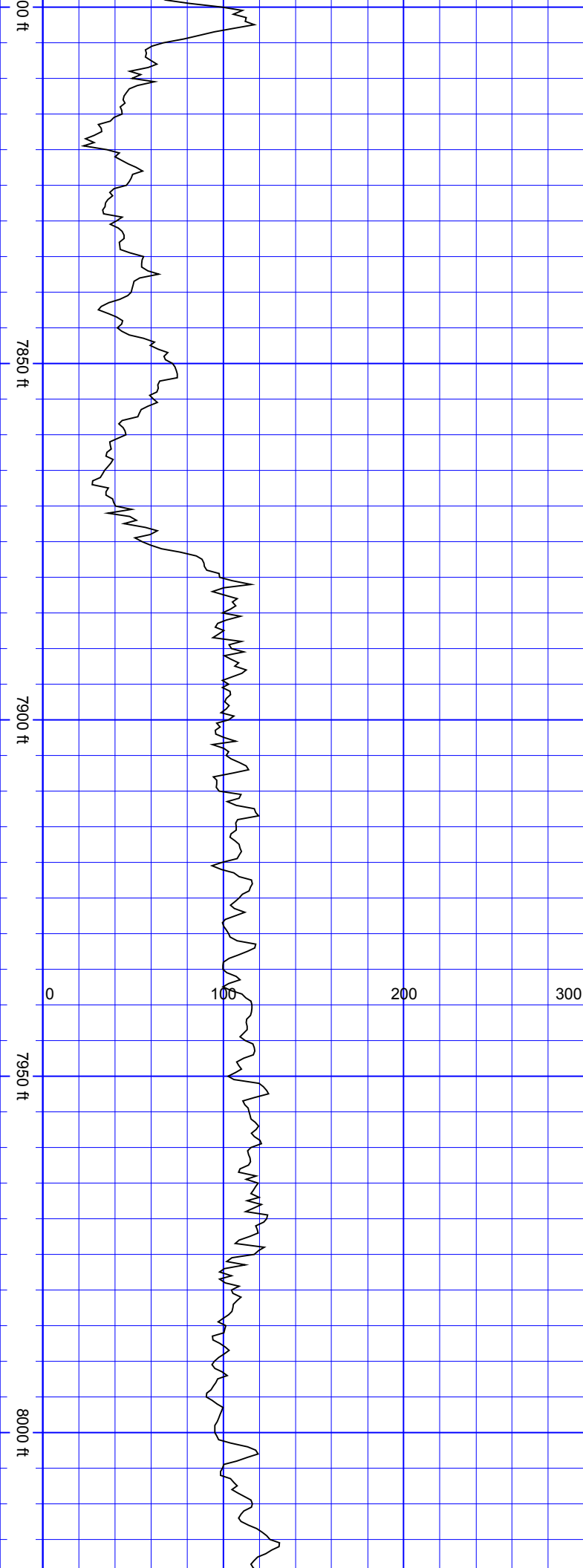
SurveyDepth:7625
TVD:7216.38 Inc:55.81
Azi:279.64
VertSec:530.97

SurveyDepth:7672
TVD:7241.09 Inc:60.73
Azi:281.05
VertSec:569.68

SurveyDepth:7719
TVD:7262.37 Inc:65.39
Azi:281.22
VertSec:610.39

SurveyDepth:7767
TVD:7281.98 Inc:66.4
Azi:282.89
VertSec:653.13



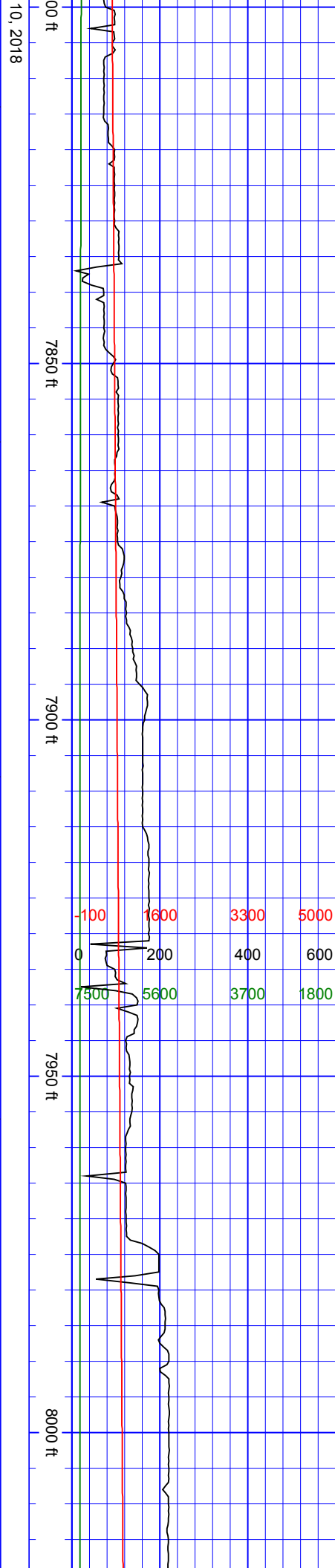


SurveyDepth:7814
TVD:7299.29 Inc:70.36
Azi:282.63
VertSec:695.87

SurveyDepth:7861
TVD:7312.64 Inc:76.64
Azi:283.07
VertSec:739.94

SurveyDepth:7908
TVD:7321.02 Inc:82.79
Azi:284.3 VertSec:785.3

SurveyDepth:7956
TVD:7324.45 Inc:89.03
Azi:282.1
VertSec:832.18

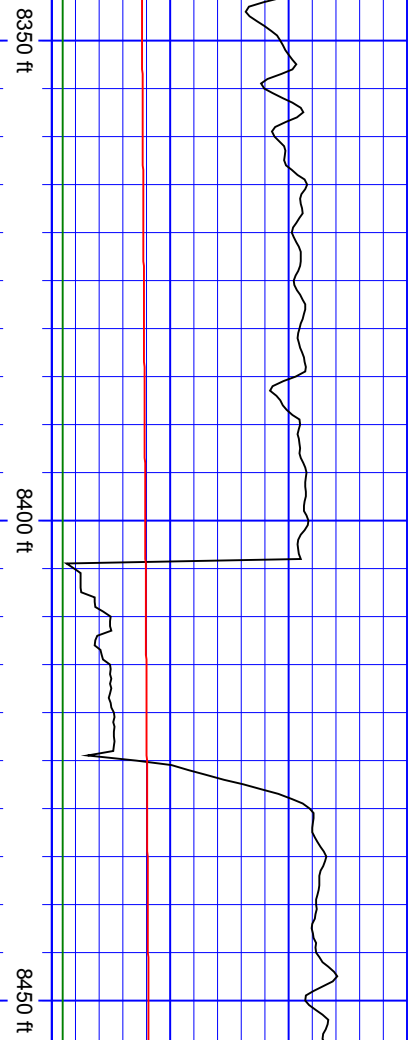
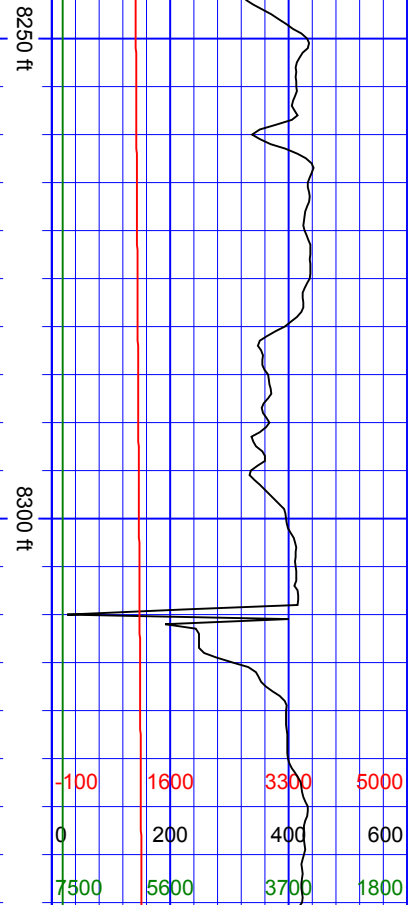
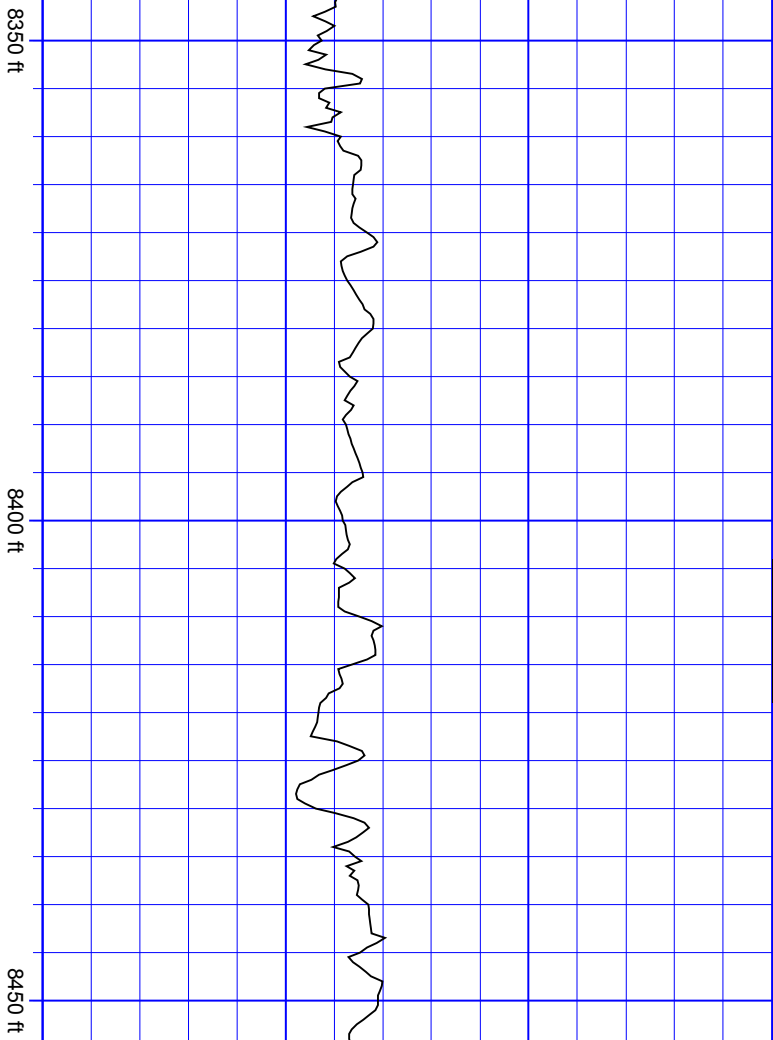
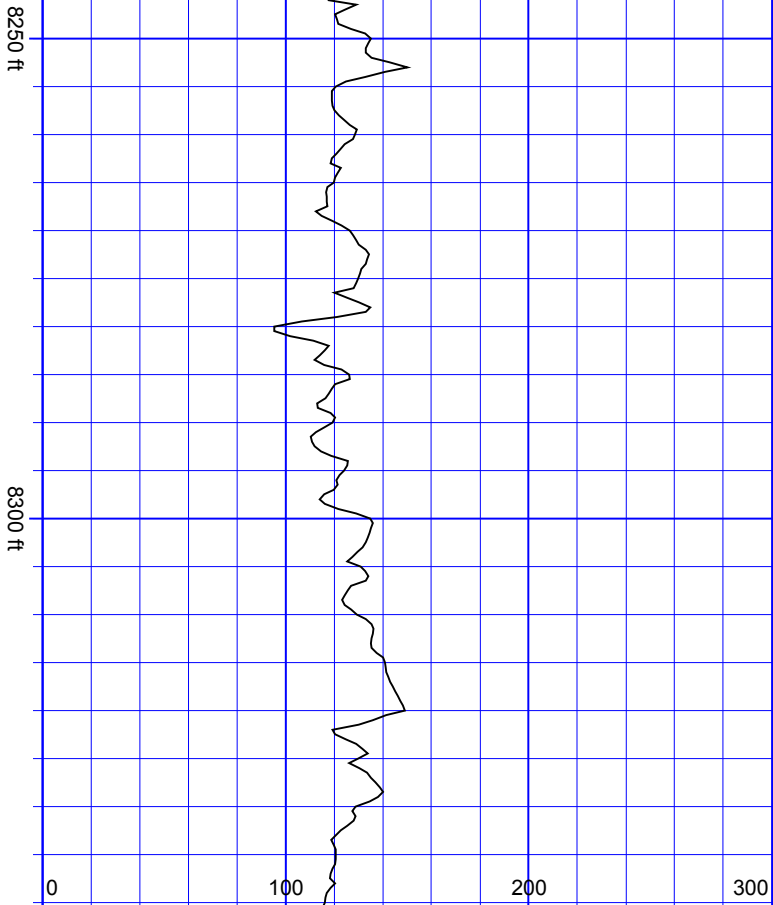


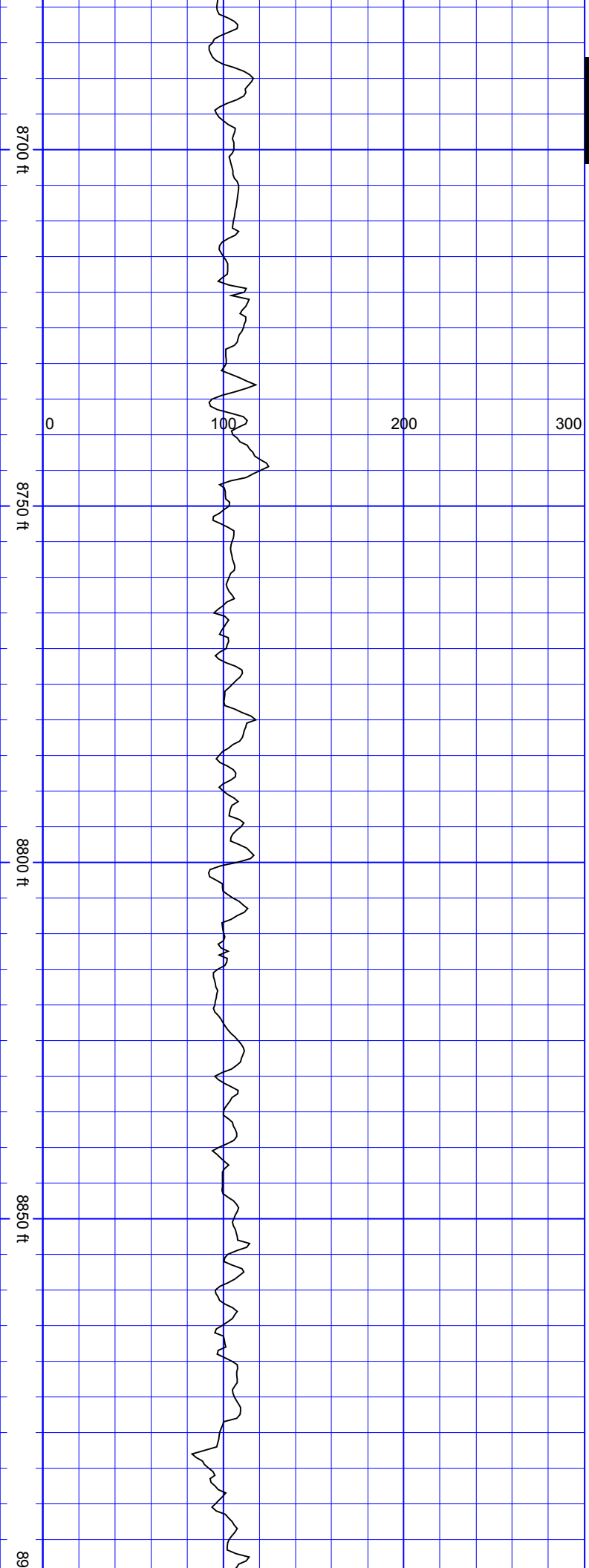
SurveyDepth:8239
TVD:7321.72 Inc:90.75
Azi:271.47
VertSec:1101.66

SurveyDepth:8334
TVD:7320.88 Inc:90.26
Azi:268.04
VertSec:1187.75

SurveyDepth:8429
TVD:7319.03 Inc:91.98
Azi:269.53
VertSec:1273.14

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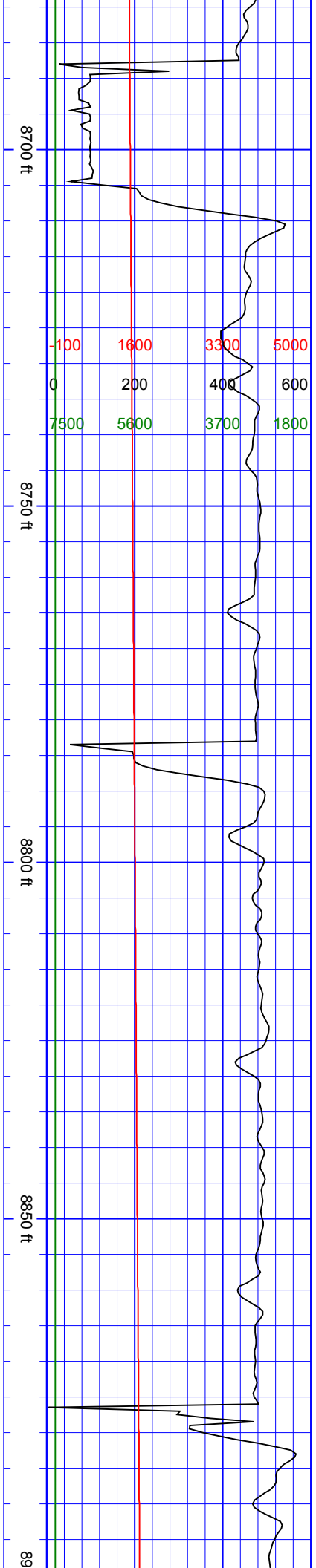


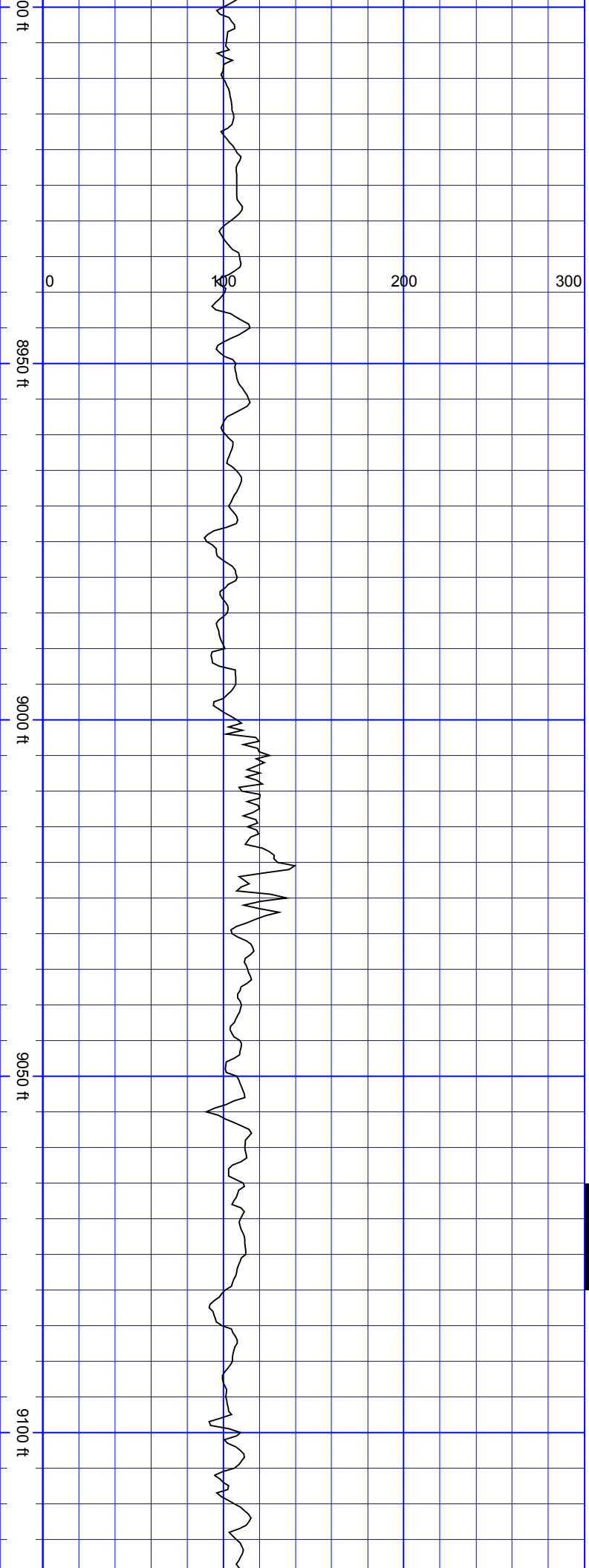


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SurveyDepth:8711
TVD:7313.47 Inc:89.78
Azi:271.56
VertSec:1528.18

SurveyDepth:8806
TVD:7313.94 Inc:89.65
Azi:270.76
VertSec:1615.24



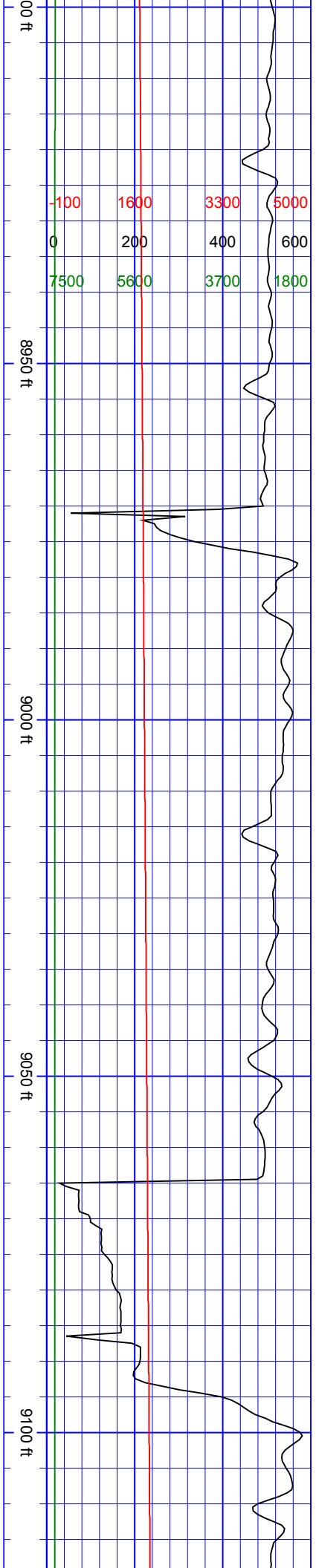


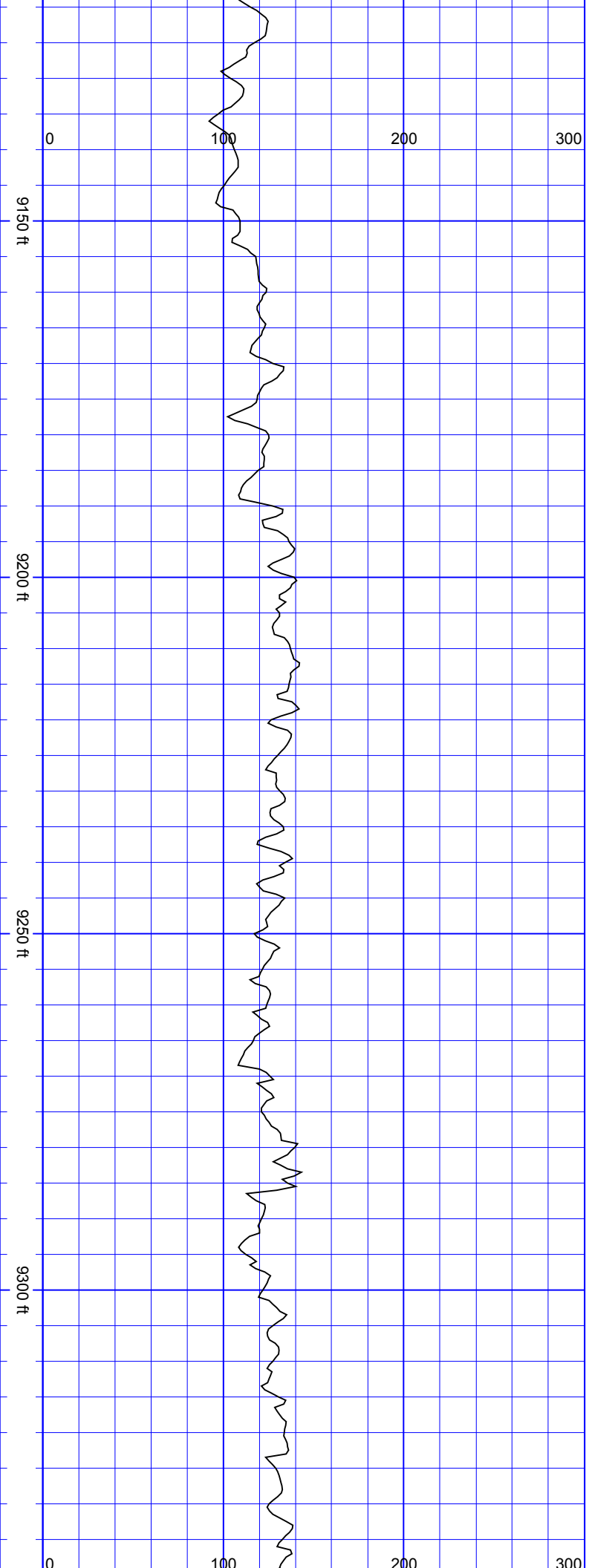
SurveyDepth:8900
TVD:7314.84 Inc:89.25
Azi:270.5
VertSec:1701.03

SurveyDepth:8995
TVD:7316.45 Inc:88.81
Azi:269.62
VertSec:1787.33

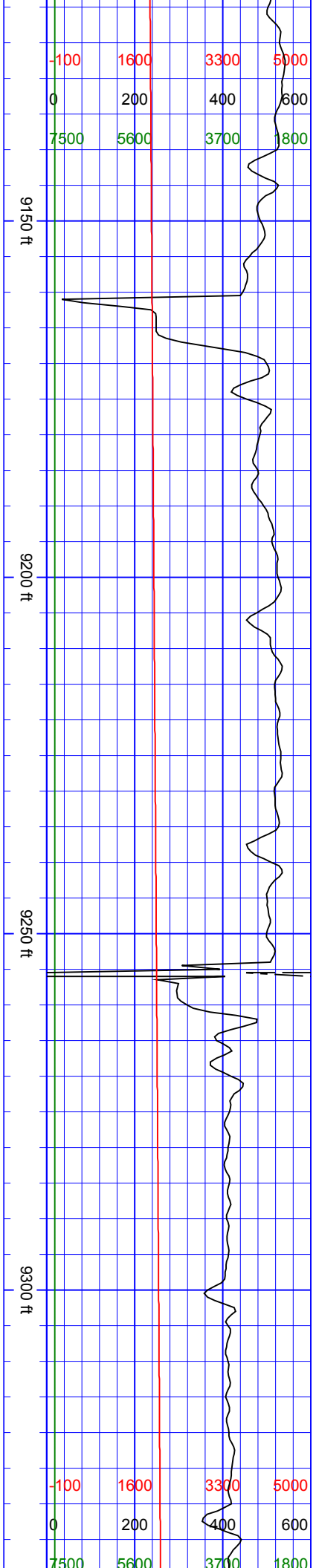
SurveyDepth:9089
TVD:7317.21 Inc:90.26
Azi:272.08
VertSec:1873.26

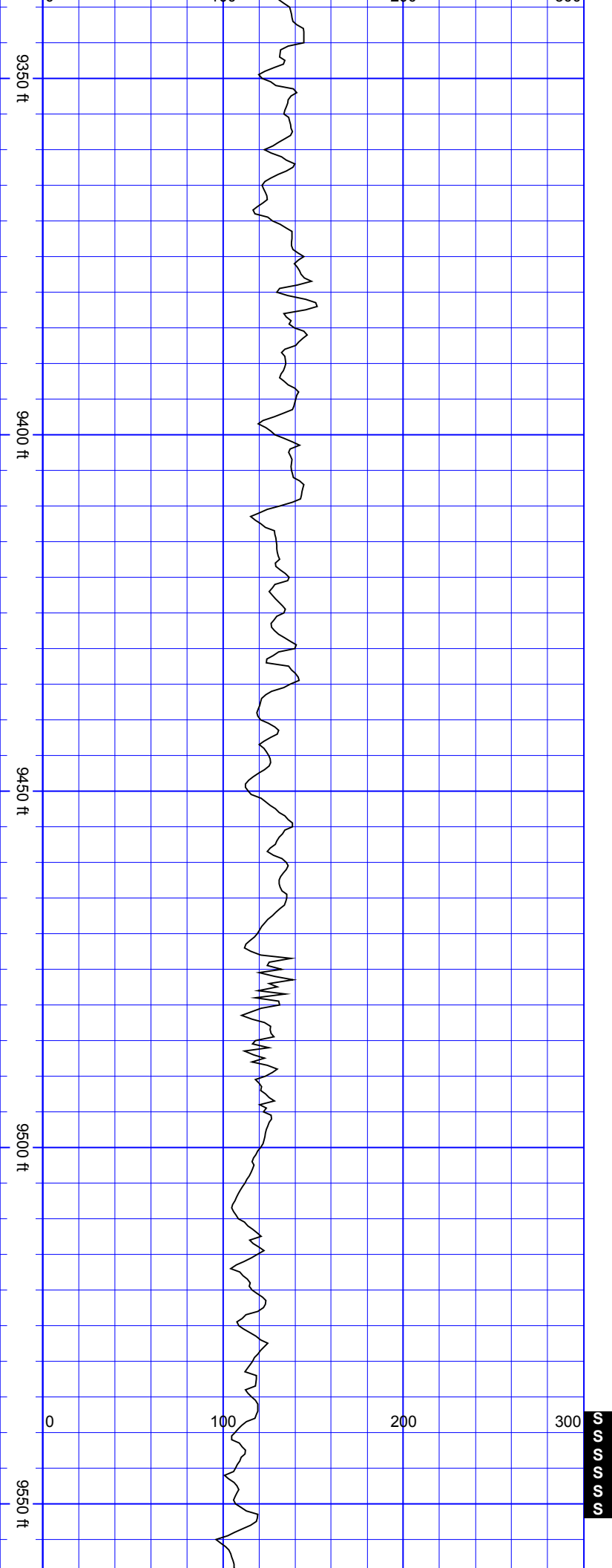
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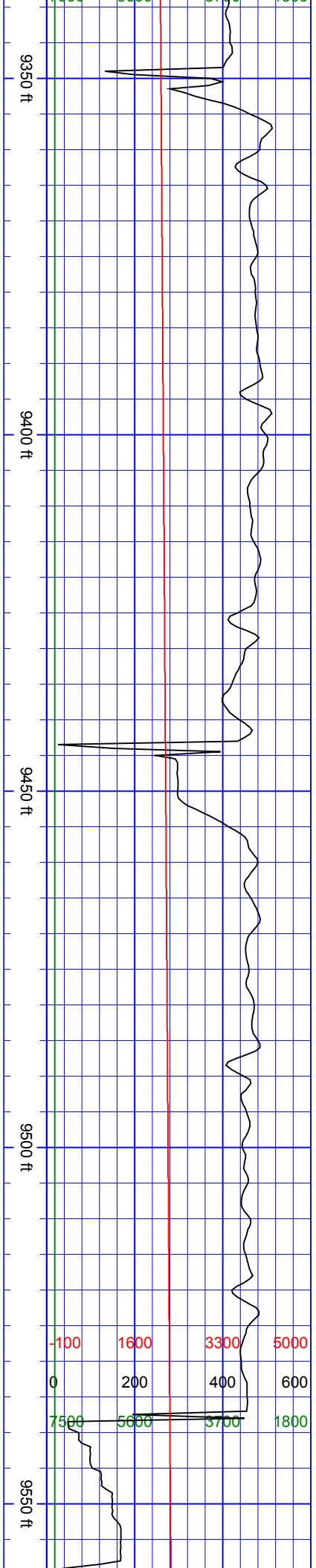
SurveyDepth:9184 TVD:7316.89 Inc:90.13 Azi:271.12 VertSec:1960.61	SurveyDepth:9278 TVD:7316.63 Inc:90.18 Azi:271.12 VertSec:2046.73
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SurveyDepth:9373
TVD:7316.63 Inc:89.82
Azi:270.68
VertSec:2133.61

SurveyDepth:9467
TVD:7317.32 Inc:89.34
Azi:268.92
VertSec:2218.84



9600 ft

9650 ft

9700 ft

9750 ft

0 100 200 300

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SurveyDepth:9562
TVD:7317.32 Inc:90.66
Azi:270.24
VertSec:2304.81

SurveyDepth:9656
TVD:7316.06 Inc:90.88
Azi:270.32
VertSec:2390.36

SurveyDepth:9750
TVD:7314.8 Inc:90.66
Azi:272.35
VertSec:2476.61

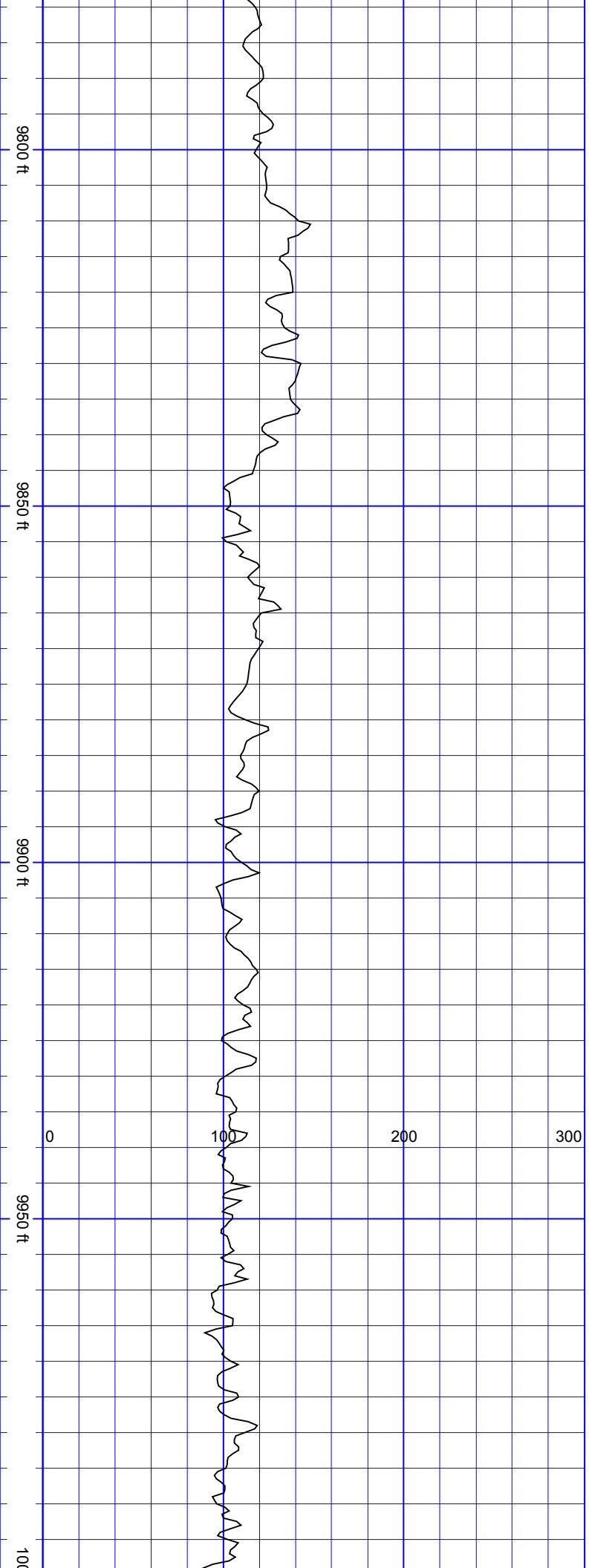
9600 ft

9650 ft

9700 ft

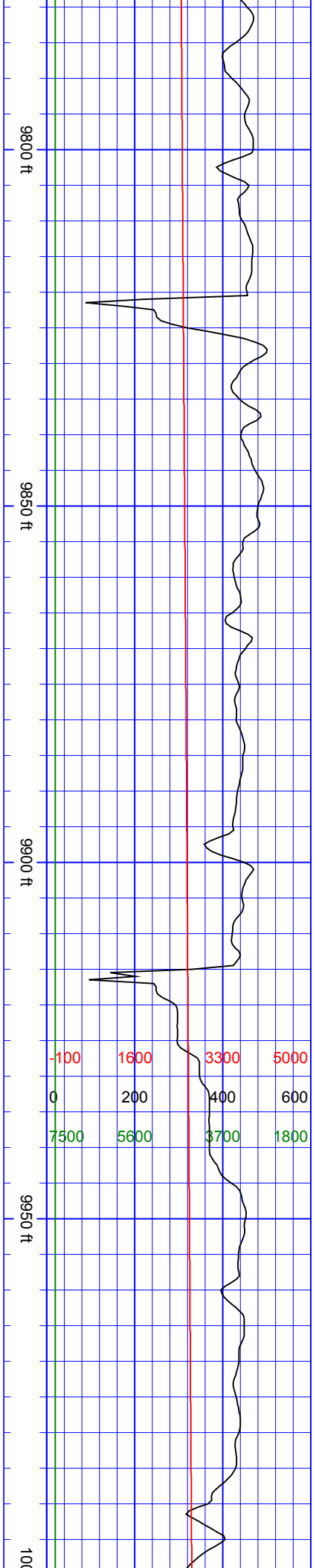
9750 ft

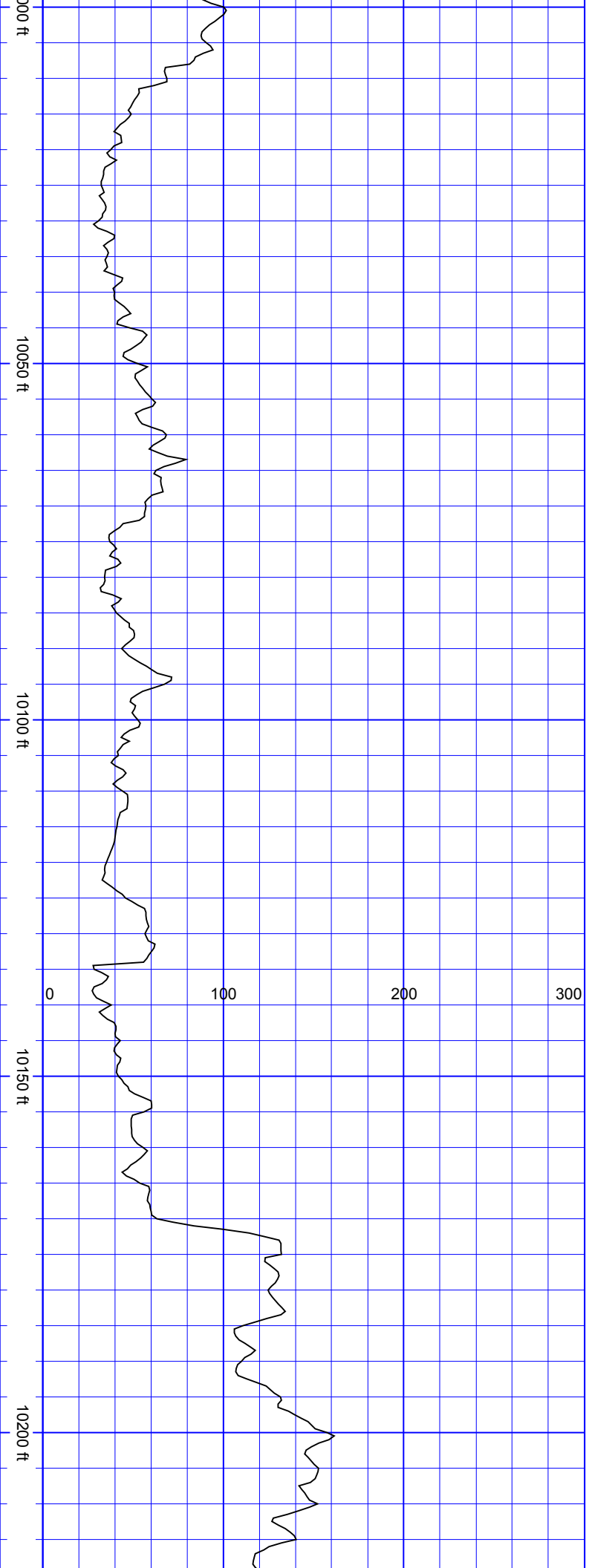
-100 1600 3360 5000
0 200 400 600
7500 5600 3700 1800



SurveyDepth:9845
TVD:7313.96 Inc:90.35
Azi:271.82
VertSec:2564.27

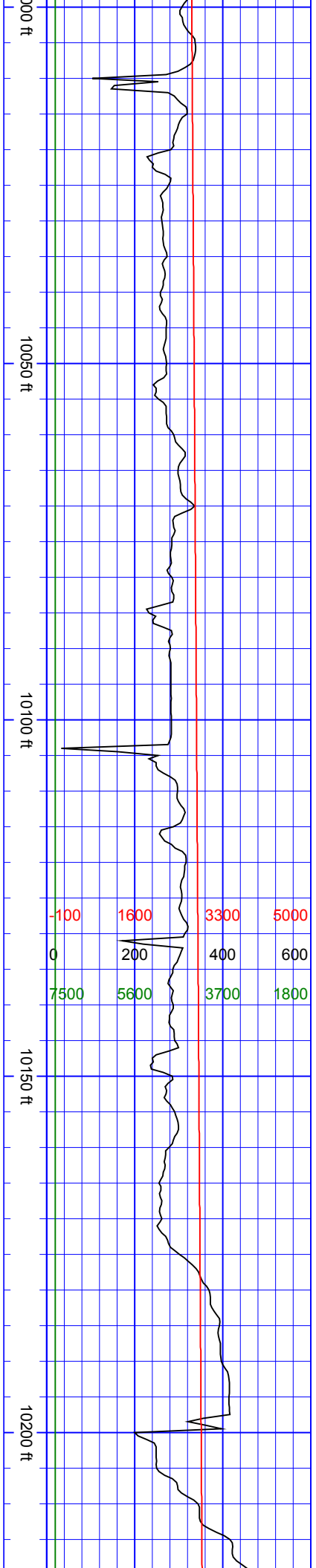
SurveyDepth:9939
TVD:7313.67 Inc:90
Azi:271.29
VertSec:2650.67





SurveyDepth:10033
TVD:7313.85 Inc:89.78
Azi:270.24
VertSec:2736.55

SurveyDepth:10128
TVD:7313.56 Inc:90.57
Azi:269.8
VertSec:2822.84



10250 ft

10300 ft

10350 ft

10400 ft

0 100 200 300

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SSSSSS

SurveyDepth:10222
TVD:7312.63 Inc:90.57
Azi:268.48
VertSec:2907.6

SurveyDepth:10317
TVD:7312.59 Inc:89.47
Azi:269.89
VertSec:2993.29

SurveyDepth:10411
TVD:7314.11 Inc:88.68
Azi:269.89
VertSec:3078.57

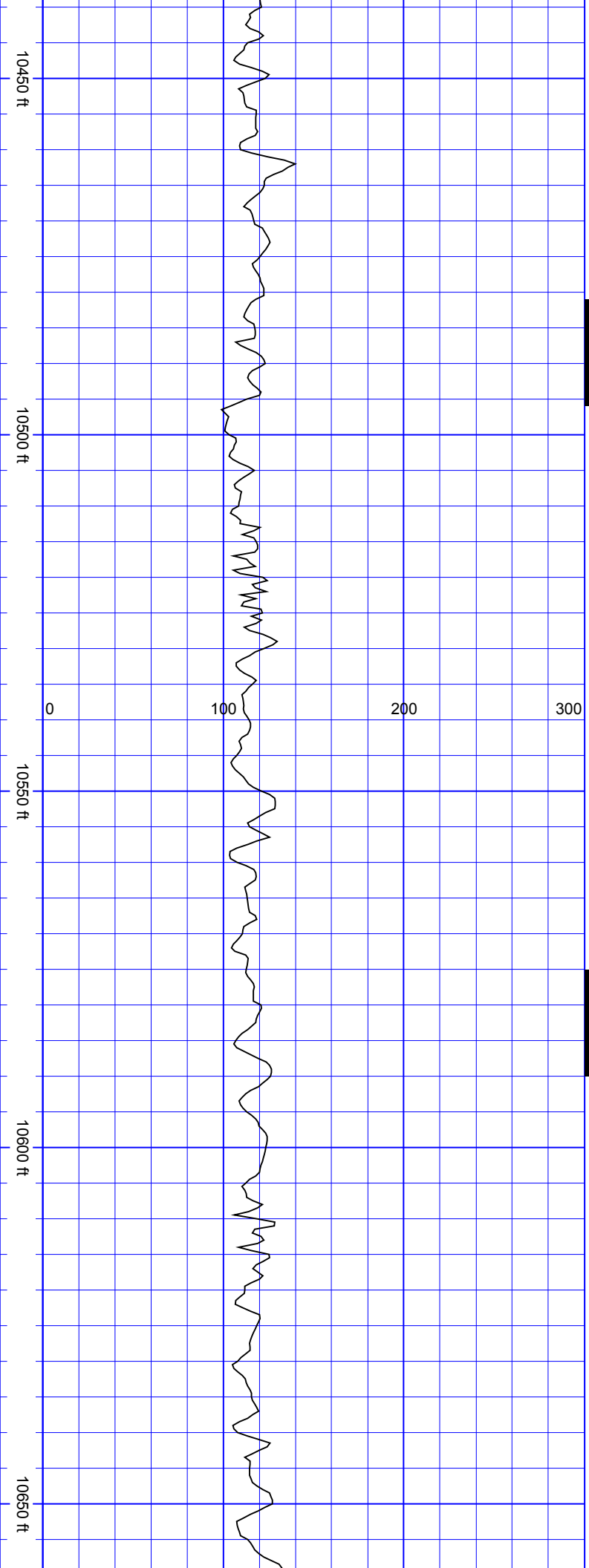
10250 ft

10300 ft

10350 ft

10400 ft

-100	1600	3300	5000
0	200	400	600
7500	5600	3700	1800

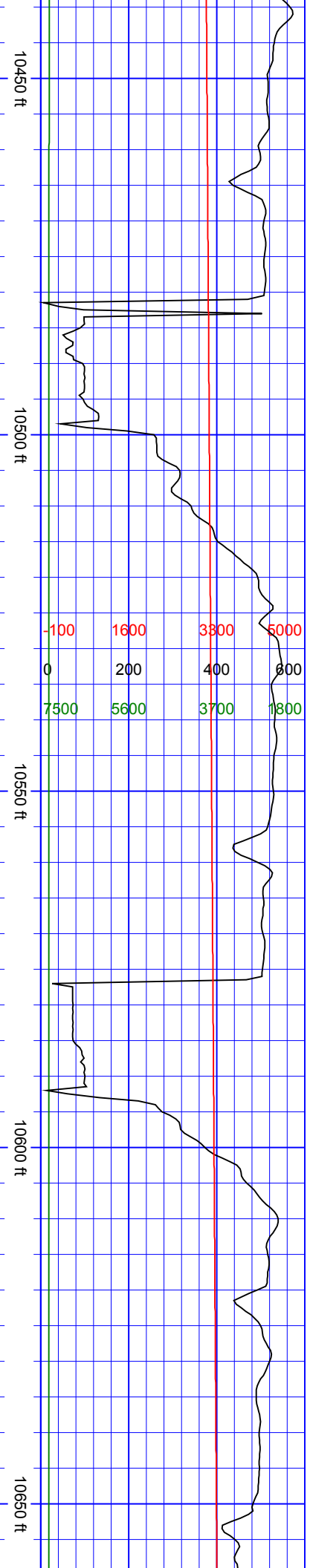


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SurveyDepth:10505
TVD:7316.1 Inc:88.9
Azi:270.85
VertSec:3164.17

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SurveyDepth:10600
TVD:7316.5 Inc:90.62
Azi:272.35
VertSec:3251.51



10700 ft

0 100 200 300

10750 ft

10800 ft

10850 ft

SurveyDepth:10695
TVD:7315.62 Inc:90.44
Azi:272.35
VertSec:3339.34

SurveyDepth:10789
TVD:7314.71 Inc:90.66
Azi:272.08
VertSec:3426.16

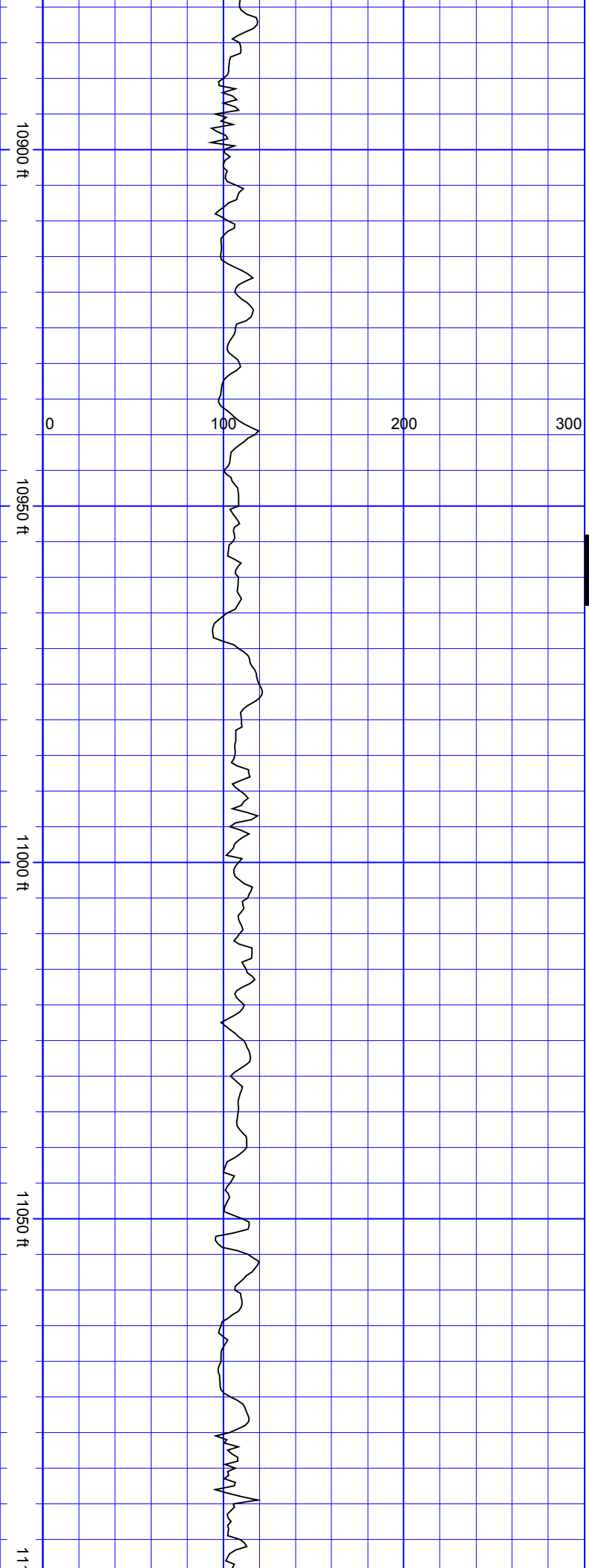
10700 ft

10750 ft

10800 ft

10850 ft

-100	1600	3300	5000
0	200	400	600
7500	5600	3700	1800

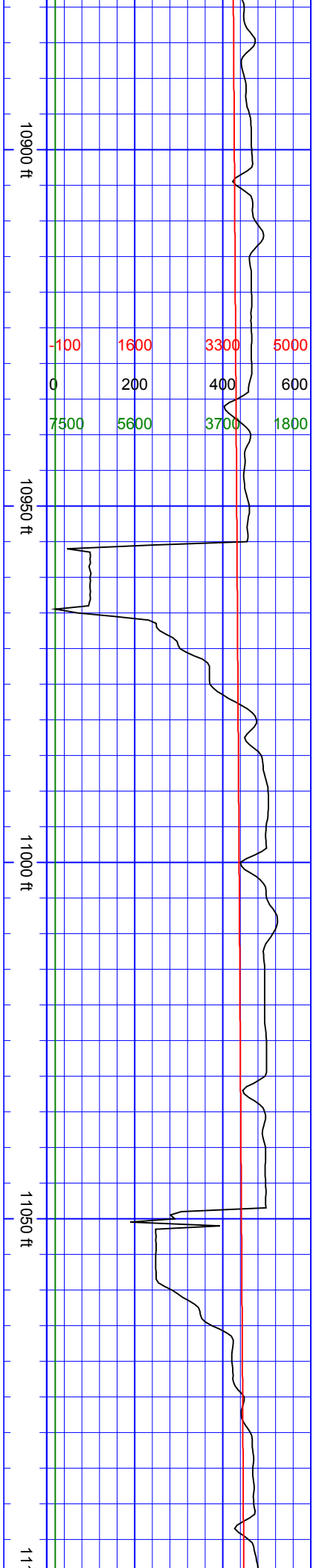


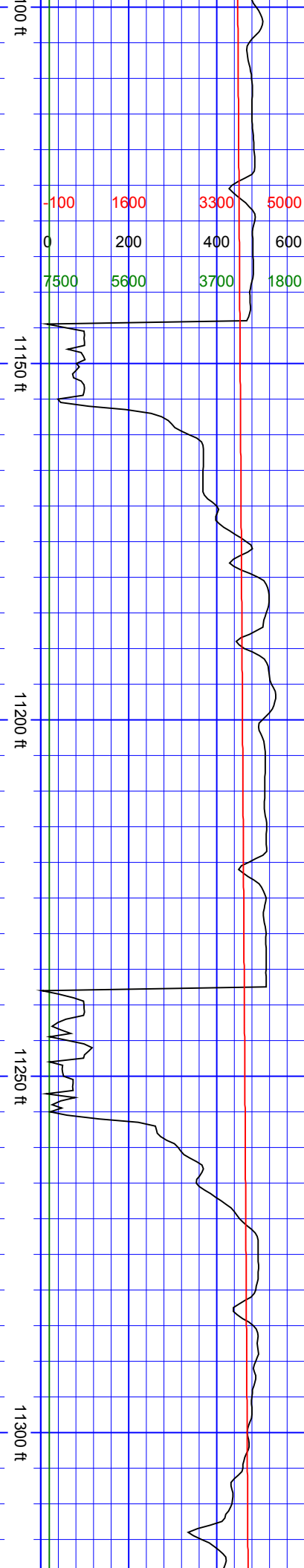
SurveyDepth:10884
TVD:7313.36 Inc:90.97
Azi:271.64
VertSec:3513.67

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SurveyDepth:10979
TVD:7312.77 Inc:89.74
Azi:270.59
VertSec:3600.69

SurveyDepth:11073
TVD:7312.66 Inc:90.4
Azi:270.94
VertSec:3686.58

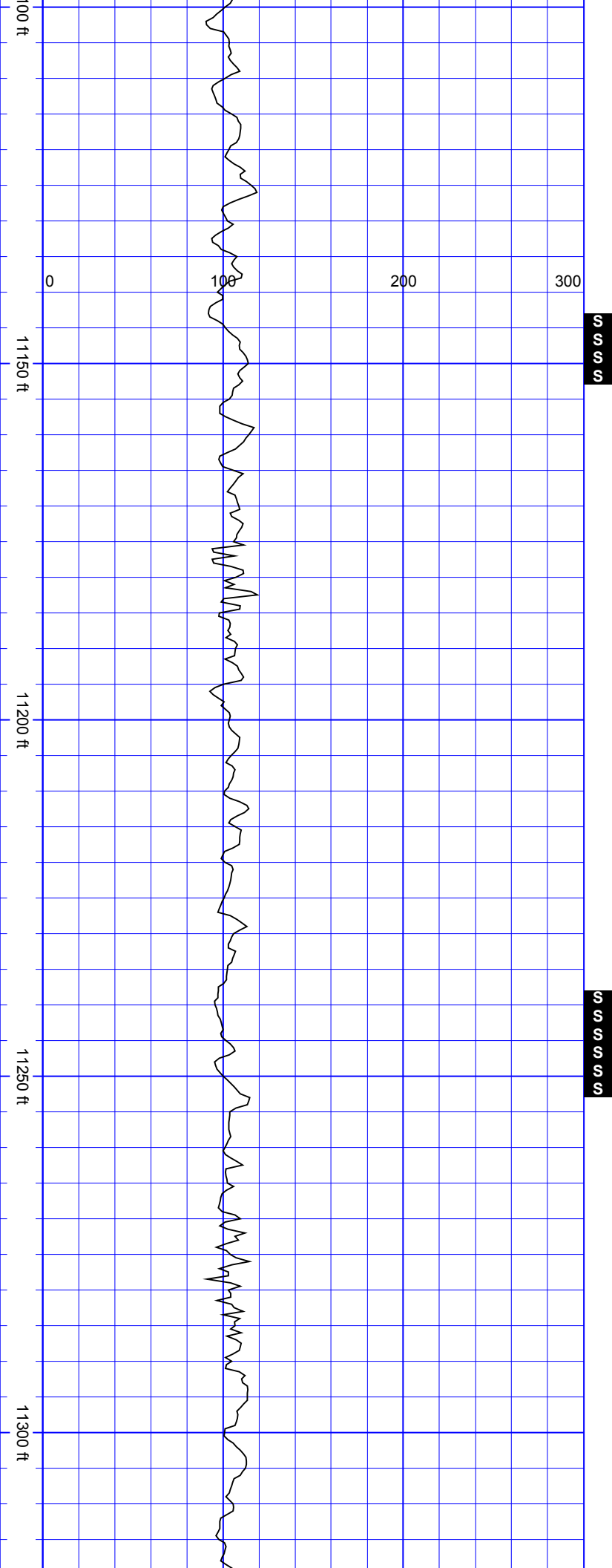


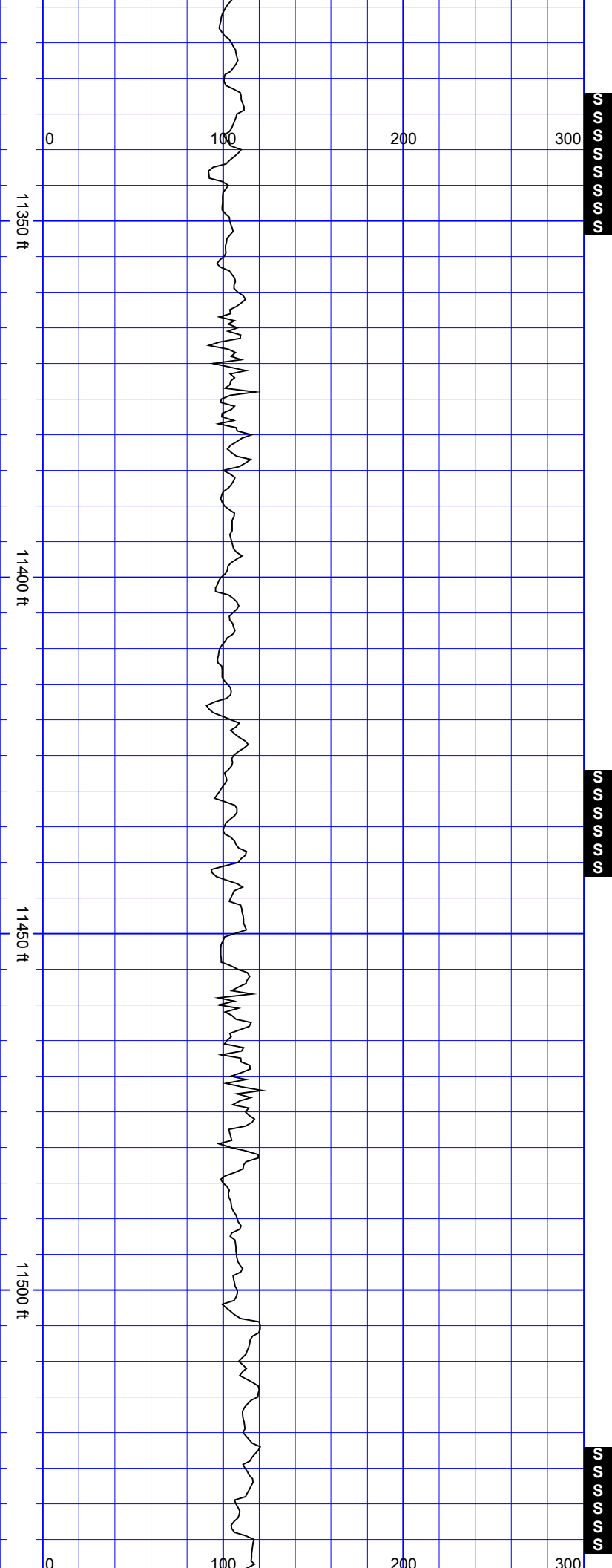


December 11, 2018

SurveyDepth:11168
TVD:7312.07 Inc:90.31
Azi:270.15
VertSec:3773.22

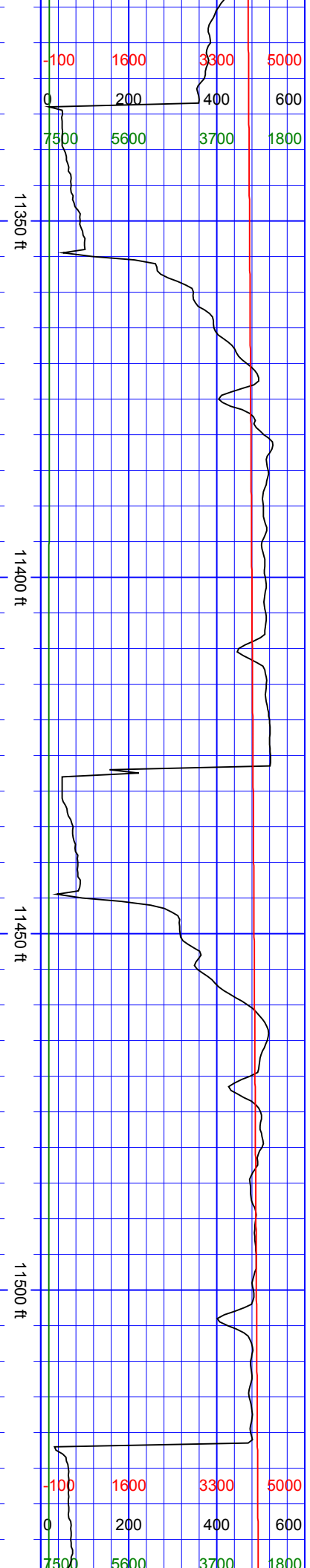
SurveyDepth:11262
TVD:7311.09 Inc:90.88
Azi:268.92
VertSec:3858.26

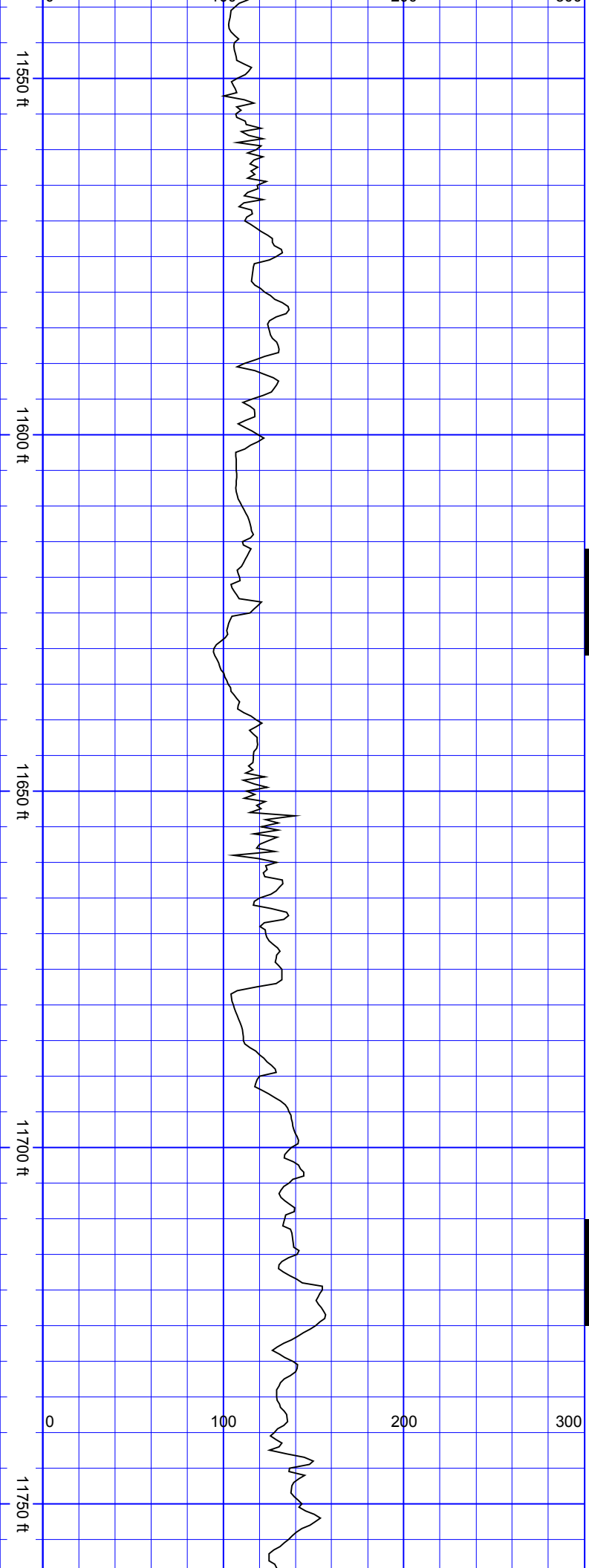




SurveyDepth:11357
TVD:7313.13 Inc:86.66
Azi:266.9
VertSec:3942.98

SurveyDepth:11452
TVD:7318.09 Inc:87.36
Azi:267.86
VertSec:4027.23

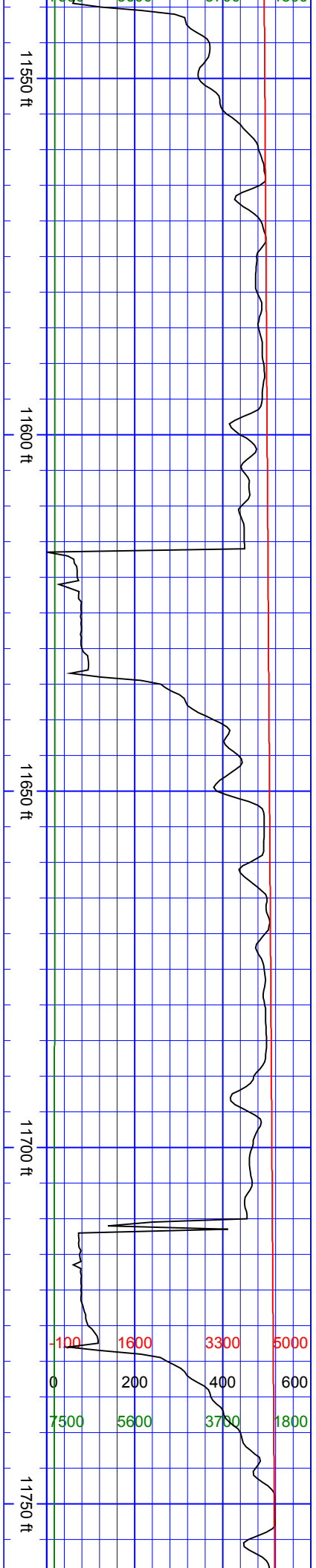


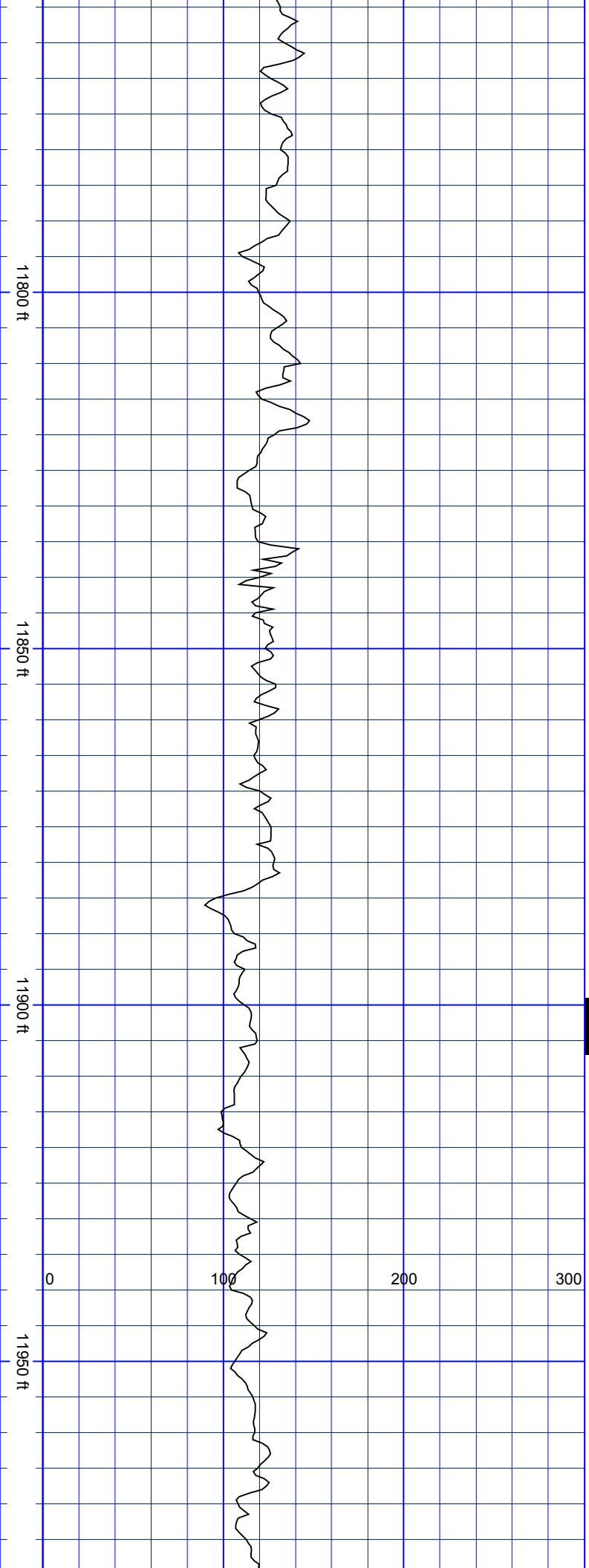


SurveyDepth:11546
TVD:7321.91 Inc:87.98
Azi:269.89
VertSec:4111.73

SurveyDepth:11640
TVD:7324.65 Inc:88.68
Azi:271.12
VertSec:4197.4

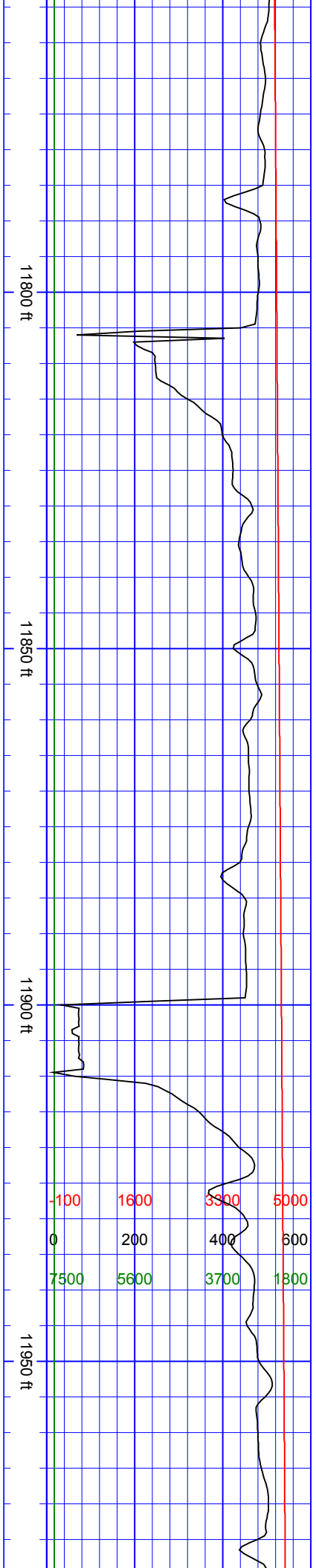
SurveyDepth:11735
TVD:7326.22 Inc:89.43
Azi:272.08
VertSec:4284.74

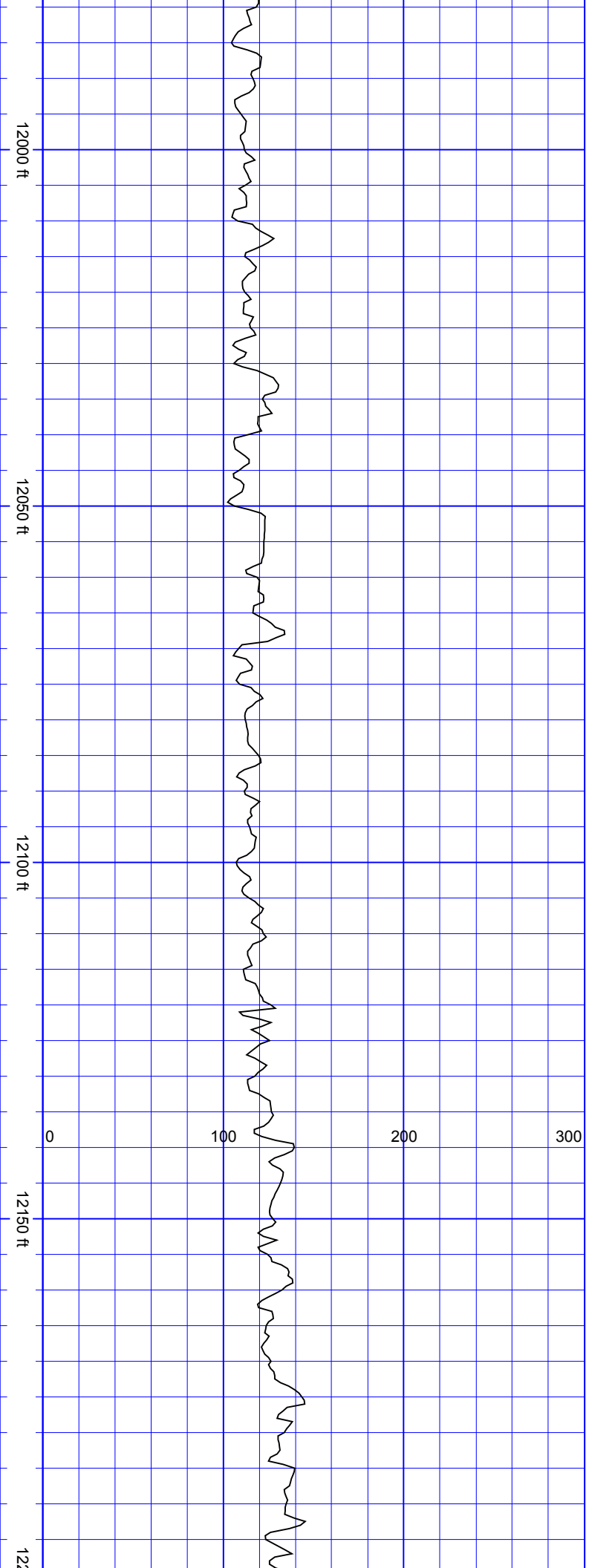




SurveyDepth:11829
TVD:7327.3 Inc:89.25
Azi:273.4
VertSec:4371.88

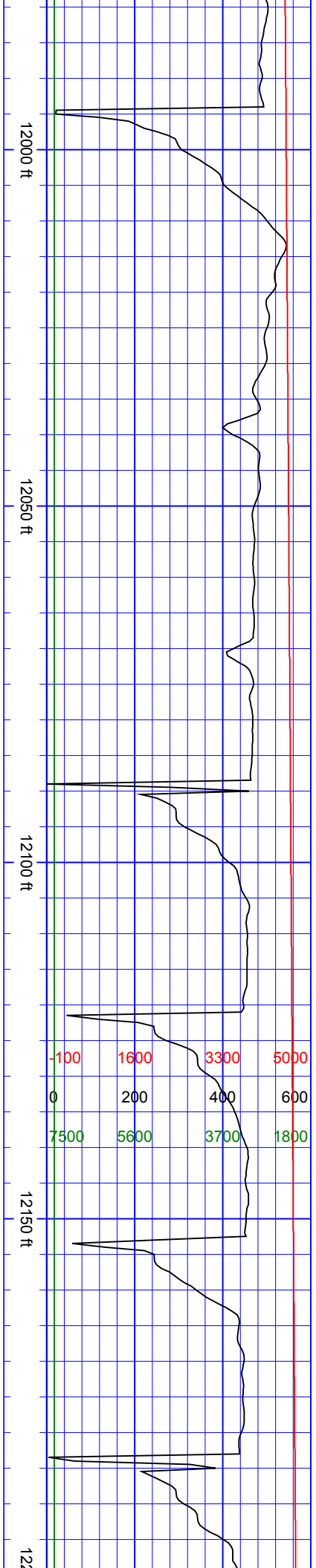
SurveyDepth:11924
TVD:7328.36 Inc:89.47
Azi:272.43
VertSec:4460.06

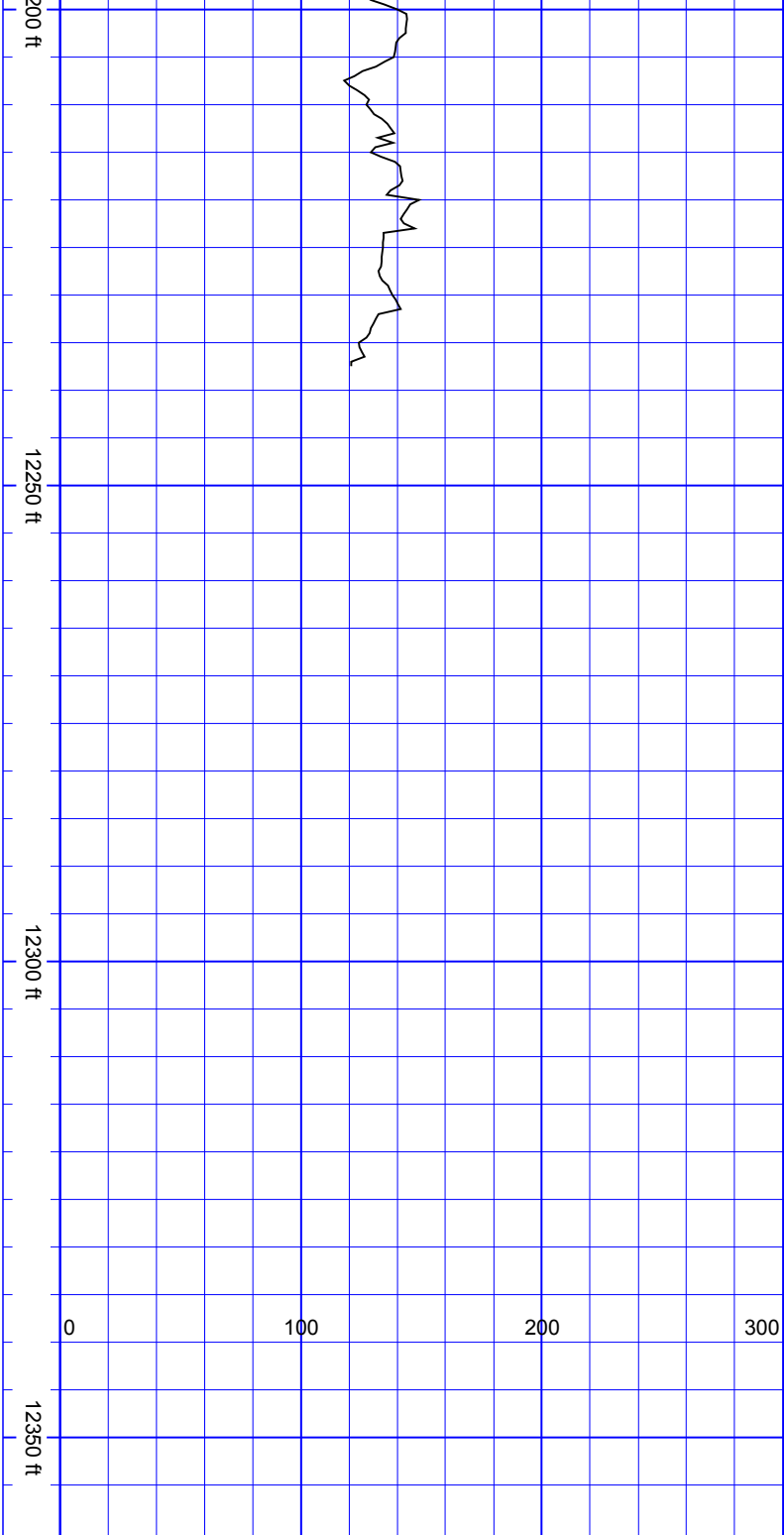




SurveyDepth:12019
TVD:7329.31 Inc:89.39
Azi:271.56
VertSec:4547.66

SurveyDepth:12113
TVD:7330.64 Inc:88.99
Azi:270.59
VertSec:4633.74





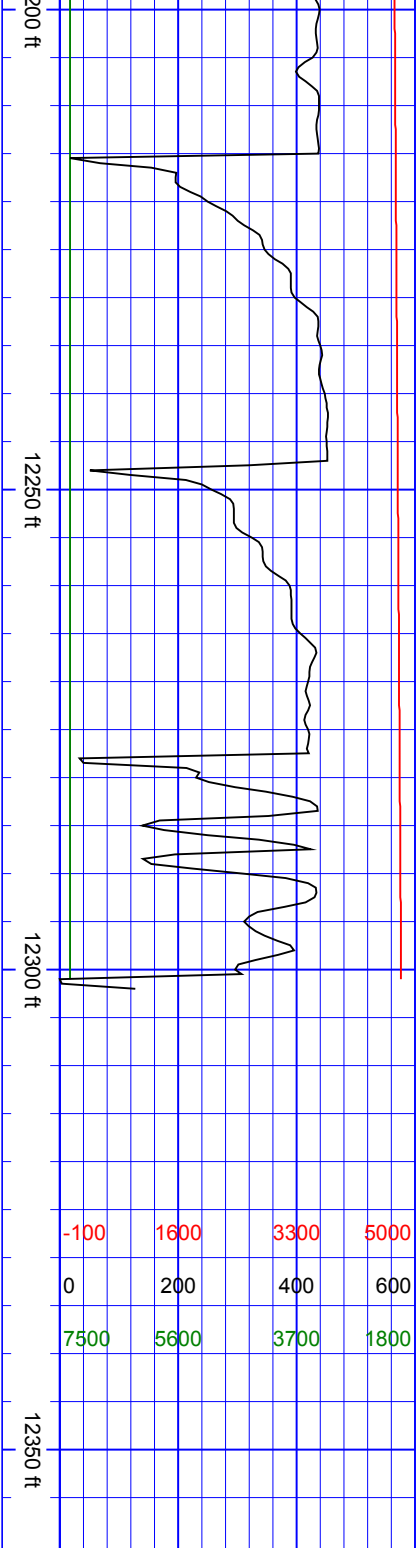
MD Depth "Scale 5" = 100 ft"	Real Time Gamma (AAPI)			
	0	100	200	300
GAMMA RAY				

SurveyDepth:12207
TVD:7332.01 Inc:89.34
Azi:270.59
VertSec:4719.5

SurveyDepth:12231
TVD:7332.26 Inc:89.43
Azi:270.85
VertSec:4741.41

Extrapolation to Bit
SurveyDepth:12301
TVD:7332.96 Inc:89.43
Azi:270.85
VertSec:4805.41

Slide - Rotate	Directional Survey			
	Date			



MD Depth "Scale 5" = 100 ft"	7500	5600	3700	1800
	TVD Depth (ft)			
Date	0	200	400	600
	Drill Rate (ft/hr)			
ROP - VERT SEC - TVD	-100	1600	3300	5000
	Vertical Section (ft)			