



PHOENIX
TECHNOLOGY SERVICES

TVD
1:240
Feet

MWD Gamma / ROP (5")

Client: Whiting Oil & Gas Corporation

Well Name: Razor Federal #12F-1307A

API/UWID: 051233872400

County: Weld Field: Wildcat

Permit #: 15-0359

State: Colorado Country: USA

Longitude: 103° 49' 3.66 W

Latitude: 40° 51' 16.041 N

Personnel

Company Representative

K. Wilkerson/ B. Honeycutt

Geologist

Directional Driller(s)

Brandon Davis
Derrick GRacie

MWD Operator(s)

Justin Amari
Michael Mount

Reference Data

North Reference: True North

Magnetic Declination: 7.43

Grid Convergence: 0.00

Total Mag Correction: 7.43

Comments:

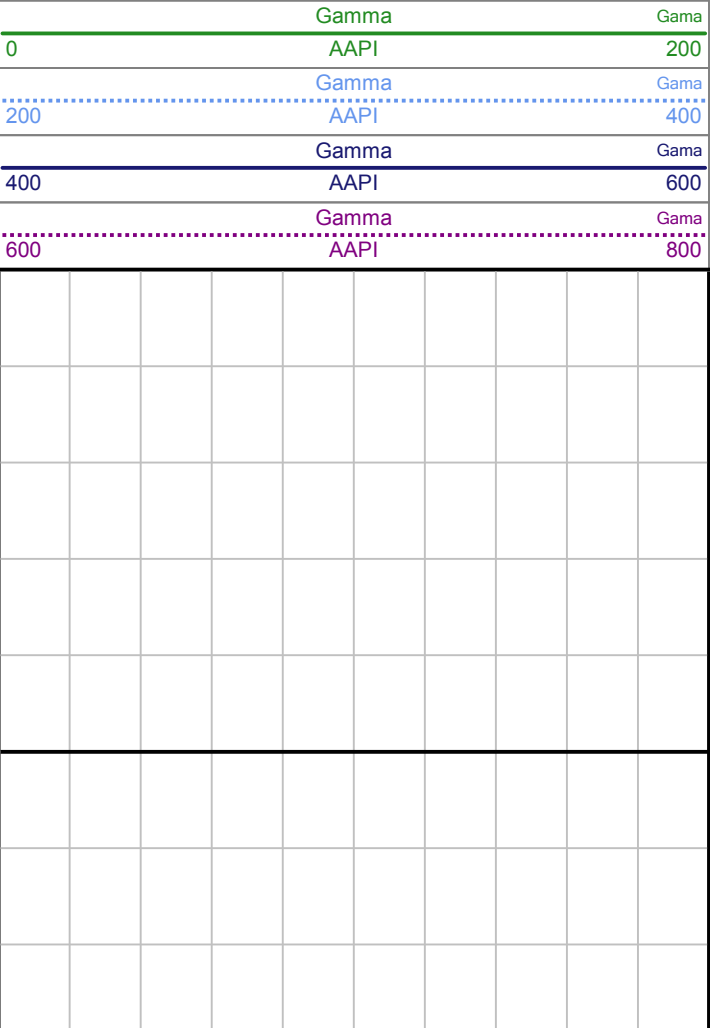
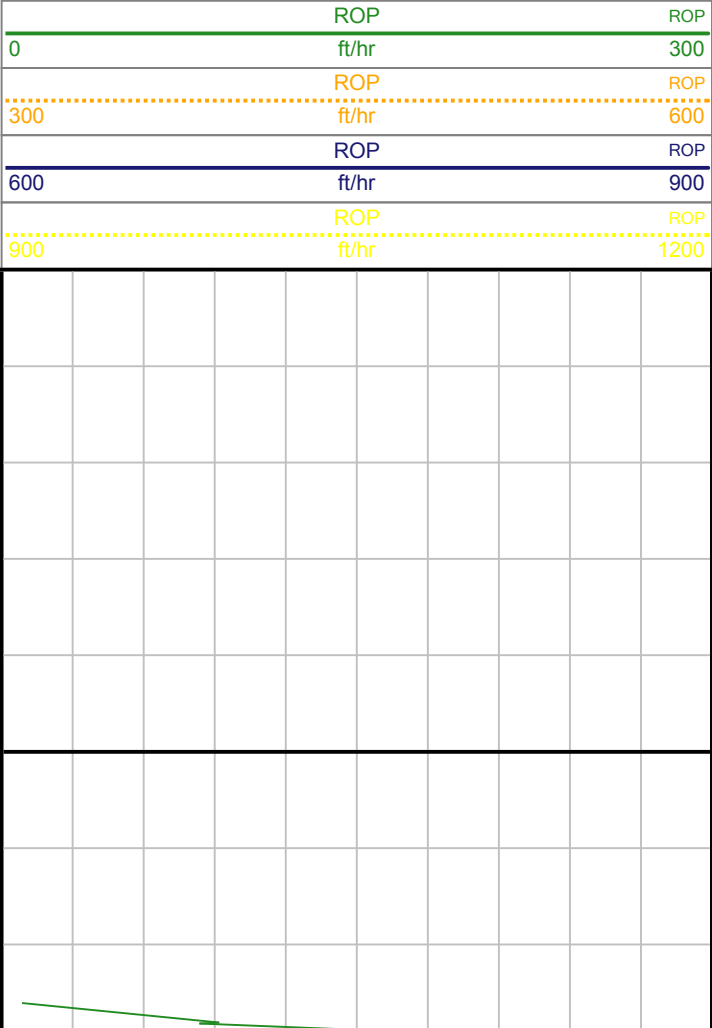
Main Leg

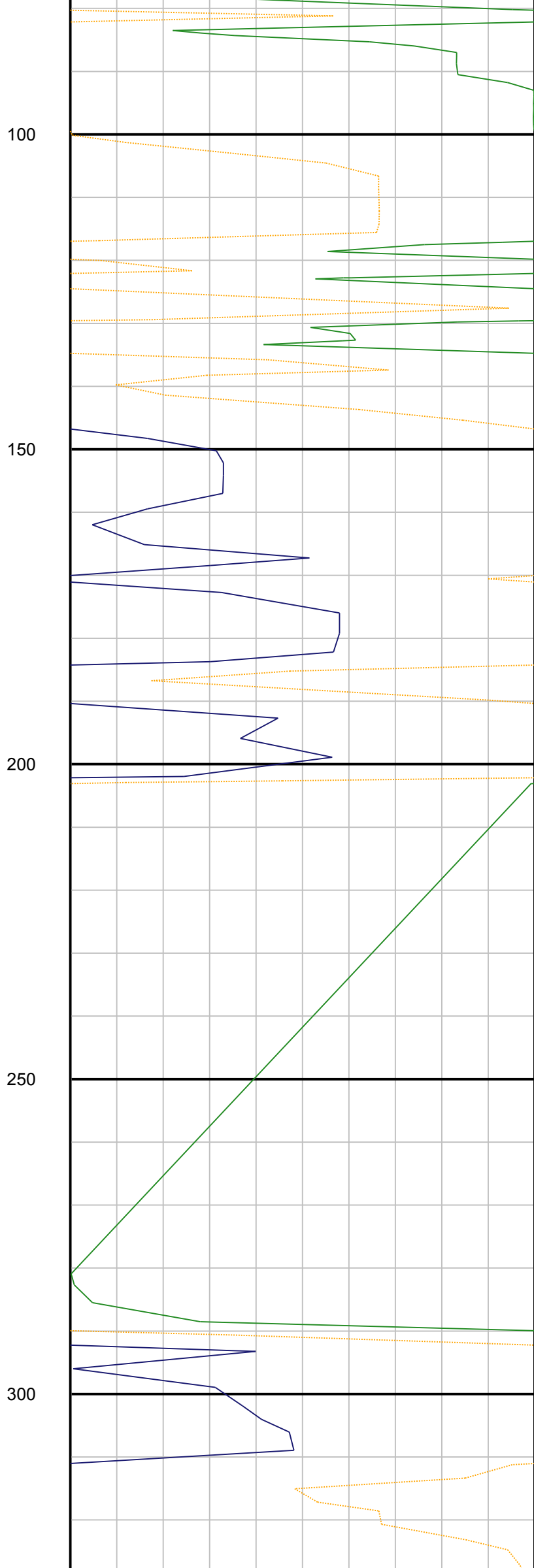
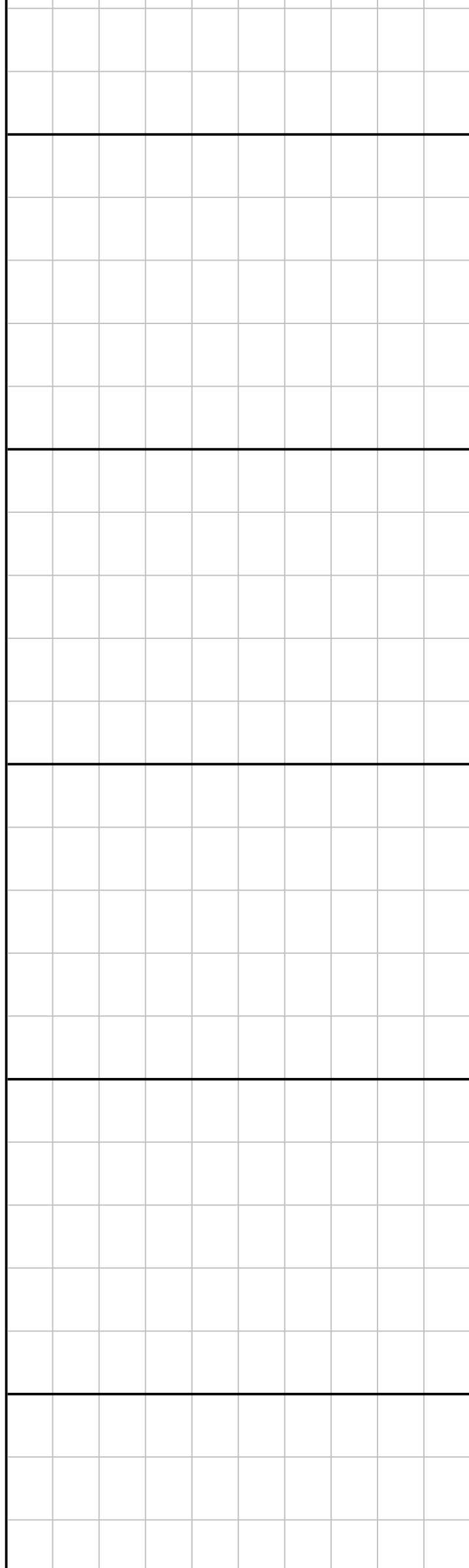
PHOENIX TECHNOLOGY SERVICES, LP ("PHOENIX") DOES NOT MAKE AND EXPRESSLY DISCLAIMS ALL WARRANTIES, REPRESENTATIONS AND CONDITIONS, WITH RESPECT TO THE INFORMATION CONTAINED IN THIS DOCUMENT, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED OR ARISING FROM CONTRACT OR OTHERWISE. THE INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. PHOENIX DOES NOT WARRANT THAT THE INFORMATION IS ACCURATE, COMPLETE, OR FREE FROM ERROR, OMISSION, DEFECT, DEFICIENCY, OR NONCONFORMITY IN THE INFORMATION AND WITHOUT LIMITING THE FOREGOING, PHOENIX DOES NOT WARRANT THAT THE INFORMATION (OR THE USE THEREOF) WILL BE FREE OF ALL ERRORS OR THAT IT DOES NOT INFRINGE ANY THIRD PARTY RIGHTS. ANYONE USING THE INFORMATION AGREES TO INDEMNIFY AND HOLD PHOENIX HARMLESS FROM ALL CLAIMS, ACTIONS, COSTS (INCLUDING LEGAL COSTS ON A SOLICITOR AND HIS OWN CLIENT BASIS), AND LIABILITIES ARISING FROM OR IN CONNECTION WITH THE USE OF THE INFORMATION.

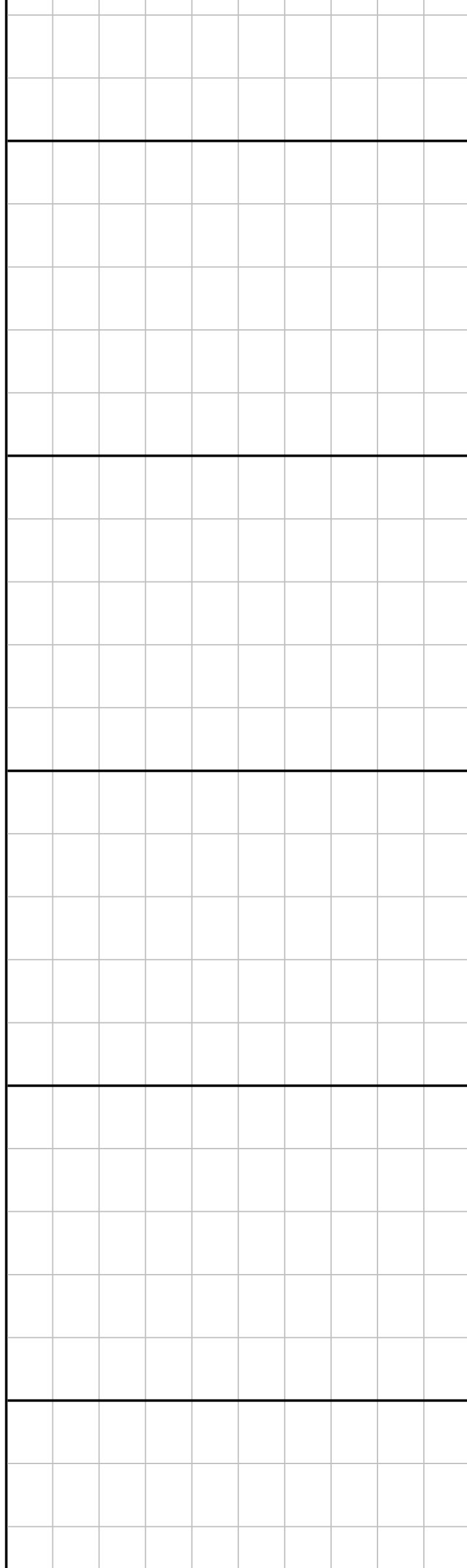
1:240

Log

Index Scale: 1:240 Index Unit: Feet Index Type: TVD Creation Date: July 26, 2015 16:04







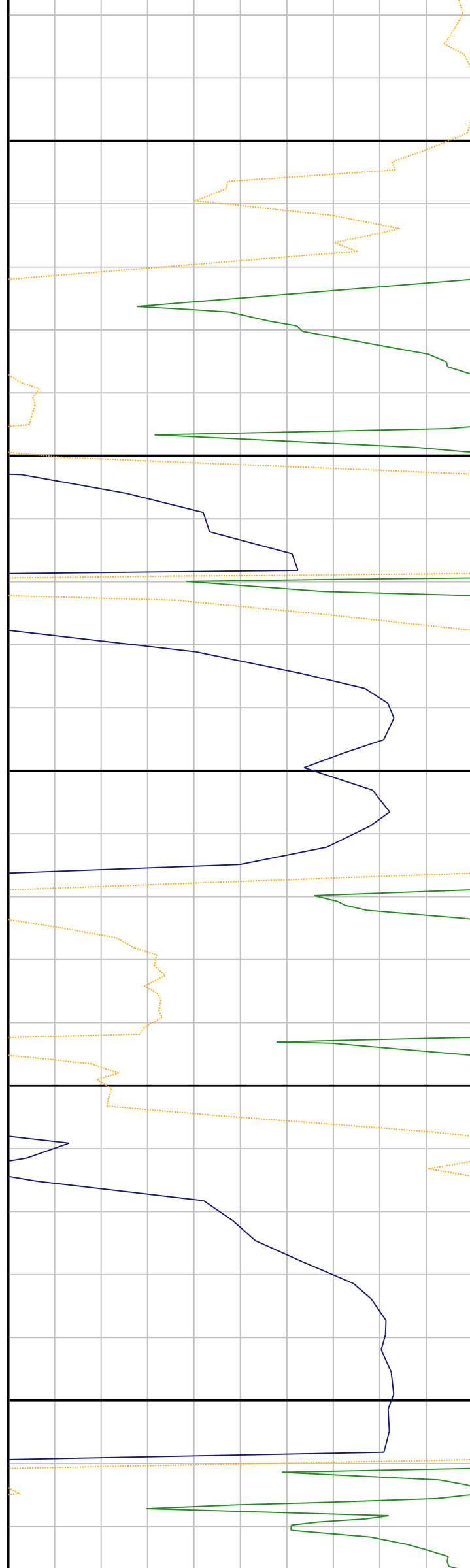
350

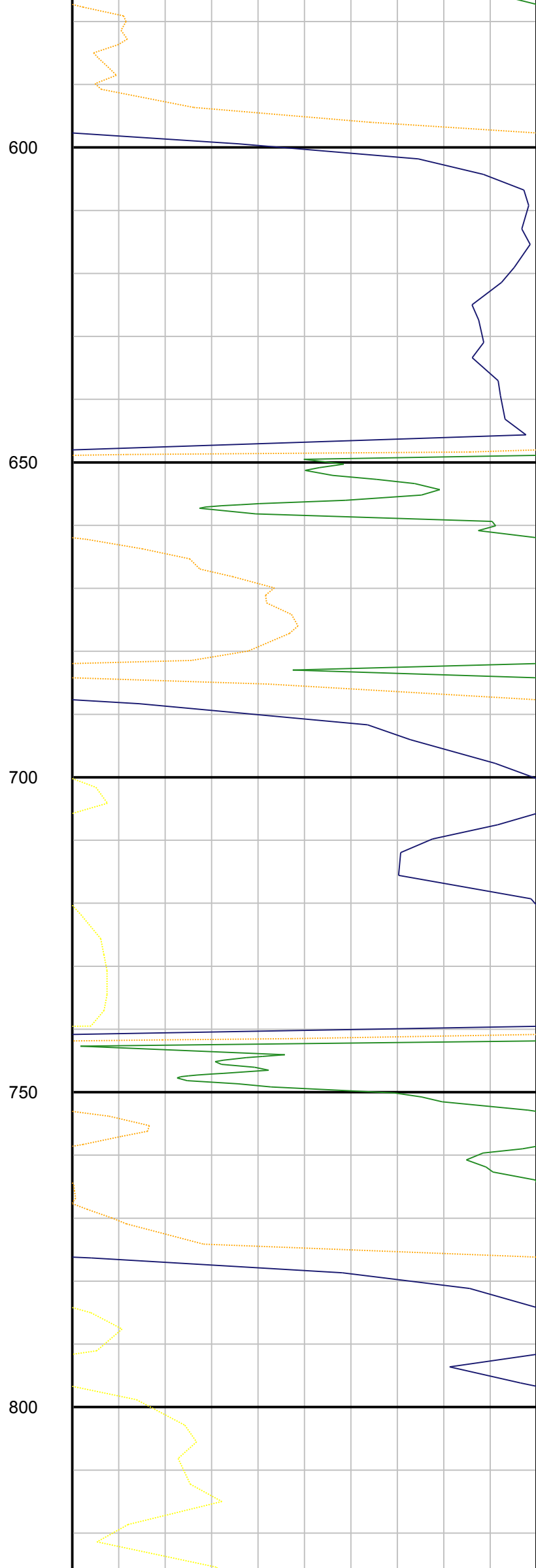
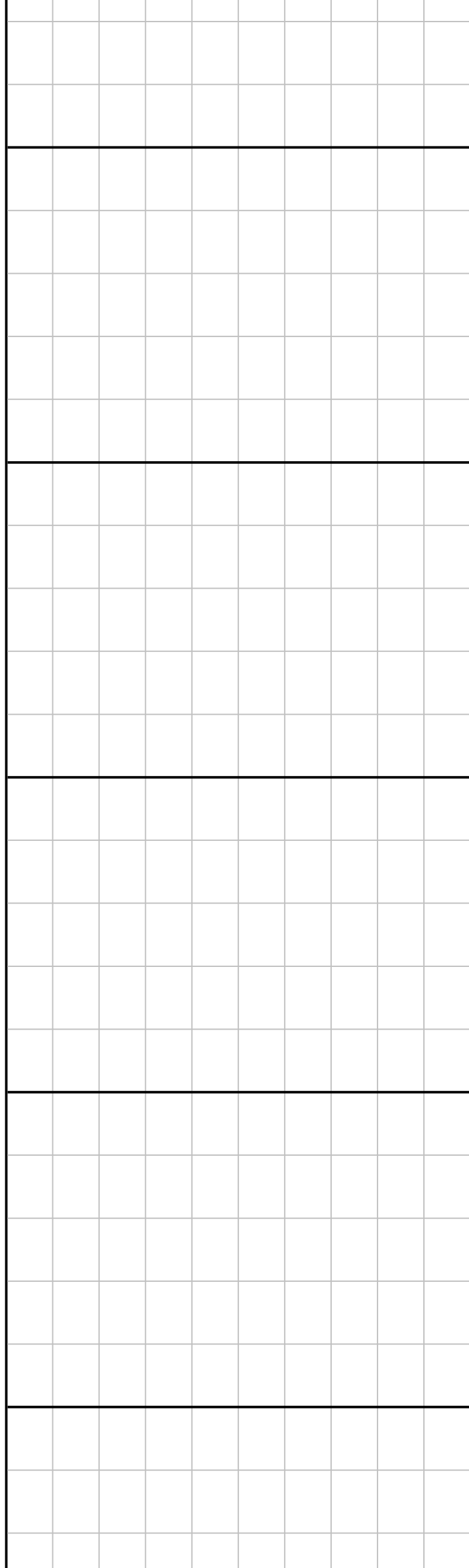
400

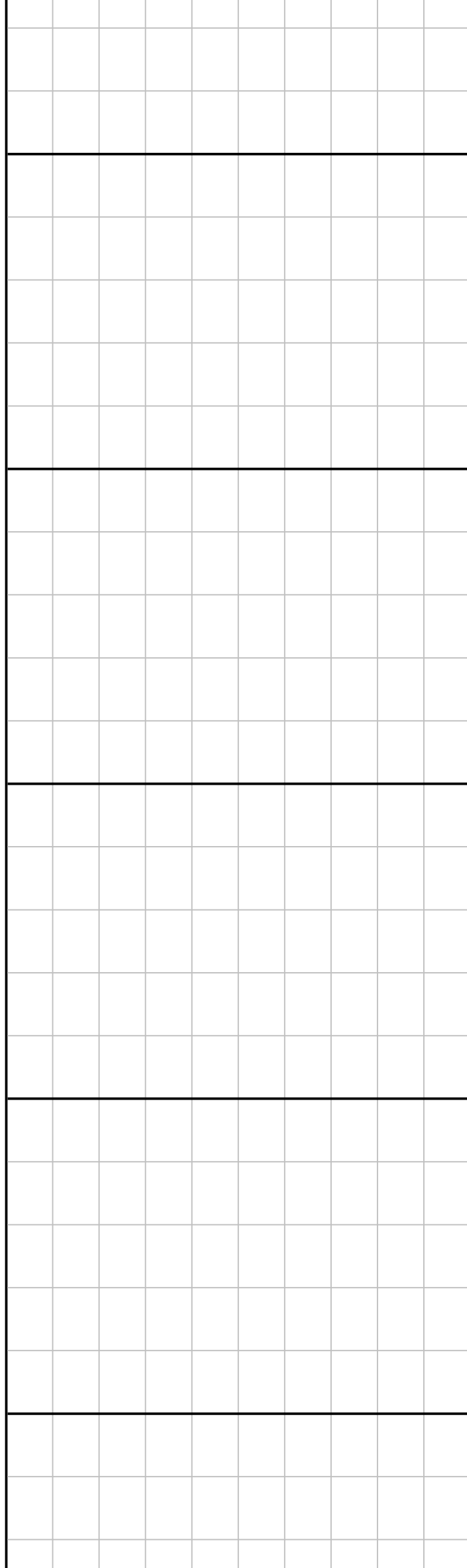
450

500

550







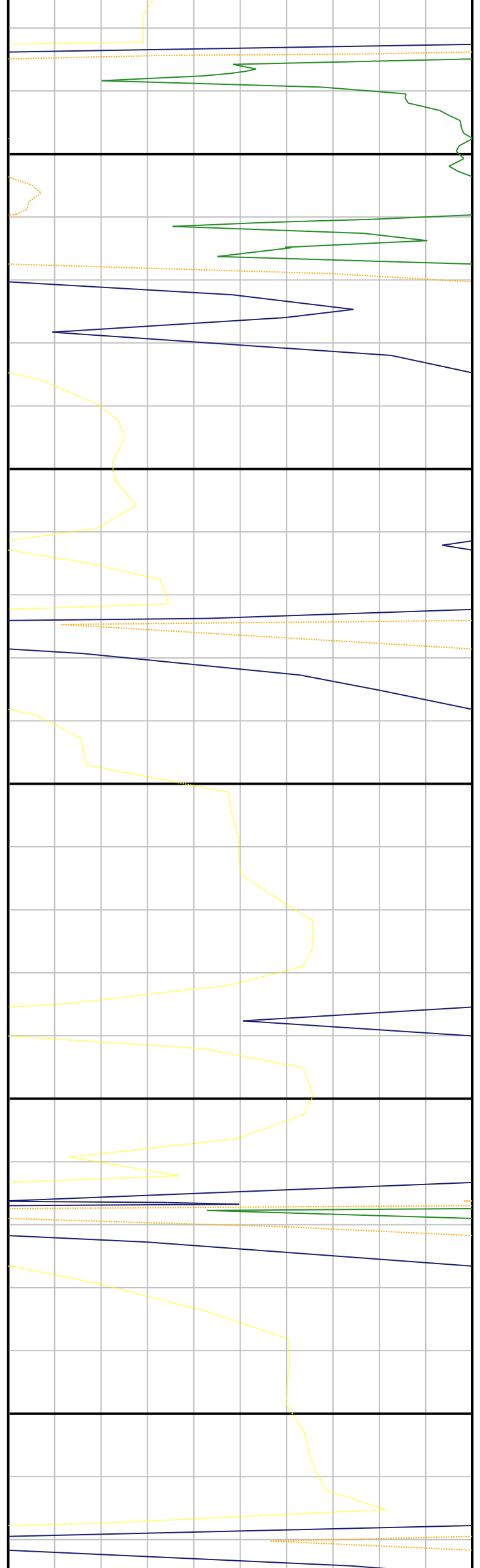
850

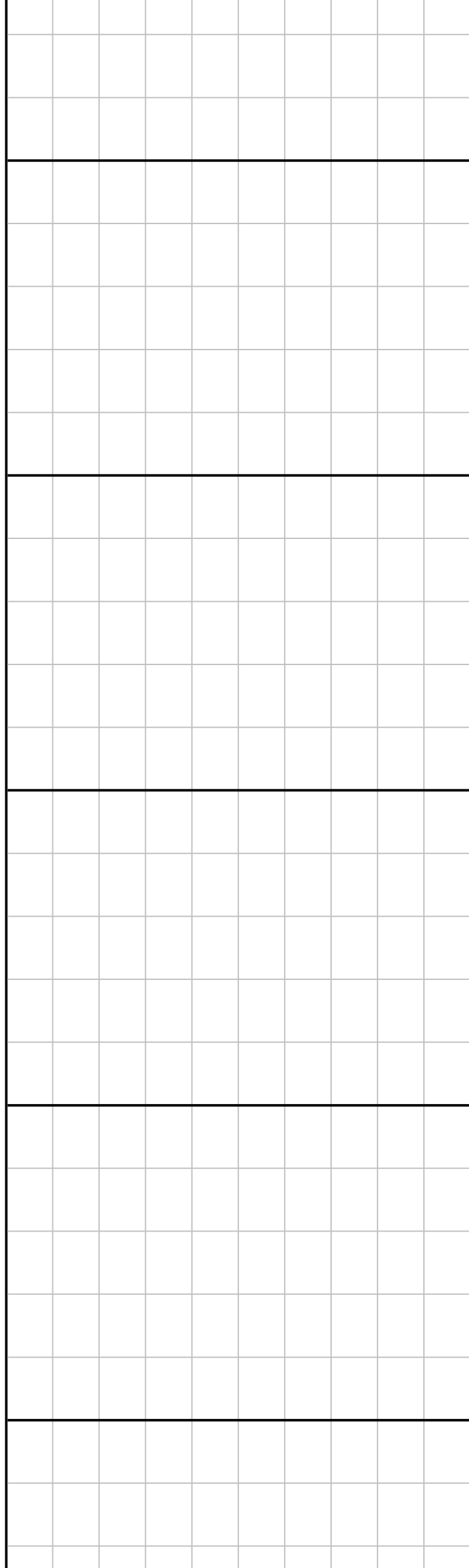
900

950

1000

1050





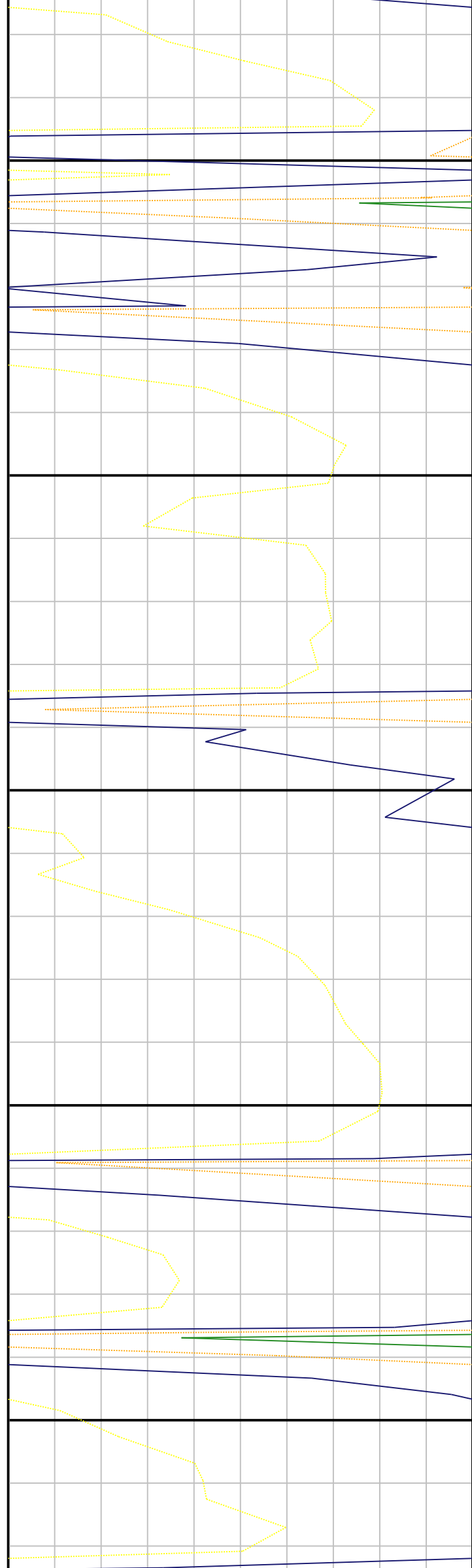
1100

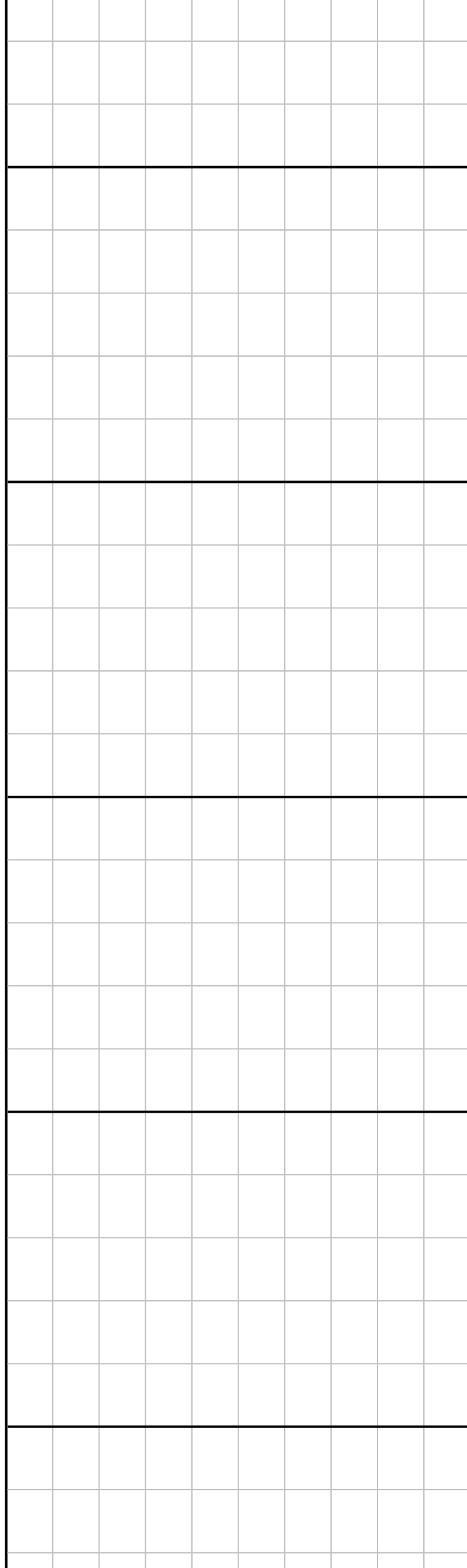
1150

1200

1250

1300





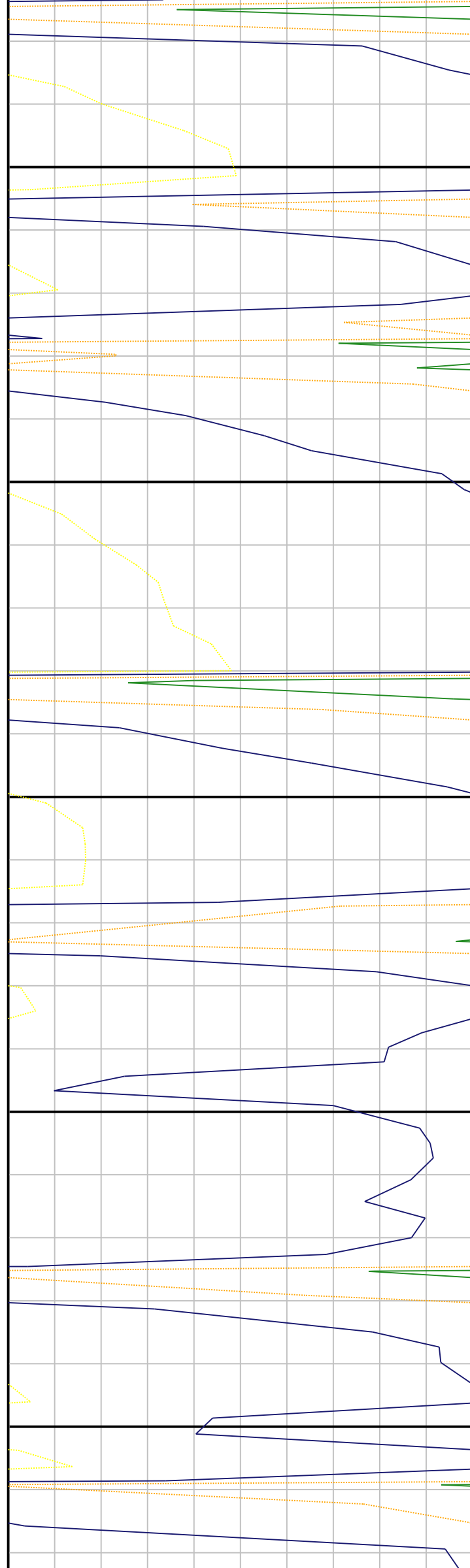
1350

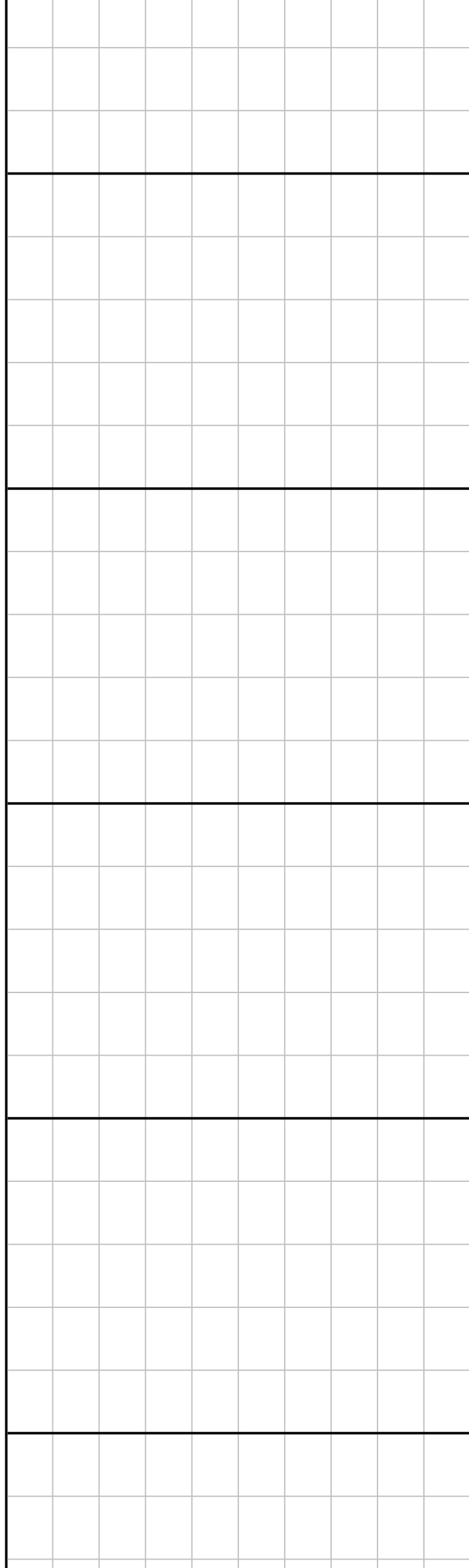
1400

1450

1500

1550





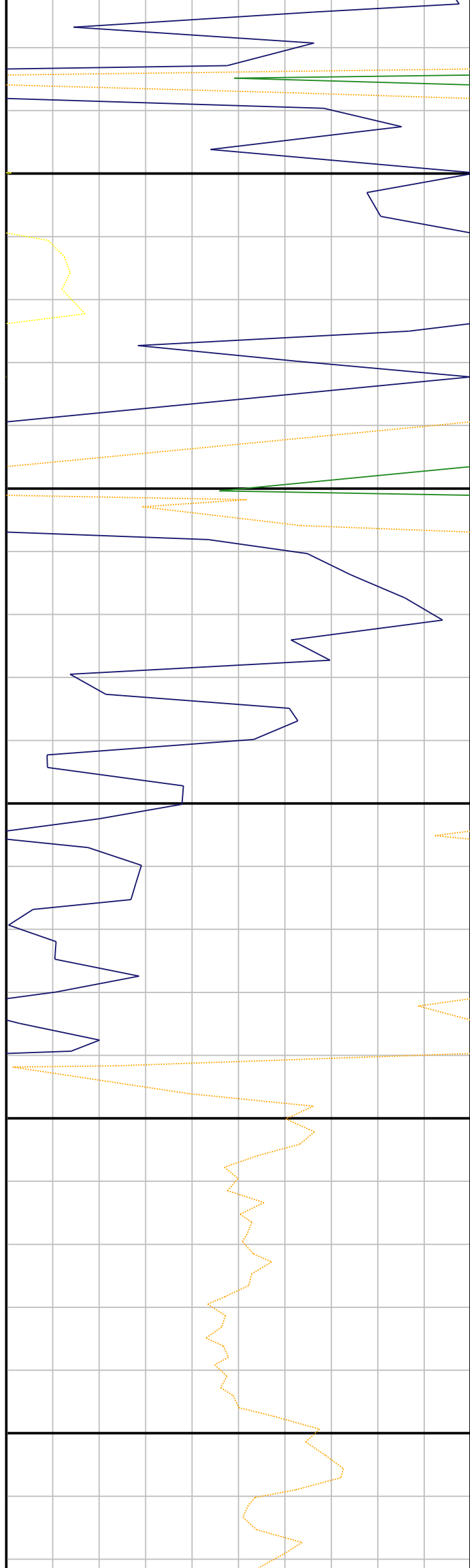
1600

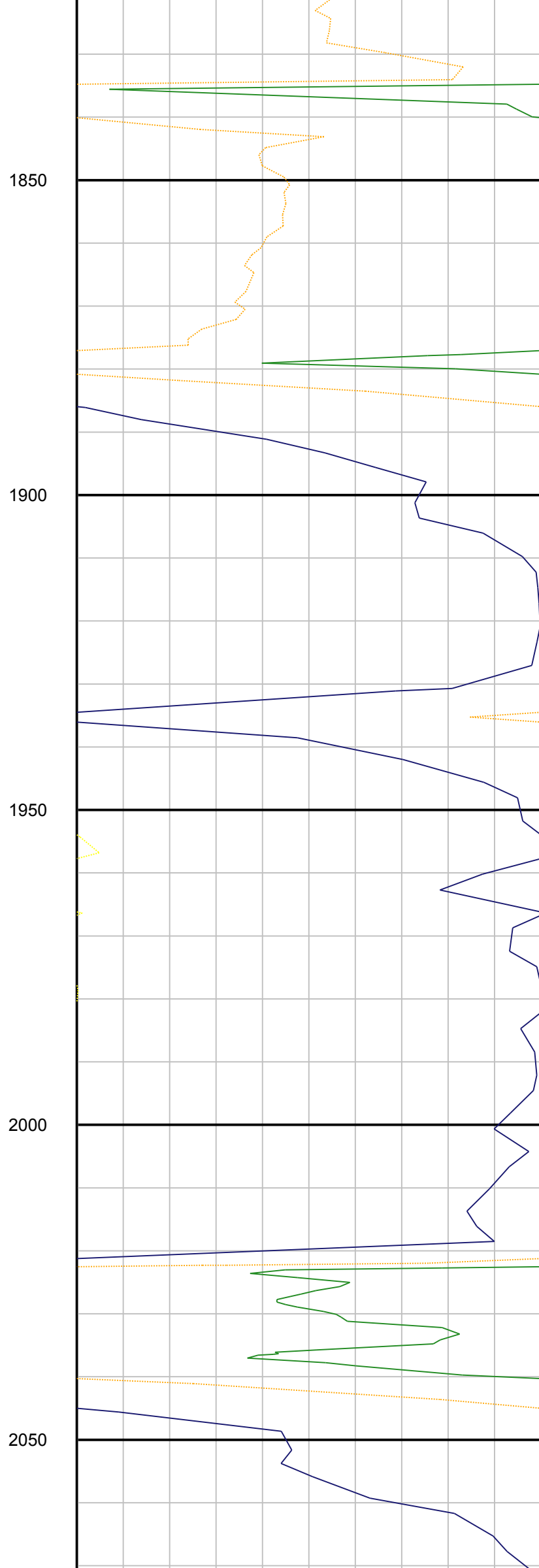
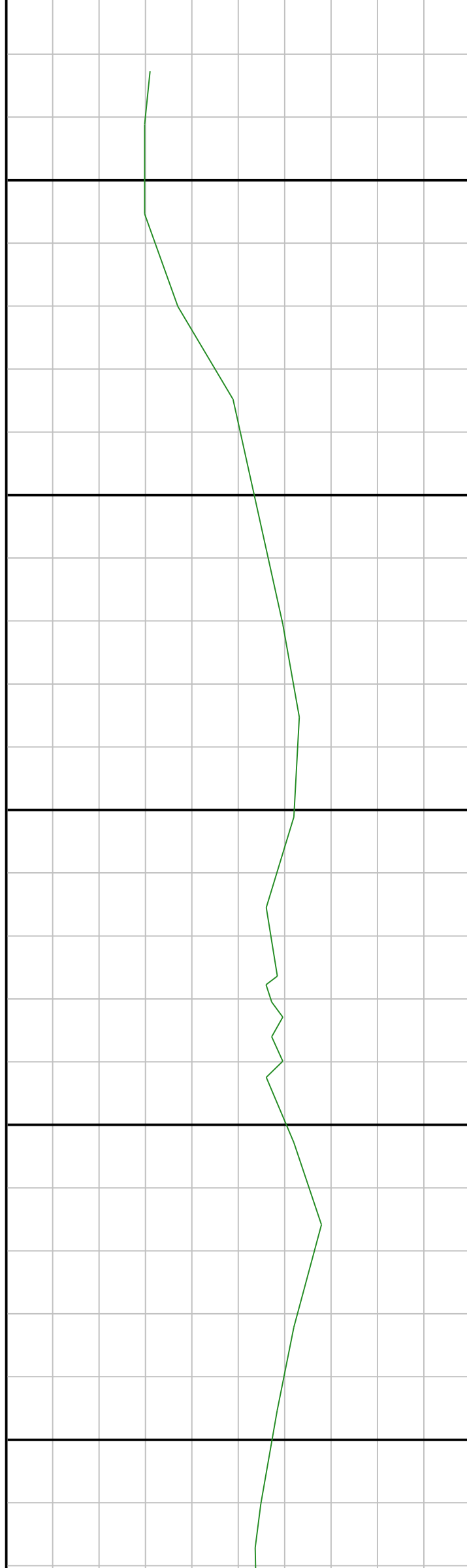
1650

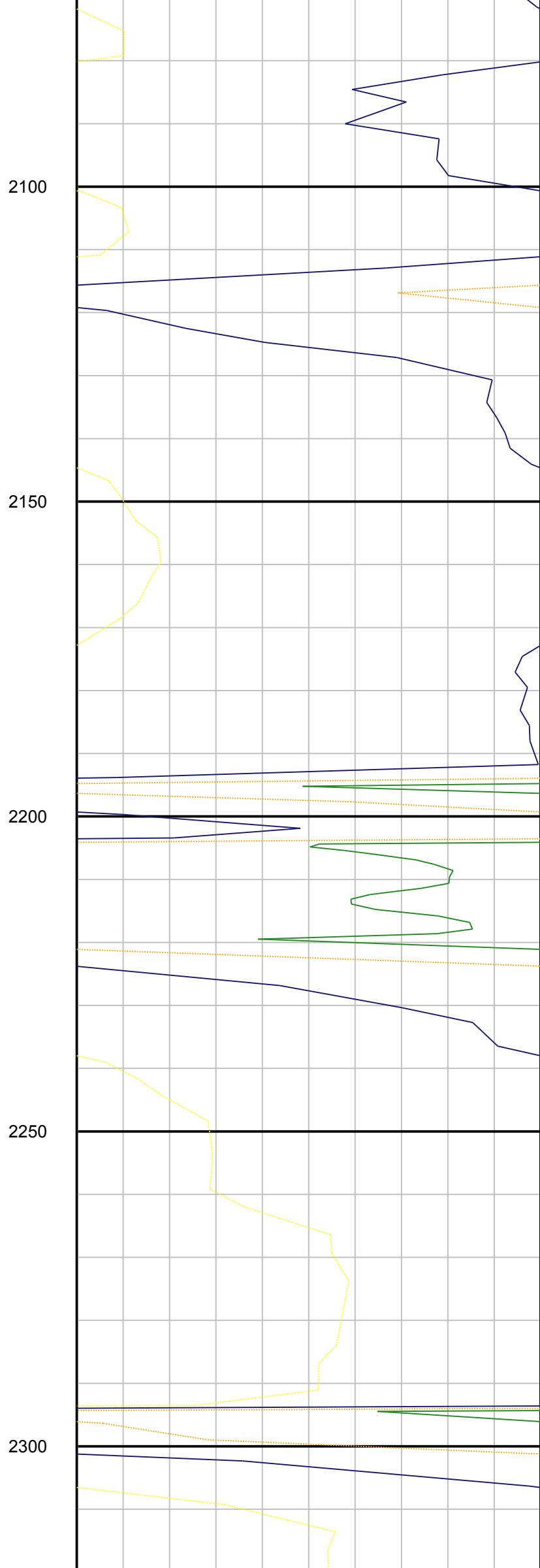
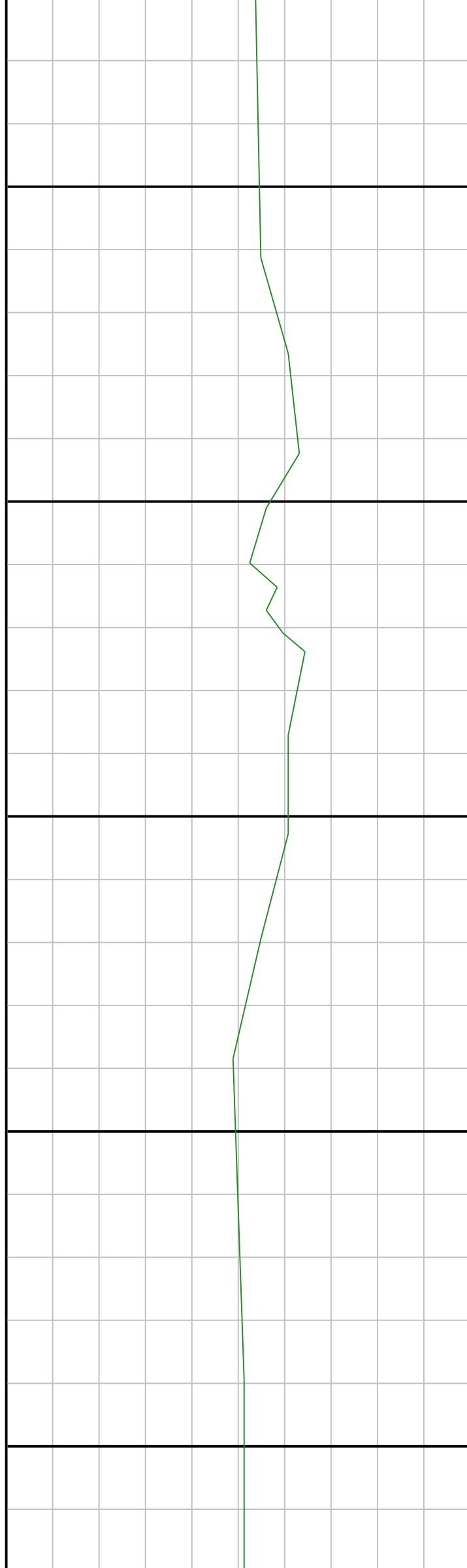
1700

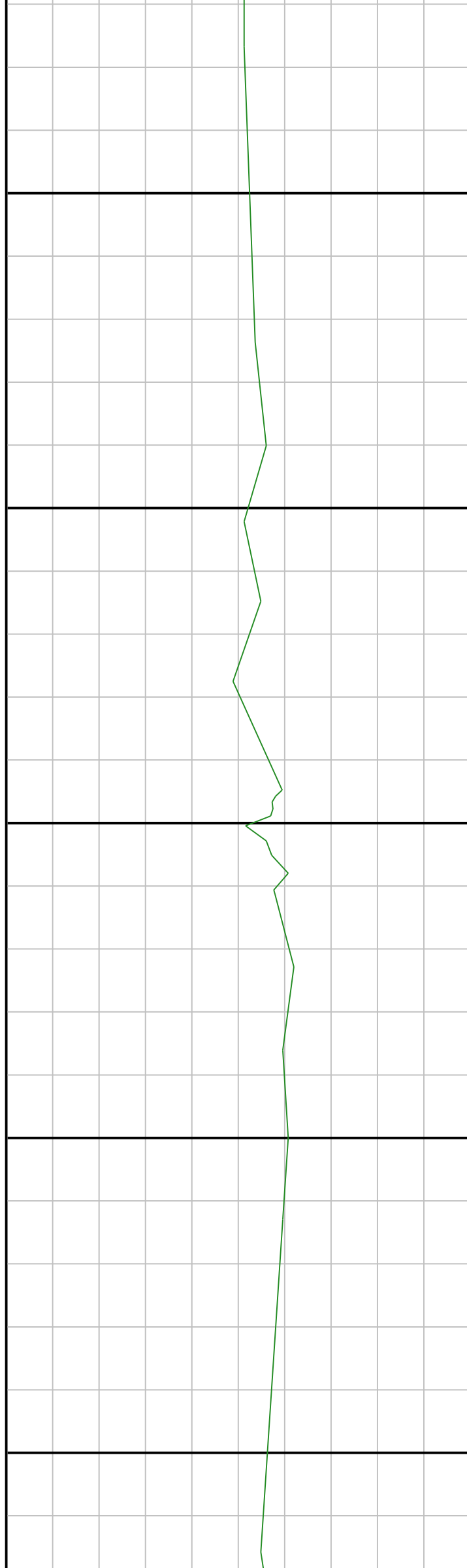
1750

1800









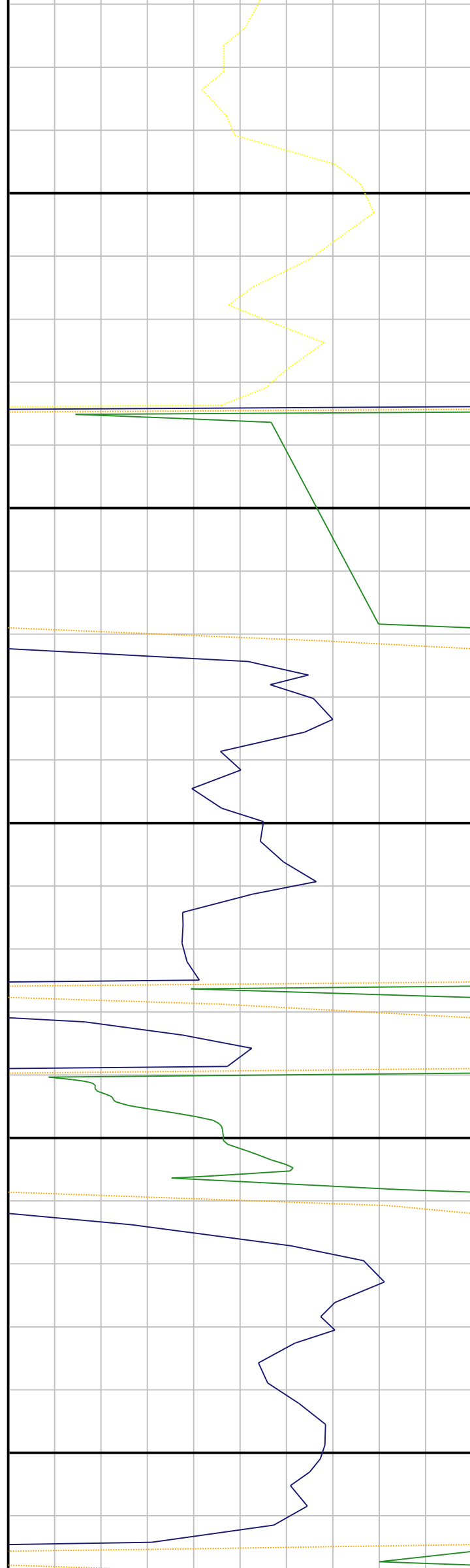
2350

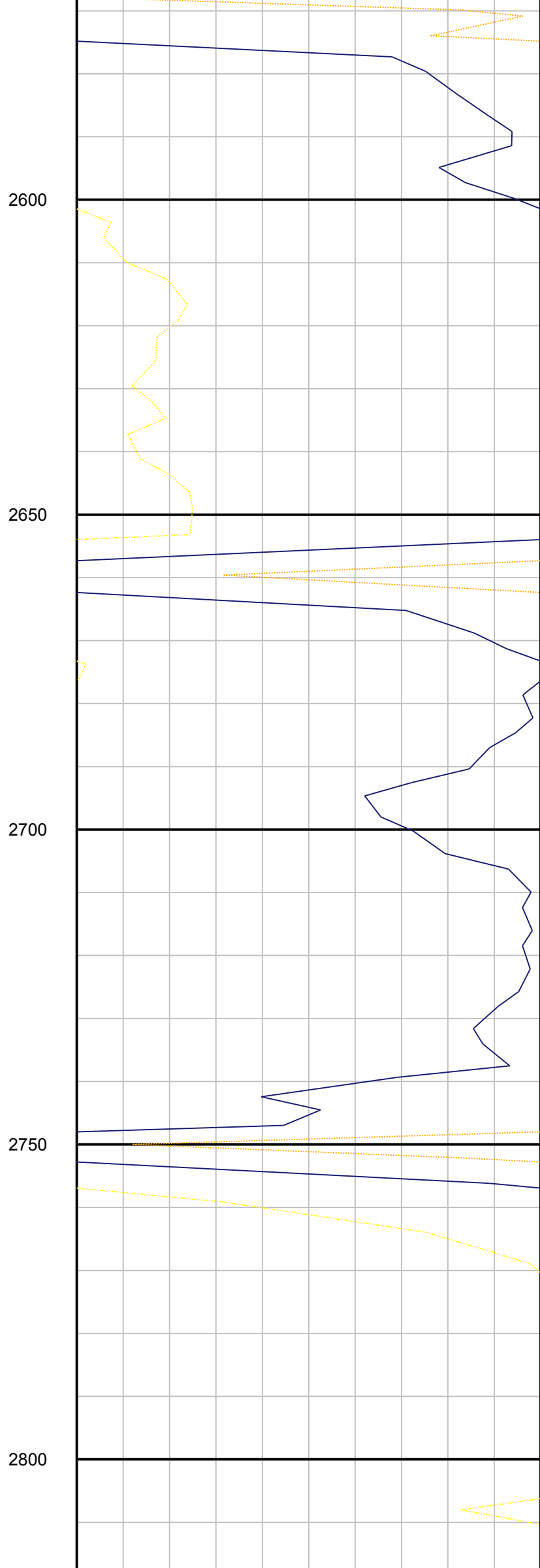
2400

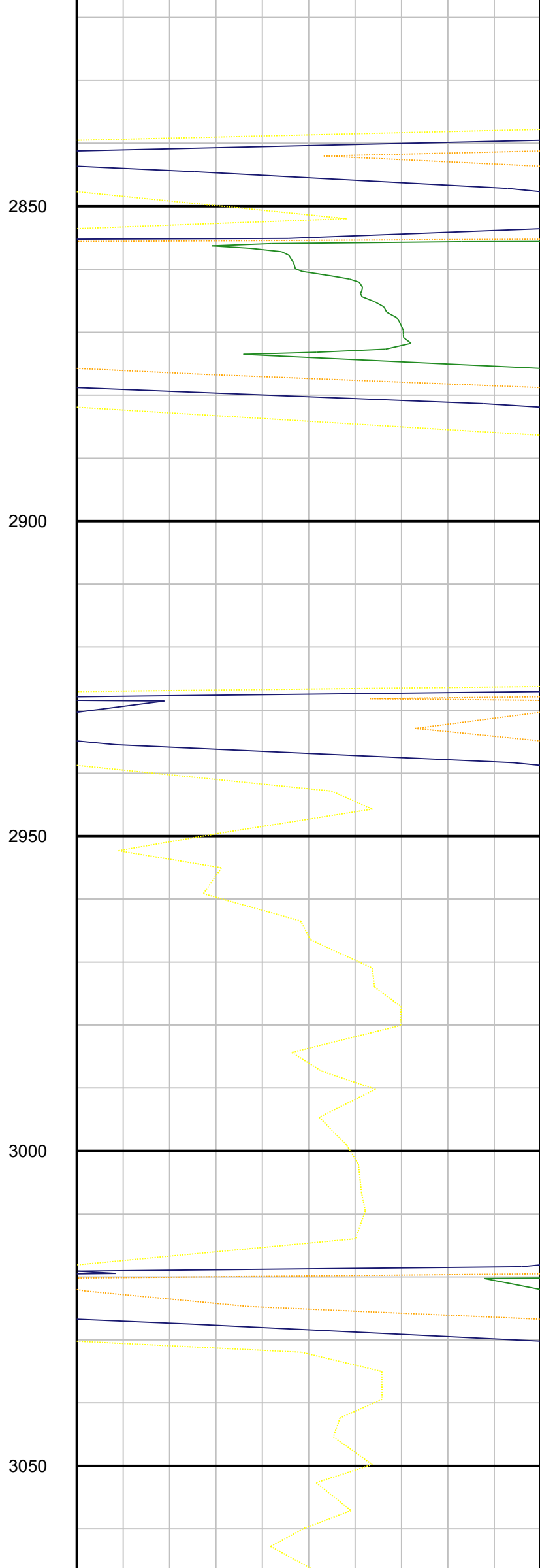
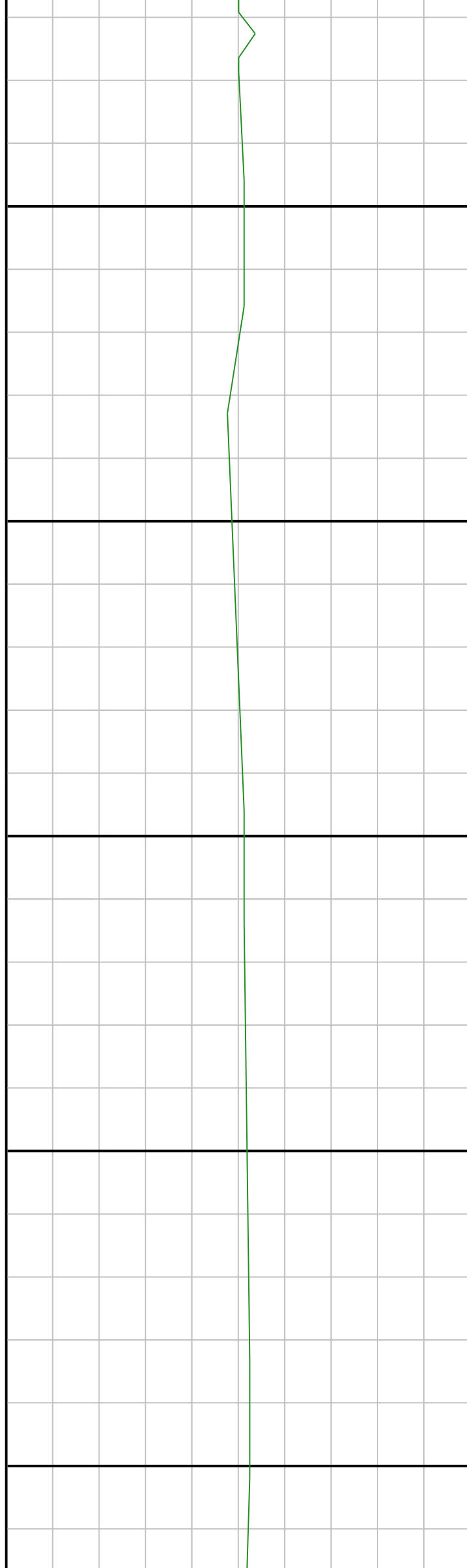
2450

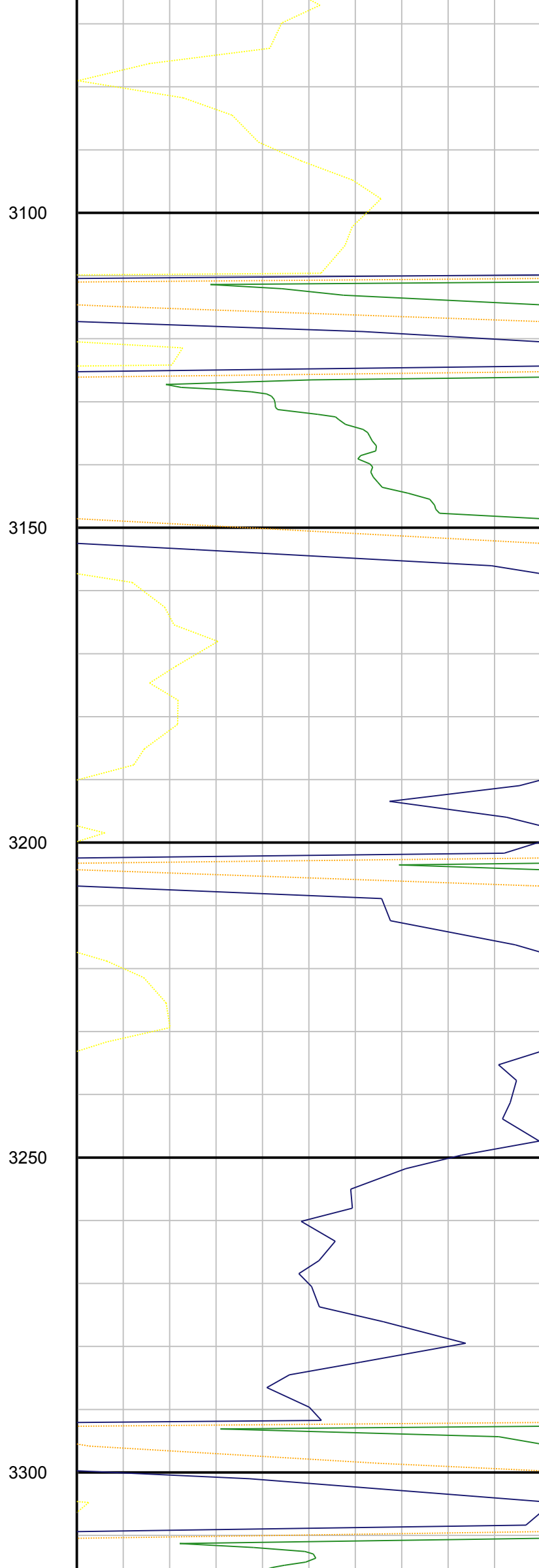
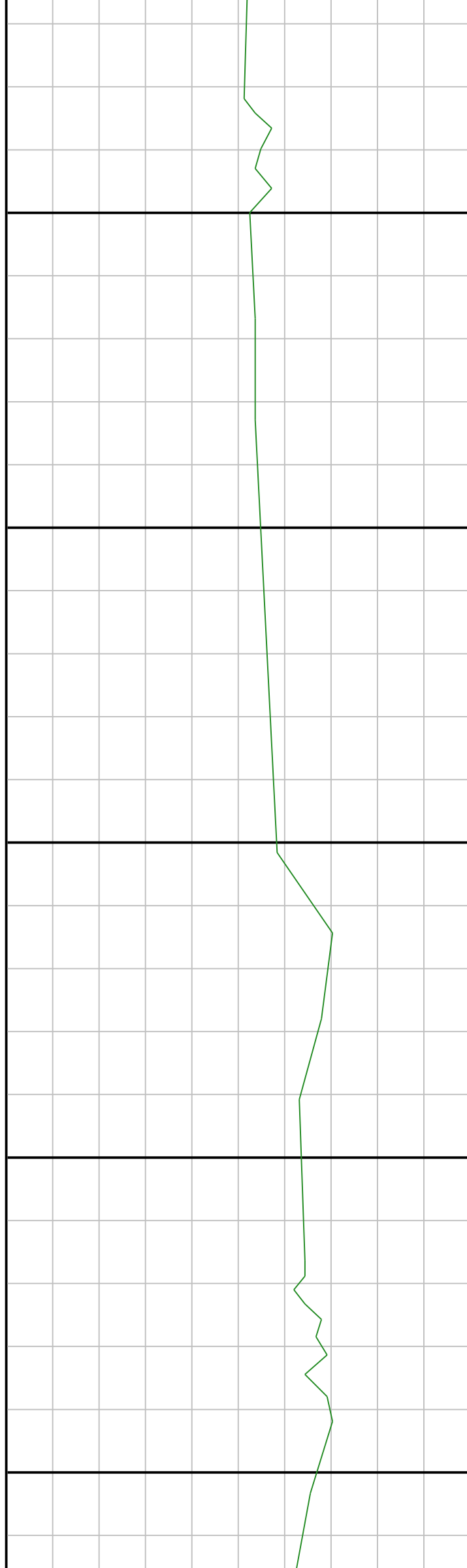
2500

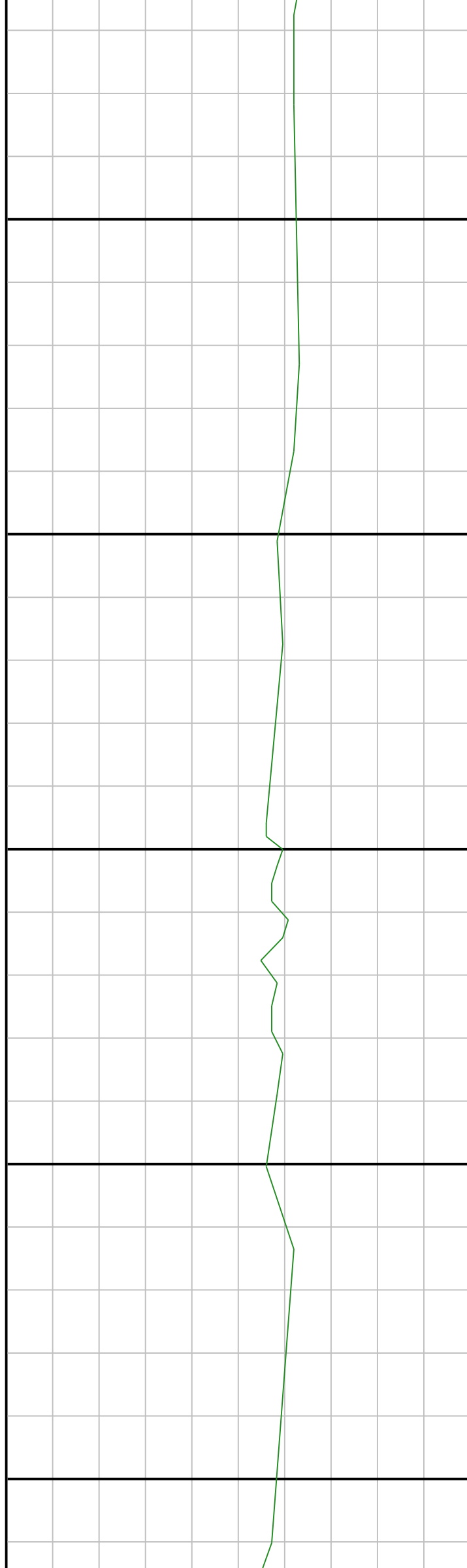
2550











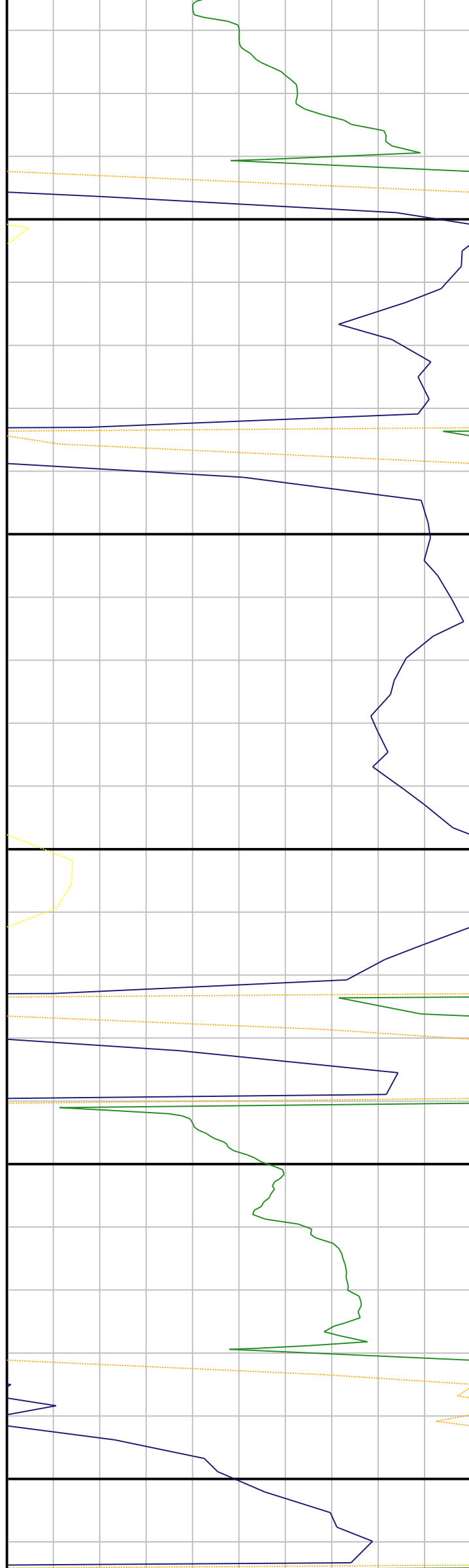
3350

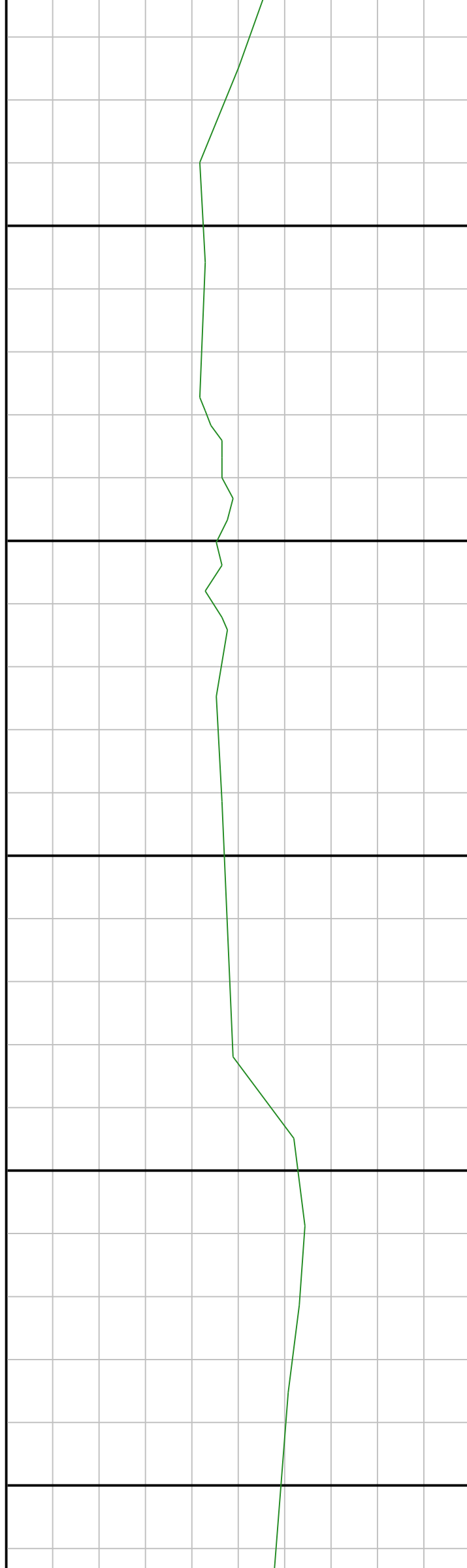
3400

3450

3500

3550





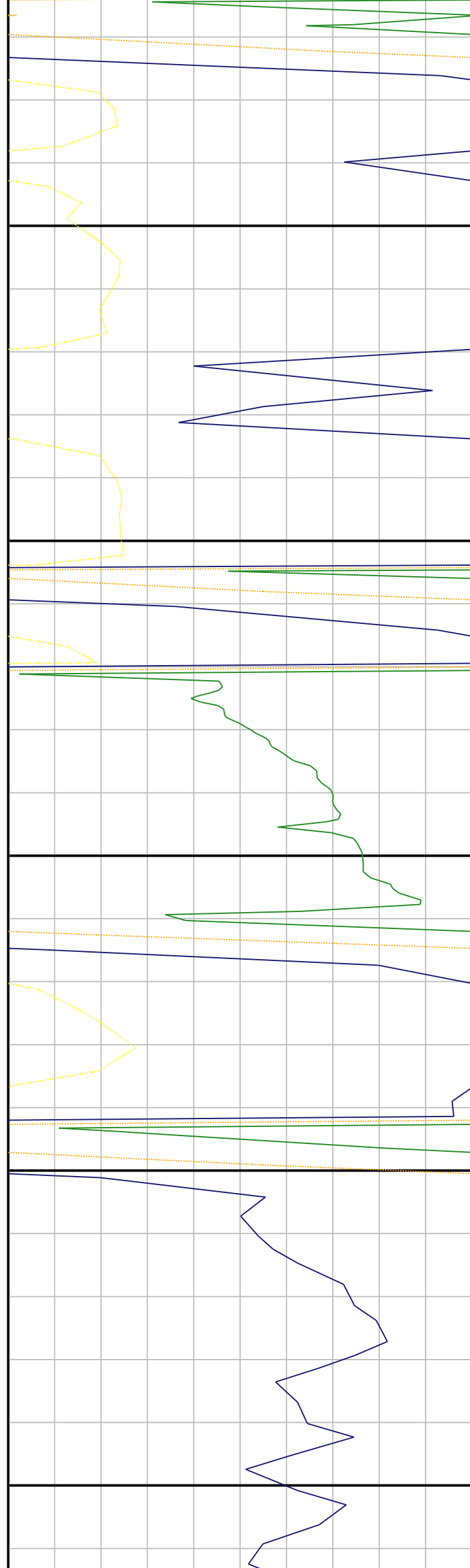
3600

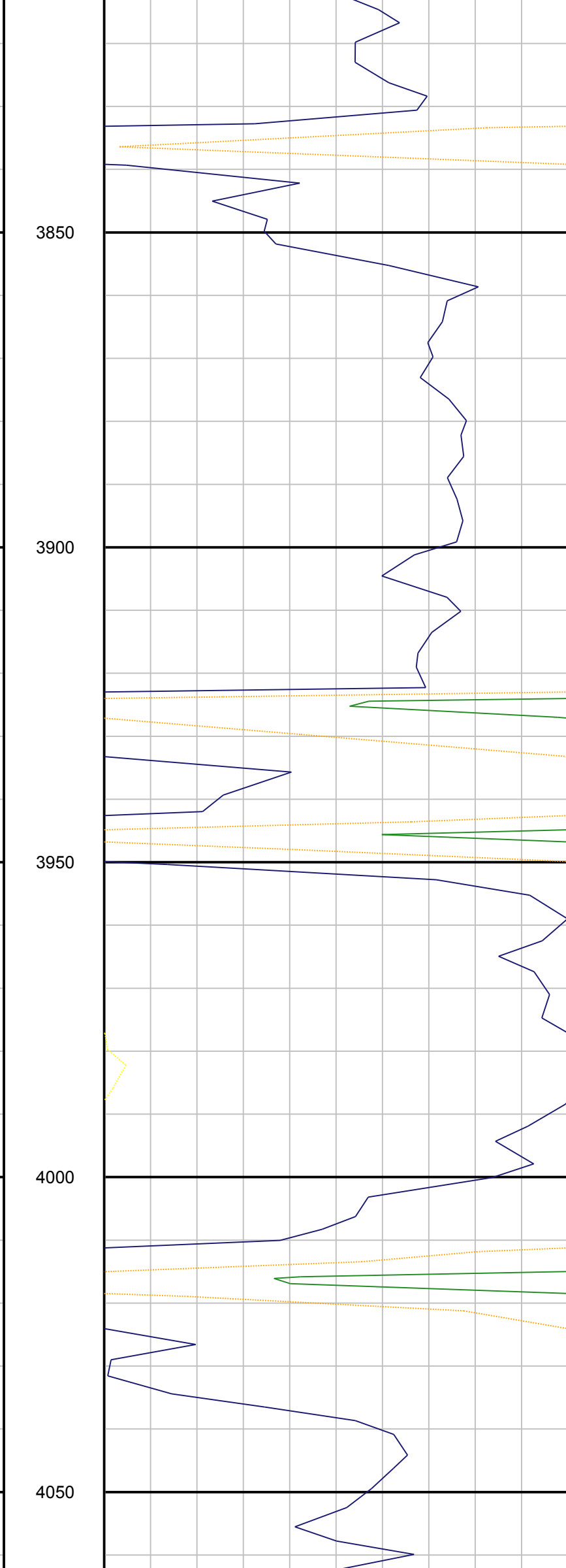
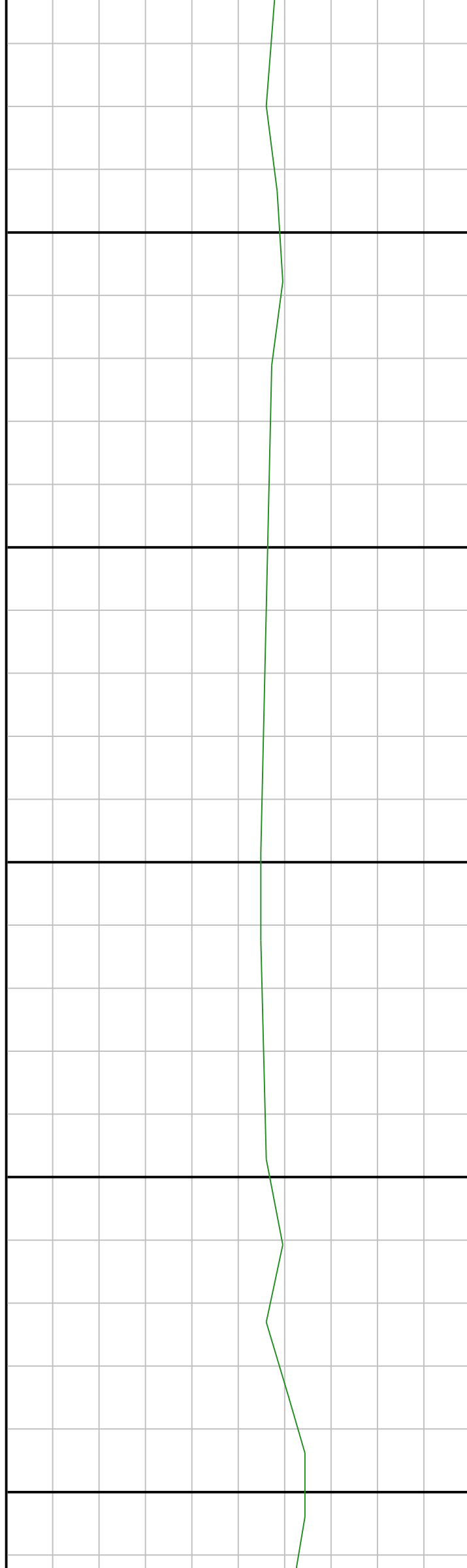
3650

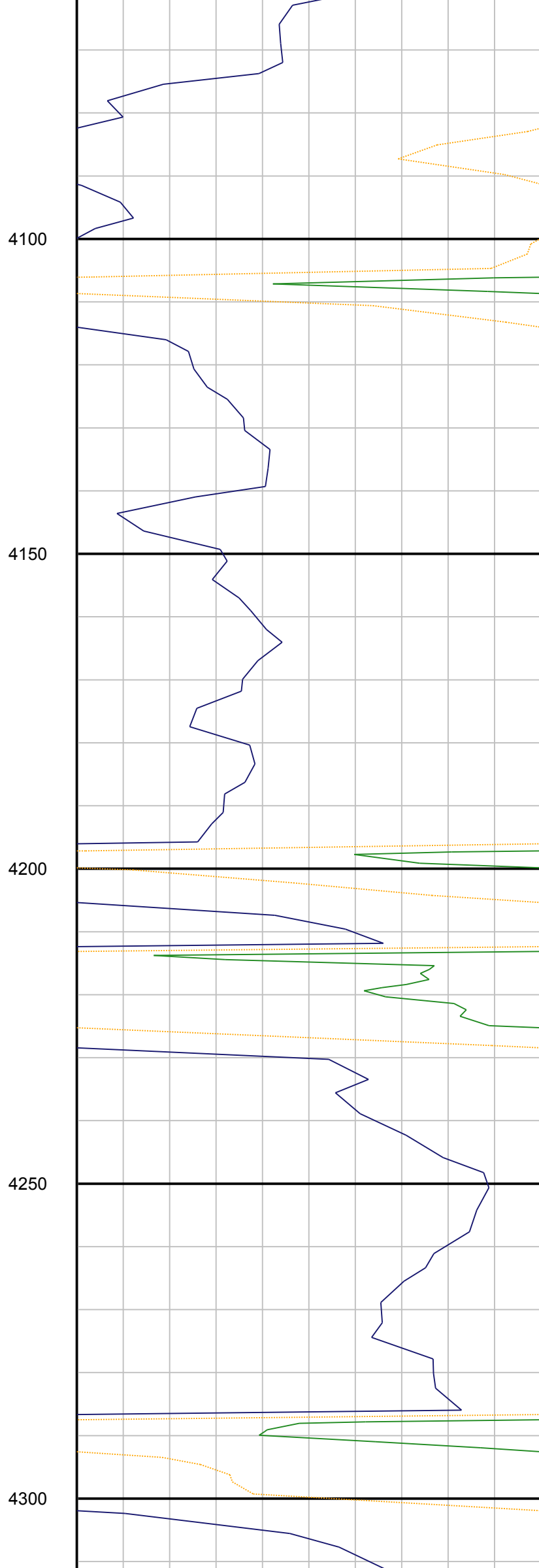
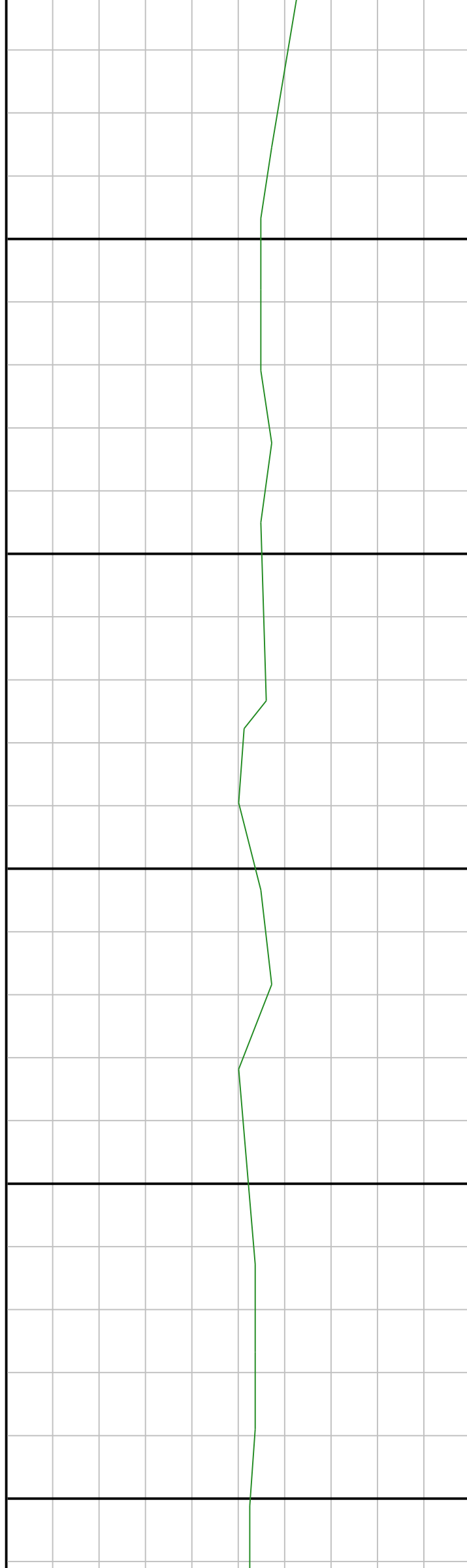
3700

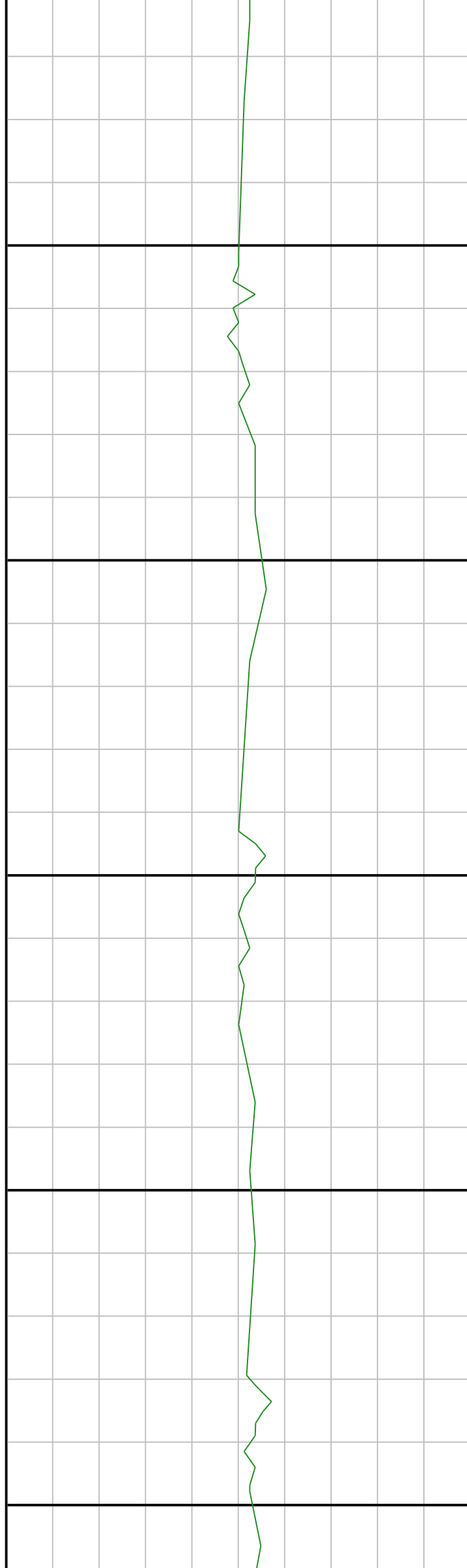
3750

3800









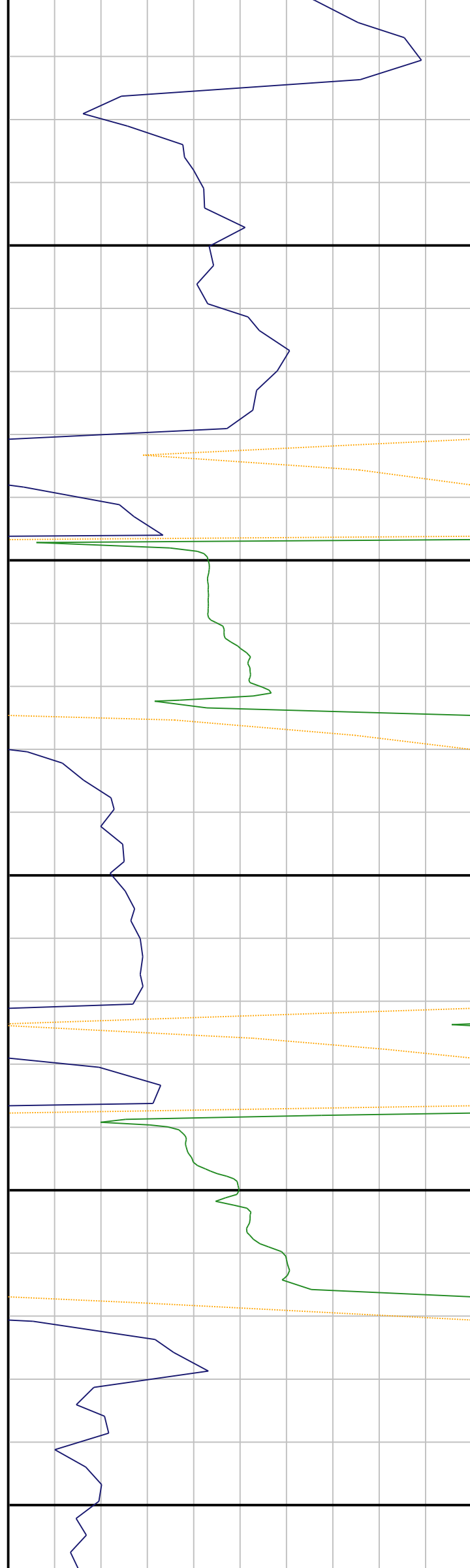
4350

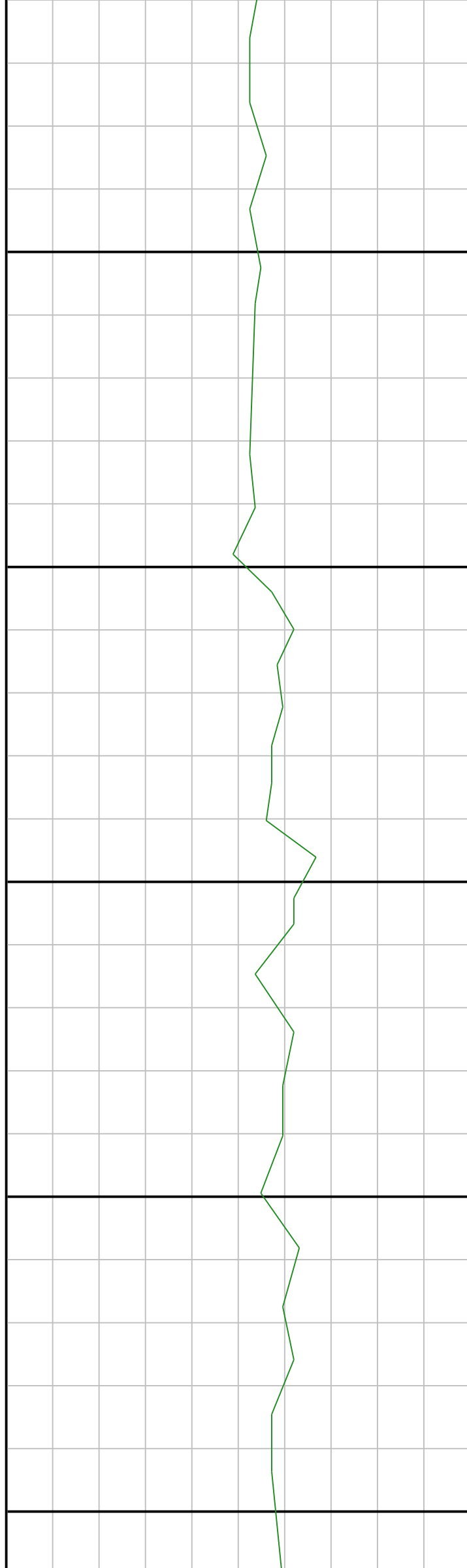
4400

4450

4500

4550





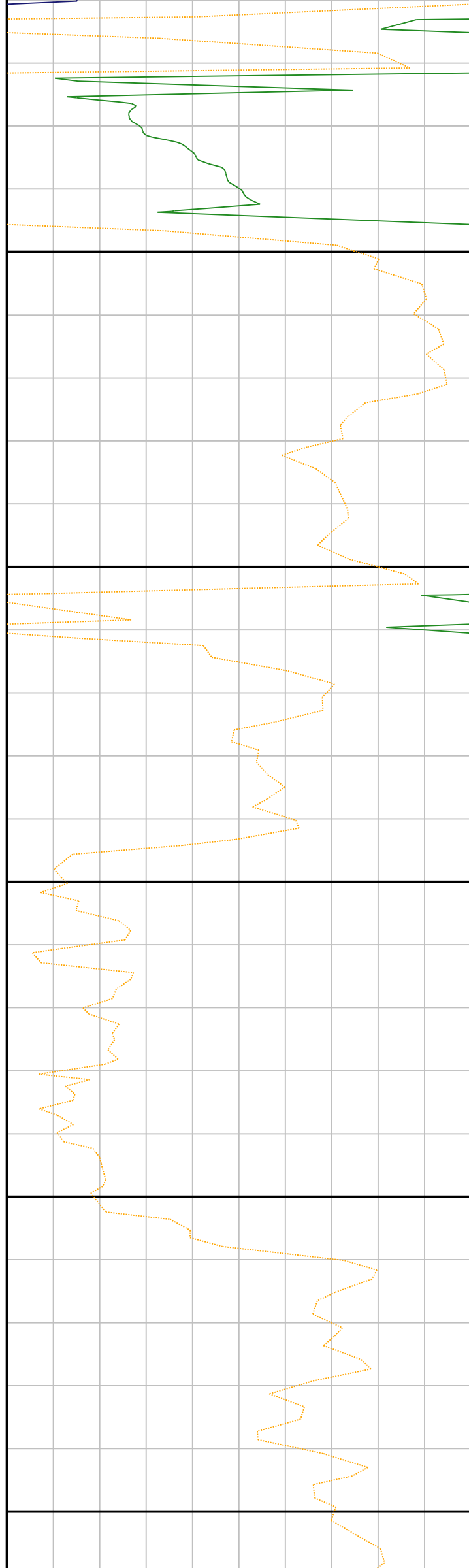
4600

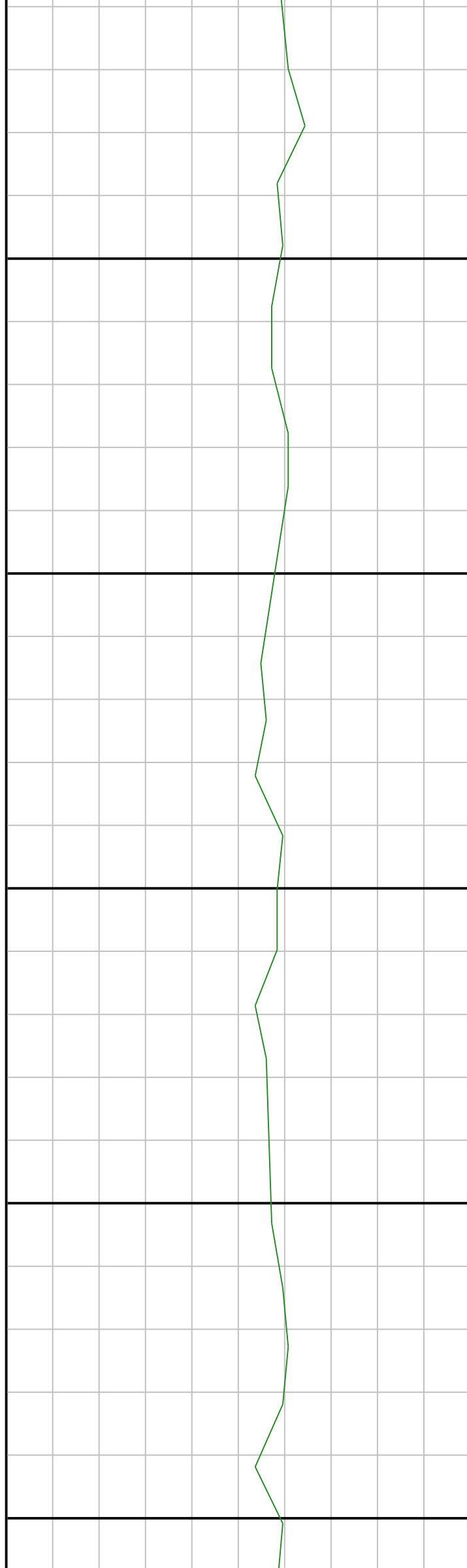
4650

4700

4750

4800





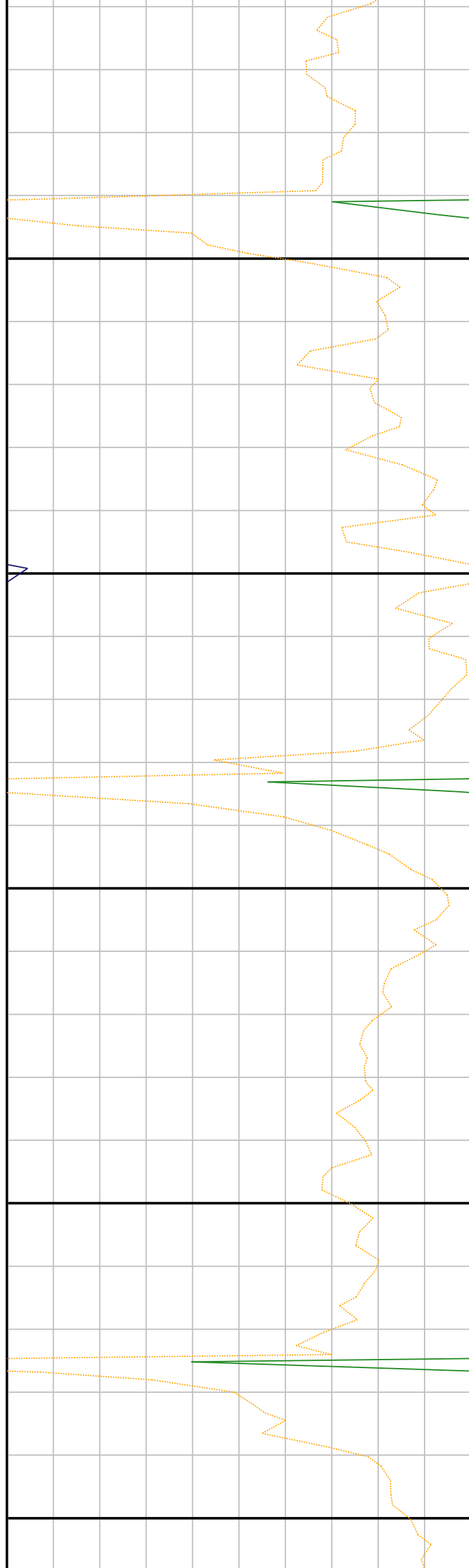
4850

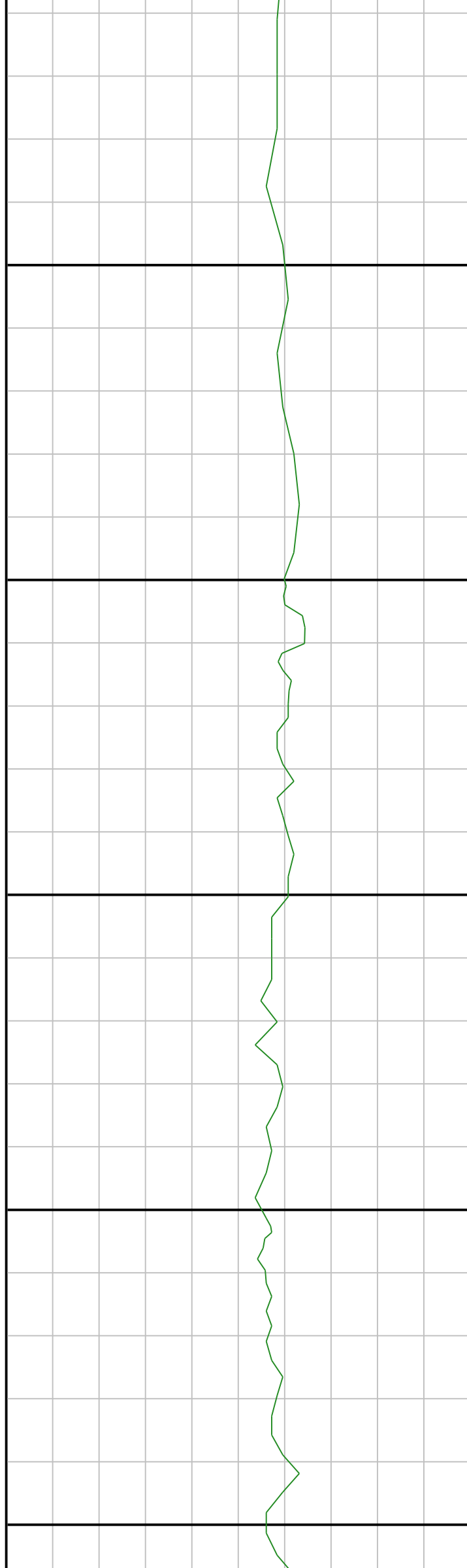
4900

4950

5000

5050





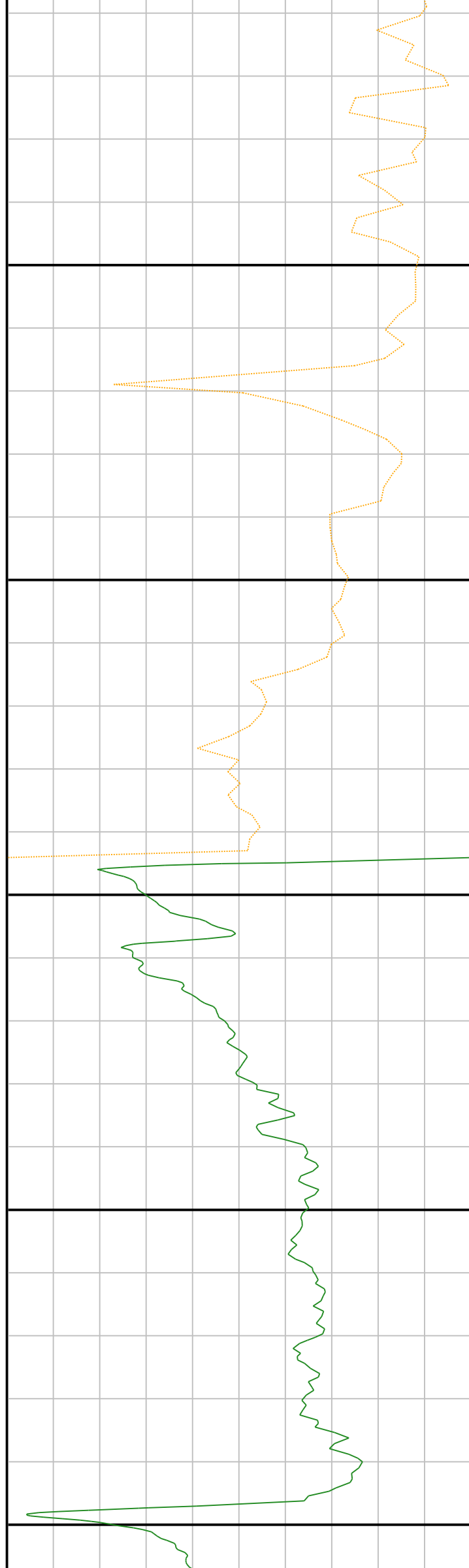
5100

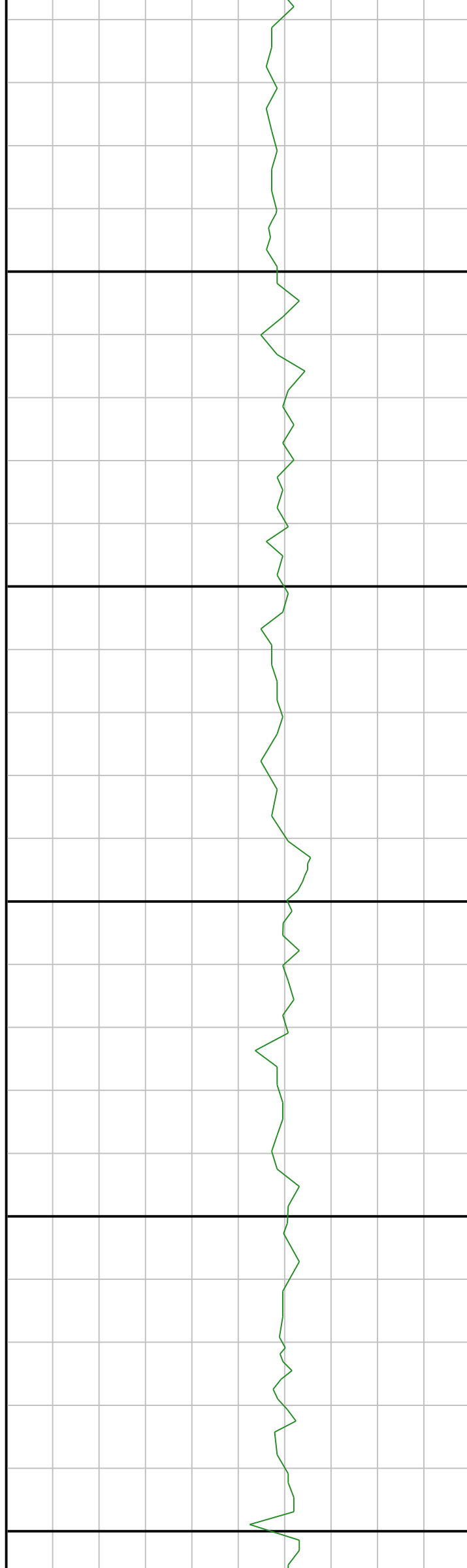
5150

5200

5250

5300





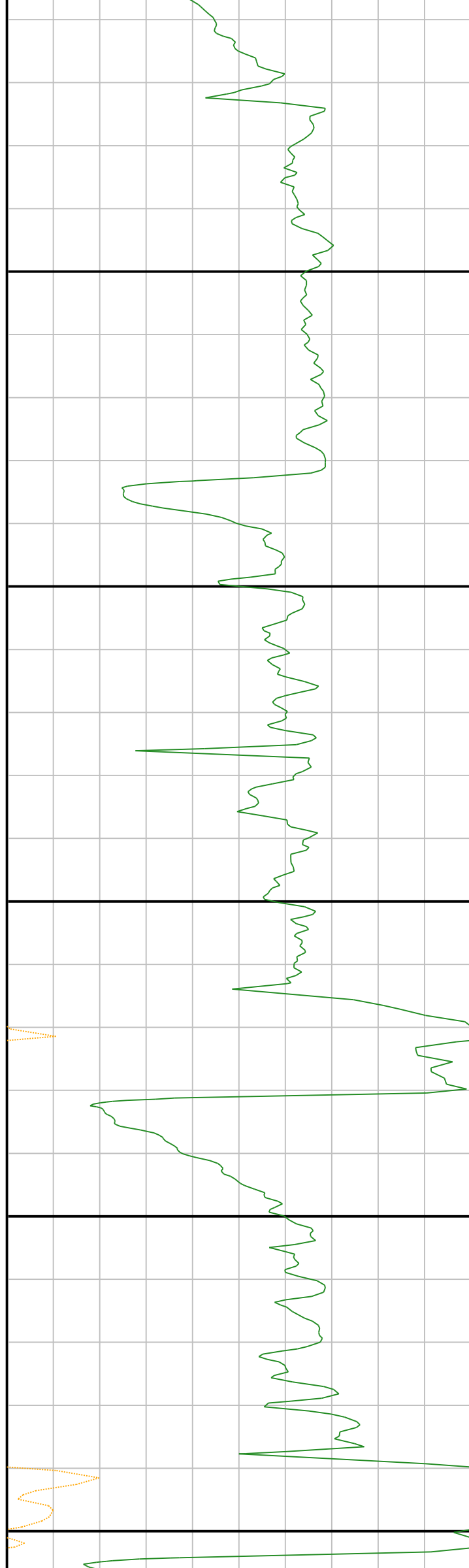
5350

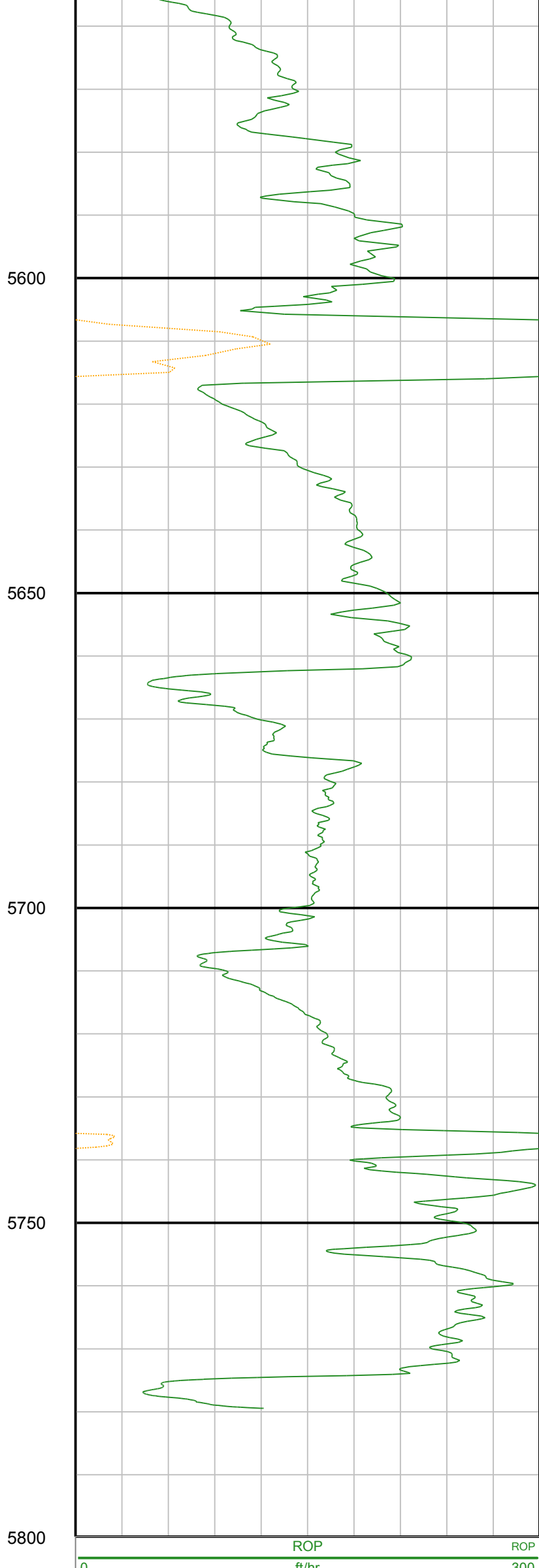
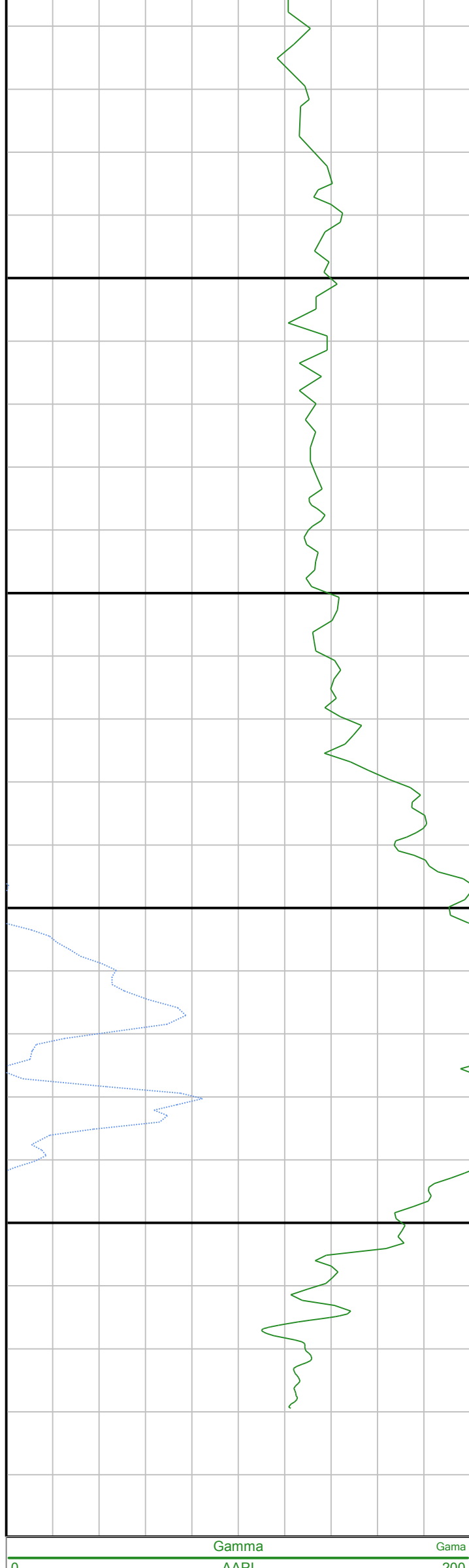
5400

5450

5500

5550





	Gamma	Gama
200	AAPI	400
	Gamma	Gama
400	AAPI	600
	Gamma	Gama
600	AAPI	800

	ROP	ROP
300	ft/hr	600
	ROP	ROP
600	ft/hr	900
	ROP	ROP
900	ft/hr	1200

Survey Information

Seq	MD (ft)	Inc (°)	Azm (°)	TVD (ft)	V Sec (ft)	N/-S (ft)	E/-W (ft)	DLS (°/100ft)	Bld Rate (°/ft)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	324.00	0.44	350.05	324.00	-1.24	1.23	-0.21	0.14	0.00
3	417.00	0.89	81.62	416.99	-1.64	1.68	0.44	1.08	0.00
4	509.00	2.46	87.65	508.95	-1.61	1.87	3.12	1.71	0.02
5	601.00	4.39	92.07	600.78	-1.11	1.82	8.61	2.12	0.02
6	694.00	6.19	89.34	693.38	-0.34	1.75	17.18	1.95	0.02
7	786.00	7.73	89.80	784.70	0.50	1.83	28.33	1.67	0.02
8	879.00	10.09	89.41	876.57	1.57	1.93	42.73	2.54	0.03
9	971.00	10.30	88.43	967.12	2.60	2.24	59.01	0.30	0.00
10	1064.00	9.96	87.27	1058.67	3.33	2.85	75.36	0.43	0.00
11	1156.00	9.91	86.79	1149.29	3.81	3.68	91.21	0.11	0.00
12	1248.00	9.53	85.82	1239.97	4.08	4.67	106.71	0.45	0.00
13	1340.00	9.77	88.86	1330.67	4.64	5.39	122.11	0.61	0.00
14	1432.00	10.00	89.56	1421.30	5.72	5.60	137.90	0.28	0.00
15	1524.00	10.12	90.71	1511.89	7.07	5.56	153.97	0.25	0.00
16	1616.00	9.93	93.63	1602.48	8.98	4.96	169.97	0.59	0.00
17	1709.00	9.91	93.24	1694.09	11.25	4.00	185.96	0.08	0.00
18	1801.00	8.83	90.07	1784.87	12.93	3.54	200.93	1.30	-0.01
19	1844.00	8.29	90.35	1827.39	13.48	3.52	207.33	1.26	-0.01
20	1982.00	7.10	90.58	1964.14	15.14	3.37	225.80	0.86	-0.01
21	2074.00	9.09	81.71	2055.22	15.21	4.36	238.68	2.55	0.02
22	2166.00	8.48	75.53	2146.15	13.60	7.11	252.44	1.22	-0.01
23	2258.00	10.73	73.38	2236.85	10.68	11.25	267.22	2.48	0.02
24	2350.00	10.78	70.15	2327.24	6.66	16.62	283.52	0.66	0.00
25	2442.00	10.56	81.28	2417.65	3.82	20.82	299.95	2.25	0.00
26	2534.00	10.87	88.66	2508.05	3.74	22.31	316.95	1.53	0.00
27	2626.00	10.47	86.41	2598.46	4.41	23.03	333.97	0.63	0.00
28	2718.00	10.00	85.24	2689.00	4.56	24.22	350.27	0.56	-0.01
29	2810.00	9.71	83.76	2779.64	4.35	25.72	365.94	0.42	0.00
30	2994.00	9.20	93.57	2961.15	6.05	26.49	396.05	0.92	0.00
31	3086.00	7.99	92.77	3052.12	7.94	25.73	409.78	1.32	-0.01
32	3269.00	8.22	85.35	3233.30	9.60	26.17	435.52	0.58	0.00
33	3361.00	9.84	71.54	3324.16	7.74	29.20	449.54	2.93	0.02
34	3454.00	10.25	61.45	3415.74	2.50	35.67	464.34	1.94	0.00
35	3546.00	11.09	66.83	3506.16	-3.61	43.06	479.67	1.42	0.01
36	3638.00	12.35	73.14	3596.24	-8.49	49.40	497.22	1.95	0.01
37	3730.00	12.50	82.35	3686.09	-11.07	53.58	516.50	2.16	0.00
38	3822.00	12.47	91.79	3775.93	-10.46	54.59	536.30	2.22	0.00
39	3914.00	10.45	90.71	3866.09	-8.55	54.18	554.58	2.21	-0.02
40	4005.00	8.51	87.56	3955.84	-7.51	54.36	569.56	2.21	-0.02
41	4097.00	6.83	83.25	4047.02	-7.44	55.30	581.79	1.93	-0.02
42	4189.00	6.19	82.60	4138.42	-7.87	56.58	592.14	0.70	-0.01
43	4281.00	5.99	81.49	4229.90	-8.42	57.93	601.81	0.25	0.00
44	4373.00	6.38	76.99	4321.37	-9.48	59.79	611.54	0.68	0.00
45	4465.00	7.28	98.02	4412.73	-8.93	60.12	622.29	2.87	0.01
46	4557.00	5.07	129.87	4504.22	-4.79	56.70	631.19	4.34	-0.02
47	4649.00	2.03	191.64	4596.05	-0.38	52.50	633.98	4.87	-0.03
48	4741.00	2.42	212.50	4687.99	2.73	49.27	632.61	0.97	0.00
49	4833.00	2.24	197.32	4779.91	5.95	45.91	631.03	0.70	0.00
50	4925.00	2.05	183.86	4871.85	9.24	42.55	630.38	0.58	0.00
51	5017.00	2.02	173.79	4963.79	12.49	39.30	630.45	0.39	0.00
52	5109.00	2.43	160.04	5055.72	15.99	35.85	631.29	0.73	0.00
53	5201.00	2.15	159.33	5147.65	19.53	32.41	632.56	0.31	0.00
54	5293.00	8.36	160.10	5239.21	27.65	24.50	635.45	6.75	0.07
55	5339.00	13.92	164.98	5284.33	36.33	16.00	638.02	12.25	0.12
56	5385.00	18.39	165.59	5328.50	48.93	3.62	641.27	9.72	0.10
57	5431.00	23.81	167.54	5371.40	65.30	-12.48	645.08	11.88	0.12
58	5477.00	28.03	170.05	5412.77	85.27	-32.21	648.95	9.48	0.09
59	5523.00	33.10	173.05	5452.37	108.60	-55.34	652.34	11.51	0.11

• Tie-in Point

60	5569.00	34.31	171.91	5490.63	134.10	-80.64	655.68	2.97	0.03
61	5615.00	39.26	171.74	5527.46	161.58	-107.90	659.60	10.76	0.11
62	5661.00	40.79	171.71	5562.69	191.11	-137.17	663.86	3.33	0.03
63	5707.00	46.11	171.98	5596.07	222.67	-168.48	668.34	11.57	0.12
64	5753.00	47.98	170.27	5627.42	256.25	-201.74	673.54	4.89	0.04
65	5799.00	54.90	171.99	5656.07	292.10	-237.26	679.06	15.32	0.15
66	5845.00	58.80	175.86	5681.23	330.58	-275.54	683.11	11.02	0.08
67	5891.00	65.96	176.55	5702.54	371.31	-316.18	685.79	15.62	0.16
68	5937.00	70.46	180.24	5719.62	413.94	-358.86	686.97	12.29	0.10
69	5983.00	77.57	182.26	5732.28	457.89	-403.04	685.99	16.02	0.15
70	6029.00	77.97	182.13	5742.02	502.52	-447.96	684.27	0.91	0.01
71	6075.00	77.65	182.14	5751.74	547.16	-492.89	682.59	0.70	-0.01
72	6122.00	77.19	181.36	5761.97	592.74	-538.74	681.19	1.89	-0.01
73	6168.00	76.24	180.69	5772.54	637.29	-583.50	680.39	2.50	-0.02
74	6215.00	79.94	178.68	5782.24	683.13	-629.48	680.65	8.92	0.08
75	6239.00	83.97	177.88	5785.60	706.86	-653.23	681.36	17.11	0.17
76	6294.00	88.52	175.45	5789.20	761.71	-708.00	684.56	9.37	0.08
77	6387.00	88.35	175.22	5791.74	854.67	-800.65	692.12	0.31	0.00
78	6481.00	91.71	176.85	5791.69	948.65	-894.41	698.62	3.97	0.04
79	6573.00	91.93	175.79	5788.77	1040.59	-986.17	704.52	1.18	0.00
80	6666.00	92.32	175.36	5785.32	1133.52	-1078.83	711.69	0.62	0.00
81	6759.00	90.08	178.25	5783.37	1226.45	-1171.65	716.87	3.93	-0.02
82	6852.00	90.70	178.61	5782.74	1319.31	-1264.61	719.42	0.77	0.01
83	6944.00	89.13	180.42	5782.88	1411.05	-1356.60	720.20	2.60	-0.02
84	7037.00	89.30	179.62	5784.15	1503.73	-1449.59	720.16	0.88	0.00
85	7131.00	91.04	180.88	5783.87	1597.37	-1543.59	719.75	2.29	0.02
86	7224.00	90.11	182.30	5782.94	1689.81	-1636.54	717.17	1.83	-0.01
87	7317.00	90.28	185.17	5782.62	1781.79	-1729.34	711.12	3.09	0.00
88	7409.00	90.36	183.67	5782.11	1872.62	-1821.06	704.03	1.63	0.00
89	7502.00	90.36	184.28	5781.52	1964.56	-1913.83	697.58	0.66	0.00
90	7595.00	90.76	184.97	5780.62	2056.32	-2006.52	690.08	0.86	0.00
91	7688.00	90.73	184.63	5779.41	2148.04	-2099.19	682.30	0.37	0.00
92	7781.00	90.84	184.94	5778.13	2239.76	-2191.86	674.54	0.35	0.00
93	7874.00	91.01	185.15	5776.63	2331.40	-2284.49	666.37	0.29	0.00
94	7967.00	89.19	183.40	5776.47	2423.26	-2377.22	659.43	2.71	-0.02
95	8060.00	88.94	179.76	5777.99	2515.67	-2470.16	656.87	3.92	0.00
96	8152.00	88.15	178.47	5780.32	2607.44	-2562.11	658.29	1.64	-0.01
97	8245.00	90.64	179.34	5781.30	2700.24	-2655.08	660.07	2.84	0.03
98	8338.00	91.01	179.76	5779.97	2792.97	-2748.07	660.80	0.60	0.00
99	8431.00	90.45	178.53	5778.78	2885.75	-2841.05	662.18	1.45	-0.01
100	8524.00	91.01	178.56	5777.60	2978.60	-2934.01	664.55	0.60	0.01
101	8617.00	90.48	177.81	5776.39	3071.47	-3026.96	667.49	0.99	-0.01
102	8709.00	88.83	176.34	5776.94	3163.42	-3118.83	672.19	2.40	-0.02
103	8801.00	91.62	177.92	5776.58	3255.36	-3210.70	676.79	3.49	0.03
104	8894.00	92.18	179.47	5773.50	3348.14	-3303.62	678.91	1.77	0.01
105	8986.00	91.85	180.80	5770.26	3439.76	-3395.56	678.69	1.49	0.00
106	9078.00	89.58	180.78	5769.11	3531.32	-3487.54	677.42	2.47	-0.02
107	9171.00	89.47	180.42	5769.88	3623.92	-3580.53	676.45	0.40	0.00
108	9263.00	89.69	180.08	5770.56	3715.57	-3672.53	676.05	0.44	0.00
109	9358.00	90.20	180.53	5770.65	3810.21	-3767.53	675.54	0.72	0.01
110	9450.00	90.08	180.56	5770.42	3901.83	-3859.52	674.67	0.13	0.00
111	9542.00	90.11	180.21	5770.27	3993.46	-3951.52	674.05	0.38	0.00
112	9635.00	90.08	180.18	5770.12	4086.12	-4044.52	673.73	0.05	0.00
113	9727.00	90.14	180.41	5769.94	4177.77	-4136.52	673.26	0.26	0.00
114	9819.00	90.06	180.55	5769.78	4269.40	-4228.51	672.49	0.18	0.00
115	9912.00	89.69	180.01	5769.98	4362.05	-4321.51	672.03	0.70	0.00
116	10004.00	90.08	182.76	5770.17	4453.52	-4413.48	669.81	3.02	0.00
117	10096.00	88.32	188.52	5771.45	4543.97	-4504.98	660.77	6.55	-0.02
118	10188.00	87.09	188.29	5775.14	4633.50	-4595.92	647.34	1.36	-0.01
119	10280.00	86.92	185.28	5779.95	4723.53	-4687.14	636.48	3.27	0.00
120	10373.00	86.92	182.04	5784.94	4815.40	-4779.80	630.56	3.48	0.00
121	10465.00	88.07	179.20	5788.97	4906.90	-4871.70	629.56	3.33	0.01
122	10558.00	89.80	178.82	5790.69	4999.69	-4964.66	631.17	1.90	0.02
123	10650.00	91.62	179.64	5789.55	5091.46	-5056.64	632.41	2.17	0.02
124	10742.00	89.97	181.15	5788.28	5183.08	-5148.63	631.77	2.43	-0.02
125	10834.00	88.55	181.39	5789.47	5274.57	-5240.59	629.73	1.57	-0.02
126	10926.00	88.24	185.34	5792.04	5365.61	-5332.38	624.34	4.30	0.00
127	11018.00	86.50	186.51	5796.27	5455.93	-5423.79	614.85	2.28	-0.02
128	11110.00	87.96	183.32	5800.71	5546.52	-5515.33	606.98	3.81	0.02

129	11202.00	88.38	179.38	5803.65	5637.94	-5607.24	604.82	4.30	0.00
130	11294.00	89.50	176.96	5805.35	5729.80	-5699.17	607.75	2.90	0.01
131	11385.00	89.05	177.35	5806.50	5820.75	-5790.05	612.27	0.65	0.00
132	11477.00	88.88	176.24	5808.17	5912.70	-5881.89	617.41	1.22	0.00
133	11569.00	91.51	174.94	5807.85	6004.69	-5973.60	624.49	3.19	0.03
134	11661.00	92.04	174.77	5805.00	6096.64	-6065.19	632.73	0.60	0.01
135	11753.00	92.60	175.27	5801.28	6188.56	-6156.77	640.71	0.82	0.01
136	11844.00	92.21	176.39	5797.46	6279.48	-6247.44	647.32	1.30	0.00
137	11936.00	91.90	178.34	5794.16	6371.35	-6339.28	651.55	2.14	0.00
138	12028.00	89.39	179.51	5793.13	6463.15	-6431.25	653.27	3.01	-0.03
139	12120.00	88.04	177.40	5795.19	6554.98	-6523.19	655.75	2.72	-0.01
140	12212.00	90.56	177.46	5796.31	6646.91	-6615.08	659.88	2.74	0.03
141	12304.00	91.32	178.65	5794.80	6738.78	-6707.01	663.00	1.53	0.01
142	12396.00	91.04	178.99	5792.91	6830.59	-6798.97	664.89	0.48	0.00
143	12488.00	90.95	178.88	5791.31	6922.39	-6890.94	666.60	0.15	0.00
144	12579.00	90.84	178.84	5789.89	7013.21	-6981.91	668.41	0.13	0.00
145	12671.00	90.36	177.71	5788.93	7105.07	-7073.87	671.18	1.33	-0.01
146	12763.00	88.91	175.65	5789.51	7197.04	-7165.70	676.51	2.74	-0.02
147	12855.00	88.55	175.39	5791.55	7289.02	-7257.40	683.70	0.48	0.00
148	12947.00	90.08	176.67	5792.65	7381.00	-7349.17	690.06	2.17	0.02
149	13039.00	88.99	174.76	5793.40	7472.99	-7440.90	696.94	2.39	-0.01
150	13131.00	90.73	179.10	5793.62	7564.92	-7532.74	701.86	5.08	0.02
151	13223.00	91.37	179.14	5791.94	7656.70	-7624.72	703.28	0.70	0.01
152	13315.00	91.93	178.93	5789.29	7748.47	-7716.66	704.82	0.65	0.01
153	13407.00	90.95	180.18	5786.98	7840.18	-7808.63	705.54	1.73	-0.01
154	13499.00	91.26	179.81	5785.20	7931.86	-7900.61	705.55	0.52	0.00
155	13591.00	91.59	179.94	5782.91	8023.54	-7992.58	705.75	0.39	0.00
156	13683.00	90.78	180.58	5781.01	8115.17	-8084.56	705.33	1.12	-0.01
157	13775.00	91.18	180.12	5779.44	8206.80	-8176.55	704.77	0.66	0.00