



ThruBit
A Schlumberger Company

**SPECTRAL DENSITY
DUAL SPACED NEUTRON
GAMMA RAY
MEMORY LOG**

Company	SANDRIDGE ENERGY	Location:	API #: 15-077-21911-01-00	Other Services
Well	MYRA 3406 1-8H	SHL: 240' FSL & 660' FWL		THRUBIT
Field	EASTHAM	BHL: 330' FNL & 660' FWL		PORTAL
County	HARPER	SEC 8 TWP 34S RGE 6W		BIT
State	KANSAS	Permanent Datum	G.L.	Elevation
		Log Measured From	K.B. 16' ABOVE PERM DATUM	K.B. 1304'
		Drilling Measured From	K.B.	D.F. 1304'
				G.L. 1288'

Date	14 MAR 2013
Run Number	ONE
Depth Driller	8867'
Depth Logger	8830'
Bottom Logged Interval	8812'
Top Log Interval	2500'
Casing Driller	7.0" @ 5410'
Casing Logger	7.0" @ 5411'
Bit Size	6.125"
Type Fluid in Hole	WBM
Density / Viscosity	8.5 / 27
pH / Fluid Loss	8.5 / NA
Source of Sample	ACTIVE PIT
Rm @ Meas. Temp	2.01 OHMS @ 70DEGF
Rmf @ Meas. Temp	1.50 OHMS @ 70DEGF
Rmc @ Meas. Temp	2.51 OHMS @ 70DEGF
Source of Rmf / Rmc	CALCULATED
Rm @ BHT	1.04 OHMS @ 143DEGF
Time Circulation Stopped	1630 14 MAR 2013
Time Logger on Bottom	1840 14 MAR 2012
Maximum Recorded Temperature	143 DEGF
Equipment Number	T011
Location	OKC, OK
Recorded By	R. BROOMFIELD
Witnessed By	ANTONIO LEIJA JR
	Z. HAGAN

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

**SERVICE: LEVEL 4- HORIZONTAL MEMORY PUMPDOWN - BIT DEPTH 8770' LOG TO 2500'
ALL SCALES AND PRESENTATION PER CLIENT REQUEST
LIMESTONE POROSITY , 2.71 G/CC, USED FOR POROSITY CALCULATIONS
LOG RAN WITH SWIVEL AND SMALL DECENTRALIZER
TBHV REPRESENTS TOTAL BOREHOLE VOLUME, FT3
ABHV REPRESENTS ANNULAR BOREHOLE VOLUME, FT3, CALCULATED FOR 4.5" CASING
RIGMINDER LITE AND PASON USED TO CREATE DEPTH LOG
LOG DEPTH CORRELATED TO MWD GAMMA RAY**

**RIG: UNIT 310
CREW: R. BROOMFIELD, Z. HOWARD, Z. HAGAN, J. HIRSCHLER**

Service Ticket No.	1797	API No.	15-077-21911-01-00	PGM Ver	WARRIOR 7.0
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The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

GAMMA RAY	NEUTRON	DENSITY	INDUCTION
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Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	PS09T	Serial No.	PS35N	Serial No.	PS52D	Serial No.	PS23R
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	PS
Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	Diameter	2.125"

LOGGING DATA

General Data

Pass	Depths		Well Head	Speed	Logging Run Comments
No.	From	To	Pressure	Ft/Min	
ONE	8830'	2500'	0	30 FPM	

	GAMMA RAY		NEUTRON		DENSITY		INDUCTION	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	R
ONE	0 API	150 API	30 %	-10 %	30 %	-10 %	0.2 OHM-M	2000 OHM-M

DIRECTIONAL INFORMATION

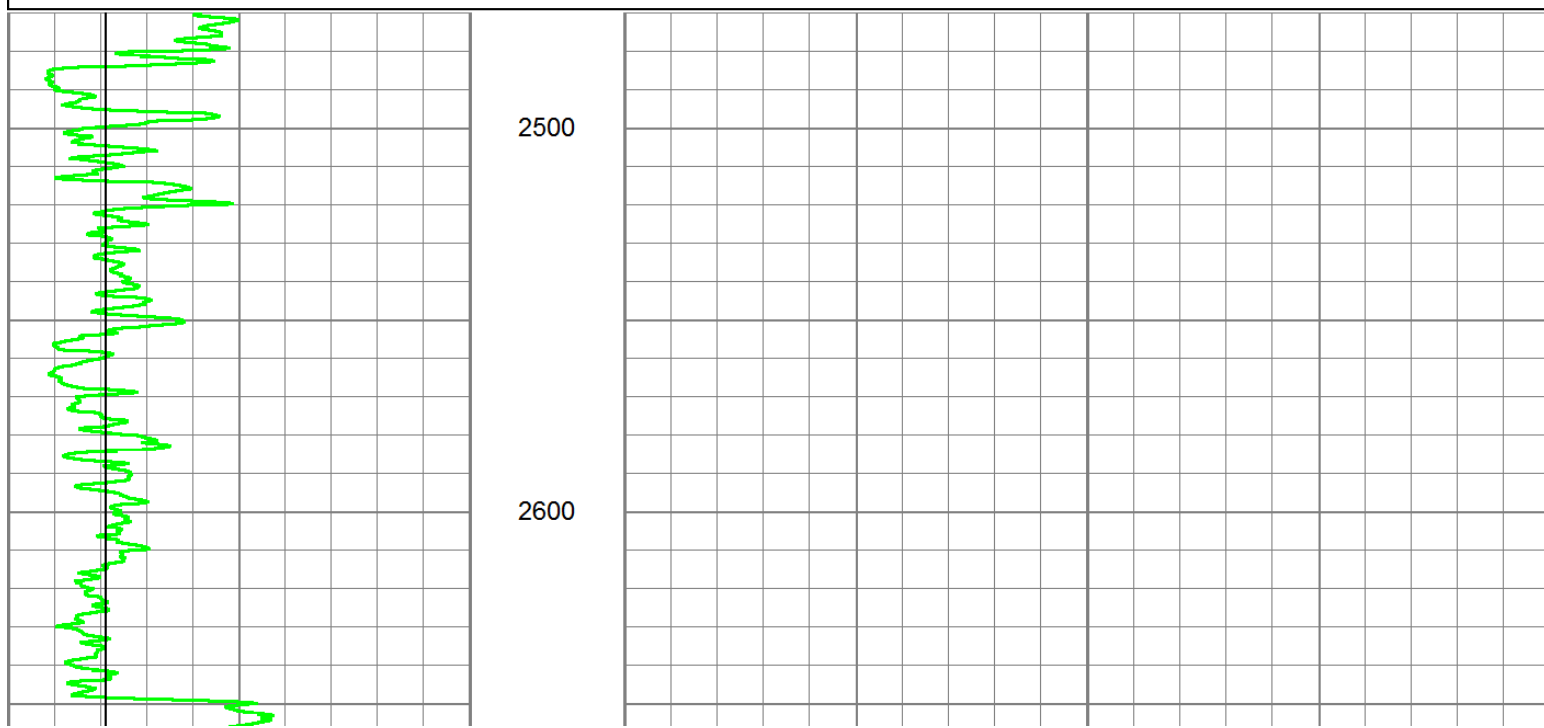
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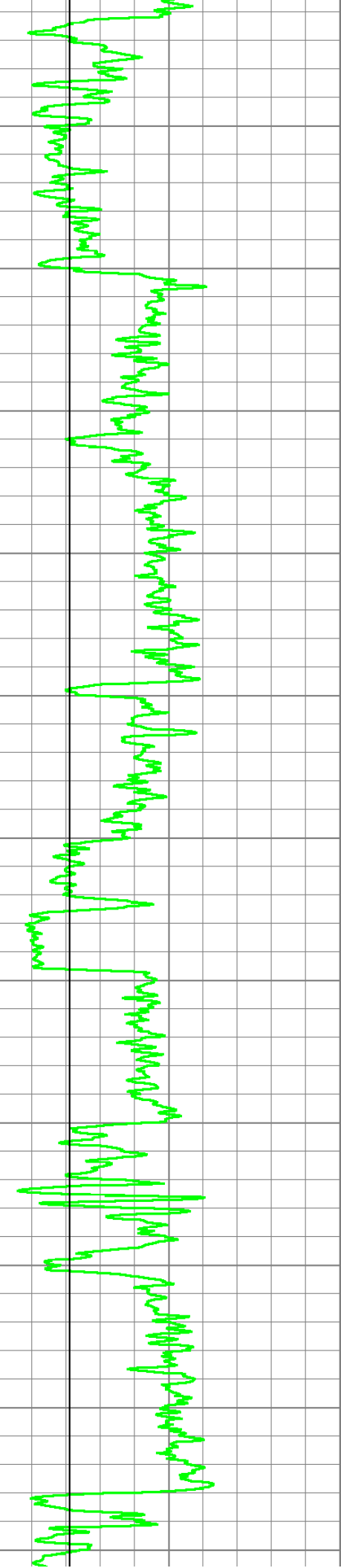


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 Presentation Format: 6_2n_chk
 Dataset Creation: Fri Mar 15 04:21:56 2013
 Charted by: Depth in Feet scaled 1:600

0	GR (GAPI)	150	0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
4	DCAL (in)	14	2	RHOB (g/cc)				3
4	BOREID (in)	14						
-5	ACCY	5						





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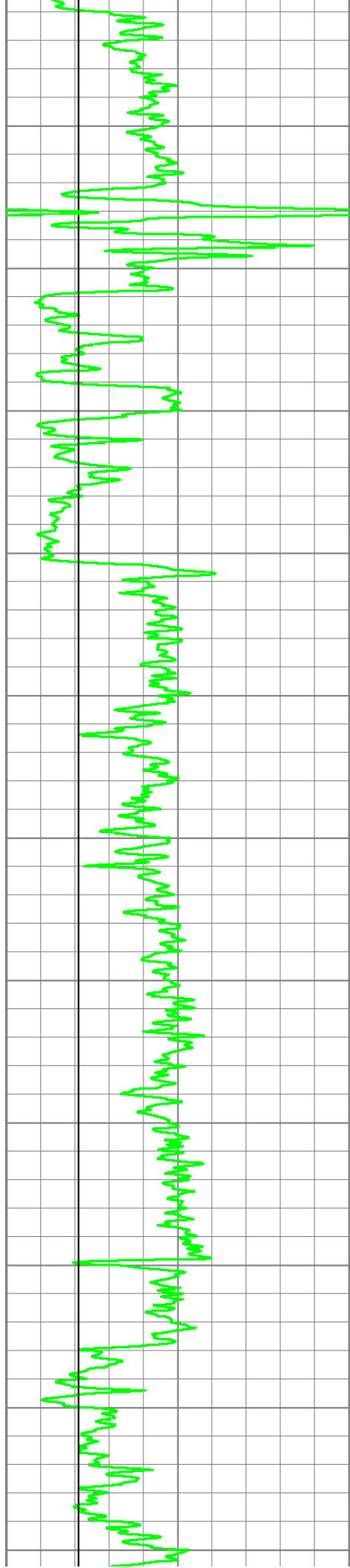
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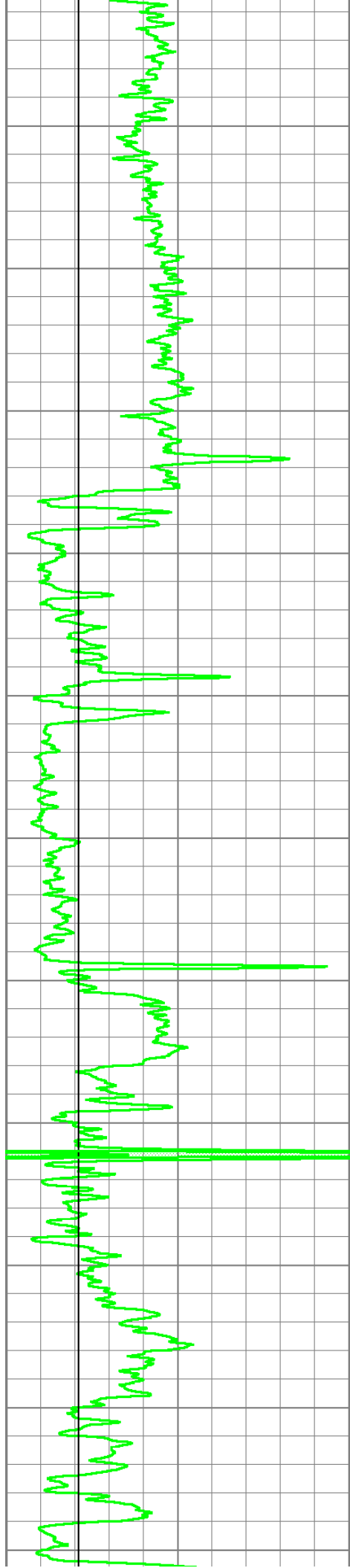
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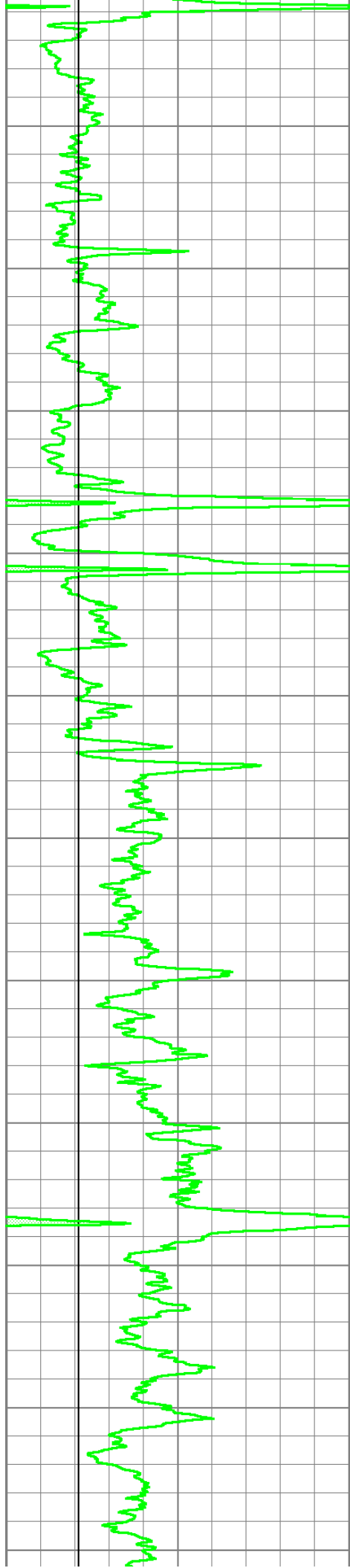
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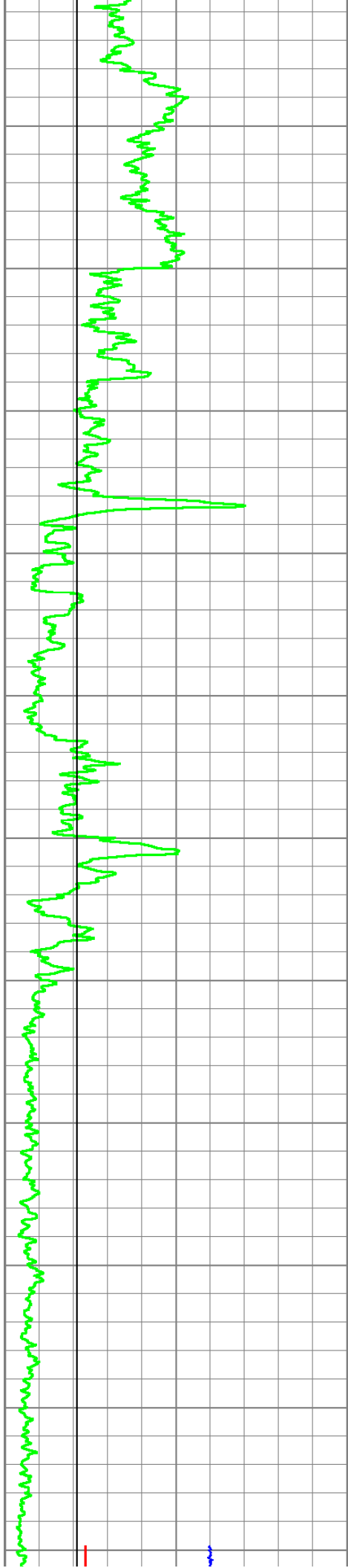
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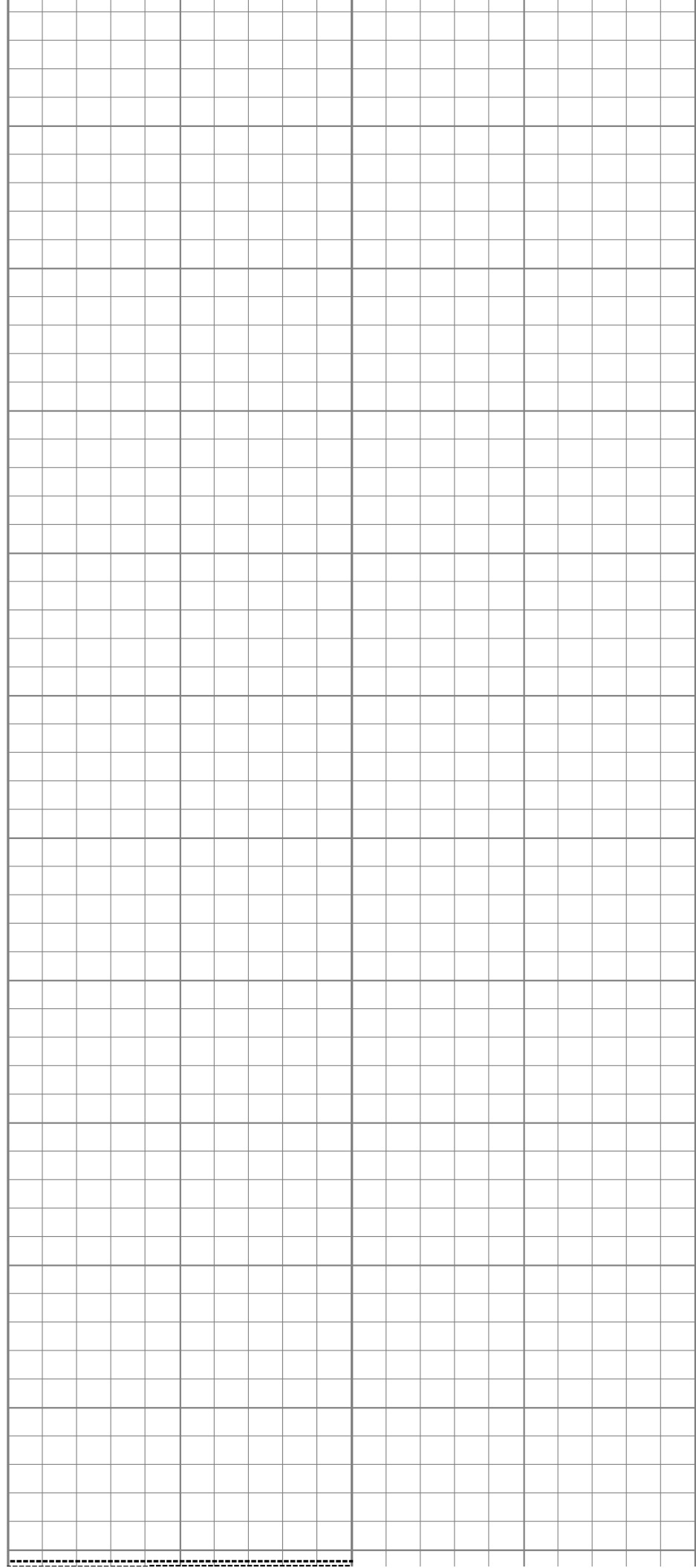
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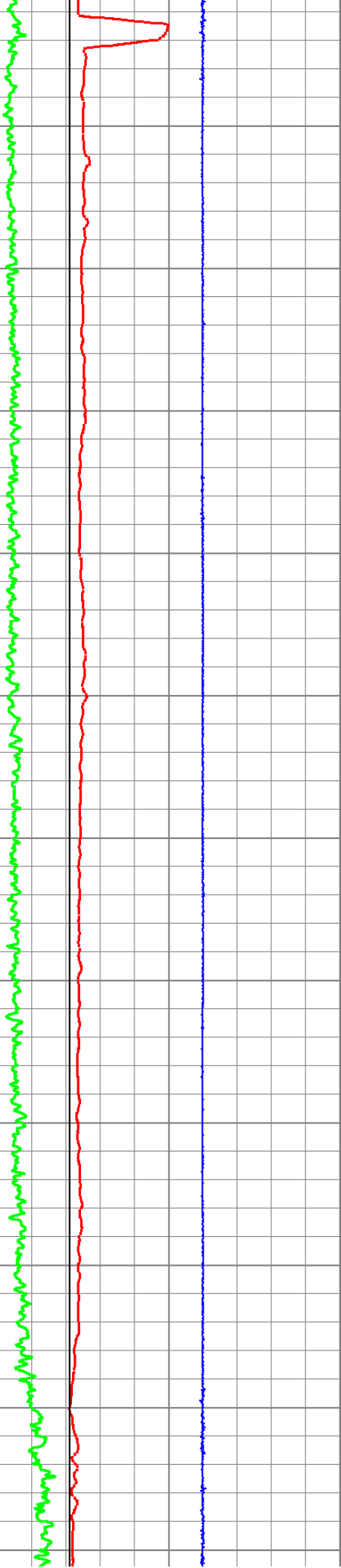
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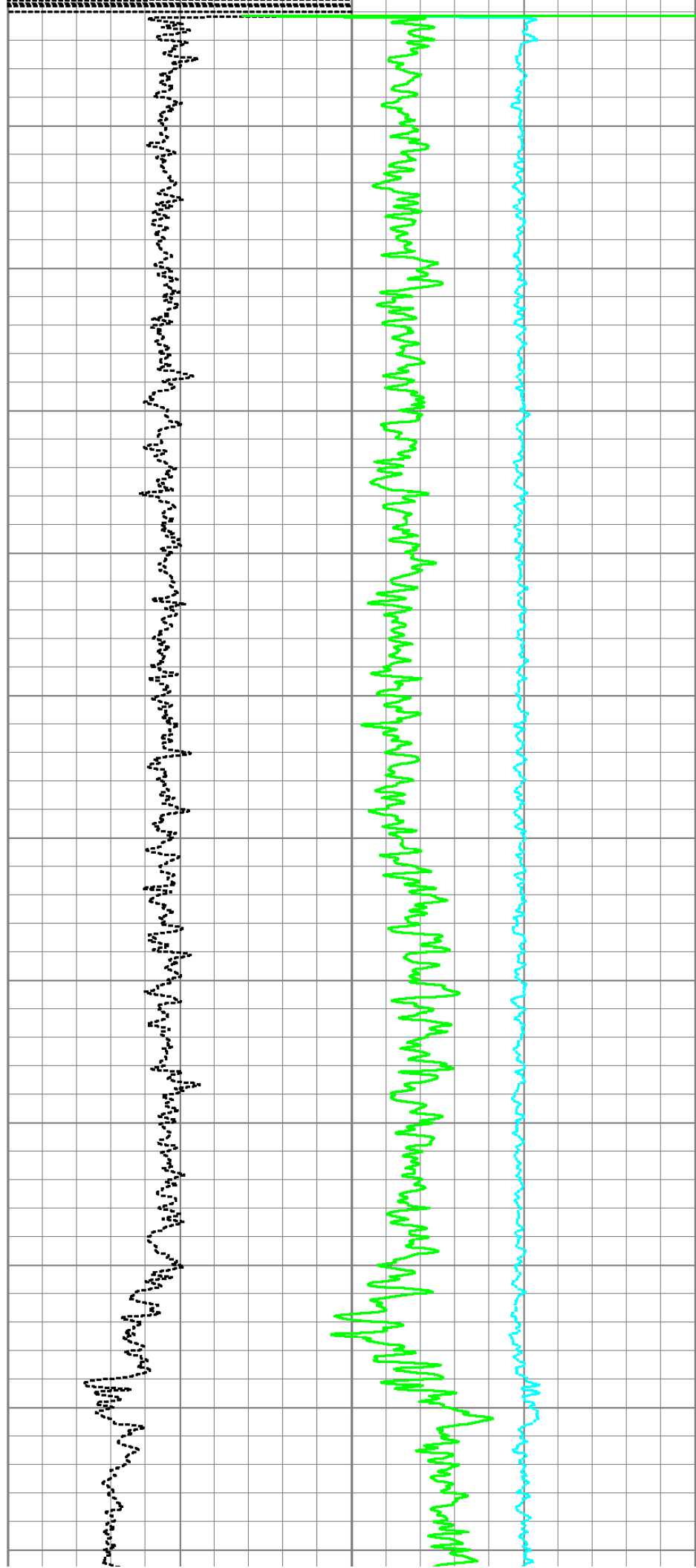
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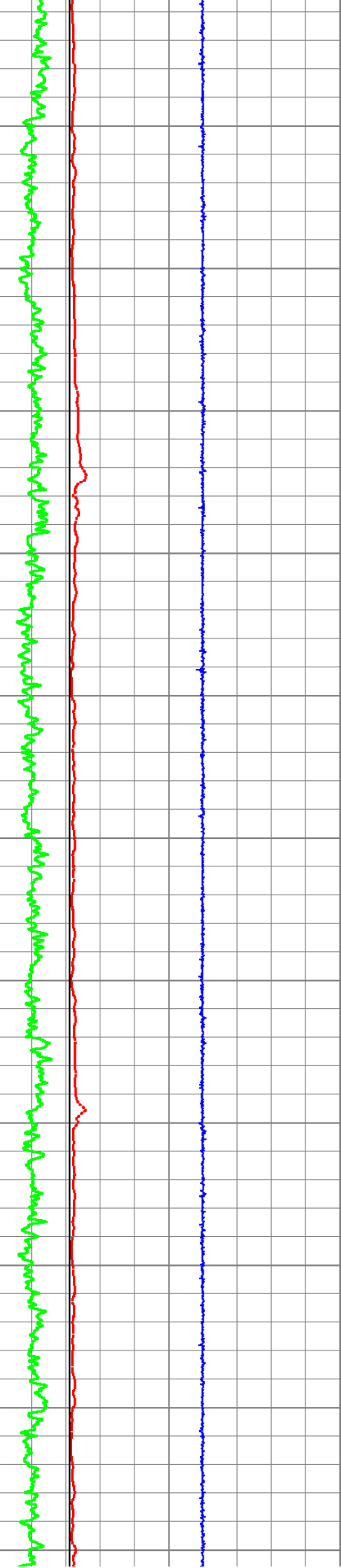
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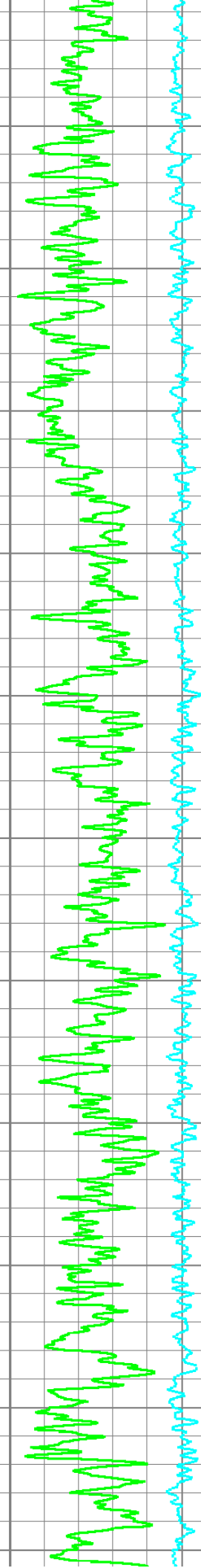
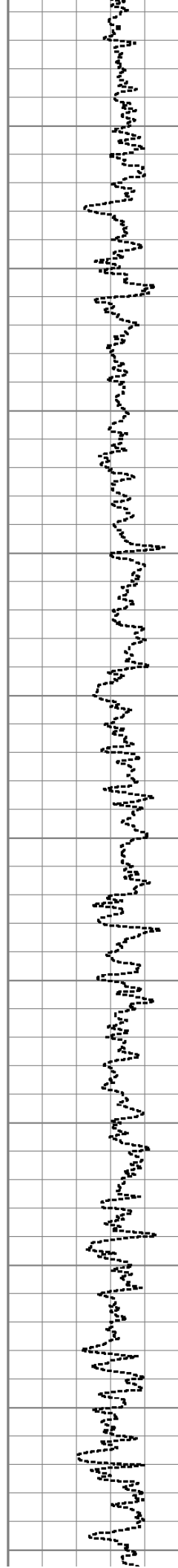
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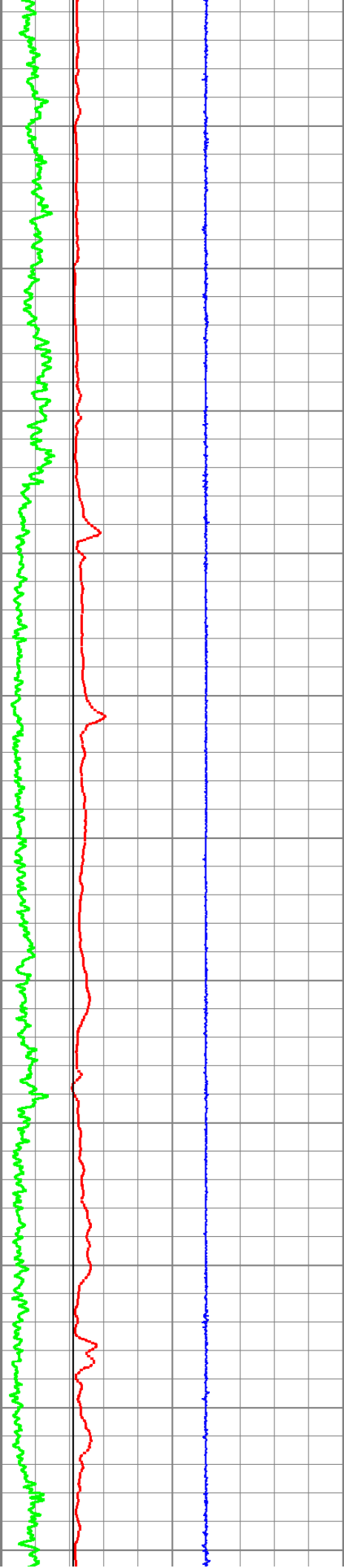
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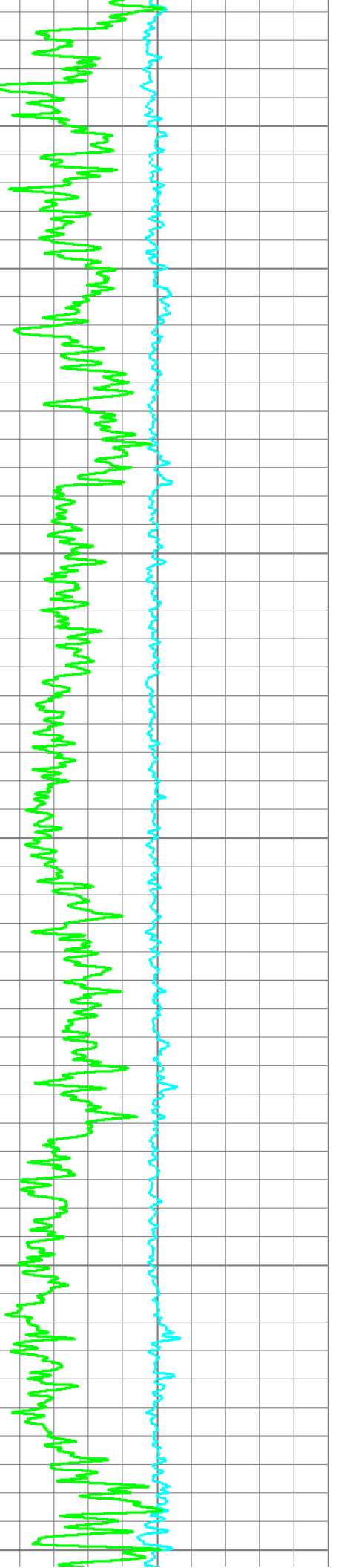
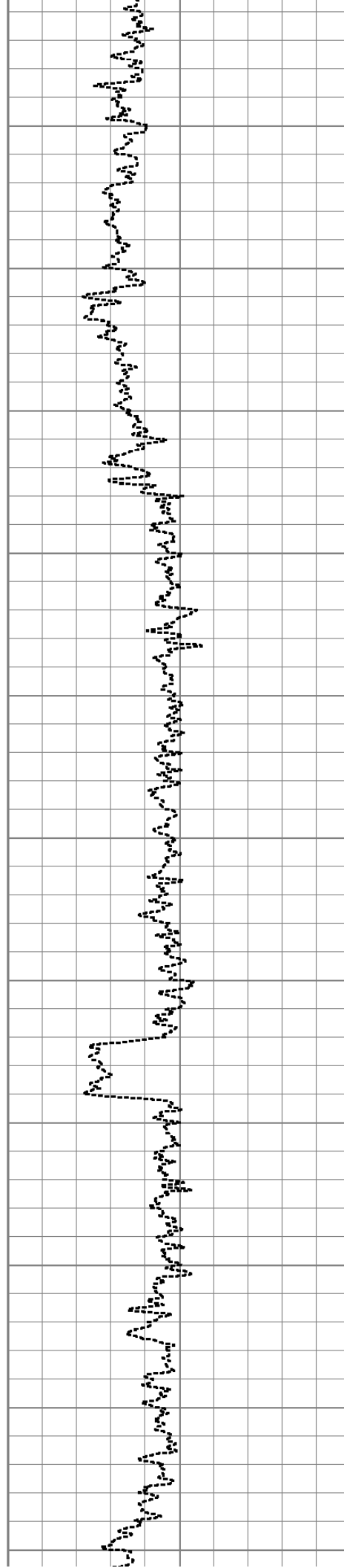
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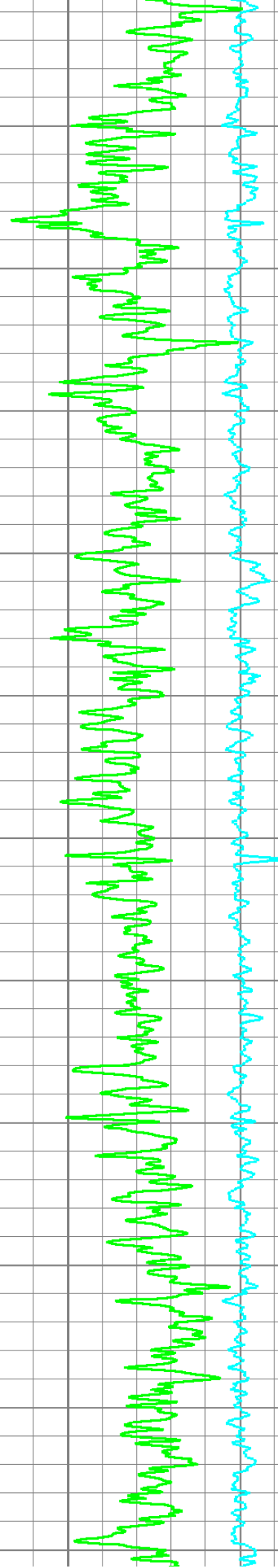
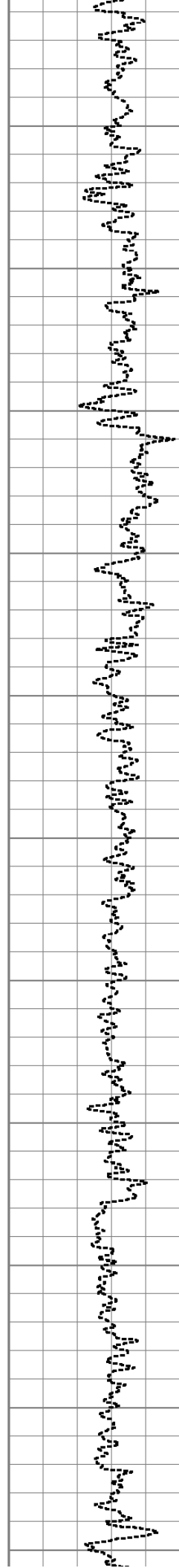
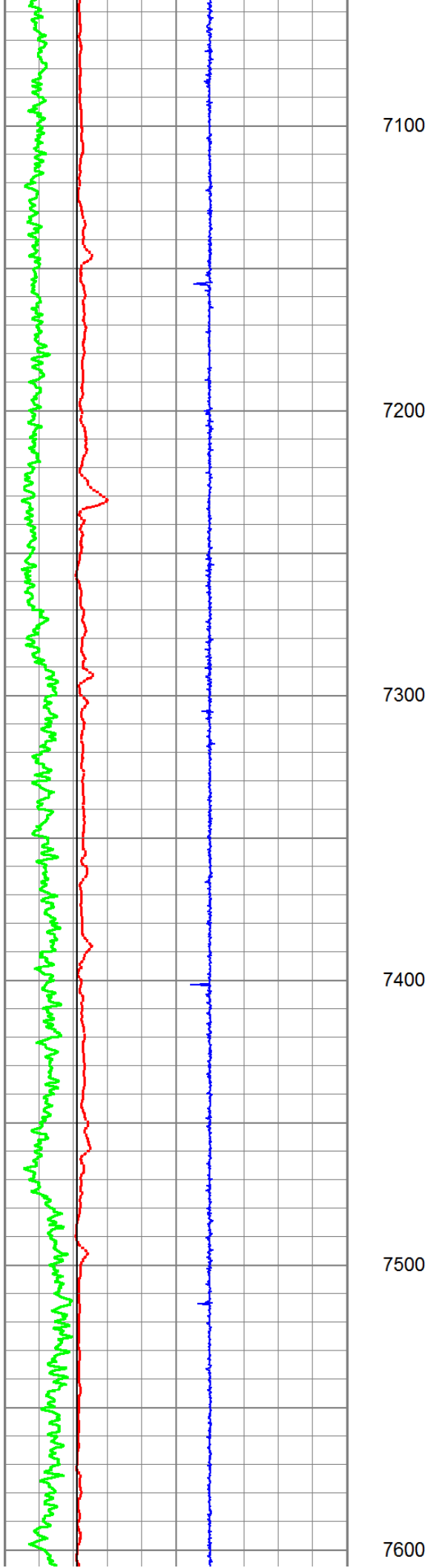
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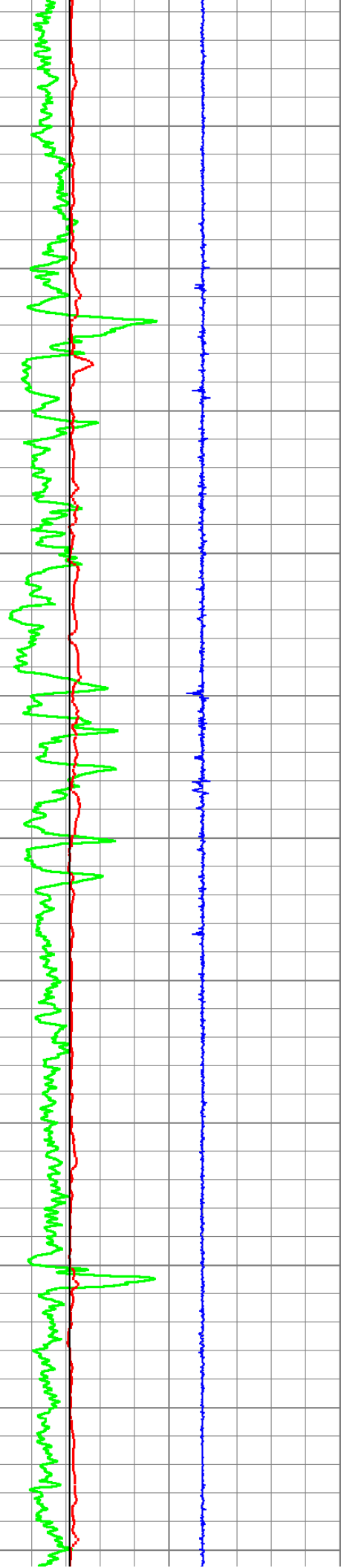
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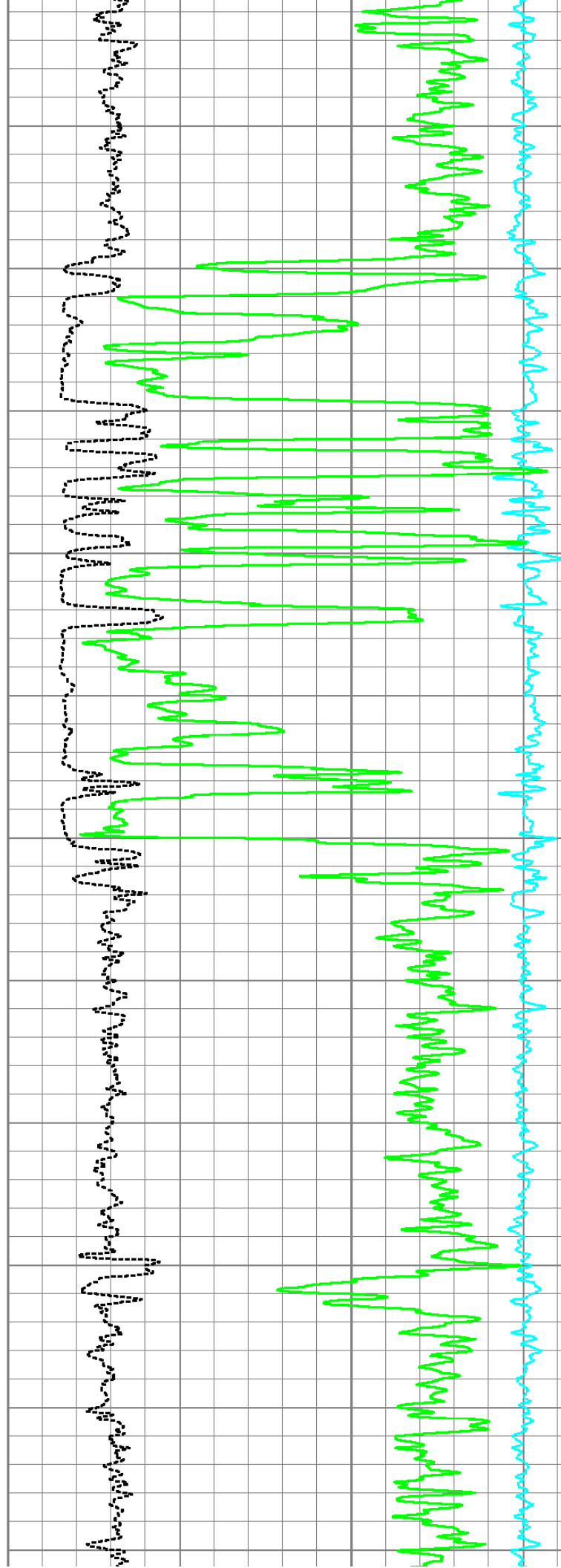
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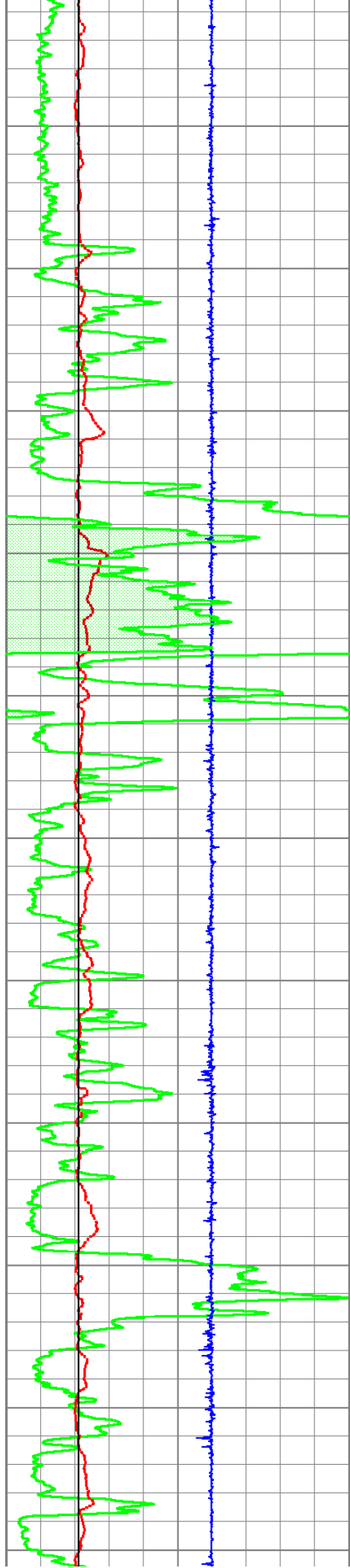
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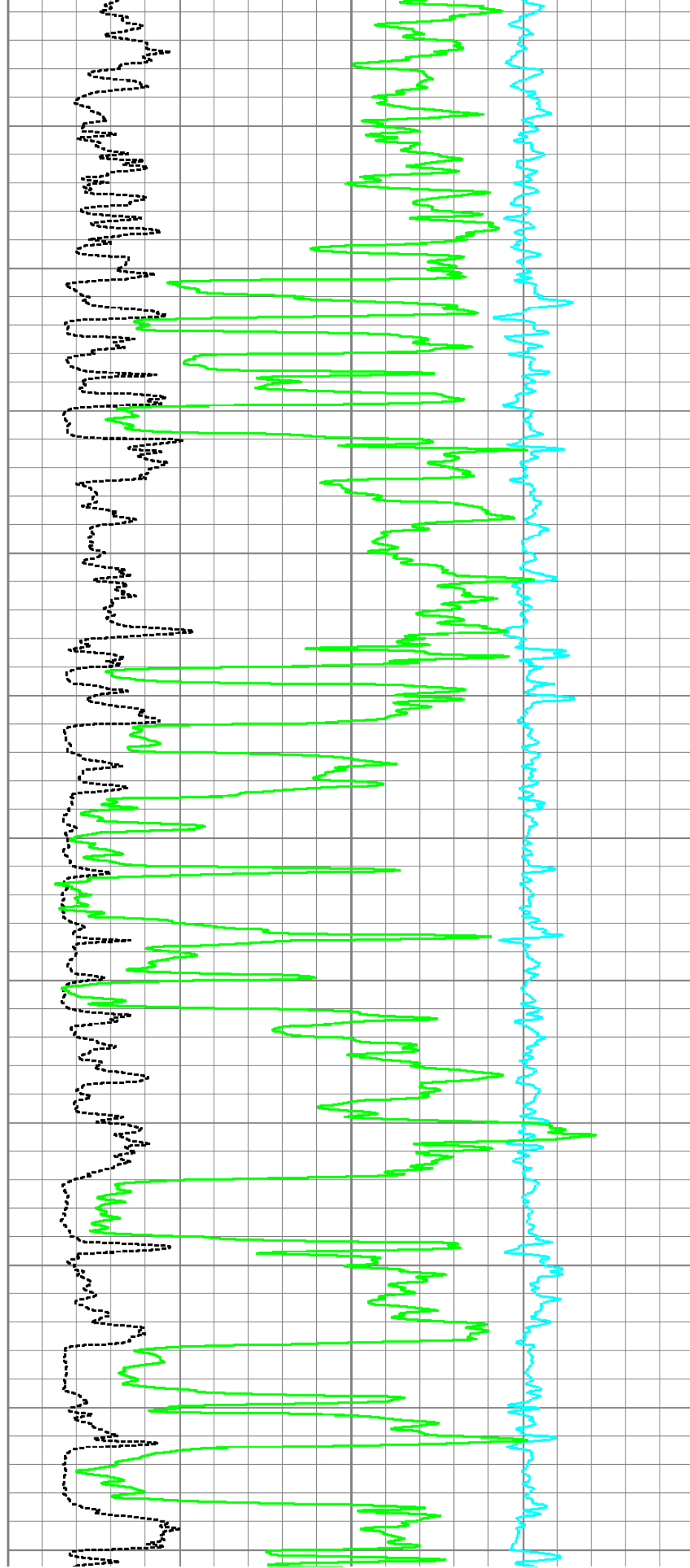
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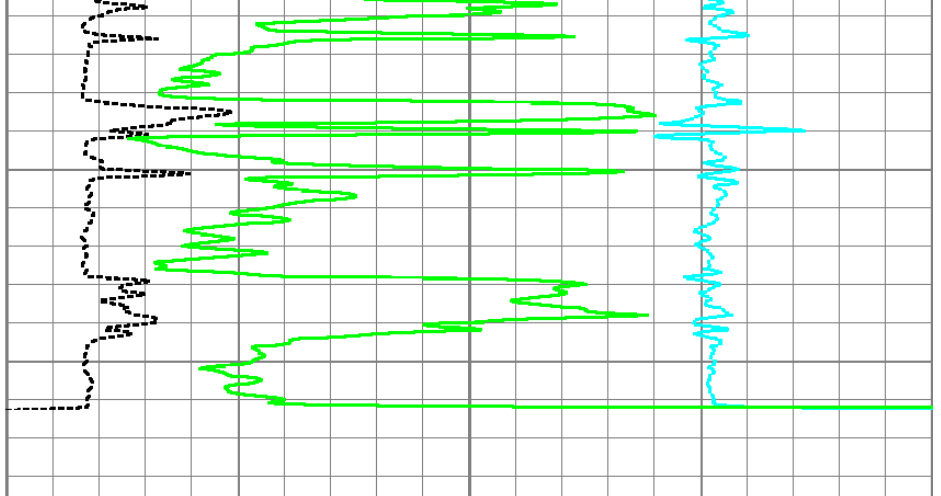
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8800



0	GR (GAPI)	150
4	DCAL (in)	14
4	BOREID (in)	14
-5	ACCY	5

0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
2	RHOB (g/cc)				
					3



MAIN PASS

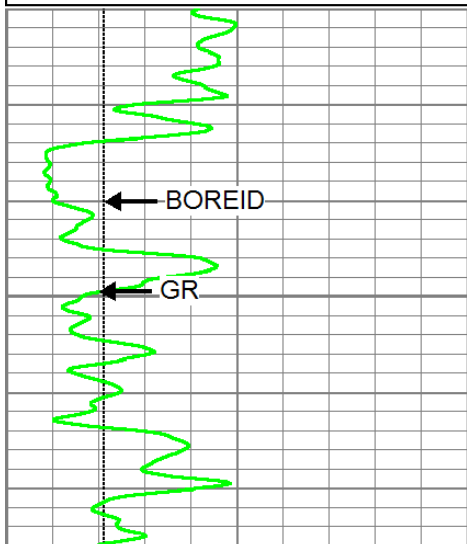


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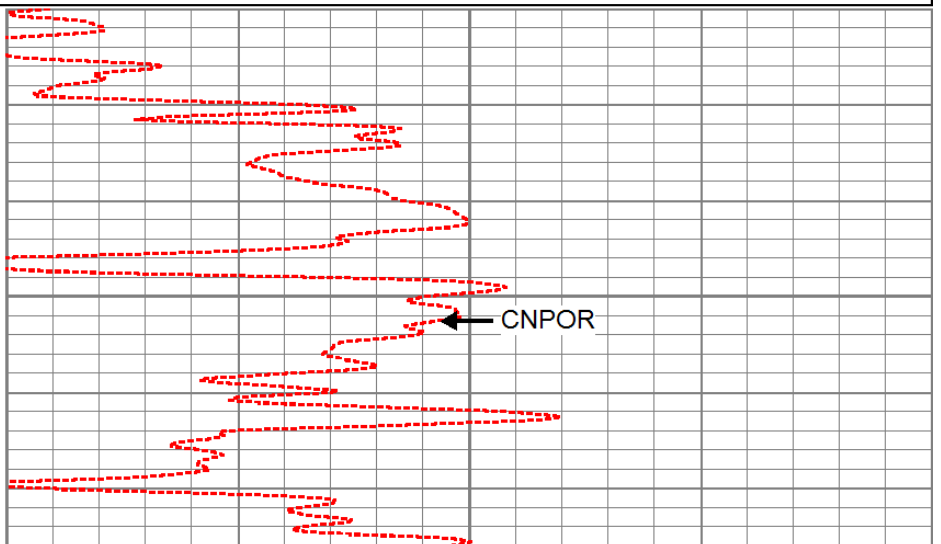
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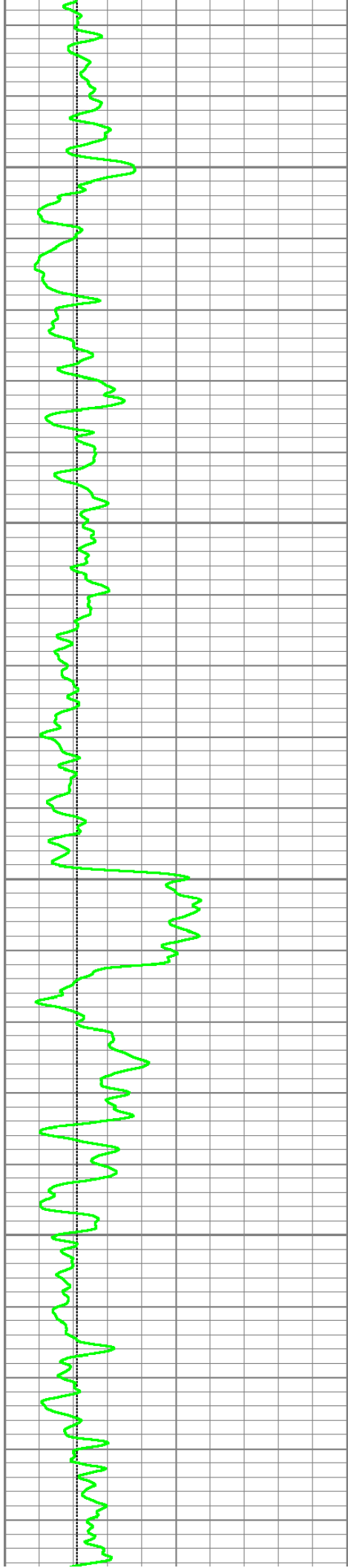
4	DCAL (in)	14
4	BOREID (in)	14
0	GR (GAPI)	150
-5	ACCY	5
	TBHV (ft3)	

30	CNPOR (pu)		-10		
30	DPHI (pu)		-10		
0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
	ABHV (ft3)				



2500



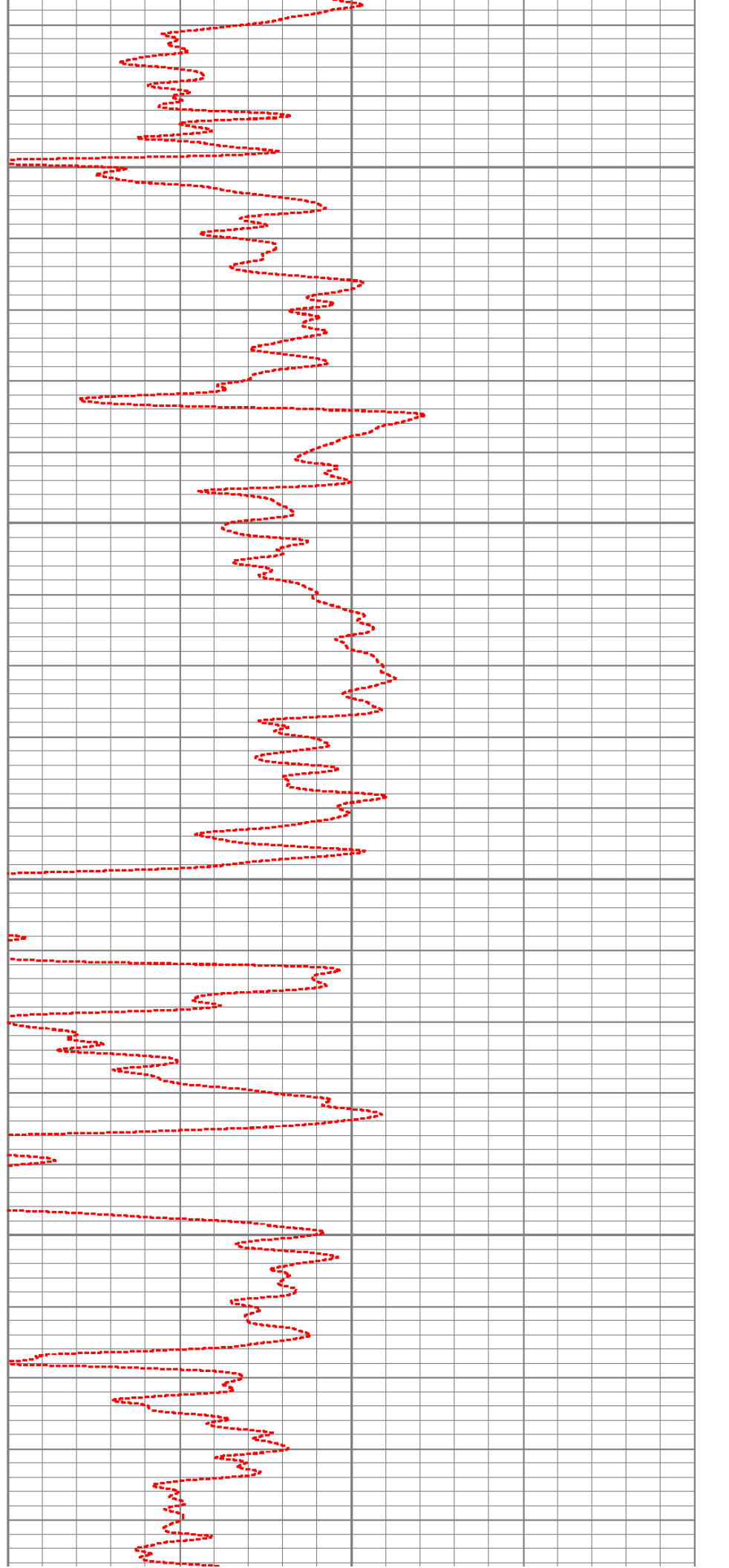


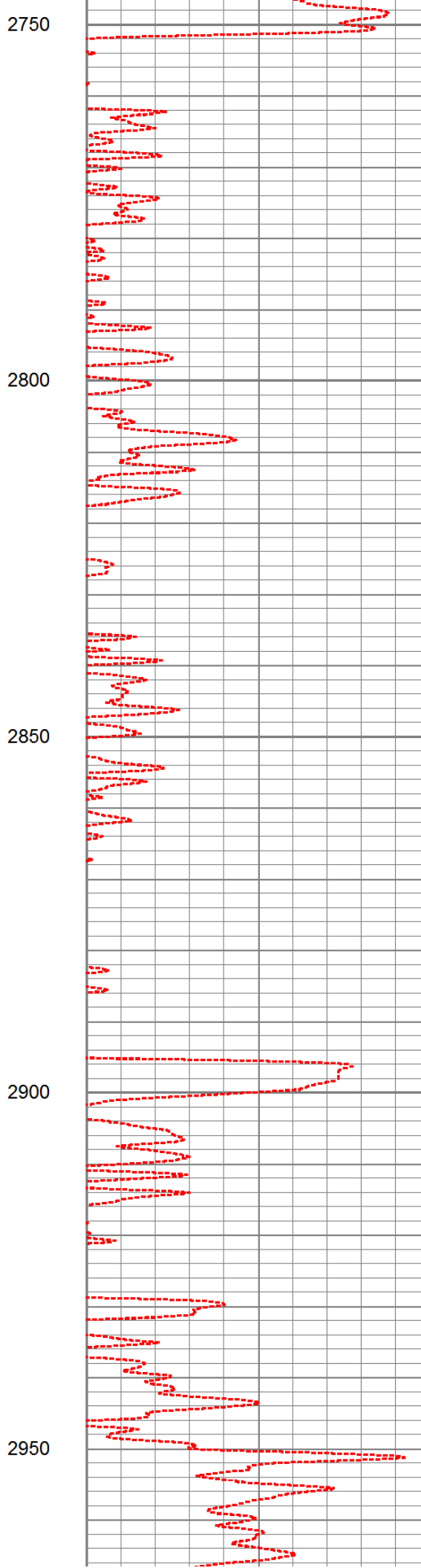
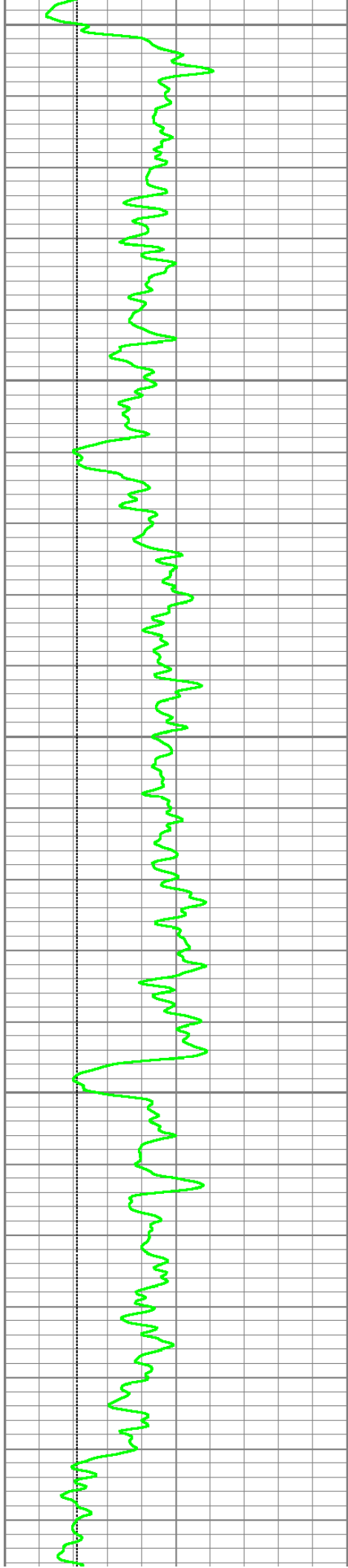
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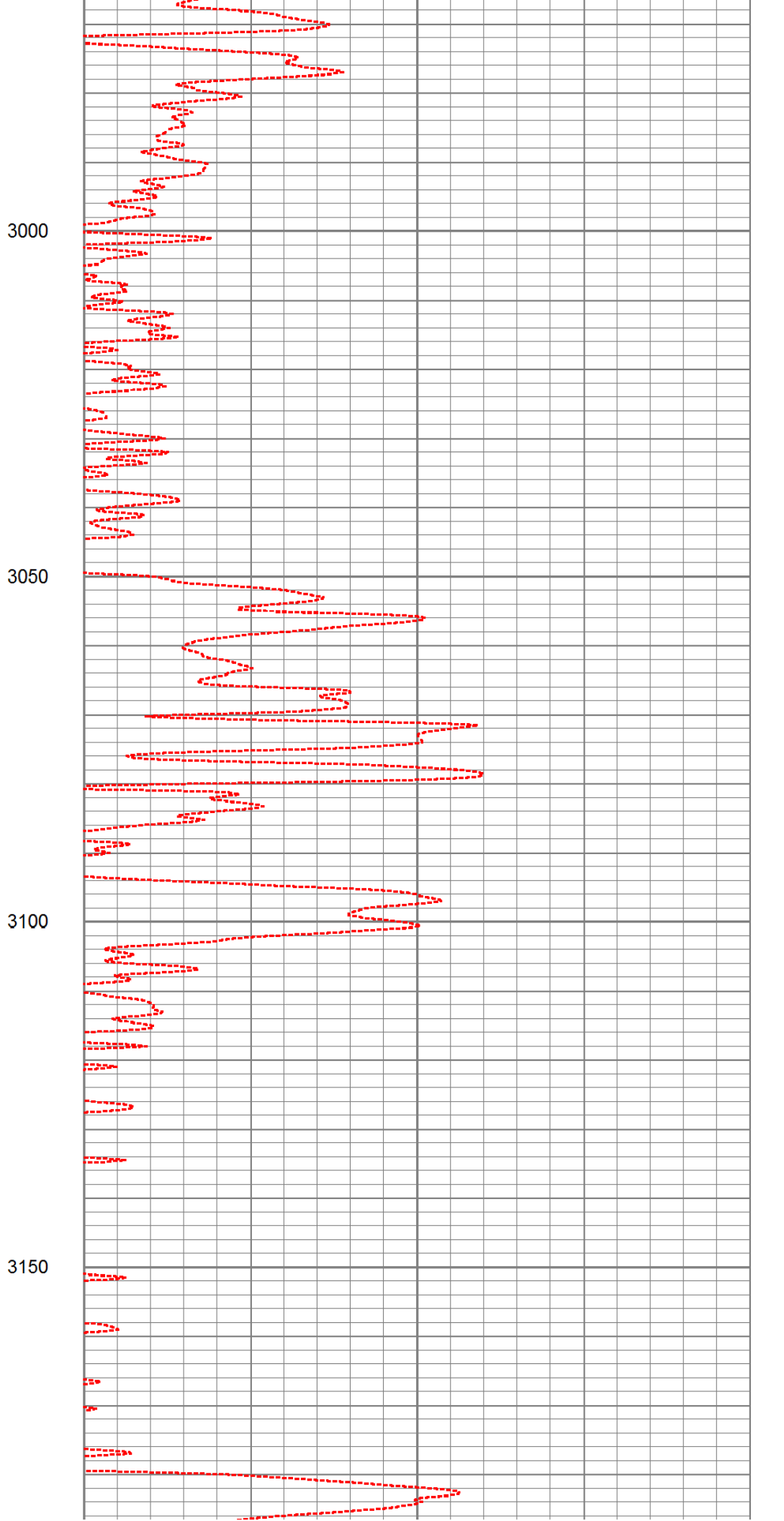
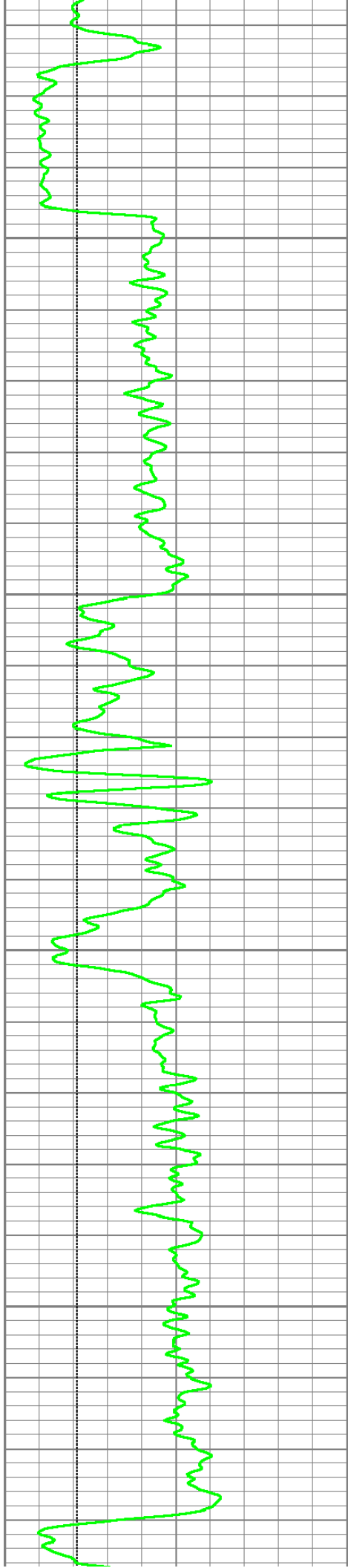
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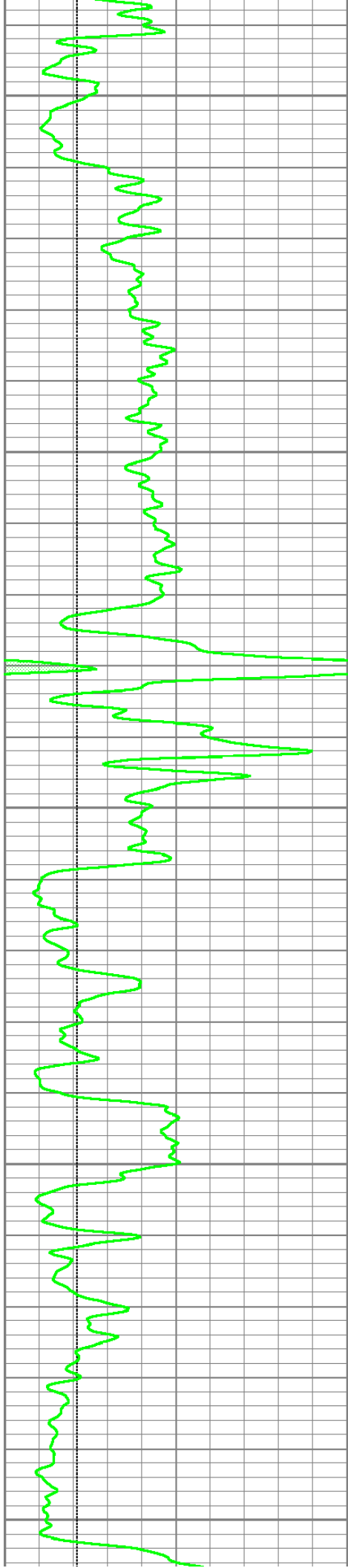
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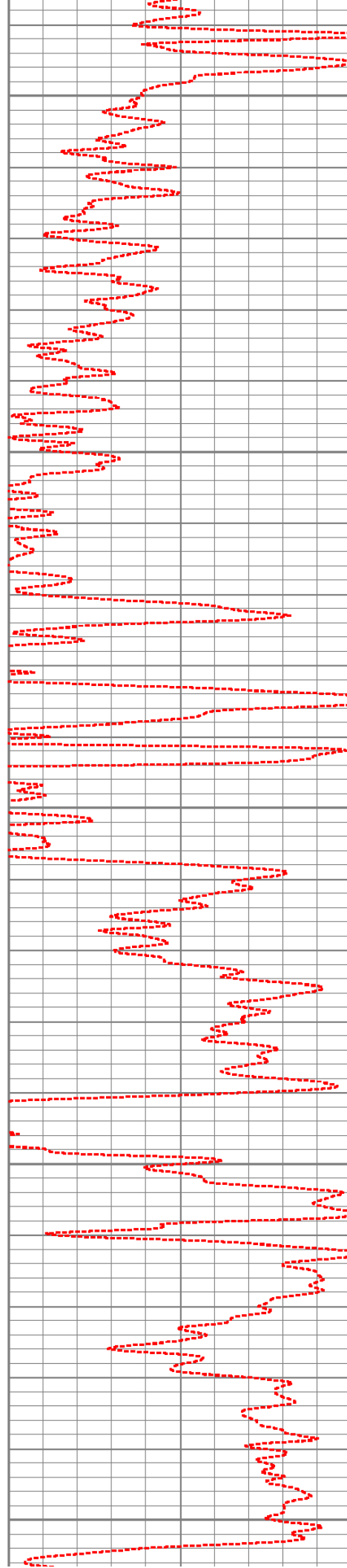
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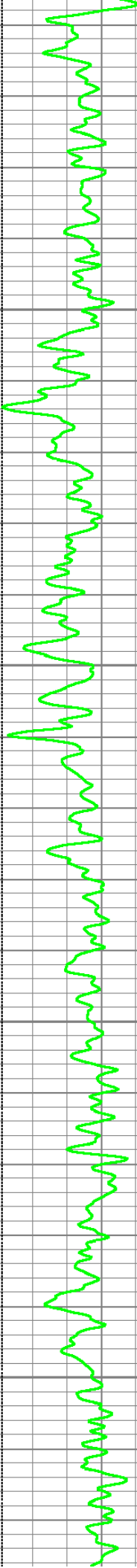
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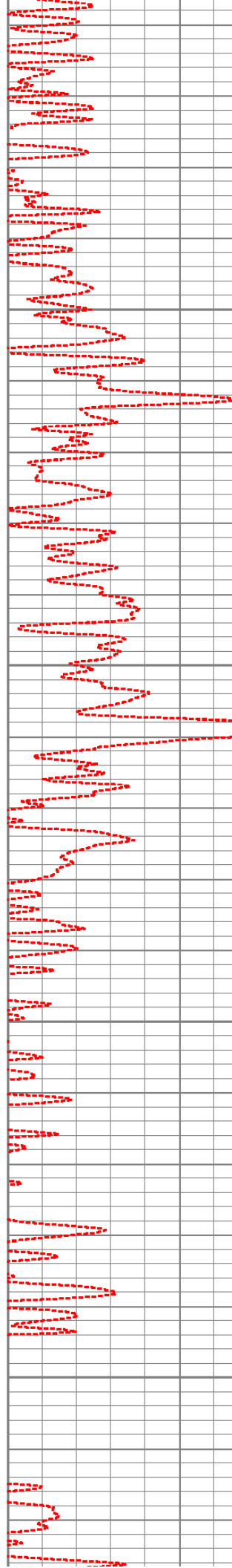


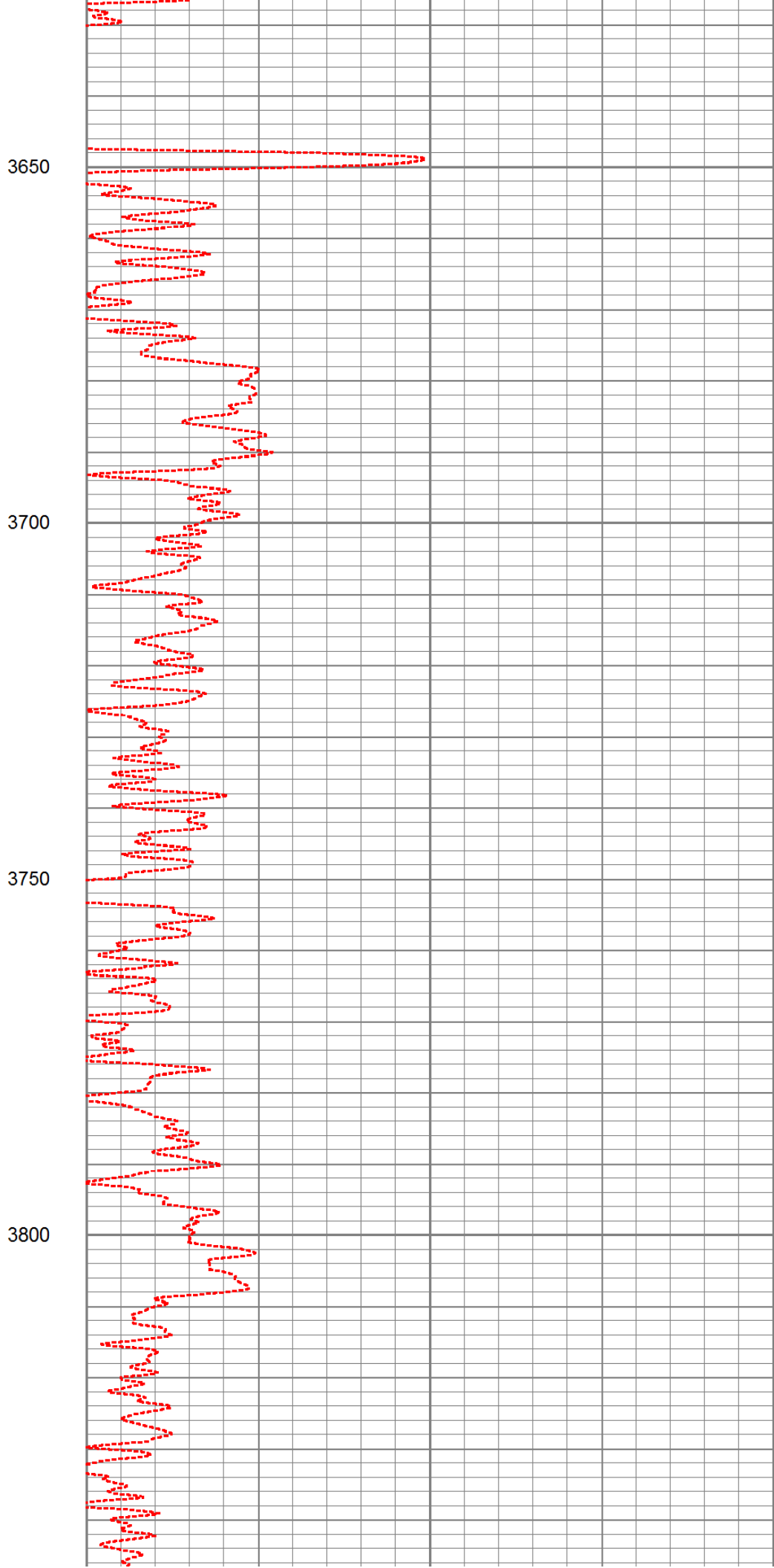
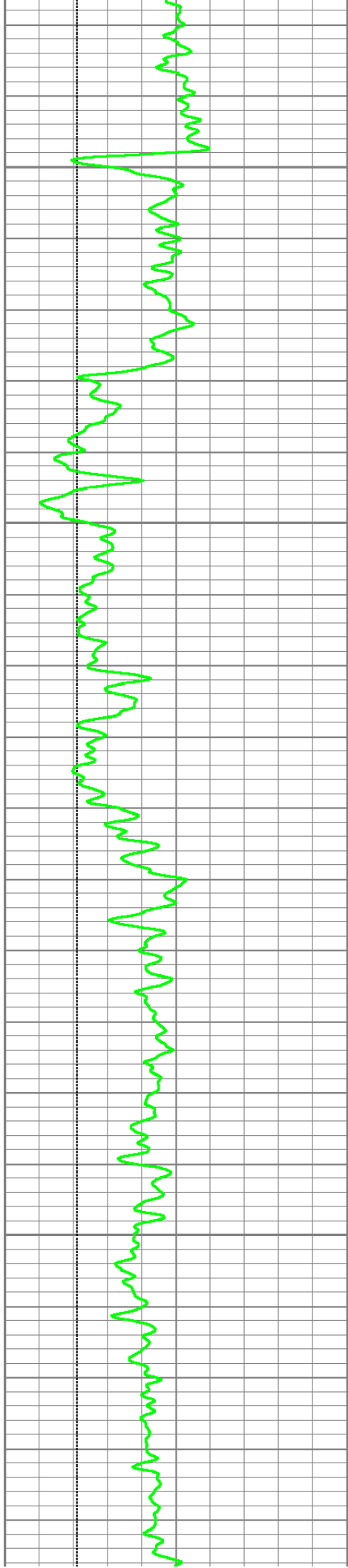
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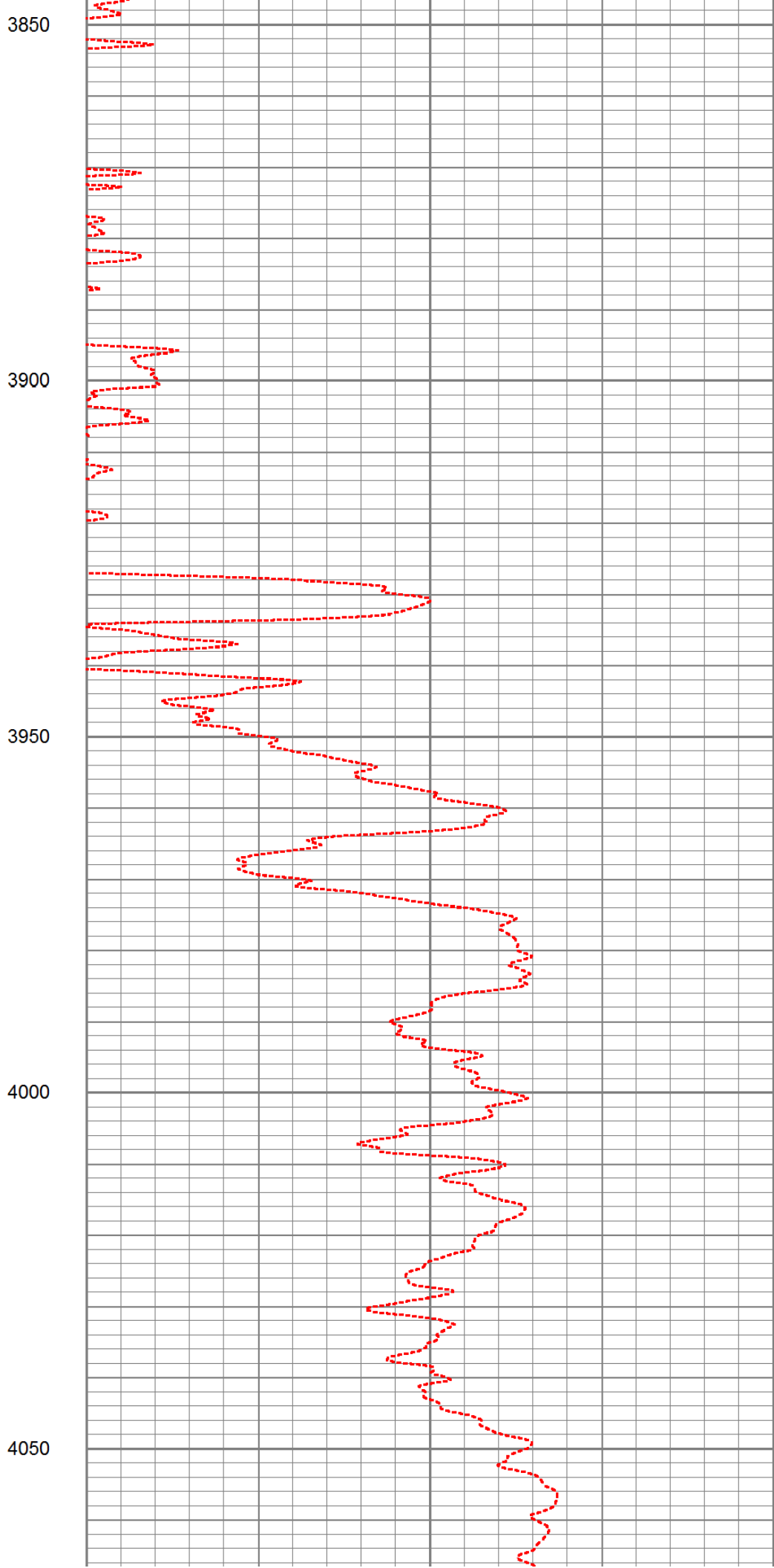
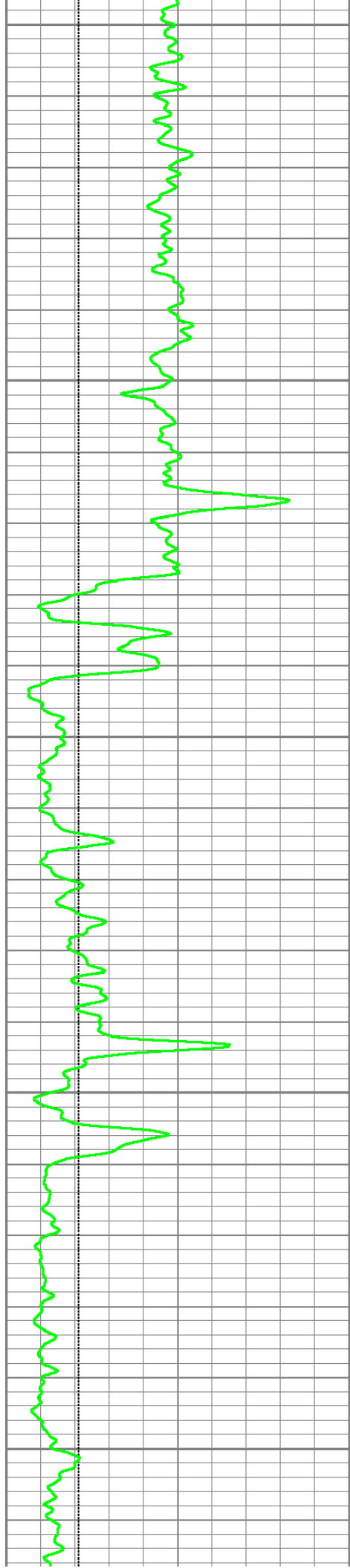
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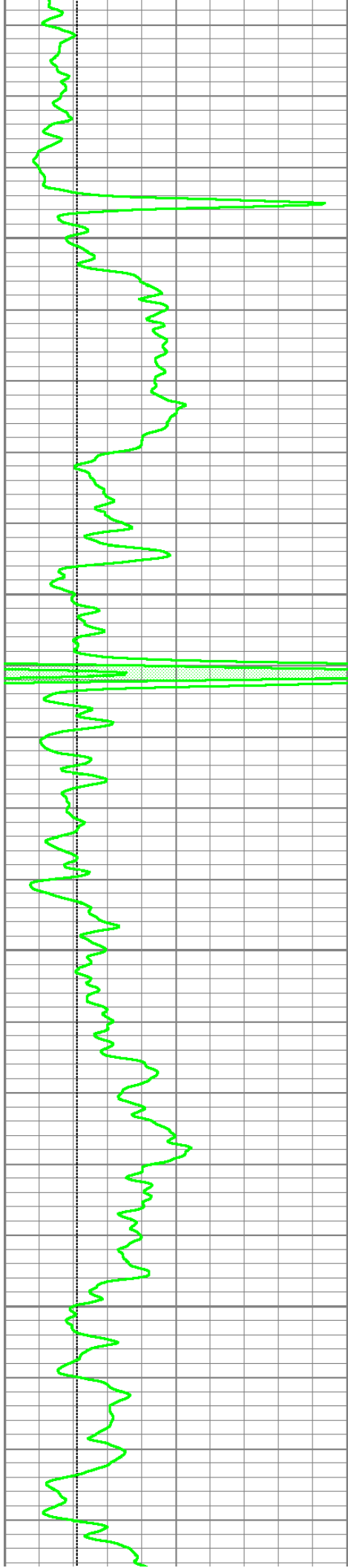
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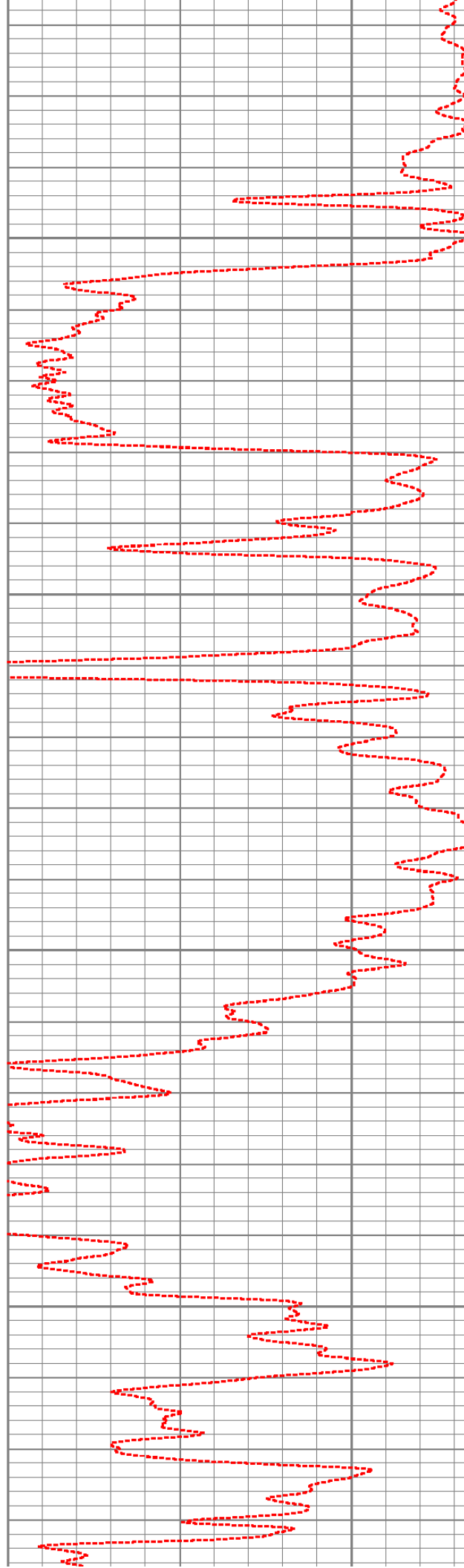


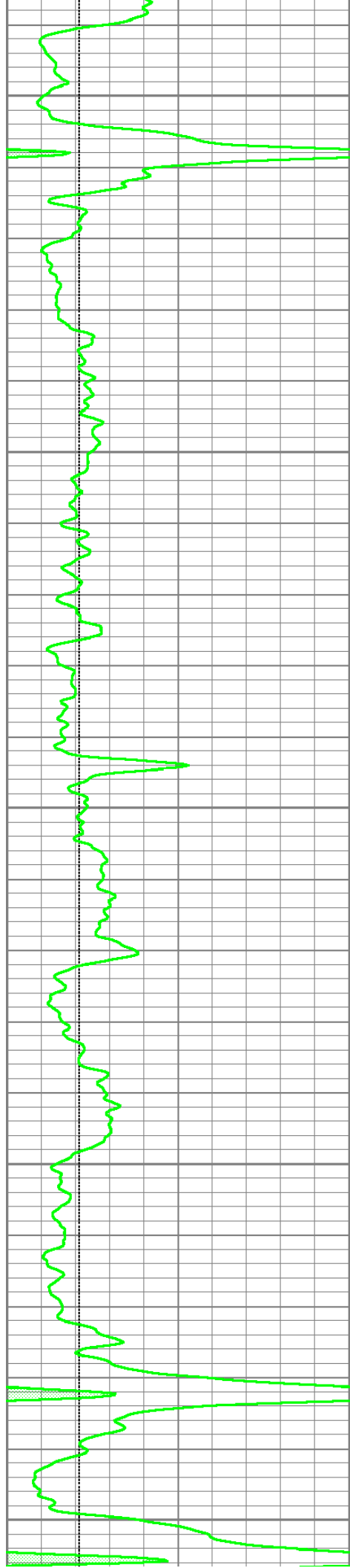
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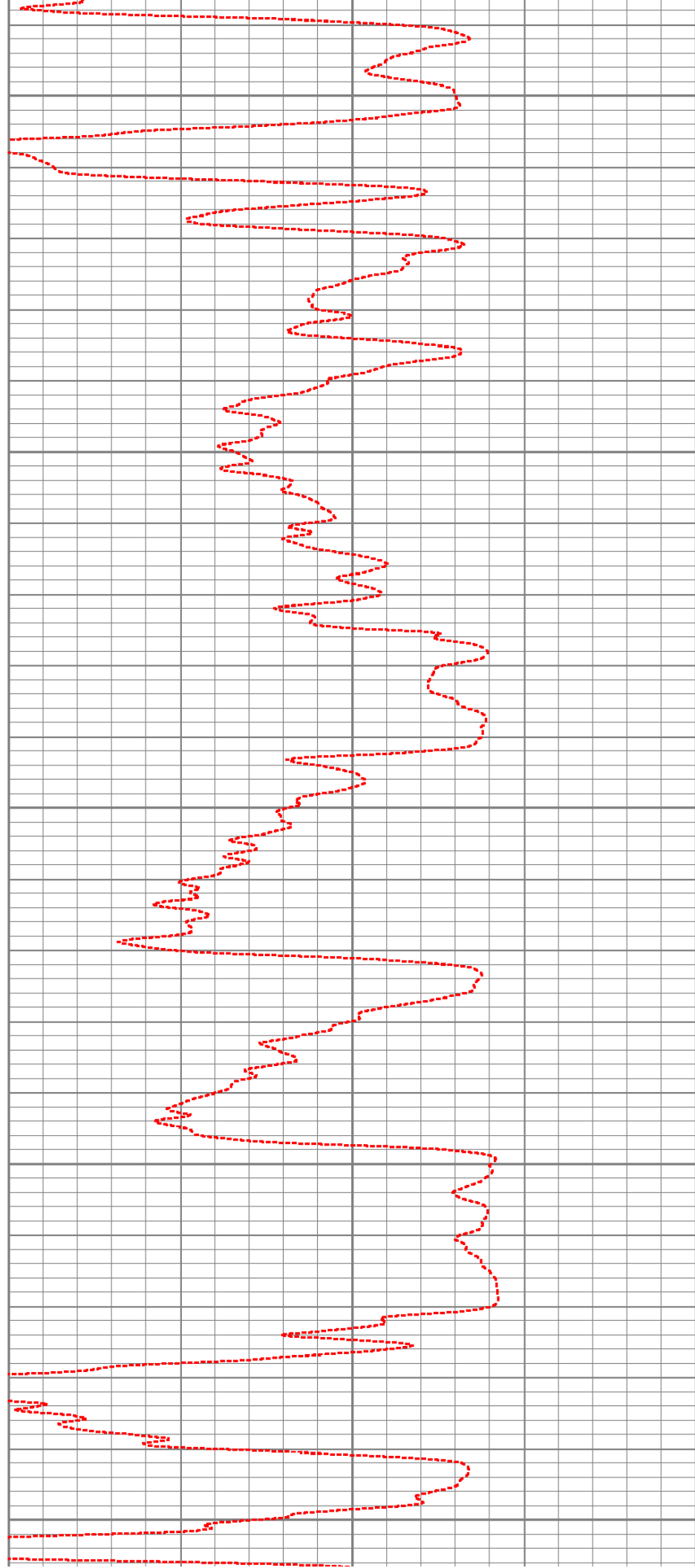
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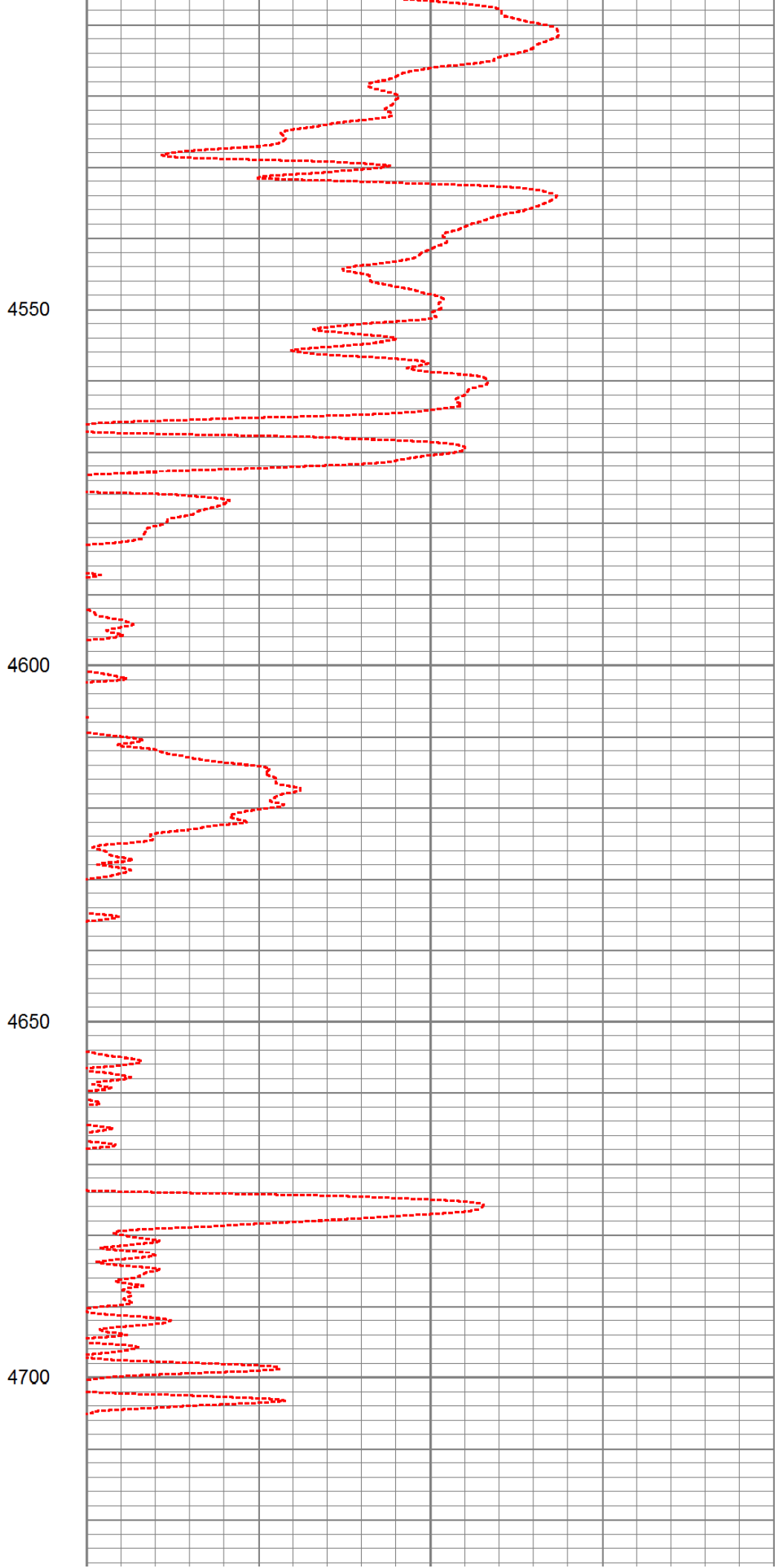
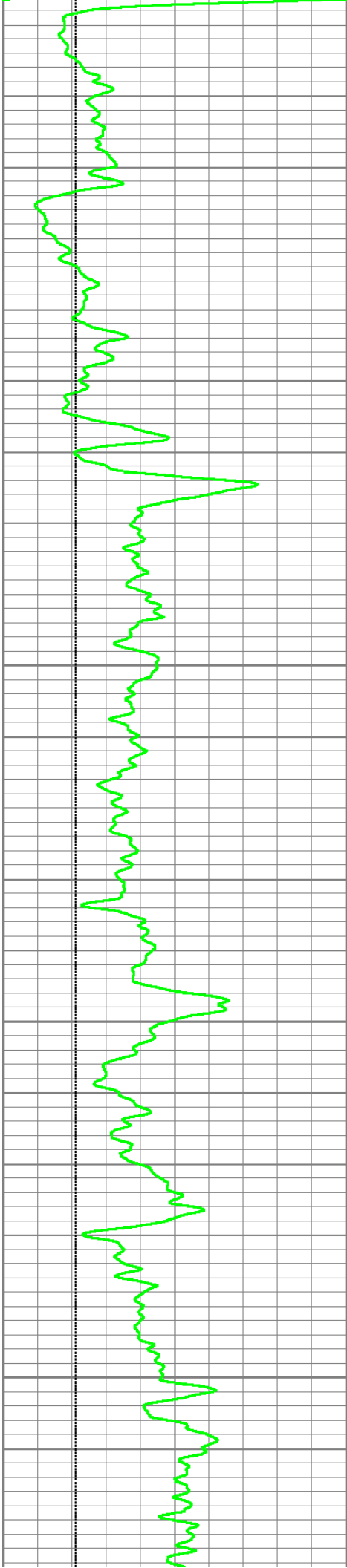
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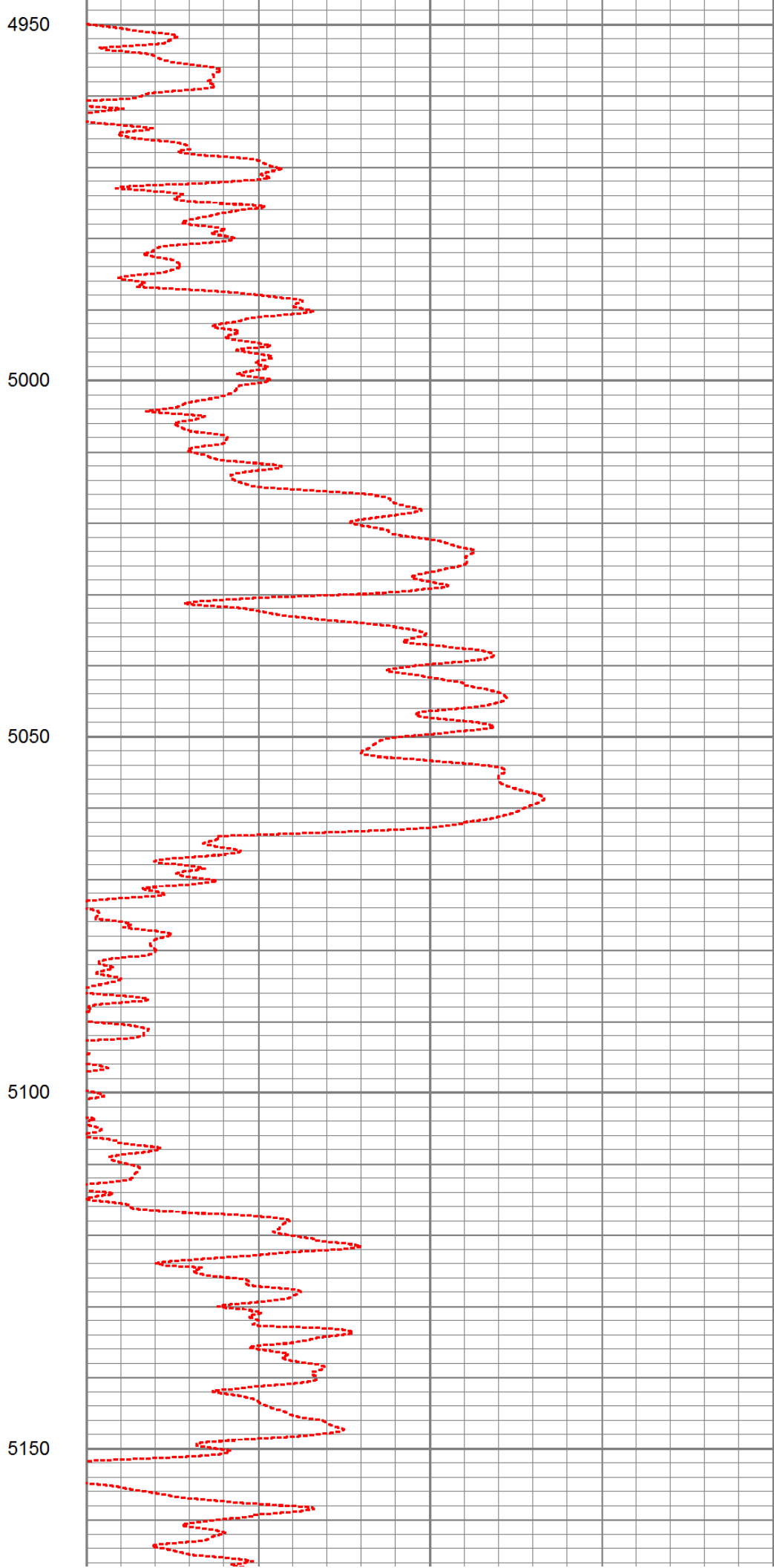
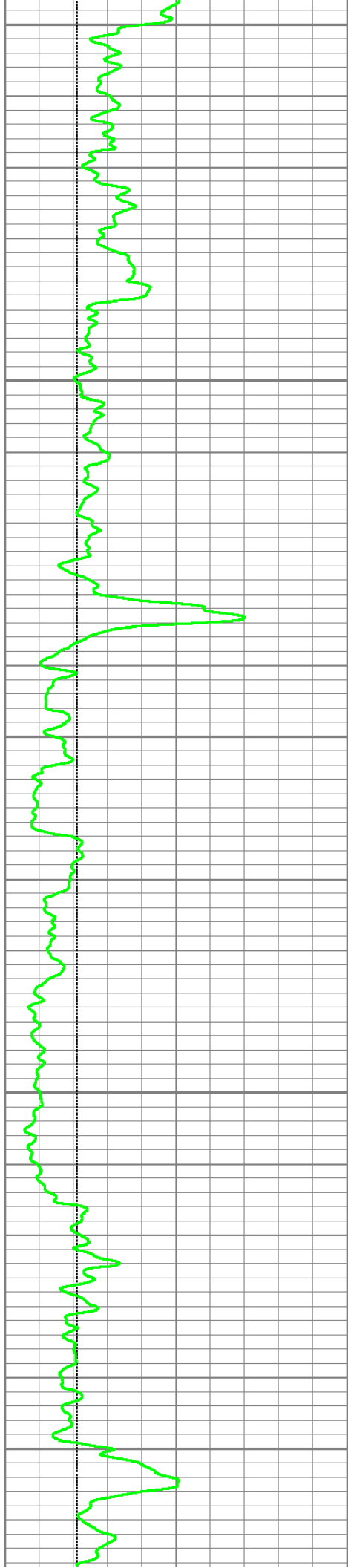
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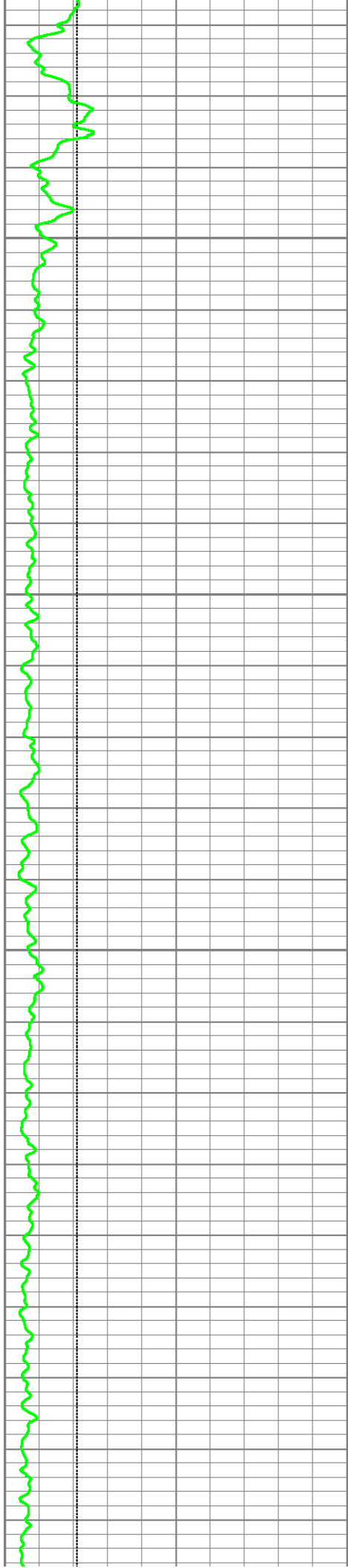
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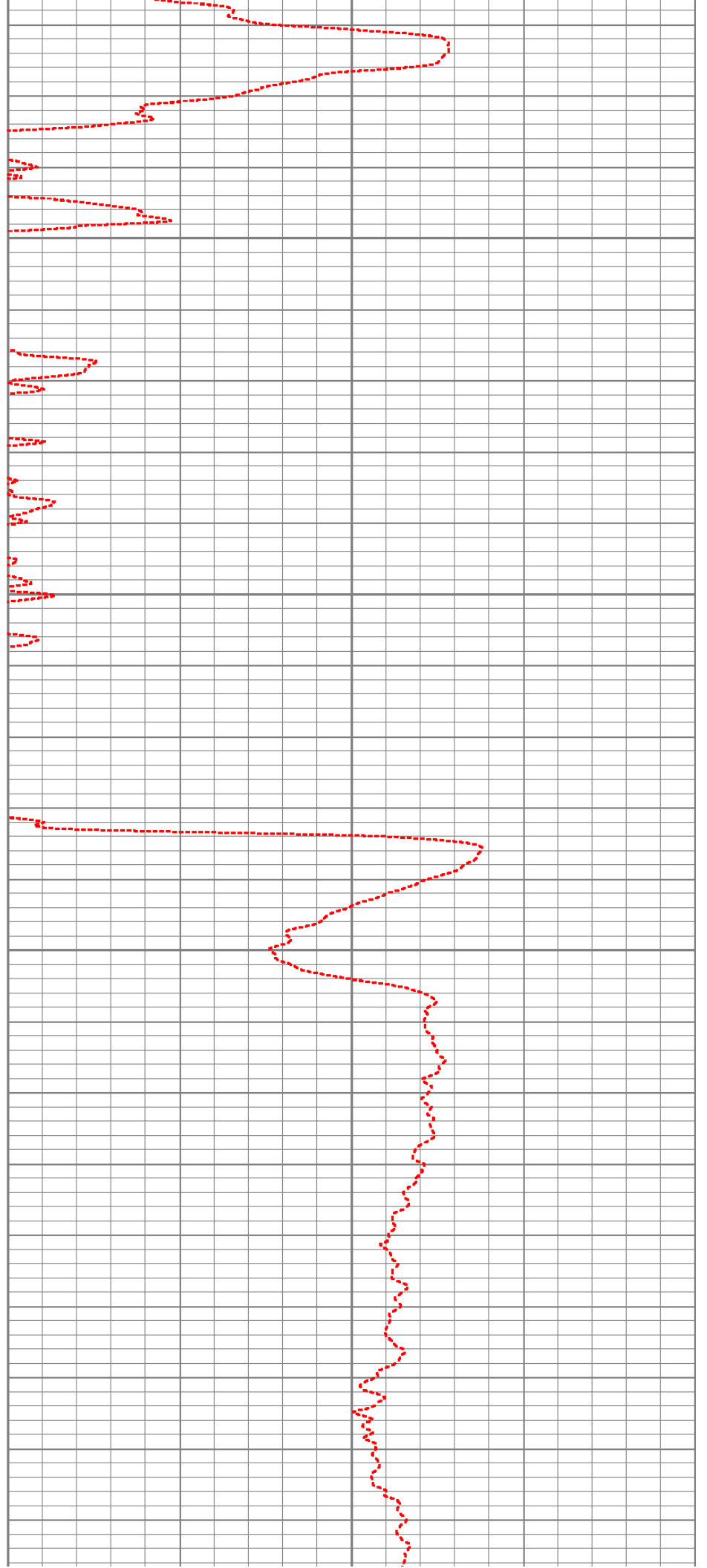


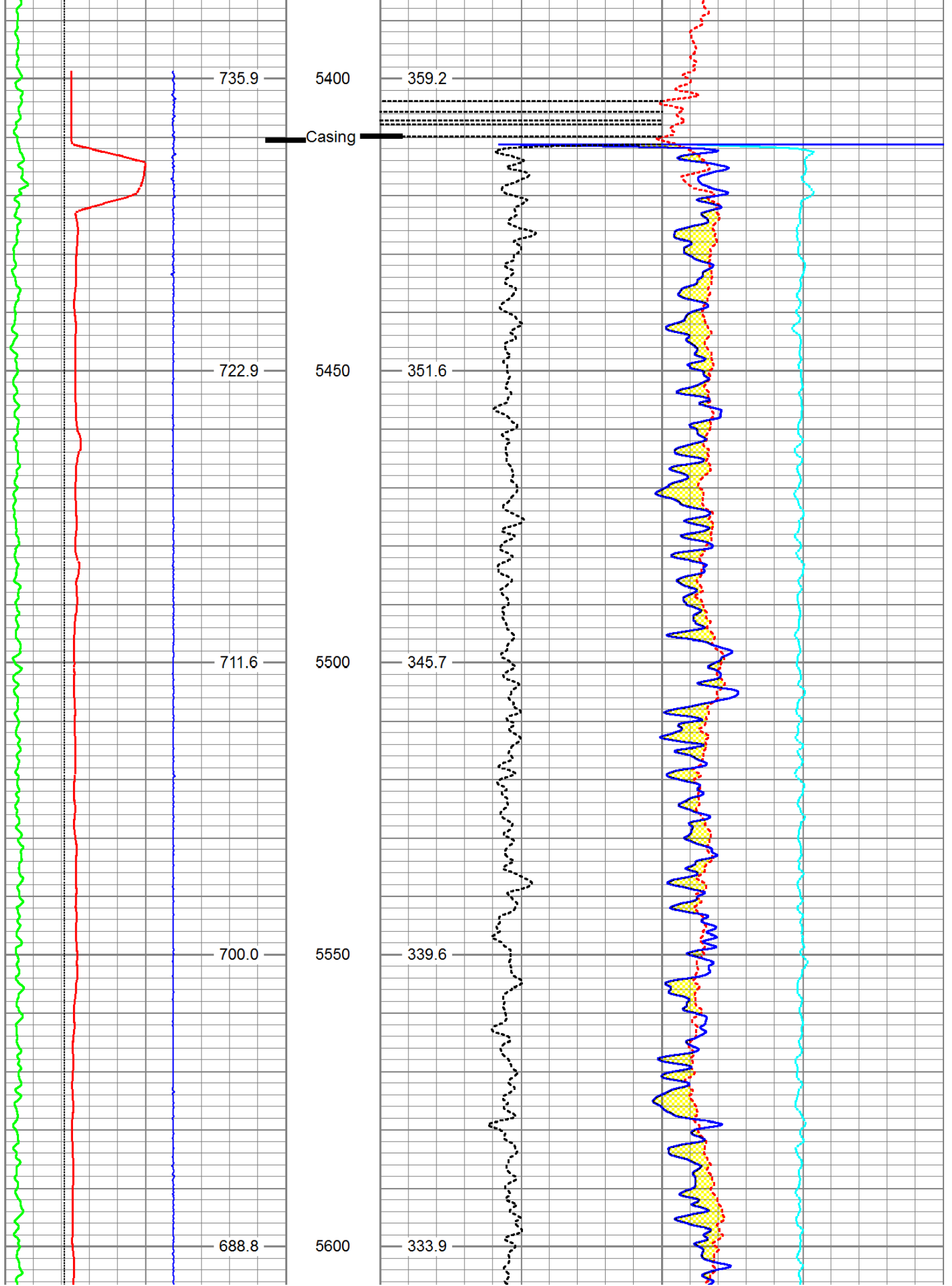
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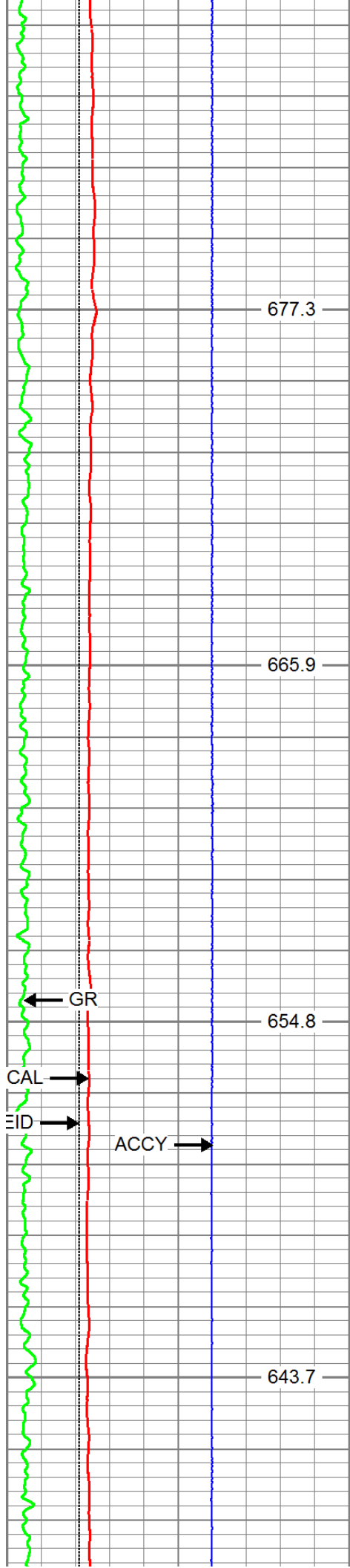
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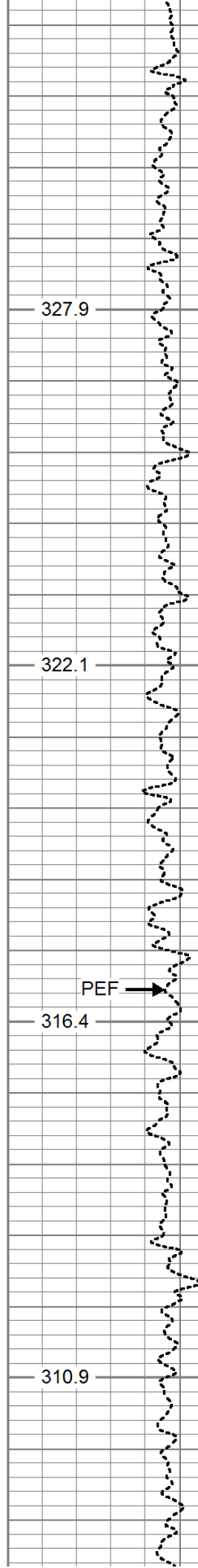
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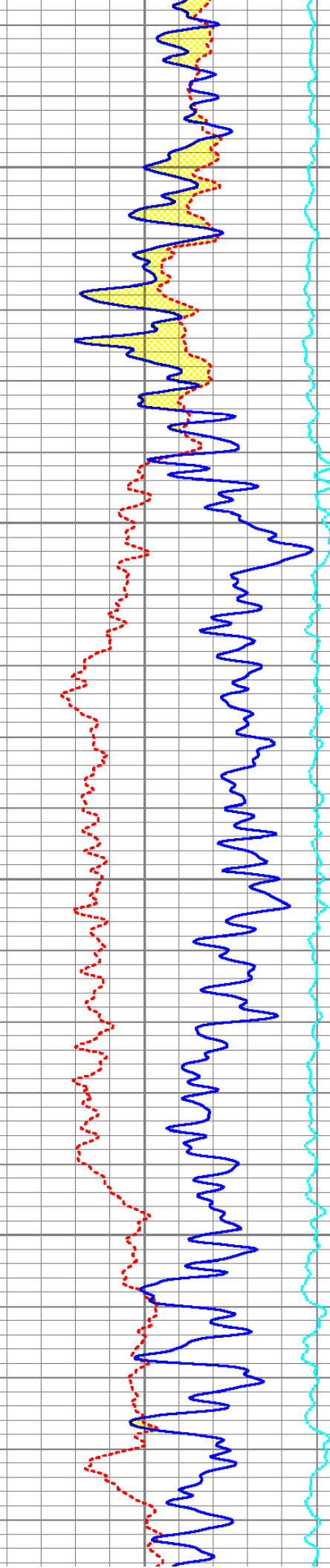
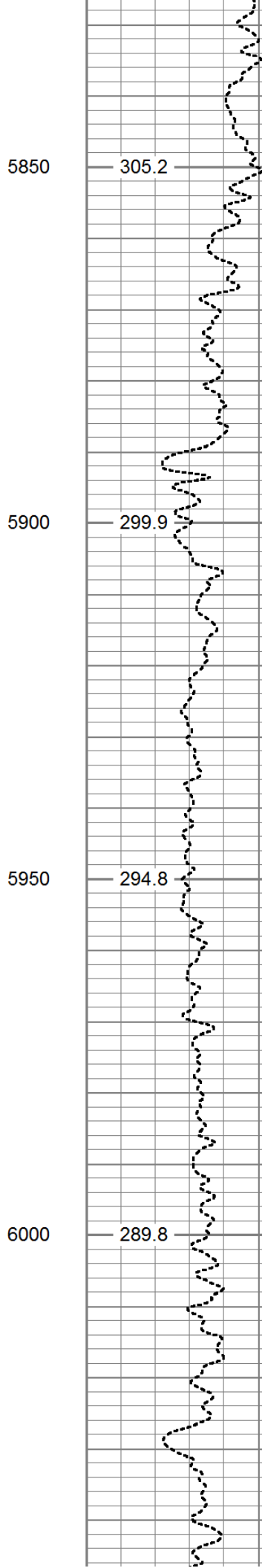
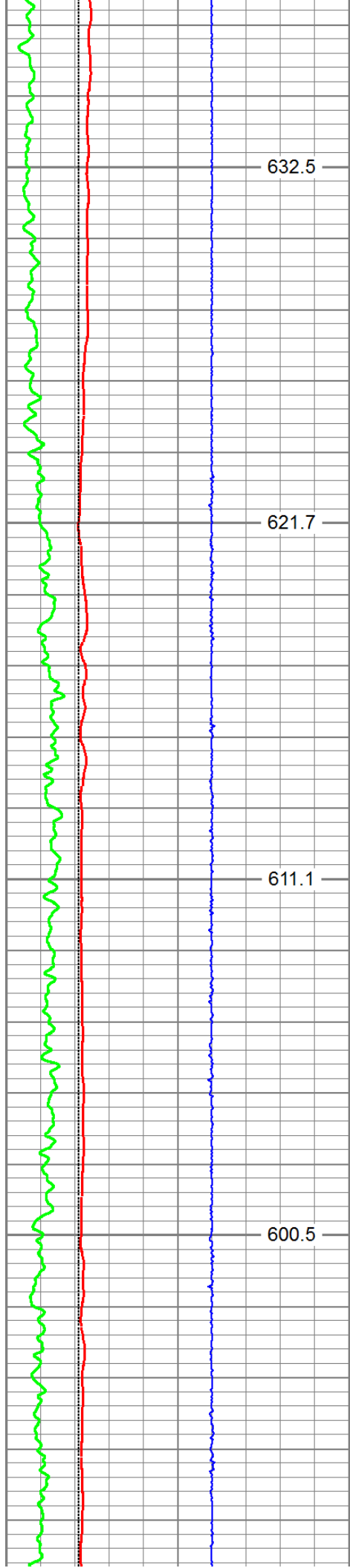
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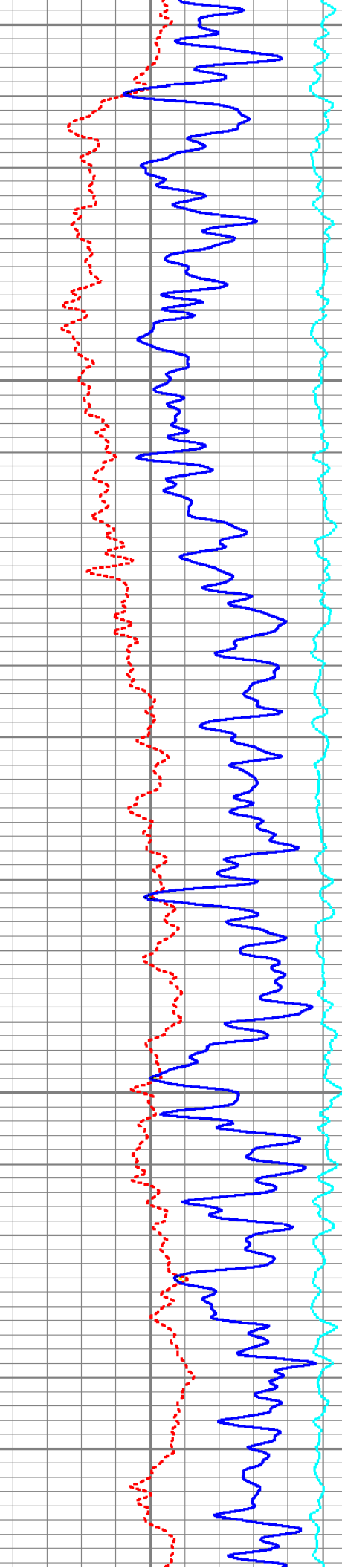
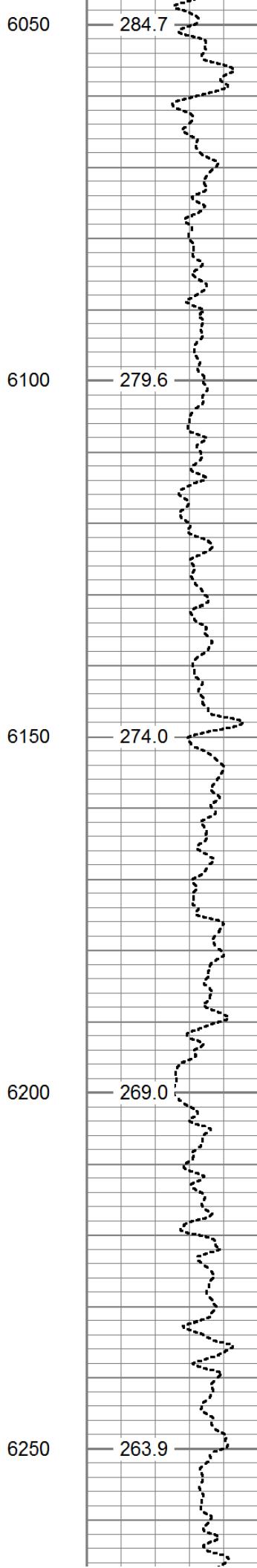
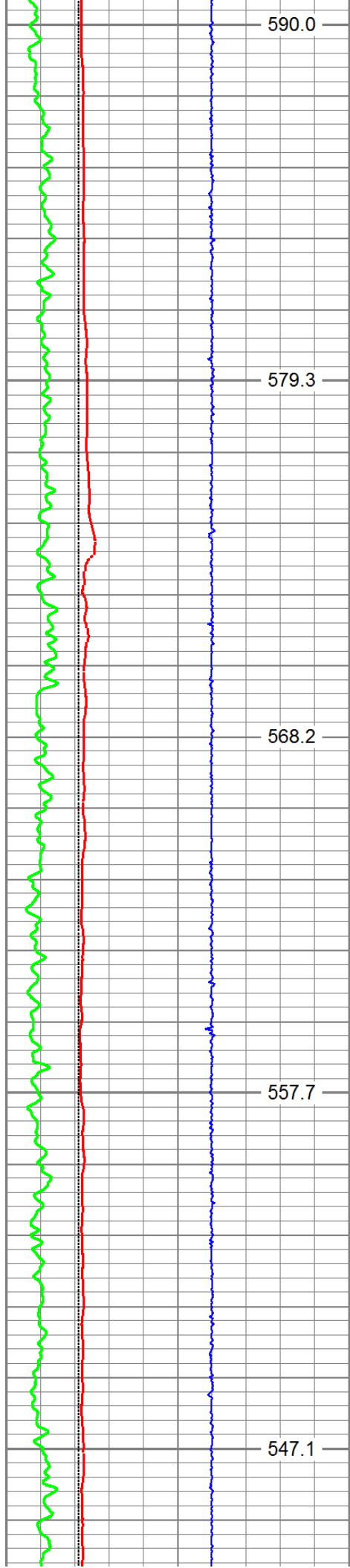
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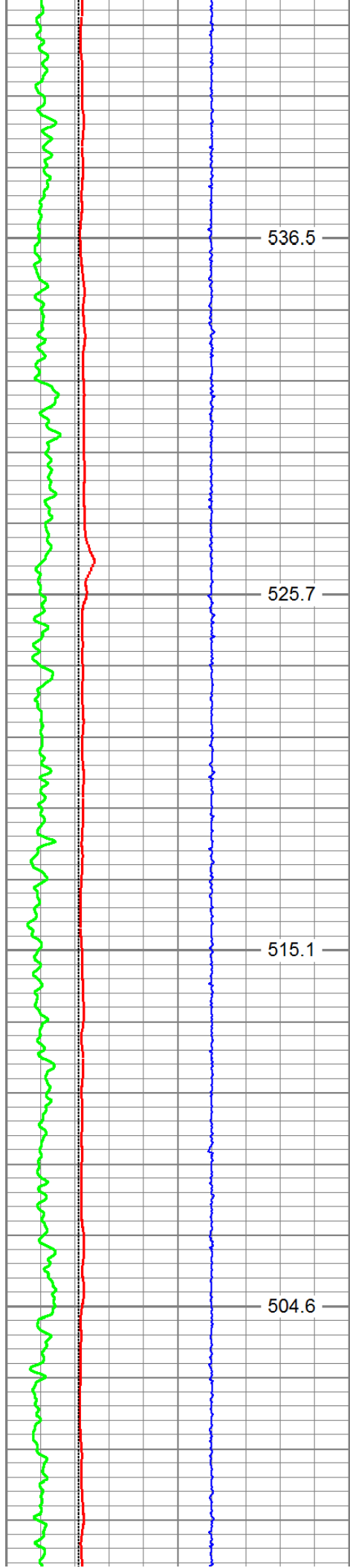
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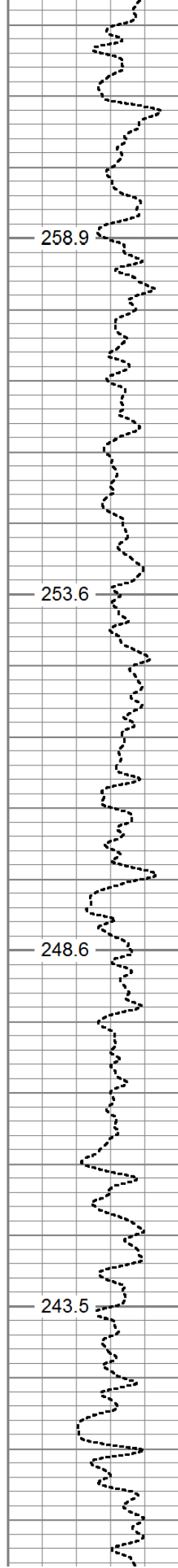


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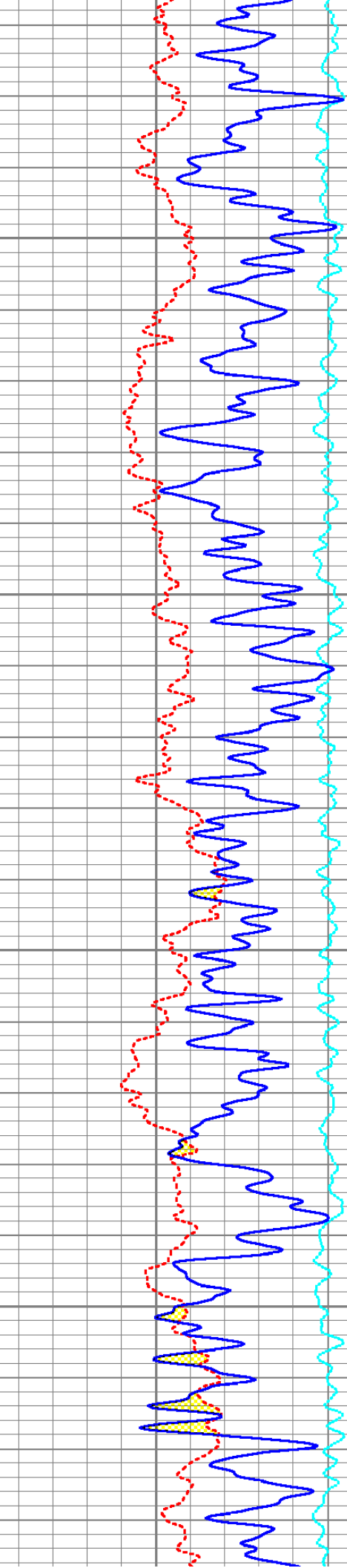


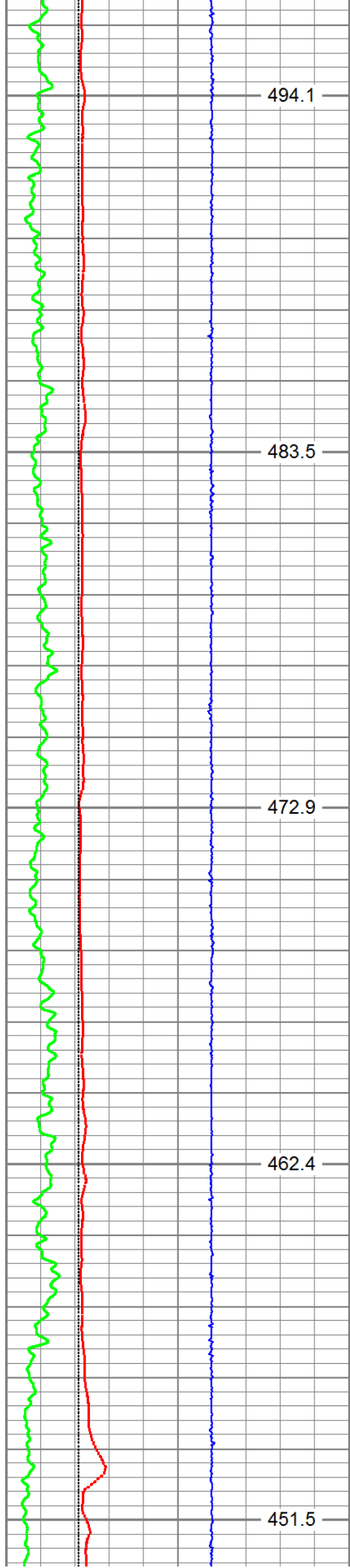
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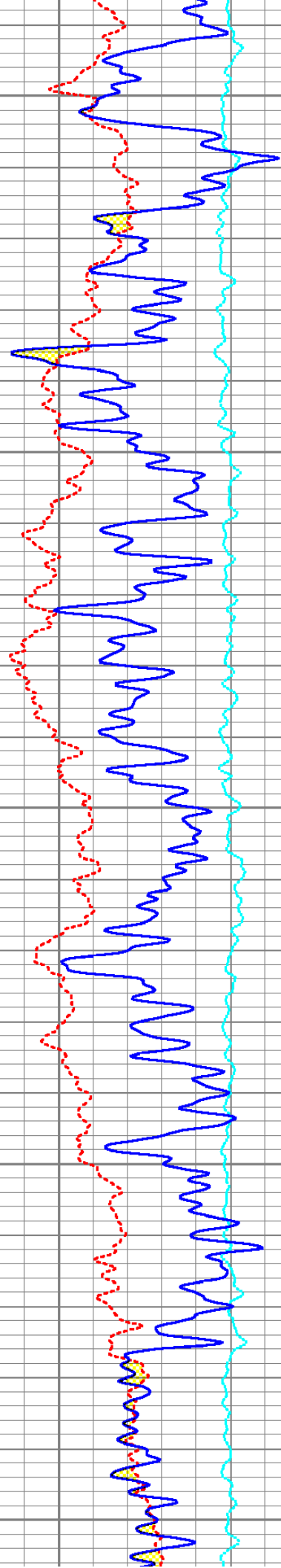
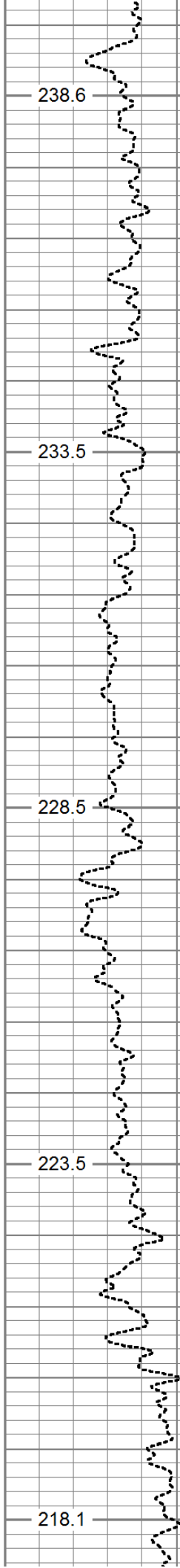
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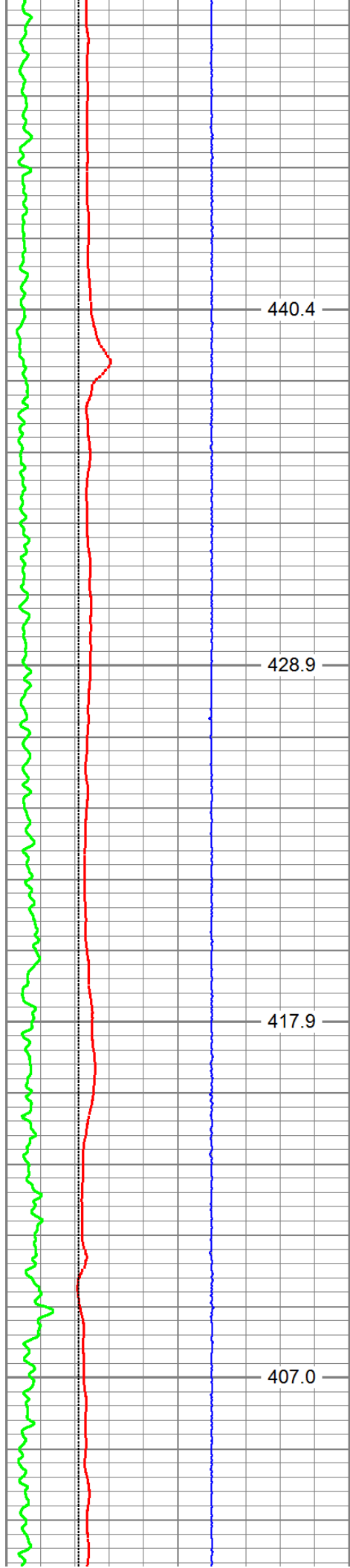
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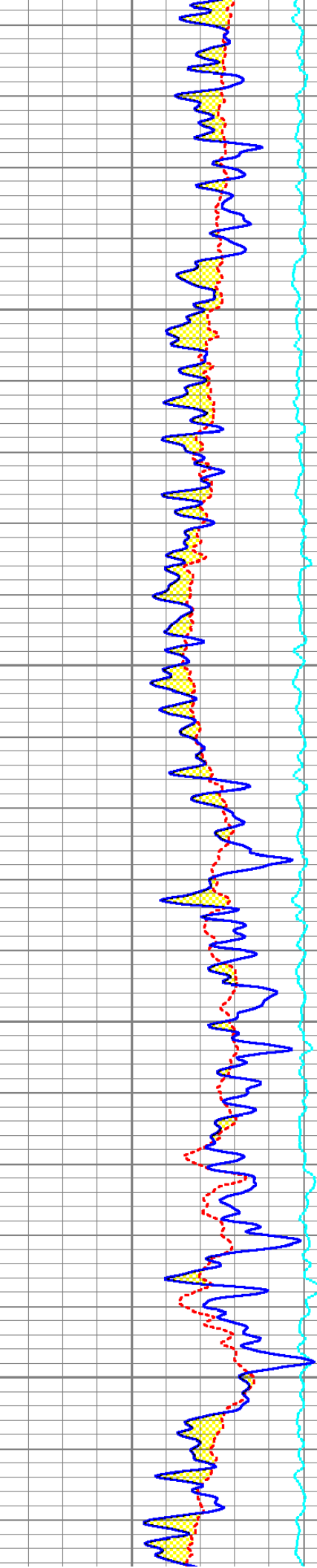
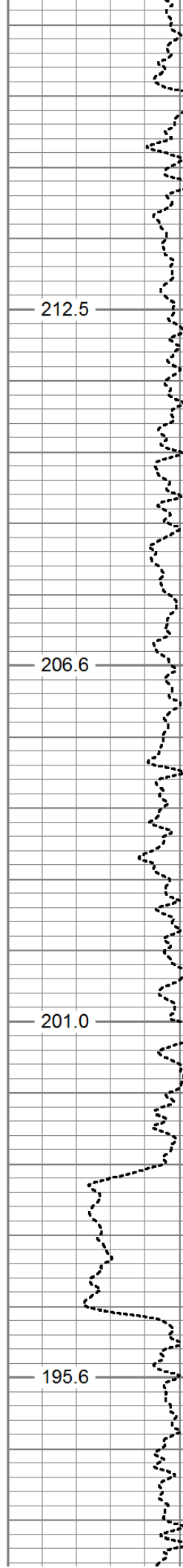


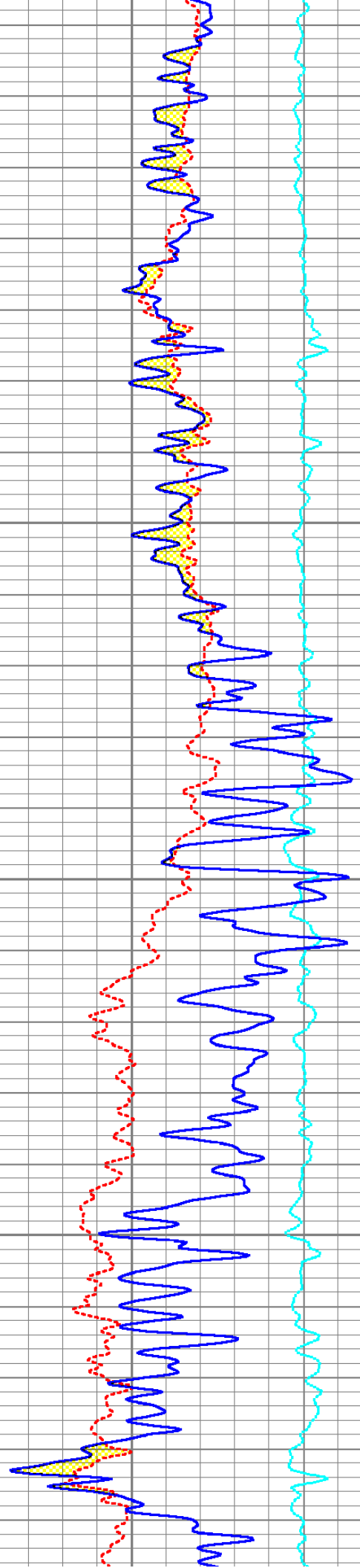
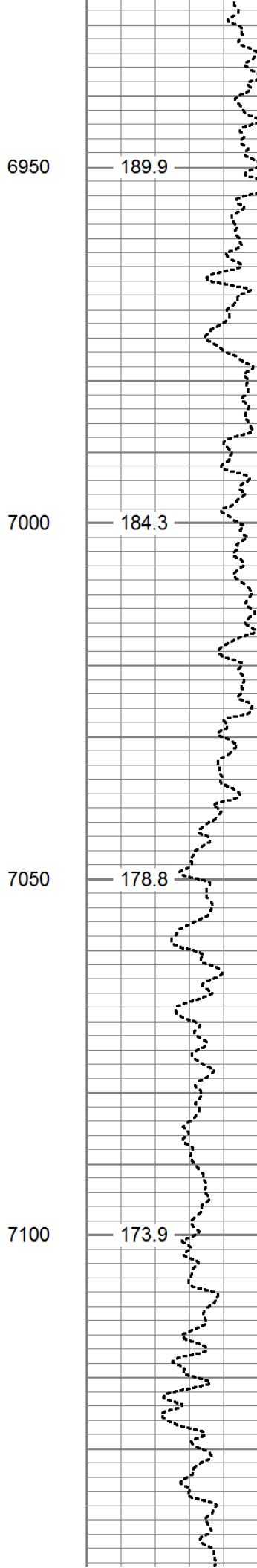
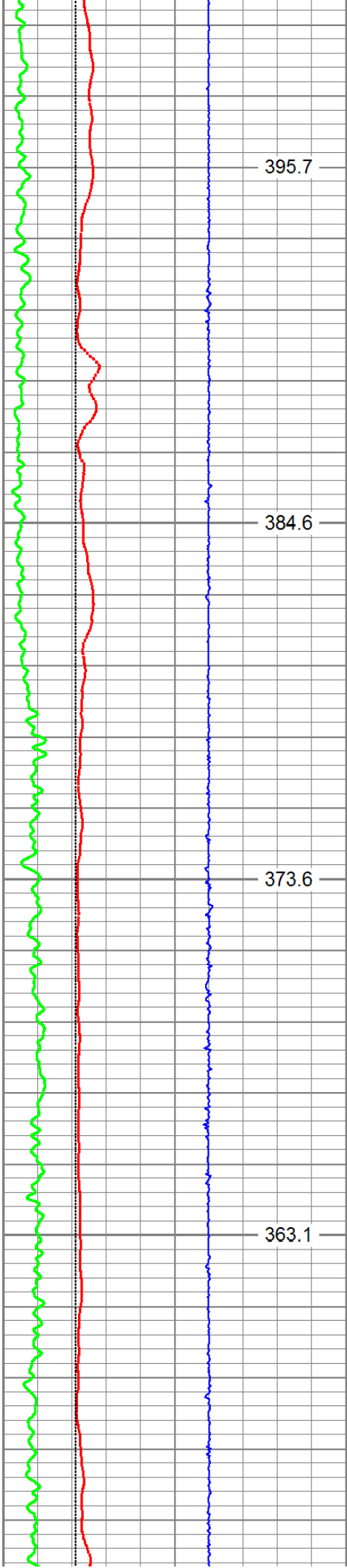
6750

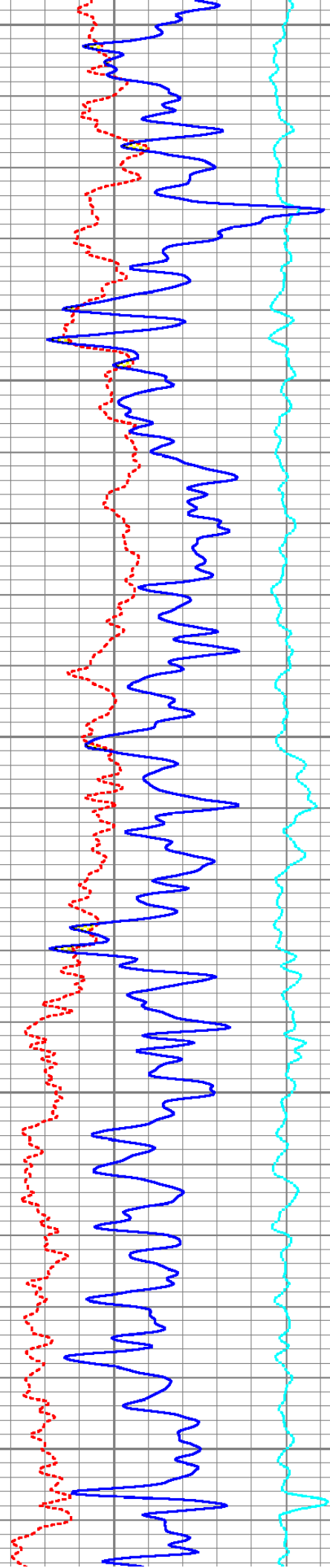
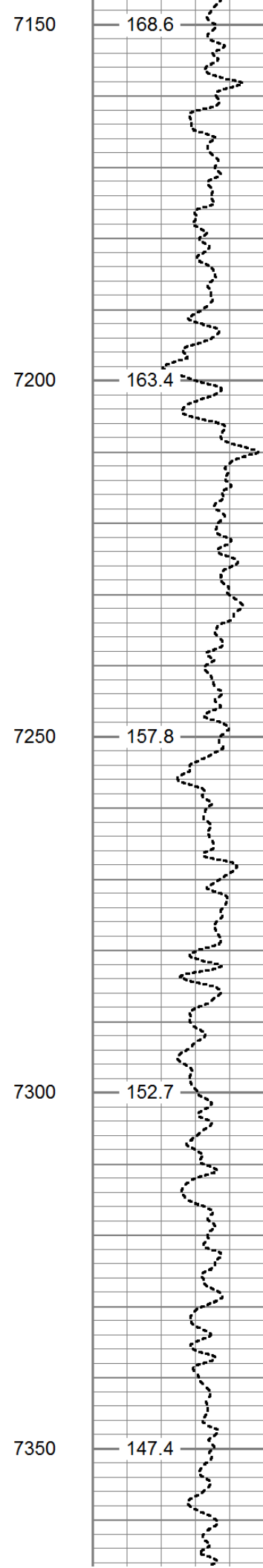
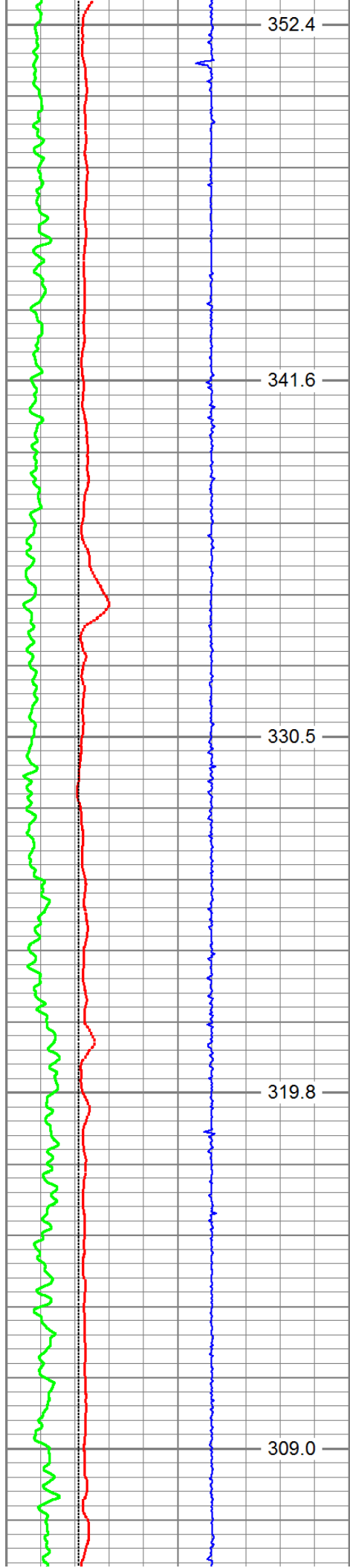
6800

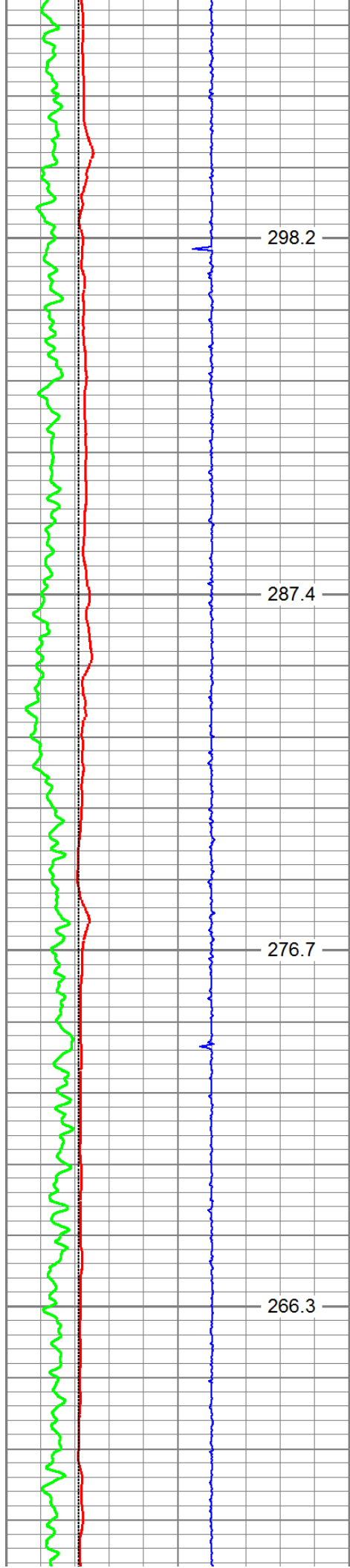
6850

6900







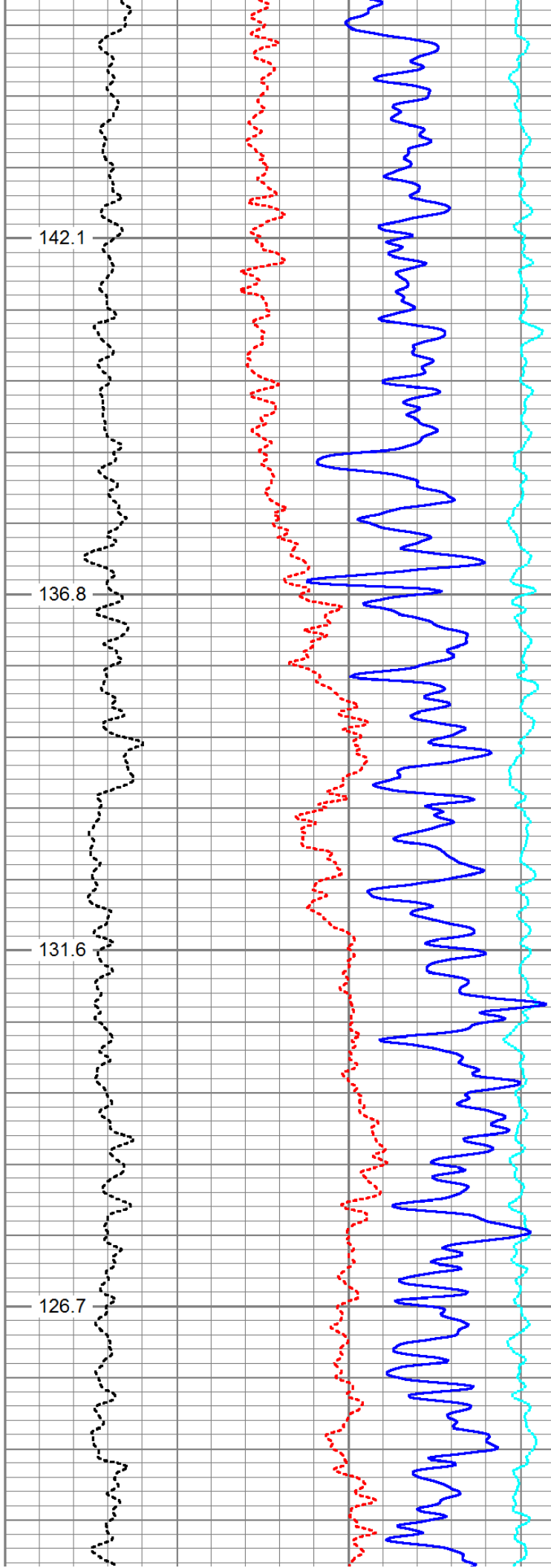


7400

7450

7500

7550

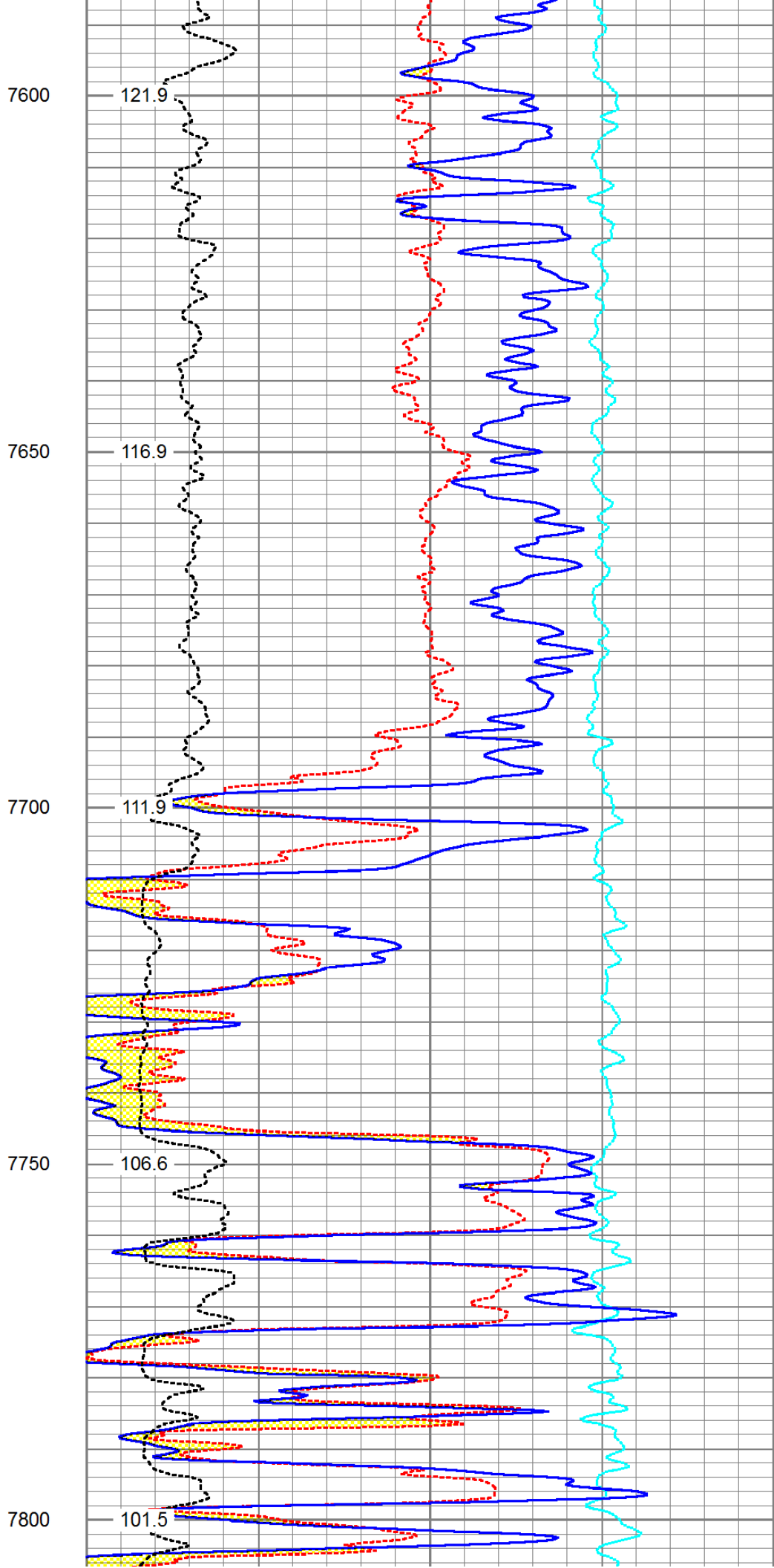
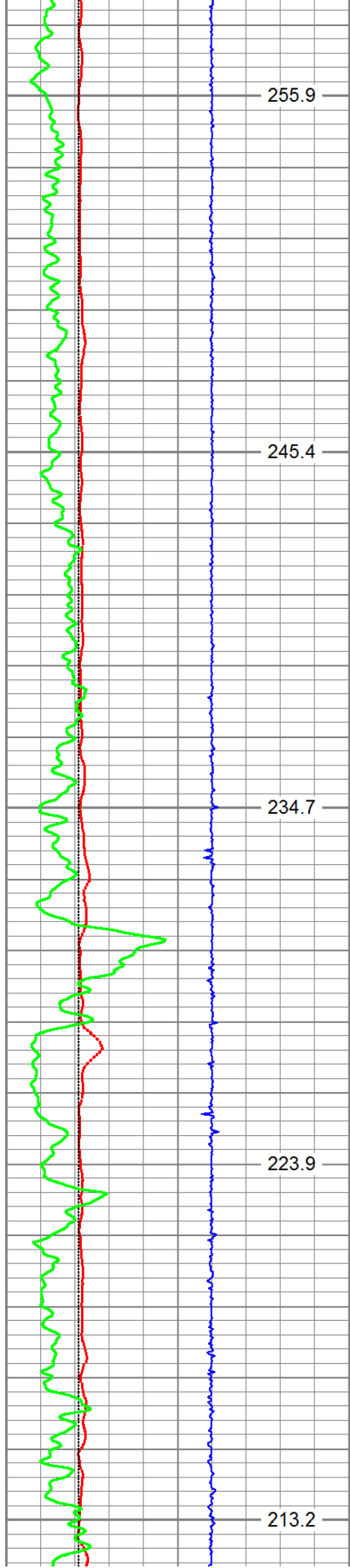


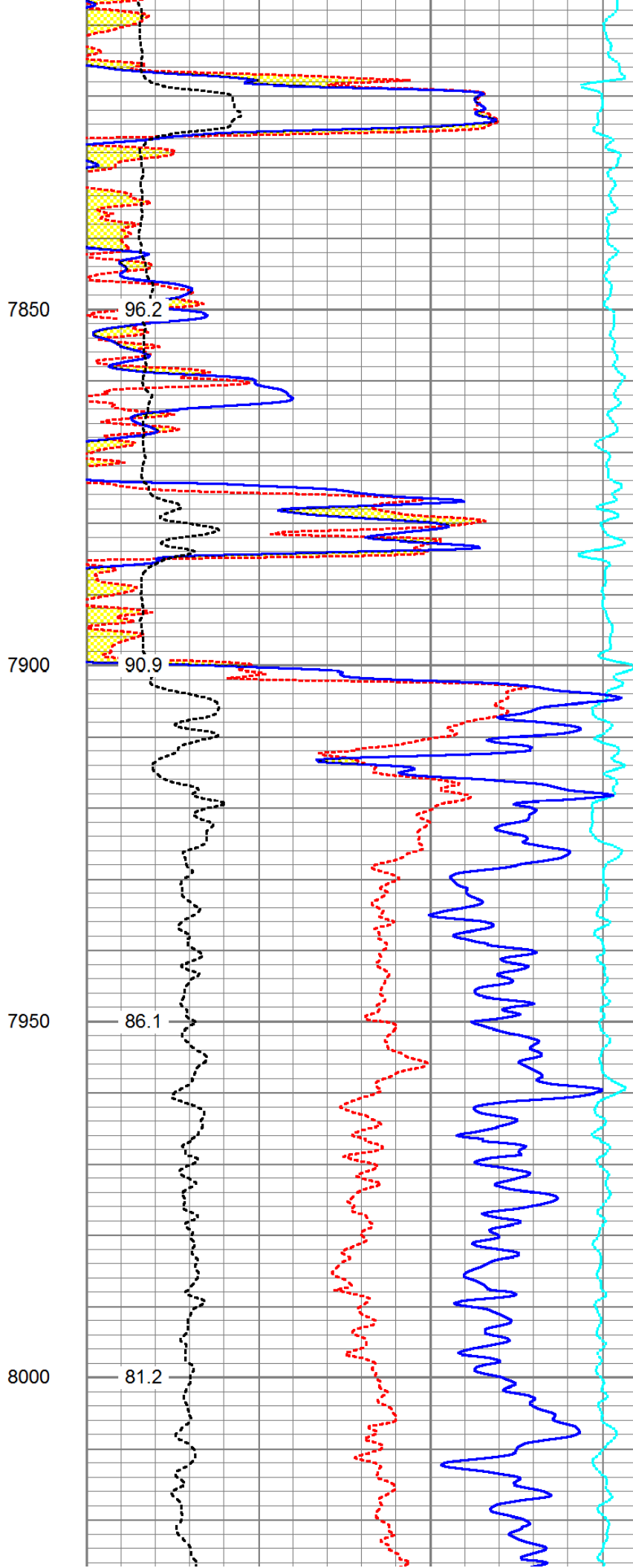
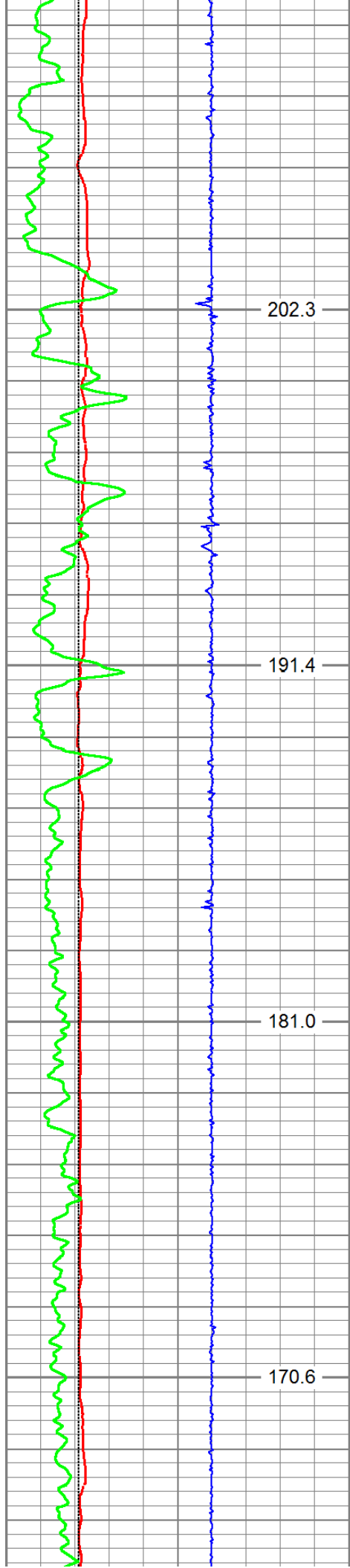
142.1

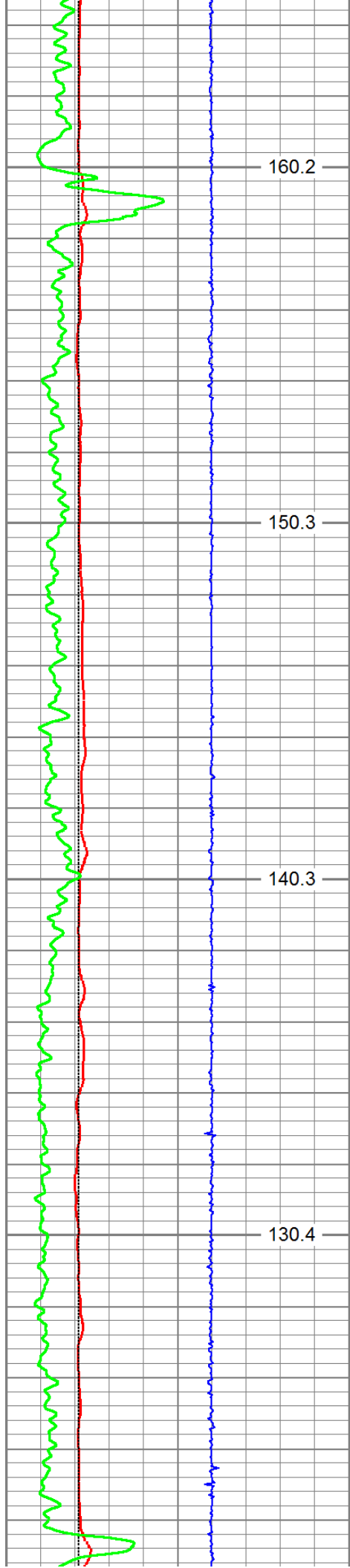
136.8

131.6

126.7







8050

160.2

8100

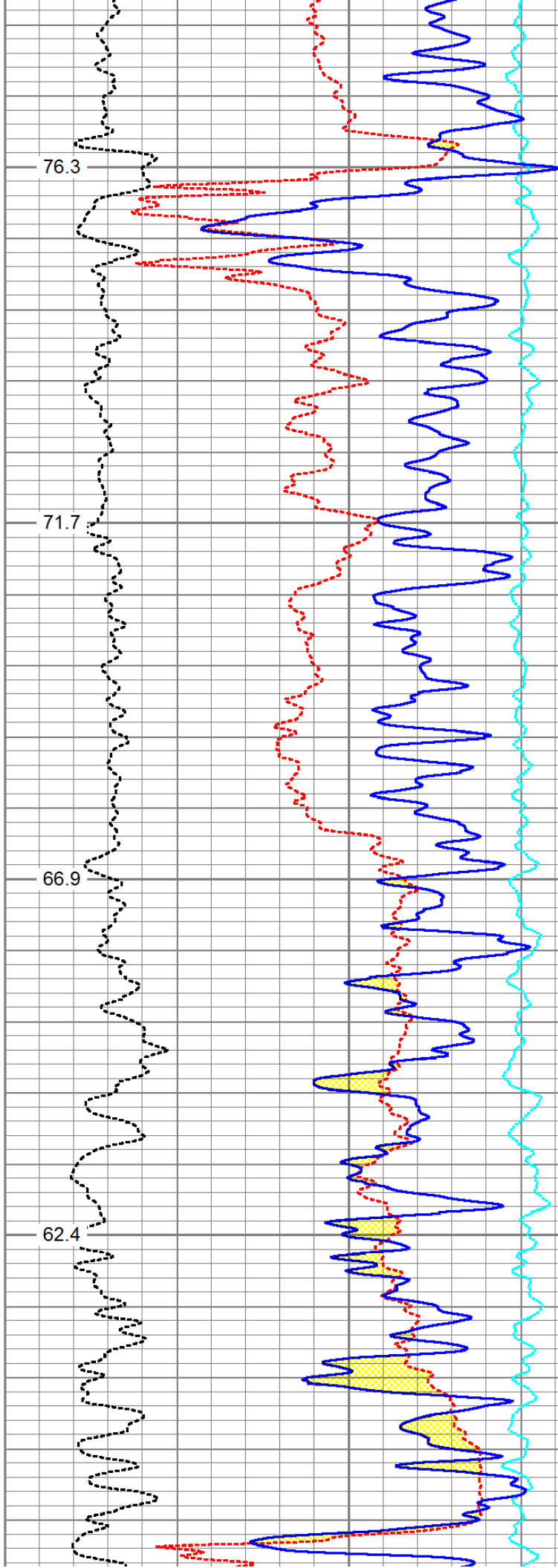
150.3

8150

140.3

8200

130.4

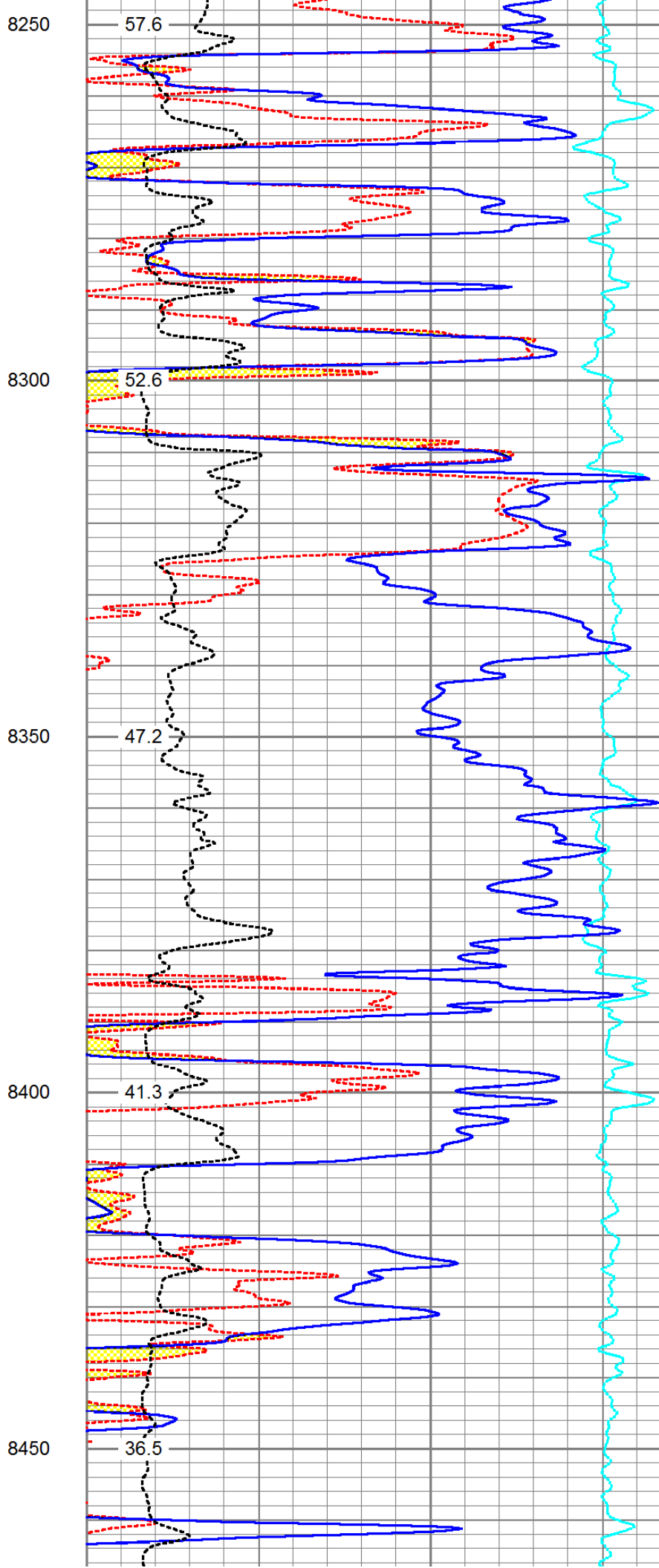
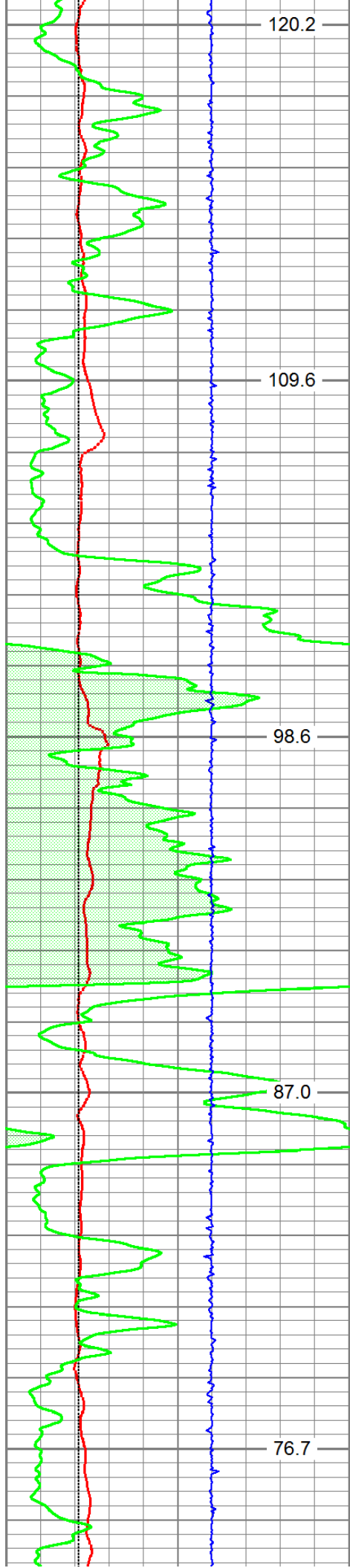


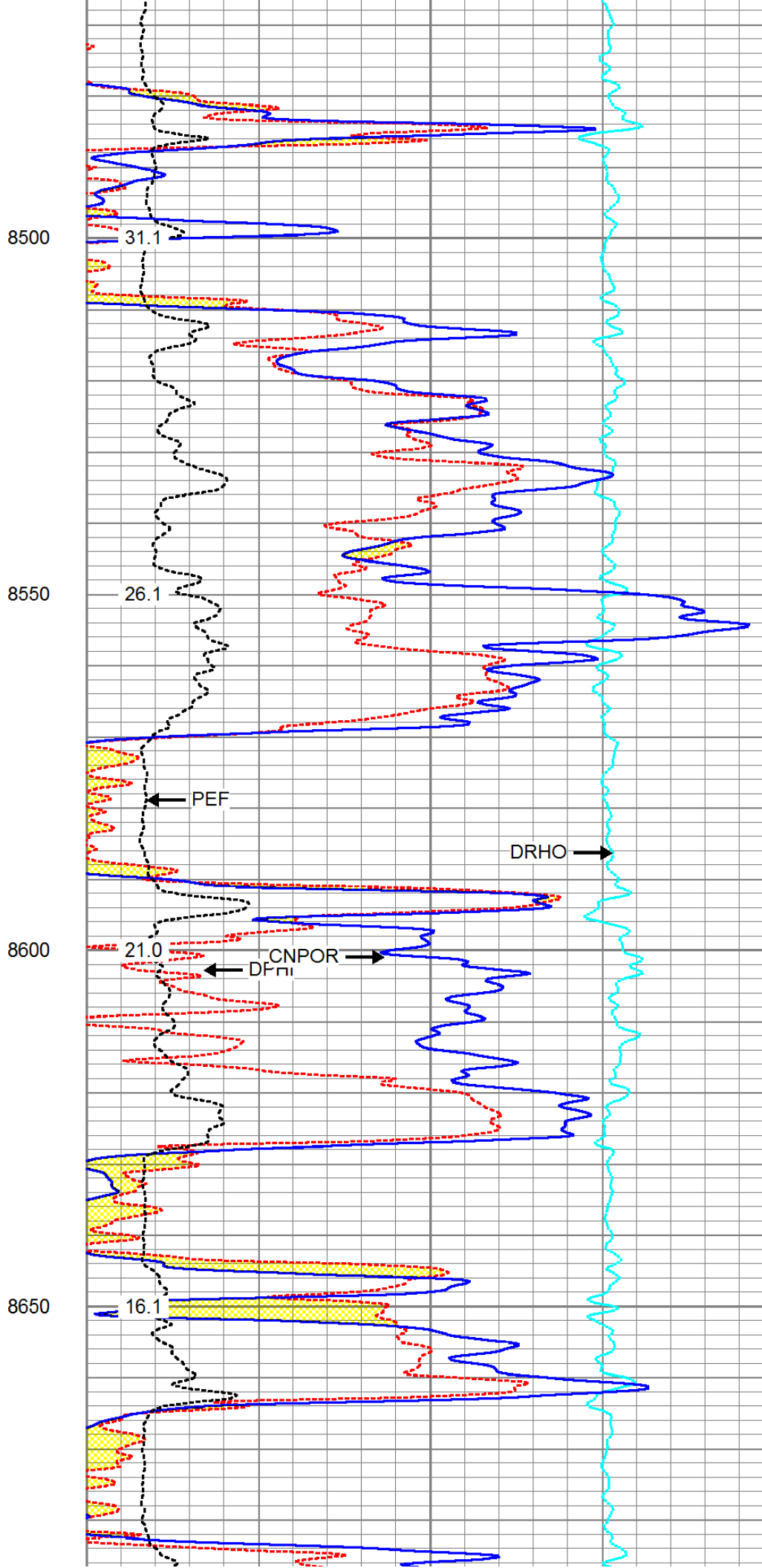
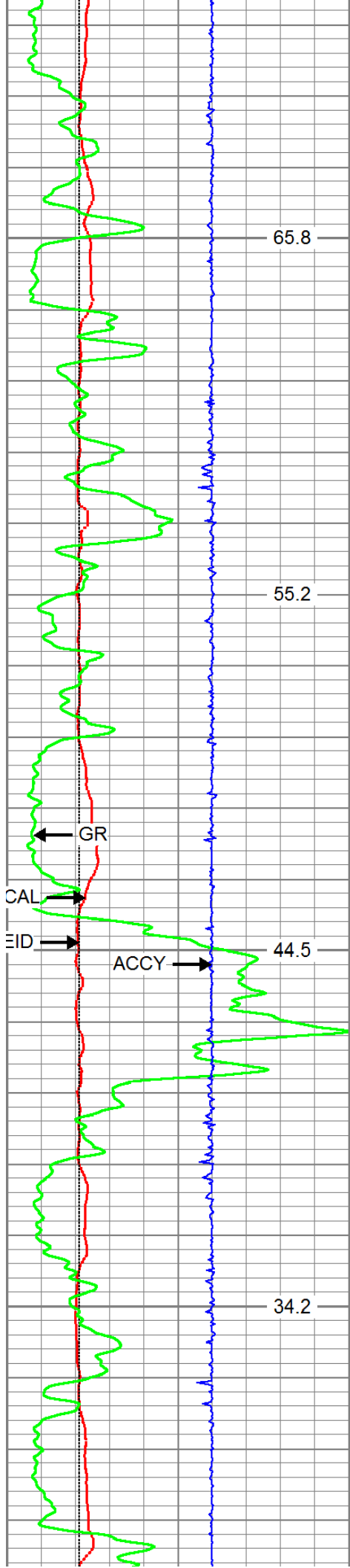
76.3

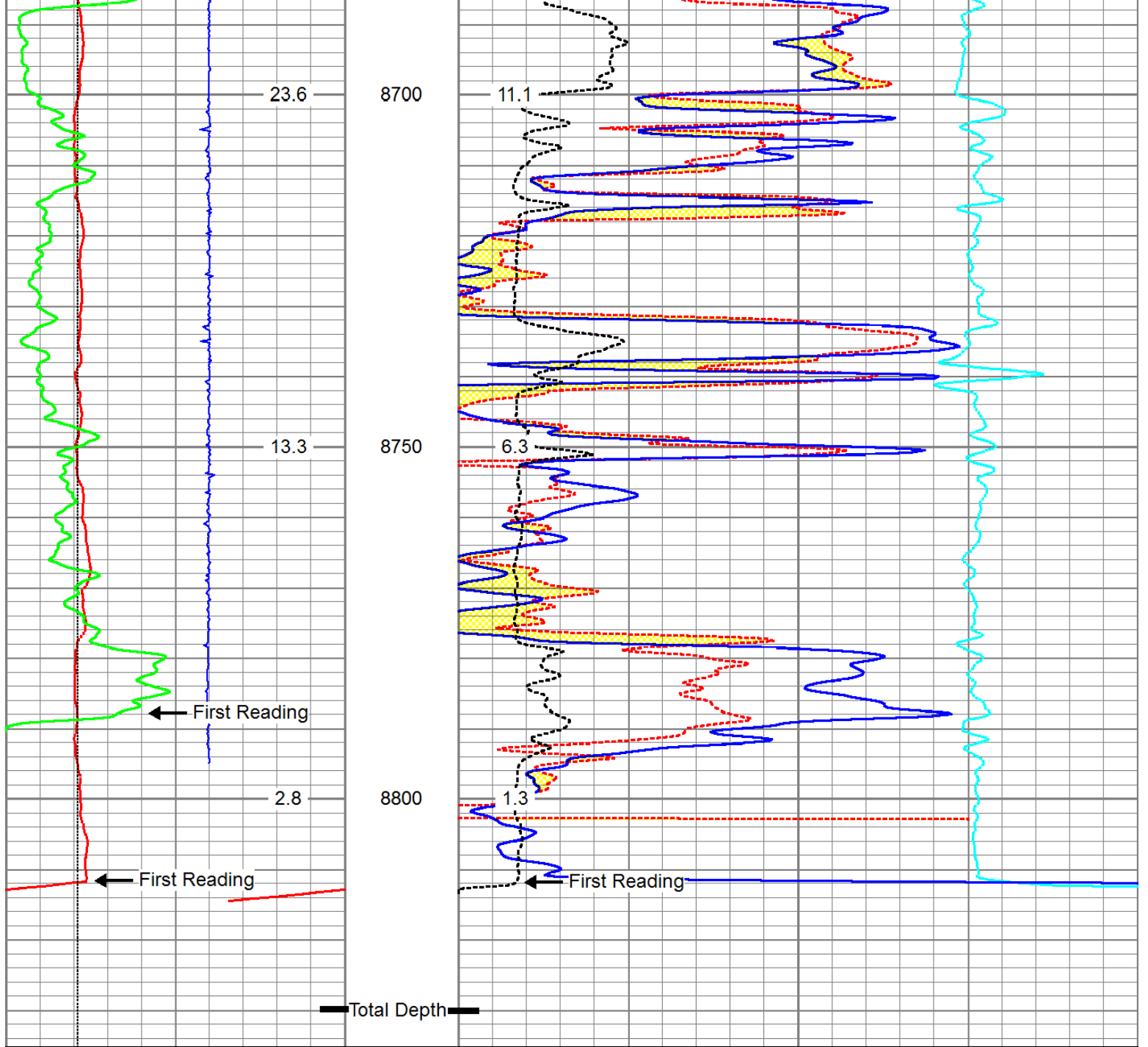
71.7

66.9

62.4







4	DCAL (in)	14
4	BOREID (in)	14
0	GR (GAPI)	150
-5	ACCY	5
	TBHV (ft3)	

30	CNPOR (pu)	-10			
30	DPHI (pu)	-10			
0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
	ABHV (ft3)				



MAIN PASS

Log Variables

Database: C:\Warrior\Data\sandridge_myra_3406_mem9.db
 Dataset: field/well/proc1/MERGE3

Top - Bottom

BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in	BOTTEMP degF
0	WDM	1	MUDCELL	CURVE	6.125	112

On	WBM	T	MUDCELL	CURVE	6.123	142
CASED? No	CASEOD in 4.5	CASETHCK in 0	CEMWATERSA kppm 0	CMNTTHCK in 0	DNBHC? NO	DPOSEL RHOB
FLUIDDEN g/cc 1	FRMSALIN kppm 0	LATNOR Off	MATRXDEN g/cc 2.71	MUDSALIN kppm 2.5	MudWgt lb/gal 8.5	NPOSEL Limestone
PEBHC? YES	PERFS 0	RESTMPSRC INTERNAL	SO in 0.5	SRFTEMP degF 65	SZCOR On	TDEPTH ft 8867
TMPCOR On	TOOLPOS Free					

Calibration Report

Database File: sandridge_myra_3406_mem9.db
Dataset Pathname: proc1/MERGE3
Dataset Creation: Fri Mar 15 04:21:56 2013

ThruBit Induction Calibration Report

Tool Model-Serial Number: PS-PS23R
Shop Calibration Performed: Sat Jan 26 12:28:42 2013

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-457.3100	[-500.00, -400.00]	256.3010	[-500.00, 500.00]
A2	-145.4560	[-180.00, -100.00]	247.8900	[-500.00, 500.00]
A3	-25.6104	[-50.00, -10.00]	116.3500	[-500.00, 500.00]
A4	-16.1336	[-30.00, -10.00]	259.0180	[-500.00, 500.00]
A5	-13.4292	[-30.00, -10.00]	128.6200	[-500.00, 500.00]
Freq 2				
A1	-237.3430	[-280.00, -180.00]	141.2030	[-500.00, 500.00]
A2	-94.1453	[-130.00, -50.00]	135.9830	[-500.00, 500.00]
A3	-19.7894	[-50.00, -10.00]	26.5205	[-500.00, 500.00]
A4	-18.9741	[-30.00, -10.00]	82.0617	[-500.00, 500.00]
A5	-18.4405	[-30.00, -10.00]	-15.0761	[-500.00, 500.00]
Freq 3				
A1	-146.9990	[-180.00, -80.00]	37.9341	[-500.00, 500.00]
A2	-71.2932	[-130.00, -30.00]	61.1558	[-500.00, 500.00]
A3	-15.5223	[-50.00, -10.00]	-34.6275	[-500.00, 500.00]
A4	-20.1992	[-30.00, -10.00]	-34.3692	[-500.00, 500.00]
A5	-20.8153	[-30.00, -10.00]	-119.2170	[-500.00, 500.00]
Freq 4				
A1	-77.7103	[-120.00, -40.00]	-123.3250	[-500.00, 500.00]
A2	-51.5767	[-110.00, -10.00]	-41.4020	[-500.00, 500.00]
A3	-13.8820	[-50.00, -10.00]	-125.5870	[-500.00, 500.00]
A4	-23.8216	[-30.00, -10.00]	-206.6320	[-500.00, 500.00]
A5	-27.4306	[-30.00, -10.00]	-295.9180	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9850	[0.95, 1.05]	0.0025	[-0.05, 0.05]
A2	0.9905	[0.95, 1.05]	0.0032	[-0.05, 0.05]
A3	0.9970	[0.95, 1.05]	-0.0059	[-0.05, 0.05]
A4	0.9868	[0.95, 1.05]	0.0037	[-0.05, 0.05]
A5	0.9907	[0.95, 1.05]	0.0010	[-0.05, 0.05]
Freq 2				
A1	0.9797	[0.95, 1.05]	-0.0063	[-0.05, 0.05]
A2	0.9850	[0.95, 1.05]	-0.0056	[-0.05, 0.05]
A3	0.9847	[0.95, 1.05]	-0.0084	[-0.05, 0.05]
A4	0.9821	[0.95, 1.05]	-0.0054	[-0.05, 0.05]
A5	0.9880	[0.95, 1.05]	-0.0083	[-0.05, 0.05]
Freq 3				
A1	0.9879	[0.95, 1.05]	-0.0032	[-0.05, 0.05]
A2	0.9935	[0.95, 1.05]	-0.0025	[-0.05, 0.05]
A3	0.9934	[0.95, 1.05]	-0.0054	[-0.05, 0.05]
A4	0.9886	[0.95, 1.05]	-0.0027	[-0.05, 0.05]
A5	0.9941	[0.95, 1.05]	-0.0049	[-0.05, 0.05]
Freq 4				
A1	0.9824	[0.95, 1.05]	-0.0055	[-0.05, 0.05]
A2	0.9877	[0.95, 1.05]	-0.0052	[-0.05, 0.05]
A3	0.9897	[0.95, 1.05]	-0.0102	[-0.05, 0.05]
A4	0.9827	[0.95, 1.05]	-0.0056	[-0.05, 0.05]
A5	1.0007	[0.95, 1.05]	-0.0105	[-0.05, 0.05]
Temperature	34.2699 degC			

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS52D
Source Number:
Shop Calibration Performed: Sat Feb 16 15:13:42 2013

REFERENCE

	Density	Units
Aluminium	2.607	g/cc
Magnesium	1.752	g/cc

READINGS

Outputs	Counts	Units	Expected
SS1 Background	135.59	cps	[130.00, 170.00]
LS1 Background	133.80	cps	[130.00, 170.00]
LS4 Background	28.88	cps	[27.00, 35.00]
SS1 Aluminium	4692.63	cps	[4500.00, 5500.00]
LS1 Aluminium	848.79	cps	[750.00, 950.00]
LS4 Aluminium	959.31	cps	[843.00, 1068.00]
SS1 Magnesium	7807.87	cps	[7000.00, 9000.00]
LS1 Magnesium	5610.59	cps	[5250.00, 6250.00]
LS1 Al + Fe	733.04	cps	[650.00, 800.00]
LS4 Al + Fe	436.03	cps	[382.00, 471.00]

RESULTS

SS Slope	1.64	[1.52, 1.77]
LS Slope	0.42	[0.38, 0.45]

PEF K Factor
PEF B Factor

4.993
-0.543

[3.510, 6.170]
[-0.700, -0.410]

RESULTS

Caliper Shop Calibration performed:

Sat Feb 16 15:13:42 2013

Reference	Reading	Units
12.00	1894.46	in
9.00	2059.77	in
6.00	2208.49	in

DENSITY PRE-SURVEY CHECK Performed:

Thu Mar 07 13:31:05 2013

Outputs	Counts	Units	Expected
SS1 Background	136.03	cps	[131.52, 139.66]
LS1 Background	135.84	cps	[129.78, 137.81]
LS4 Background	28.14	cps	[27.14, 30.61]

CALIPER PRE-SURVEY CHECK Performed:

Thu Mar 07 13:24:34 2013

Reference	Readings	Units	Expected
6.00	5.93	in	[5.80, 6.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number:
Source Number:

PS-PS35N

Calibration Tank Temperature:
Shop Calibration Performed:

59.4 degF
Thu Feb 21 14:48:07 2013

BACKGROUND MEASUREMENT

Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.0	cps	<4

WATER TANK REFERENCE

Outputs	Measured	Units	Expected
SS Counts	3011.8	cps	
LS Counts	97.6	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	30.0792	SS/LS	
Tank Ratio Gain	1.0292		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	35540.7	cps	
LS Counts	3226.6	cps	

AI Ratio Ref	10.797	SS/LS	
AI Ratio	11.054	SS/LS	
AI Ratio Gain	0.95		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Wed Mar 13 14:25:48 2013

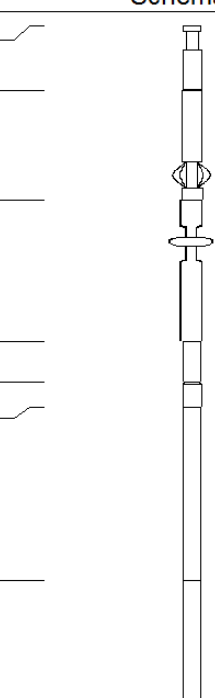
Outputs	Measured	Units	Expected
SS Counts	0.1	cps	<10
LS Counts	0.1	cps	<4

Gamma Ray Calibration Report

Tool Model-Serial Number:	PS-PS09T		
Performed:	Thu Feb 21 08:09:51 2013		
Calibrator Value:	162.7	GAPI	
Background Reading:	62.4	cps	
Calibrator Reading:	435.2	cps	
Sensitivity:	0.3750	GAPI/cps	

Inclinometer Calibration Report

Performed:	Sun Jun 13 14:33:21 1993				
	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	0.00	1.00	0.00	1.00	gee
Y Accelerometer	0.00	1.00	0.00	1.00	gee
Z Accelerometer	0.00	1.00	0.00	1.00	gee

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
Thrubit	66.92		Cablehead-S	2.31	2.13	5.00
Thrubit	64.61		Solid Weakpoint			
			PSBDOT	3.87	2.25	35.00
Thrubit	60.75		HangOff_Tool	5.00	2.38	60.00
Thrubit	55.75		Universal Joint	1.46	2.06	15.00
Thrubit	54.29		10-1	0.88	2.13	3.95
TBBAT	53.41		TBBAT-A (PS30B) Thrubit Battery	6.13	2.13	38.20
TBBAT2	47.29		TBBAT2-A (PS29B) Thrubit Battery	6.13	2.13	40.00

TMG	41.16					
GR	41.04					
GRTEMP	40.20		TMG-PS (PS09T) ThruBit Telemetry Gamma Ray	6.13	2.13	45.00
ThruBit	35.04		Decentralizer Decentralizer (Small)	4.50	2.13	70.00
CNLSC	28.60		TBN-PS (PS35N) ThruBit Neutron	4.77	2.13	63.00
LSW1	18.04		TBD-PS (PS52D) ThruBit Density	10.48	2.13	91.00
DCAL	17.13					
A1_P	10.60					
A2_P	10.10					
A3_P	9.35					
A4_P	8.35	TBI-PS (PS23R) ThruBit Induction	15.29	2.13	94.00	
A5_P	6.60					

Dataset: sandridge_myra_3406_mem9.db: field/well/proc1/MERGE3
 Total Length: 66.92 ft
 Total Weight: 560.15 lb
 O.D.: 2.38 in



Company SANDRIDGE ENERGY
Well MYRA 3406 1-8H
Field EASTHAM
County HARPER
State KANSAS