



ThruBit
A Schlumberger Company

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

Company SANDRIDGE ENERGY, INC.
Well COOPER 3305 1-27H
Field HARPER KS PROSPECT / MISS LIME
County HARPER
State KS

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Location: API #: 15077218780000
SURF LOC: 250' FNL & 660' FEL
SEC 27 TWP 33S RGE 5W
Permanent Datum G.L. Elevation 1283'
Log Measured From D.F. 16' ABOVE PERM DATUM
Drilling Measured From D.F.
Elevation
K.B. 1299'
D.F. 1299'
G.L. 1283'

Date	21 SEPTEMBER 2012
Run Number	ONE
Depth Driller	8518'
Depth Logger	8482'
Bottom Logged Interval	8464'
Top Log Interval	2490'
Casing Driller	7.0" @ 4890'
Casing Logger	7.0" @ 4880'
Bit Size	6.125"
Type Fluid in Hole	WBM
Density / Viscosity	8.40 / 27
pH / Fluid Loss	8.0 / 60
Source of Sample	SUCTION PIT
Rm @ Meas. Temp	1.10 OHMS@71 DEGF
Rmf @ Meas. Temp	0.83 OHMS@71 DEGF
Rmc @ Meas. Temp	1.40 OHMS@71 DEGF
Source of Rmf / Rmc	CALCULATED
Rm @ BHT	0.54 OHMS 151 DEGF
Time Circulation Stopped	19:15 20SEPT2012
Time Logger on Bottom	20:40 20SEPT2012
Maximum Recorded Temperature	151 DEGF
Equipment Number	T011
Location	OKC, OK
Recorded By	D. THOMAS
Witnessed By	BRENT SECREST

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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 PUMP DOWN - BIT DEPTH: 8423', LOG TO: 2490'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 G/CC, USED TO CALCULATE POROSITIES
TOOL STRING RAN WITH SWIVEL, S. DECENTRALIZER, NO STANDOFFS
TBHV = TOTAL BOREHOLE VOLUME, FT3
ABHV = ANNULAR BOREHOLE VOLUME, FT3, CALCULATED FOR 4.50" CSG
RIG MINDER LITE AND PASON USED TO CREATE LOG DEPTH
LOG DEPTH CORRELATED TO MWD GAMMA AT CUSTOMERS REQUEST

RIG: UNIT # 310
CREW: D. THOMAS, R. WILSON, Z. HOWARD

Service Ticket No. 1438 API No. 15077218780000 PGM Ver WARRIOR 7.0

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.	PS9T	Serial No.	ENP3N	Serial No.	PS28D	Serial No.	ENP6R
Model No.	PS	Model No.	ENP	Model No.	PS	Model No.	ENP
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	8482'	2490'		30	

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

DIRECTIONAL INFORMATION

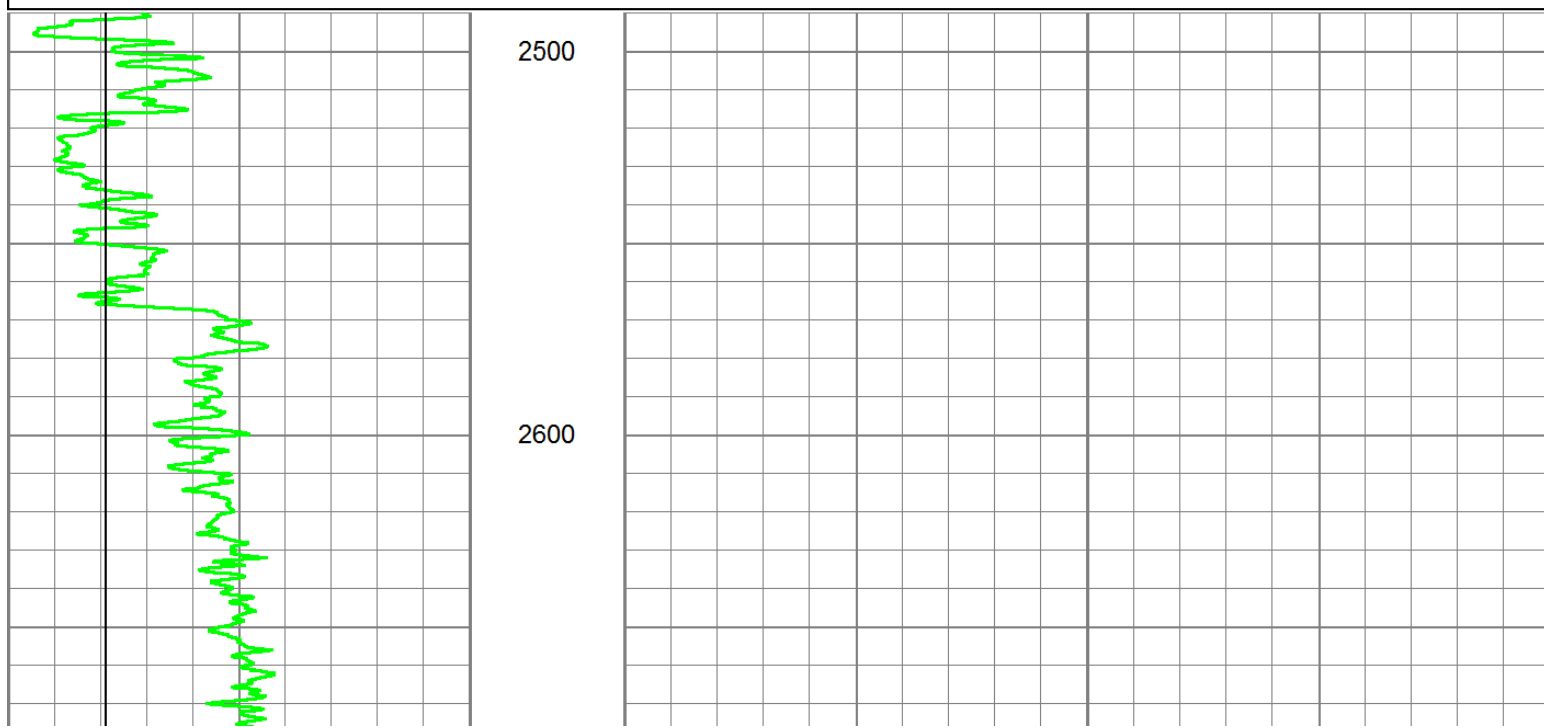
Maximum Deviation	92.0	deg. @	7689'	KOP	3536'
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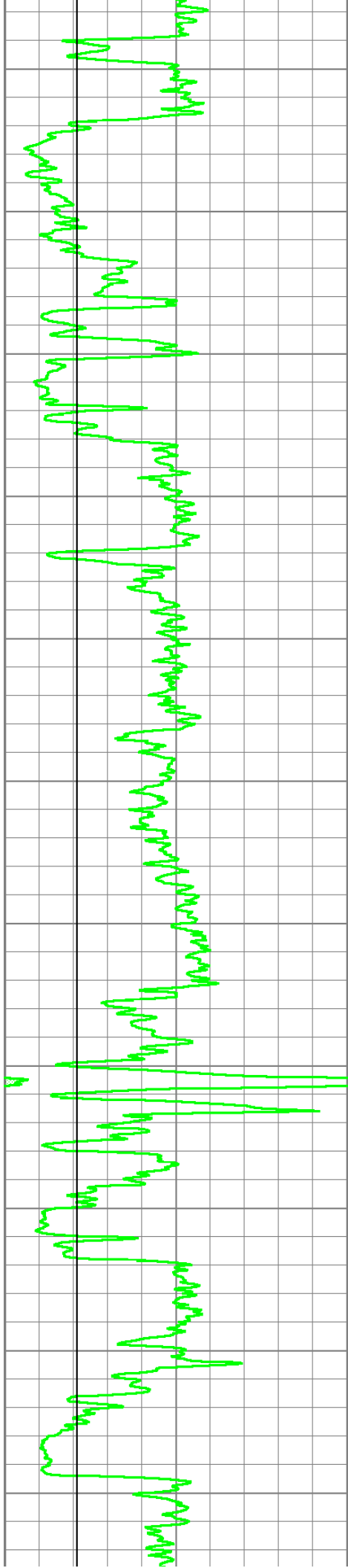


MAIN PASS

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 Dataset Pathname: proc1/pass1.5
 Presentation Format: 6_2n_chk
 Dataset Creation: Fri Sep 21 05:00:15 2012
 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						





2700

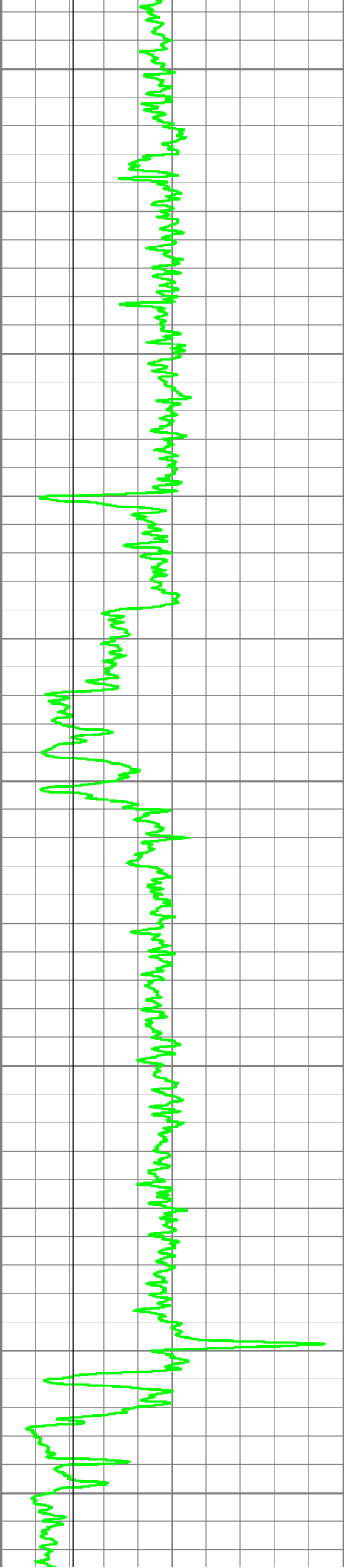
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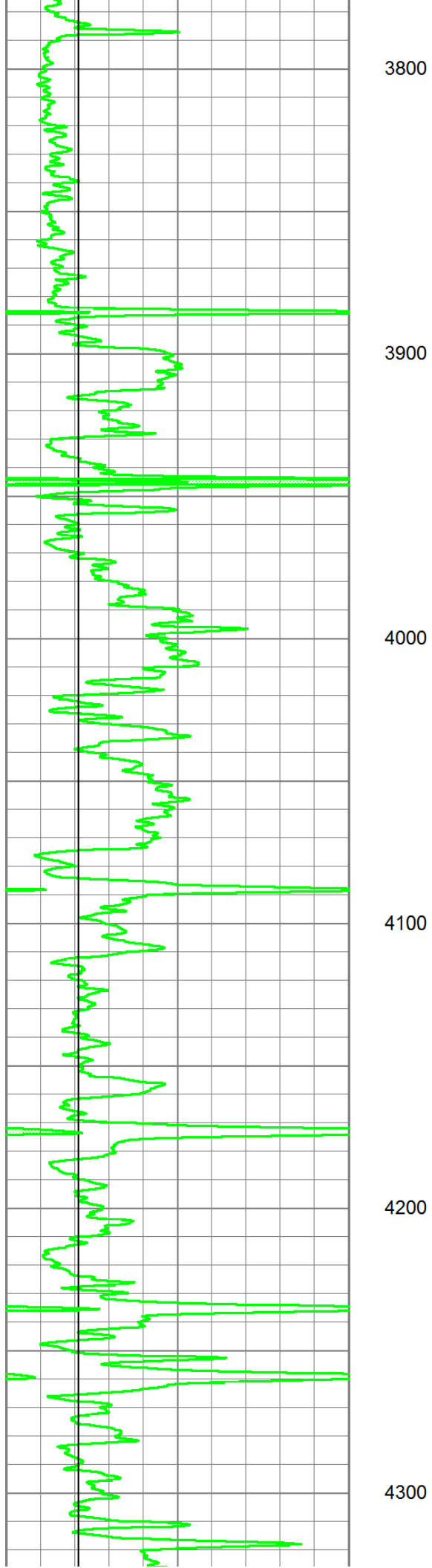
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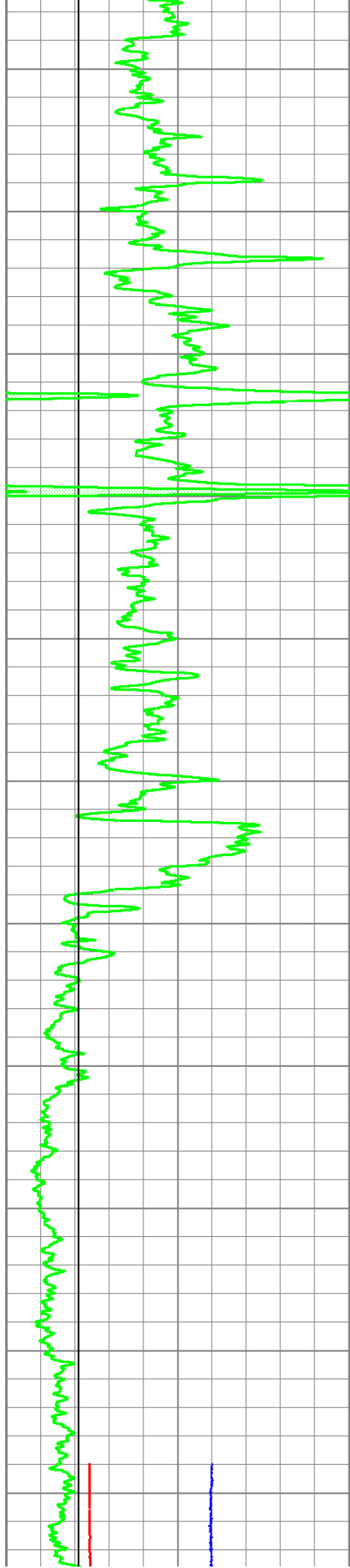
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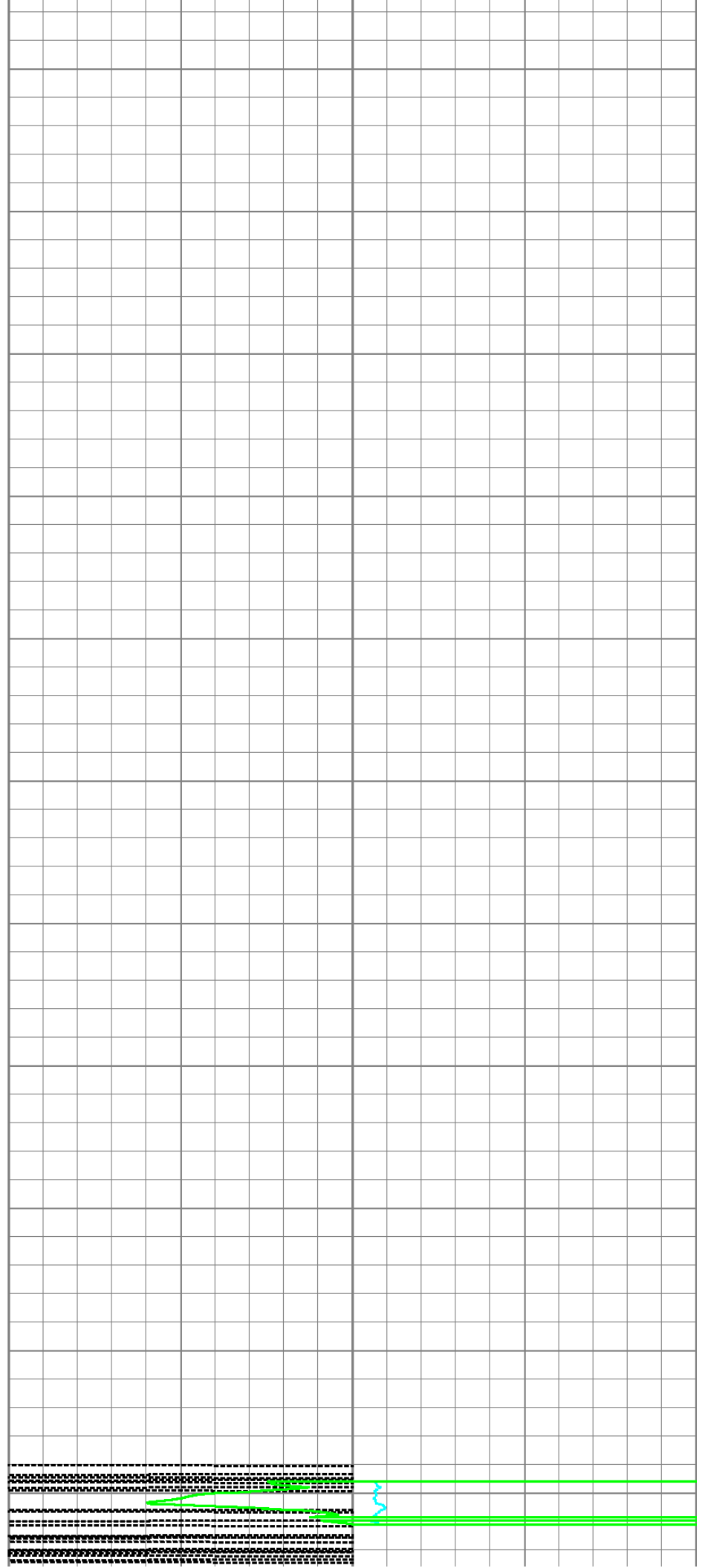
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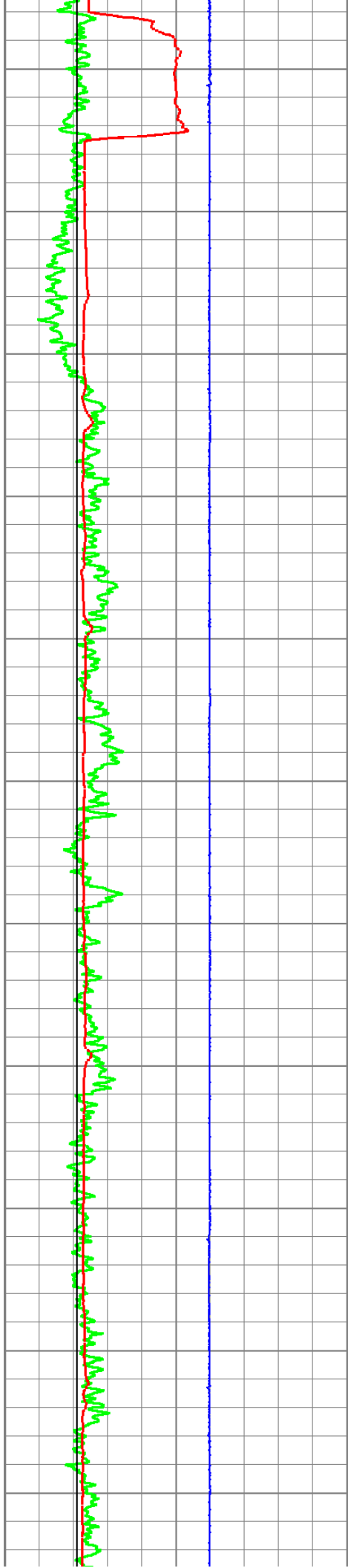
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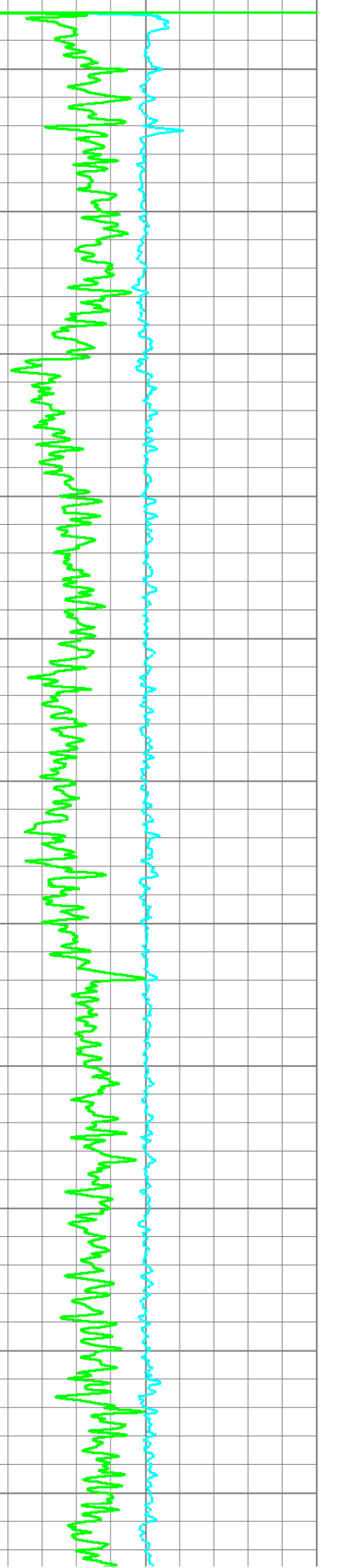
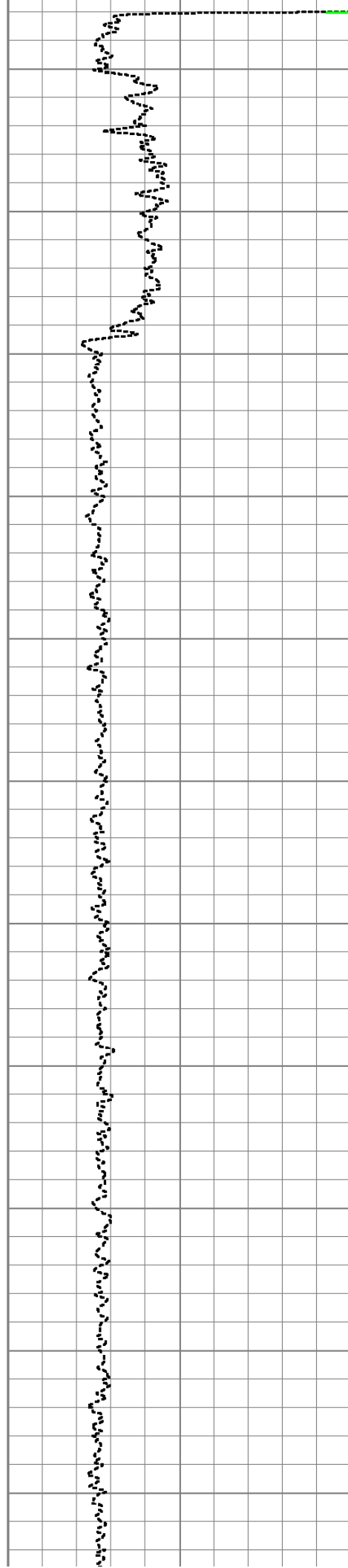
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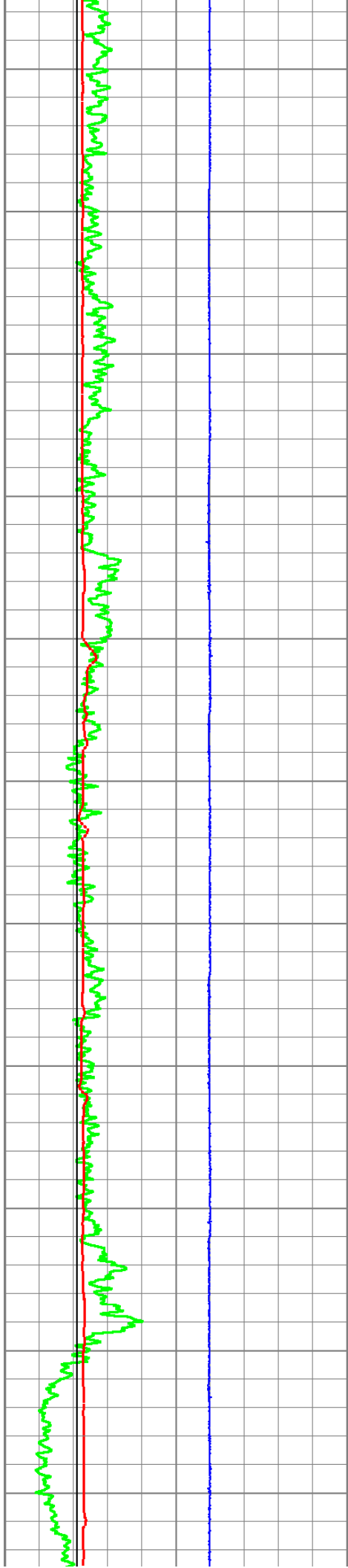
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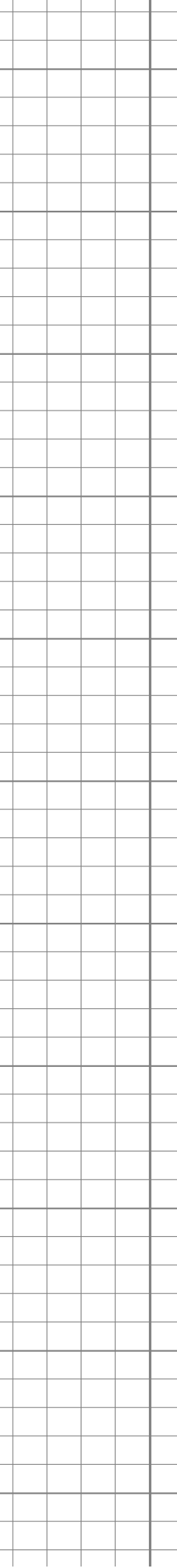
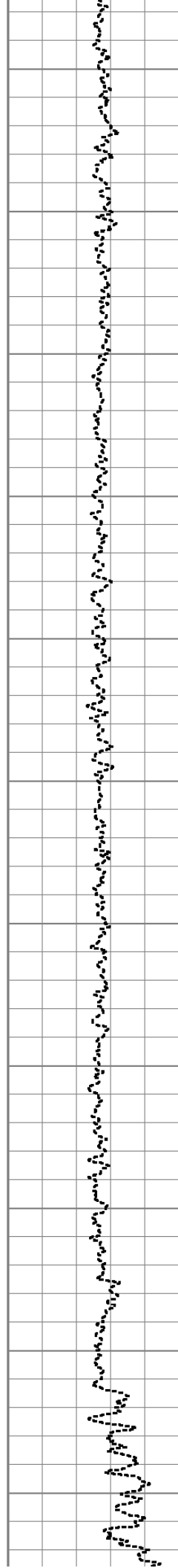
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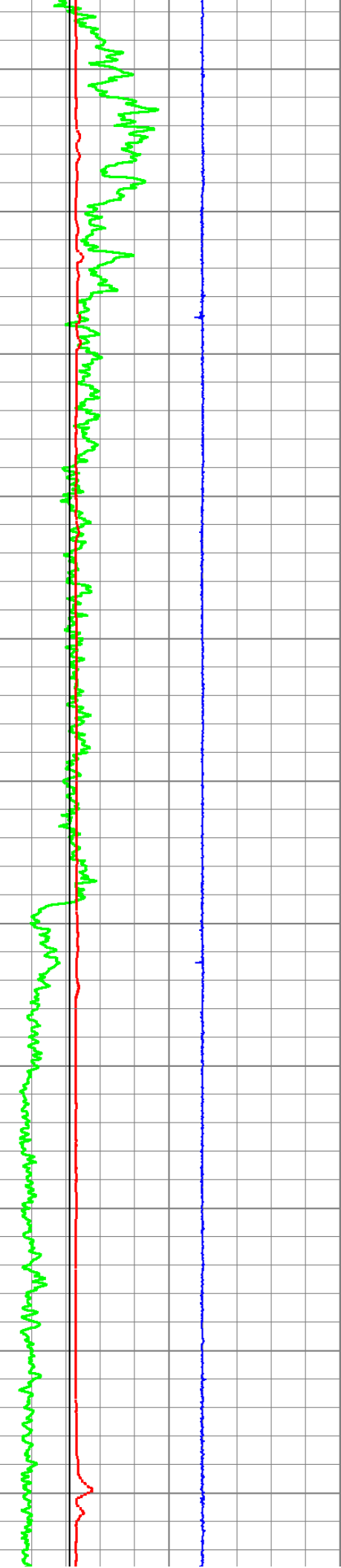
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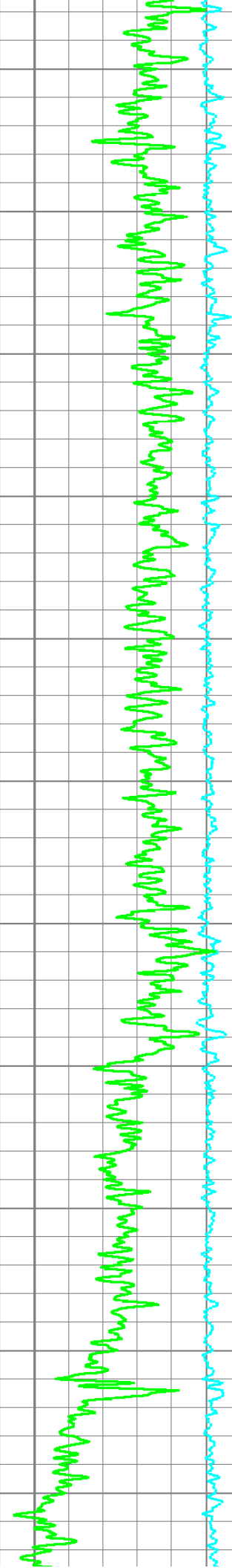
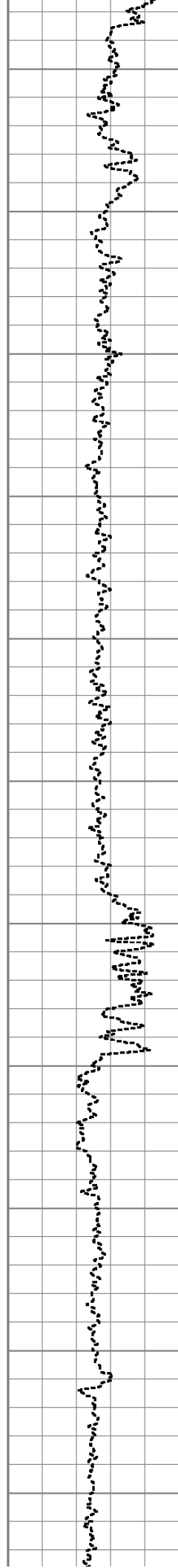
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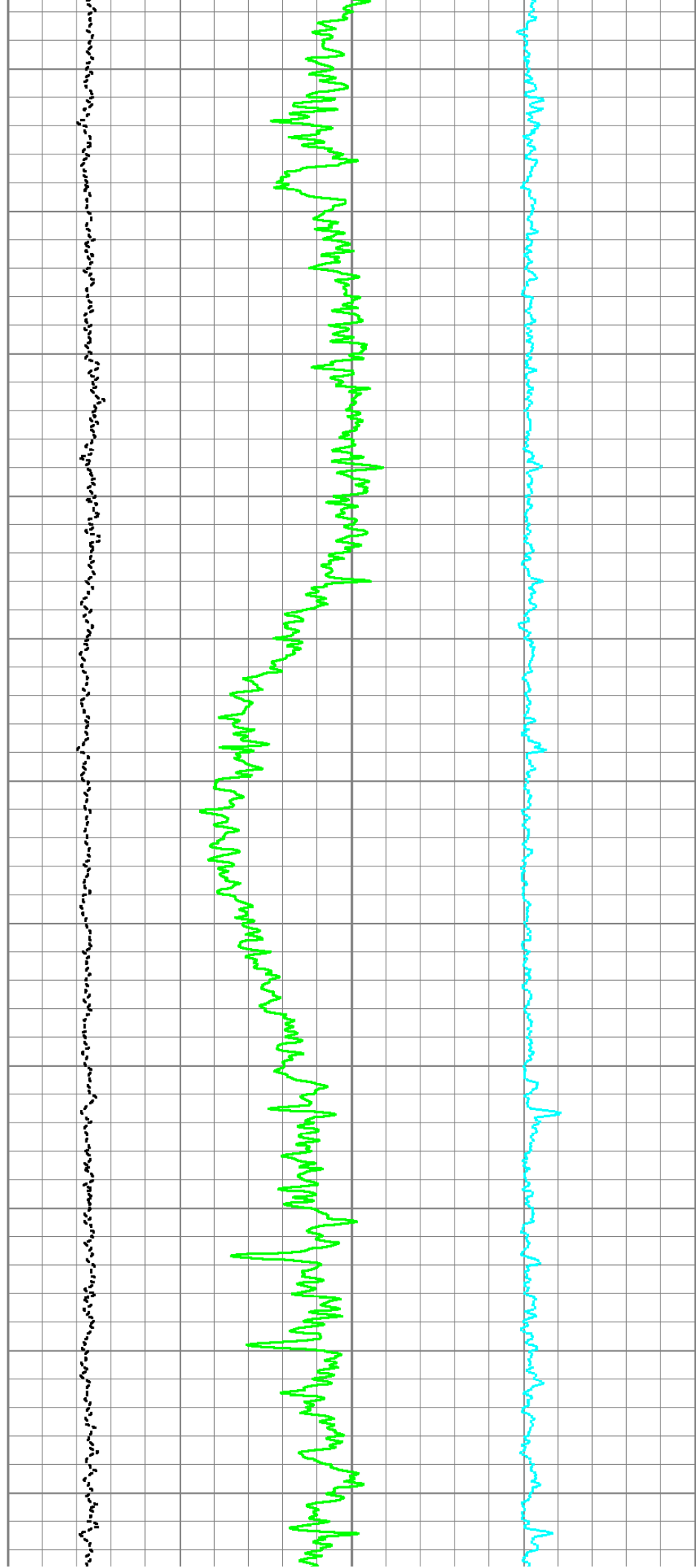
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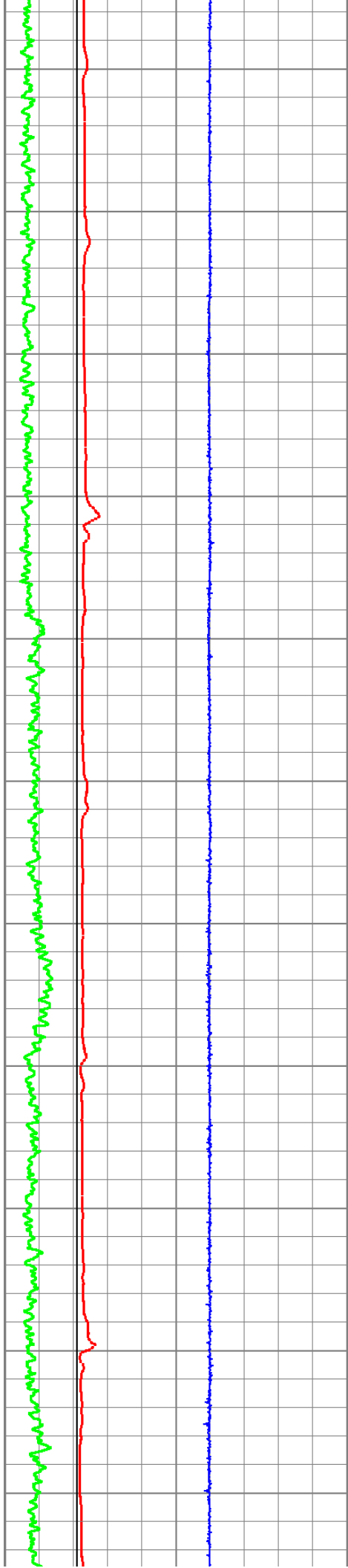
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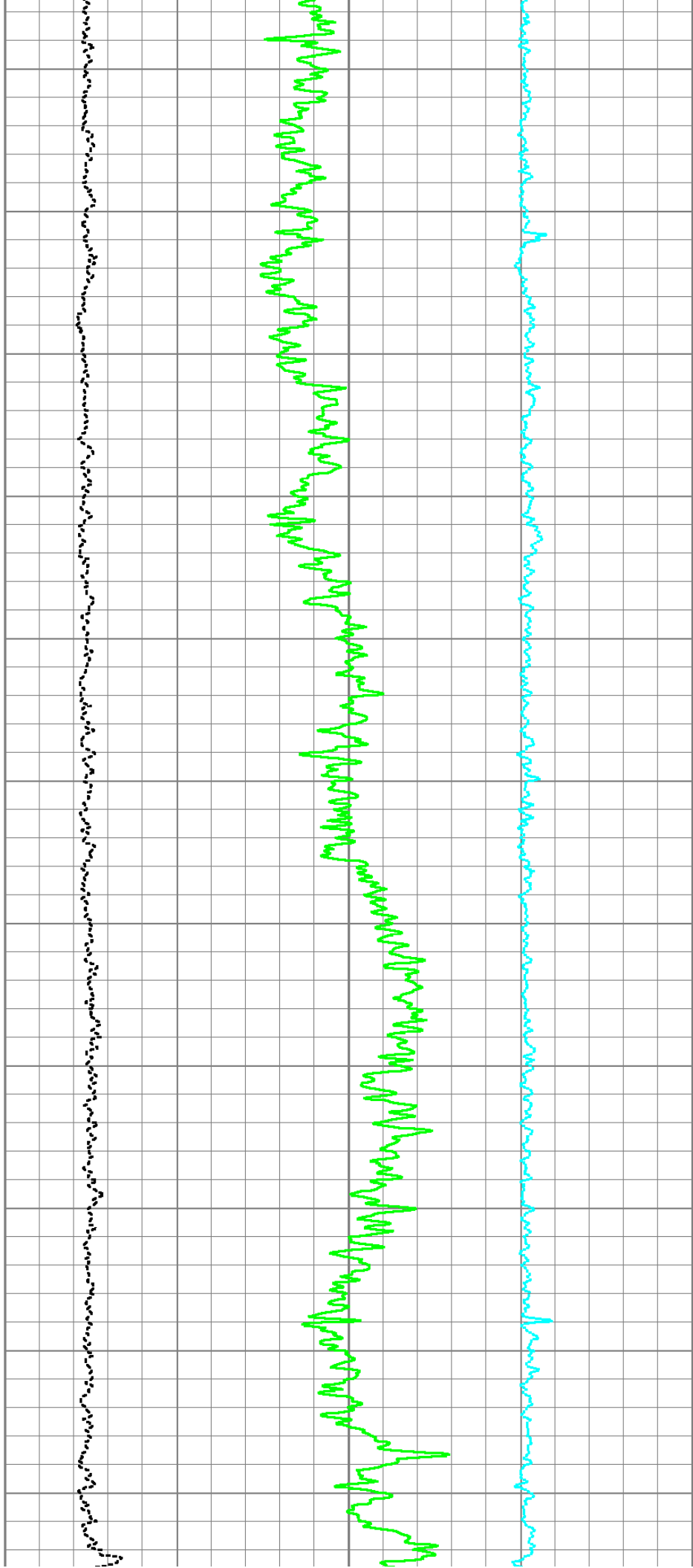
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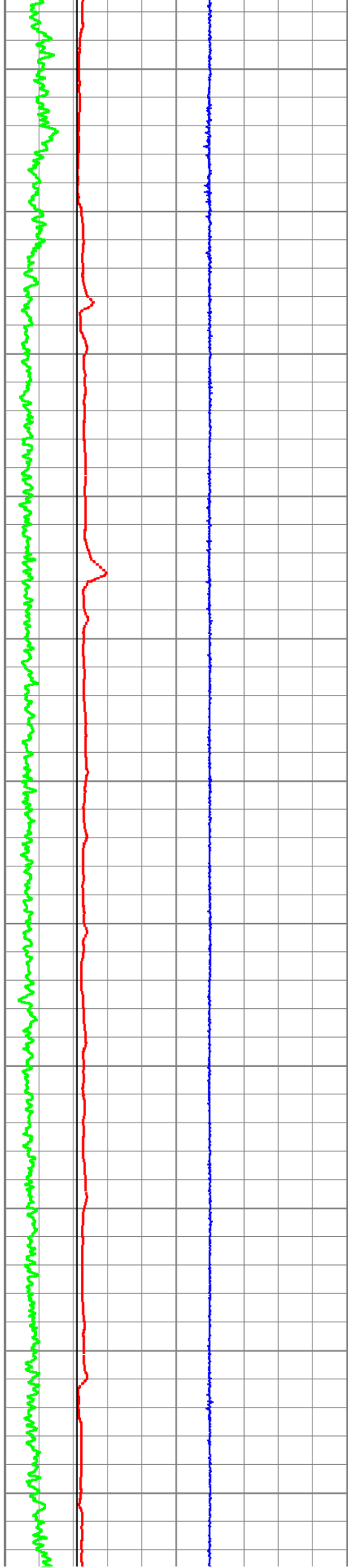
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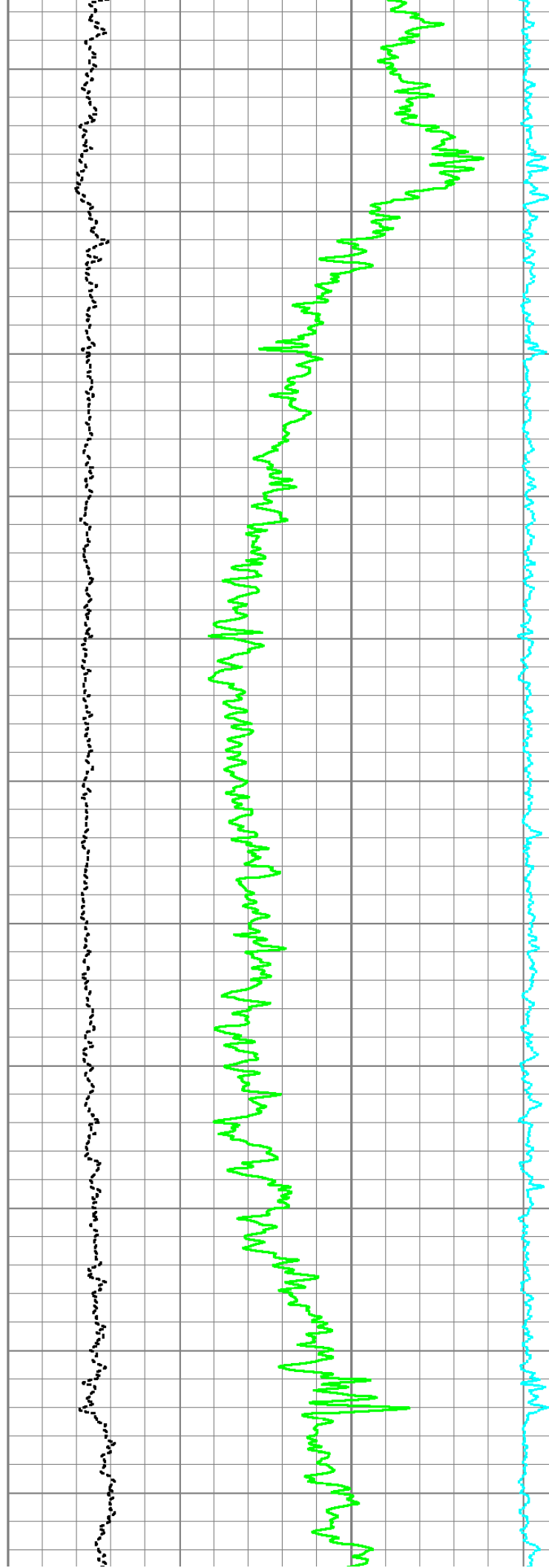
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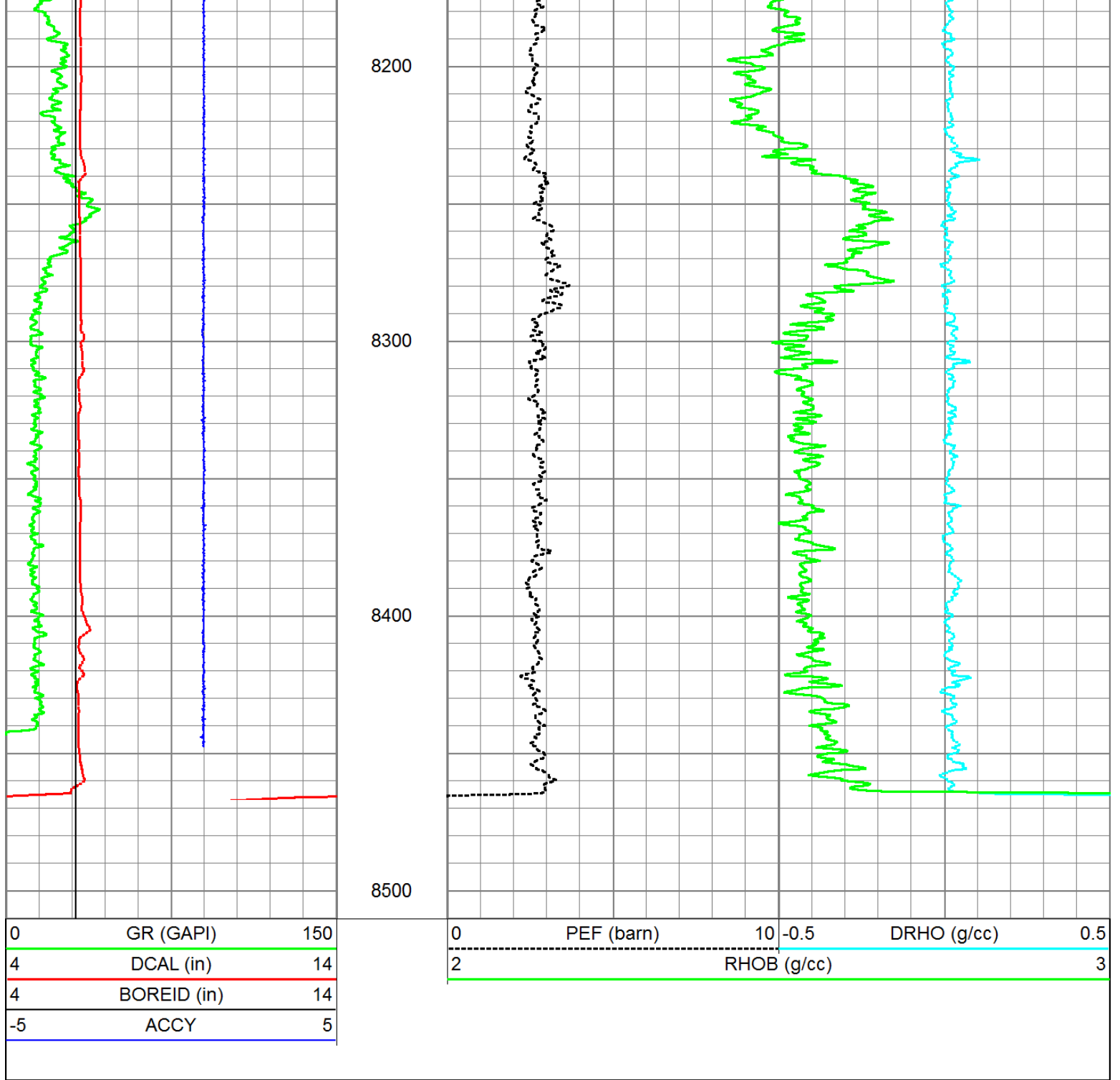
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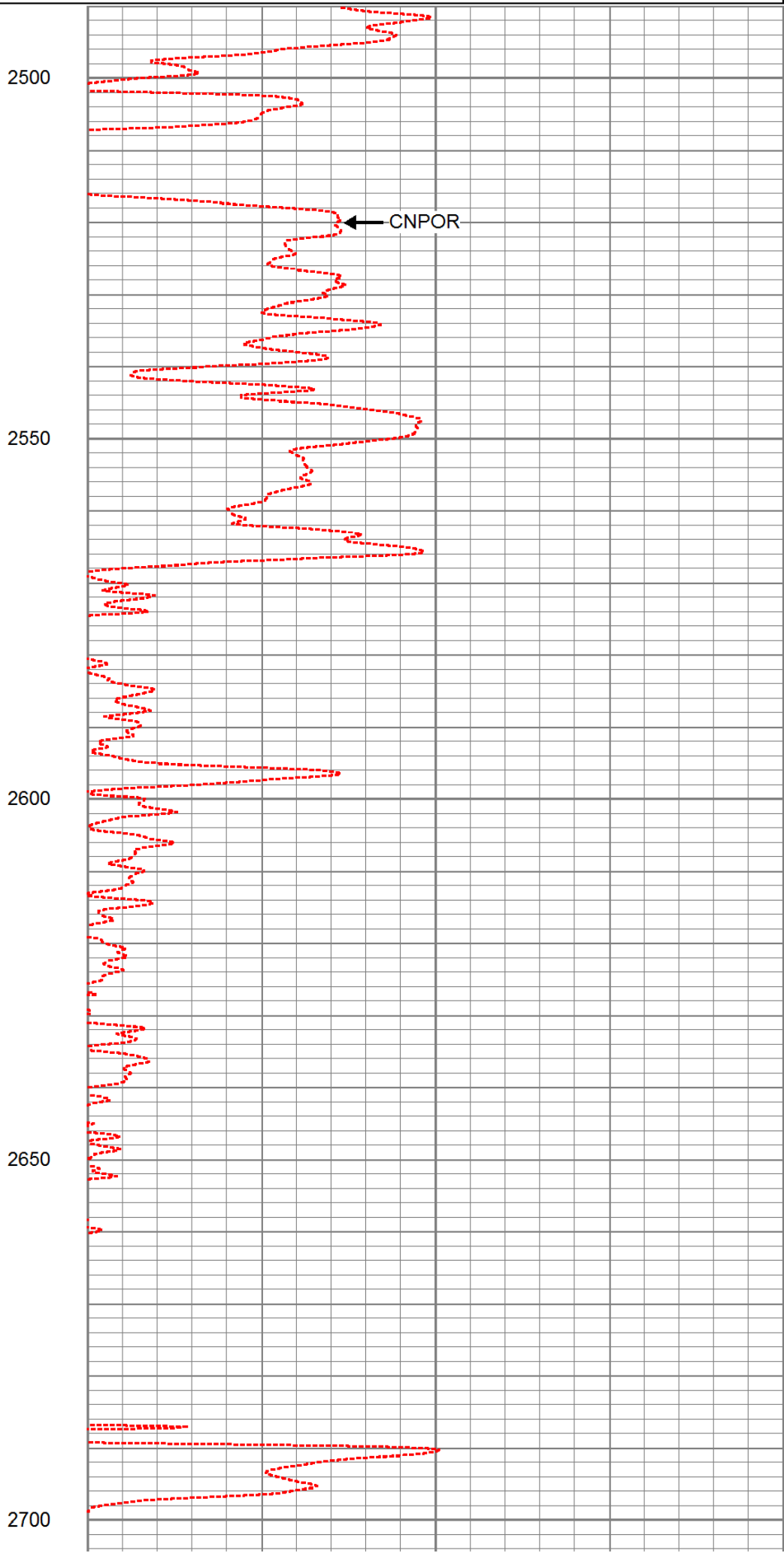
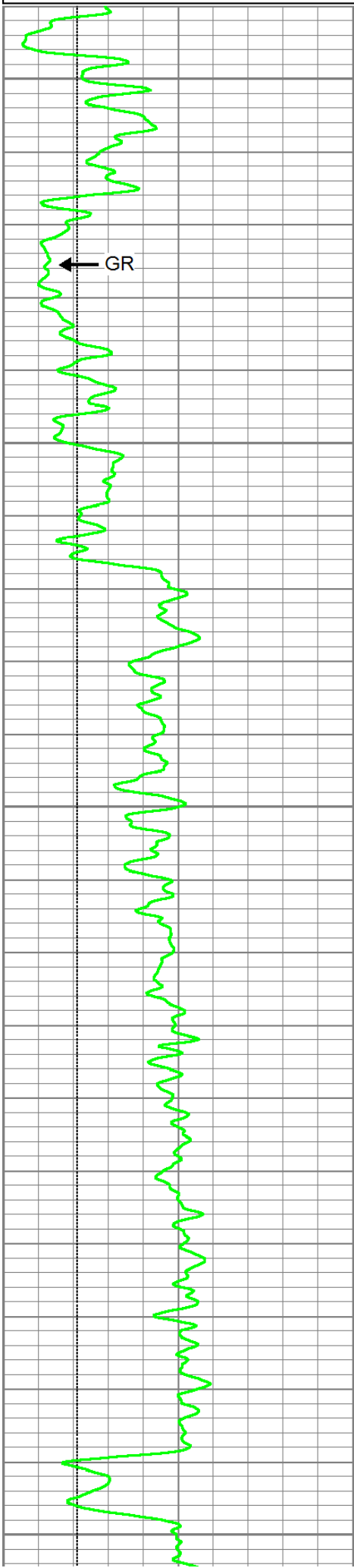
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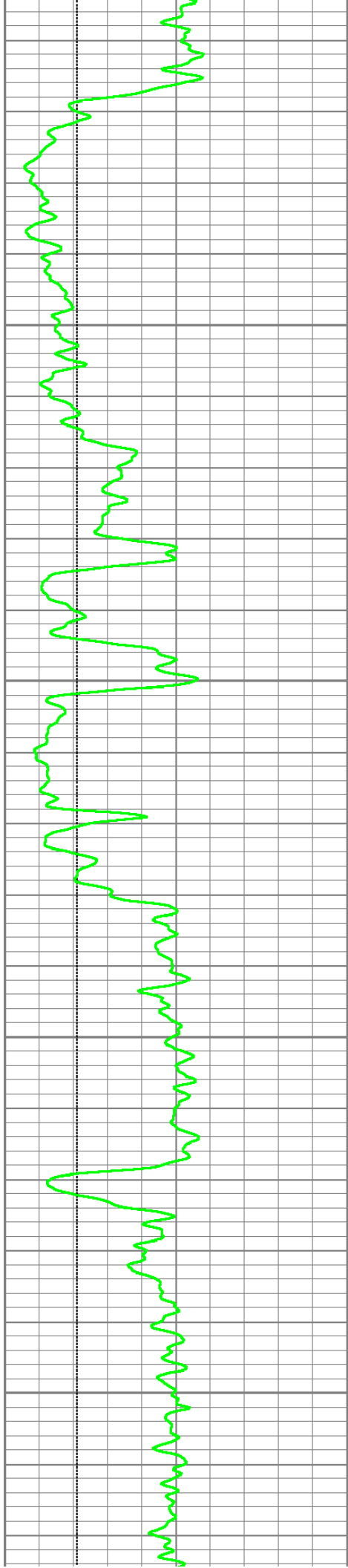
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 Dataset Pathname: proc1/pass1.5
 Presentation Format: 6_5n_chk
 Dataset Creation: Fri Sep 21 05:00:15 2012
 Charted by: Depth in Feet scaled 1:240

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

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

TBHV (ft3)



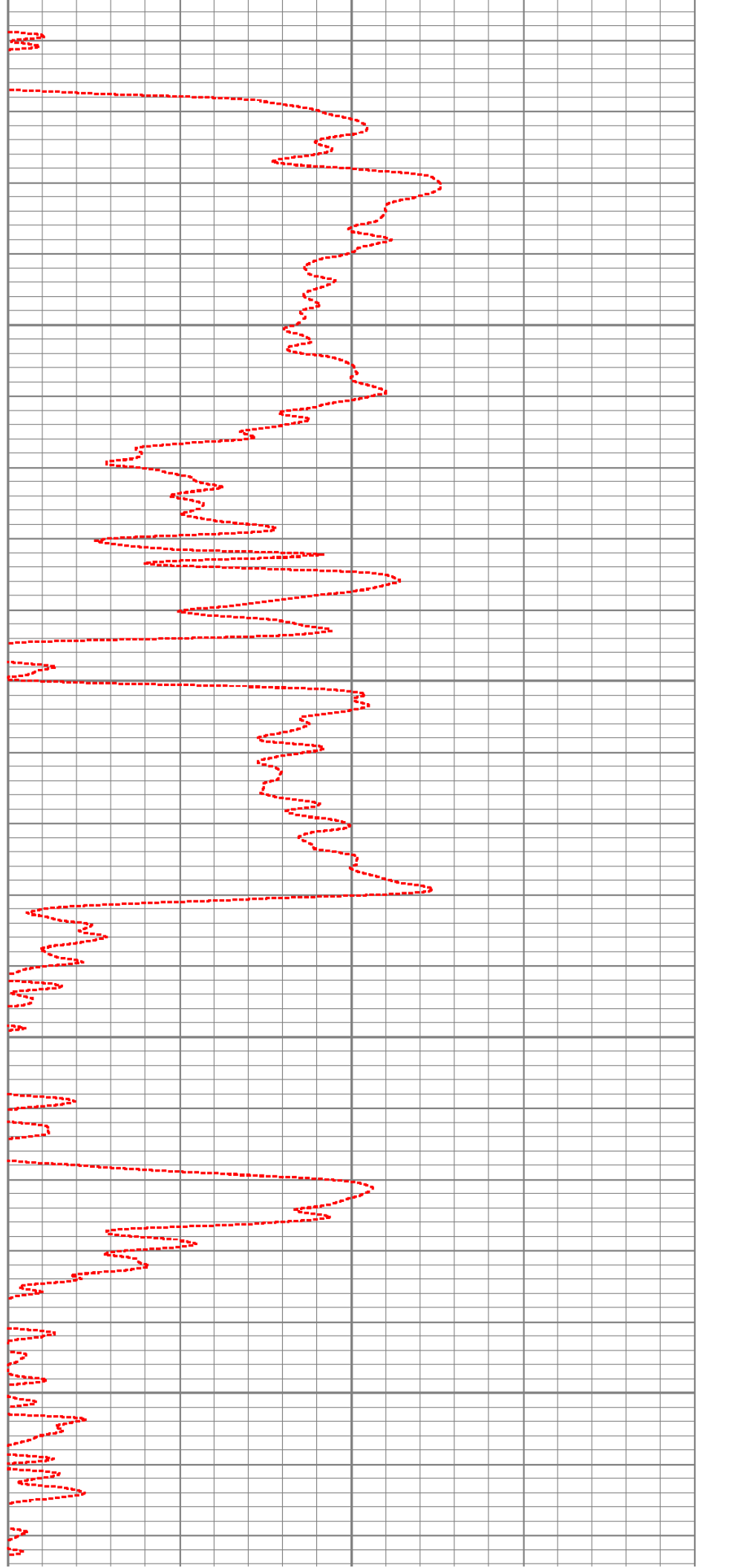


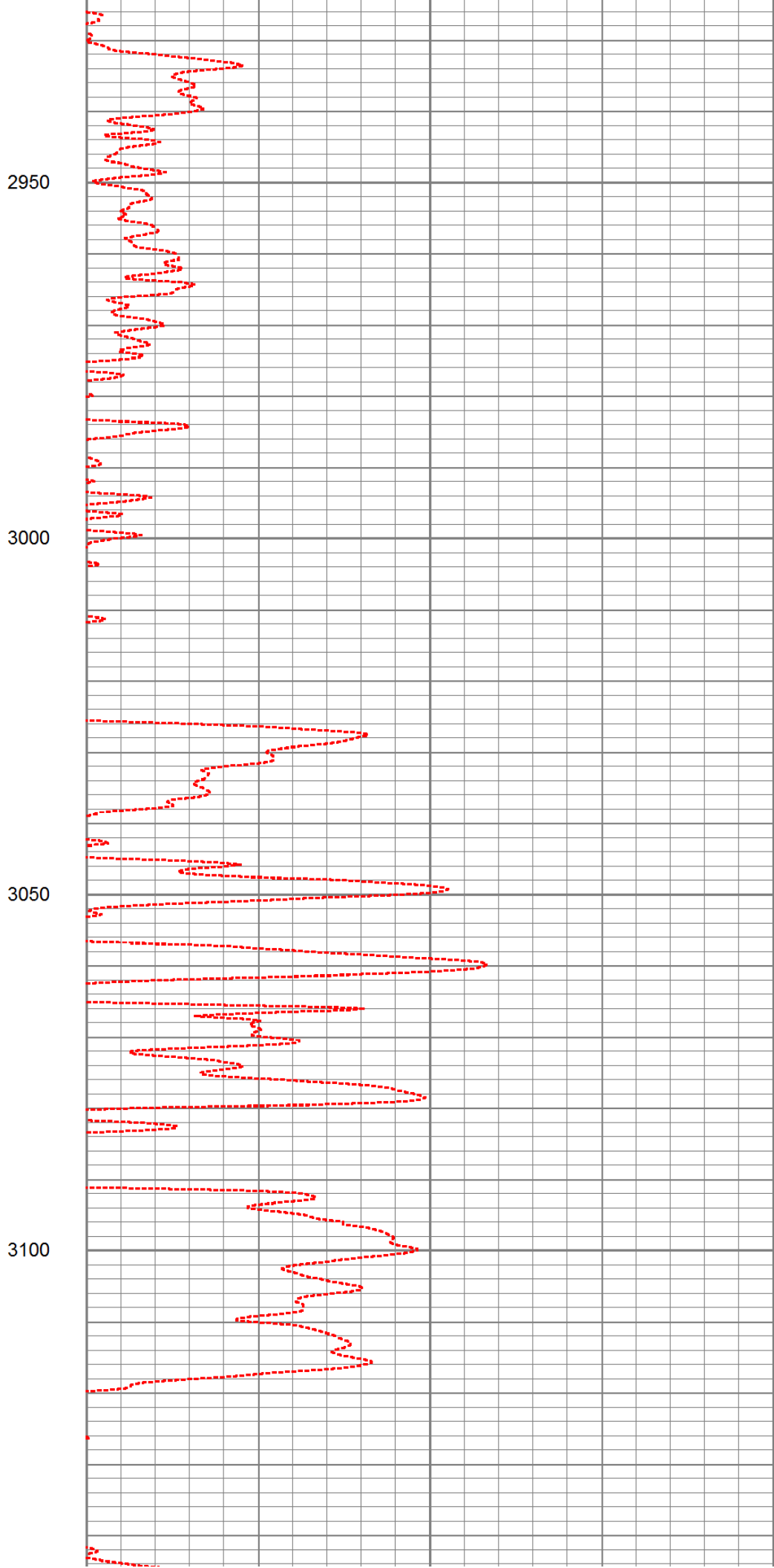
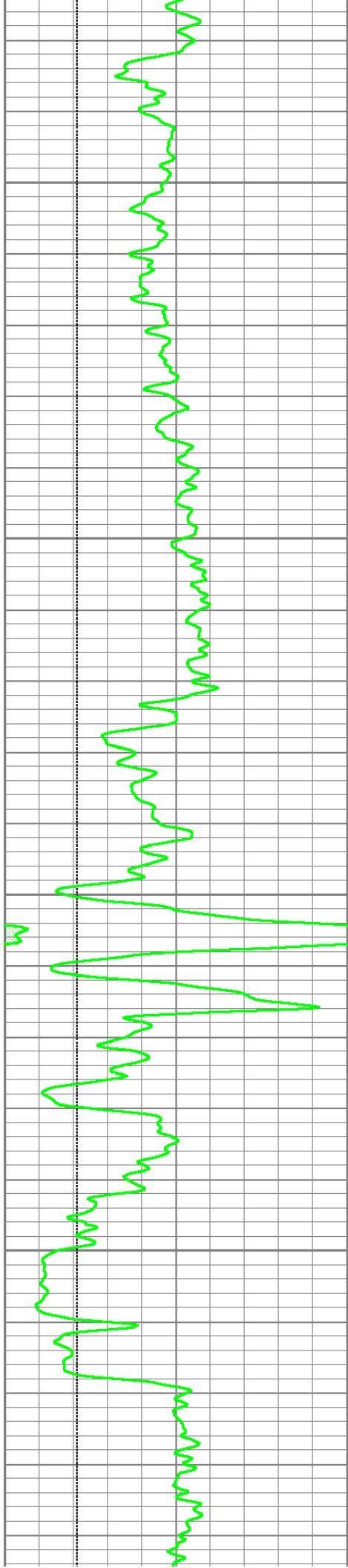
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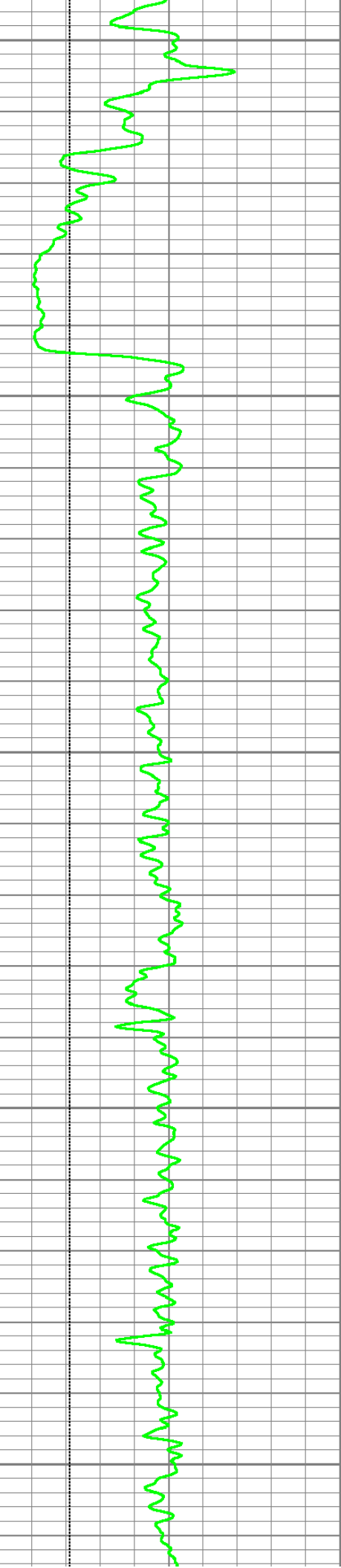
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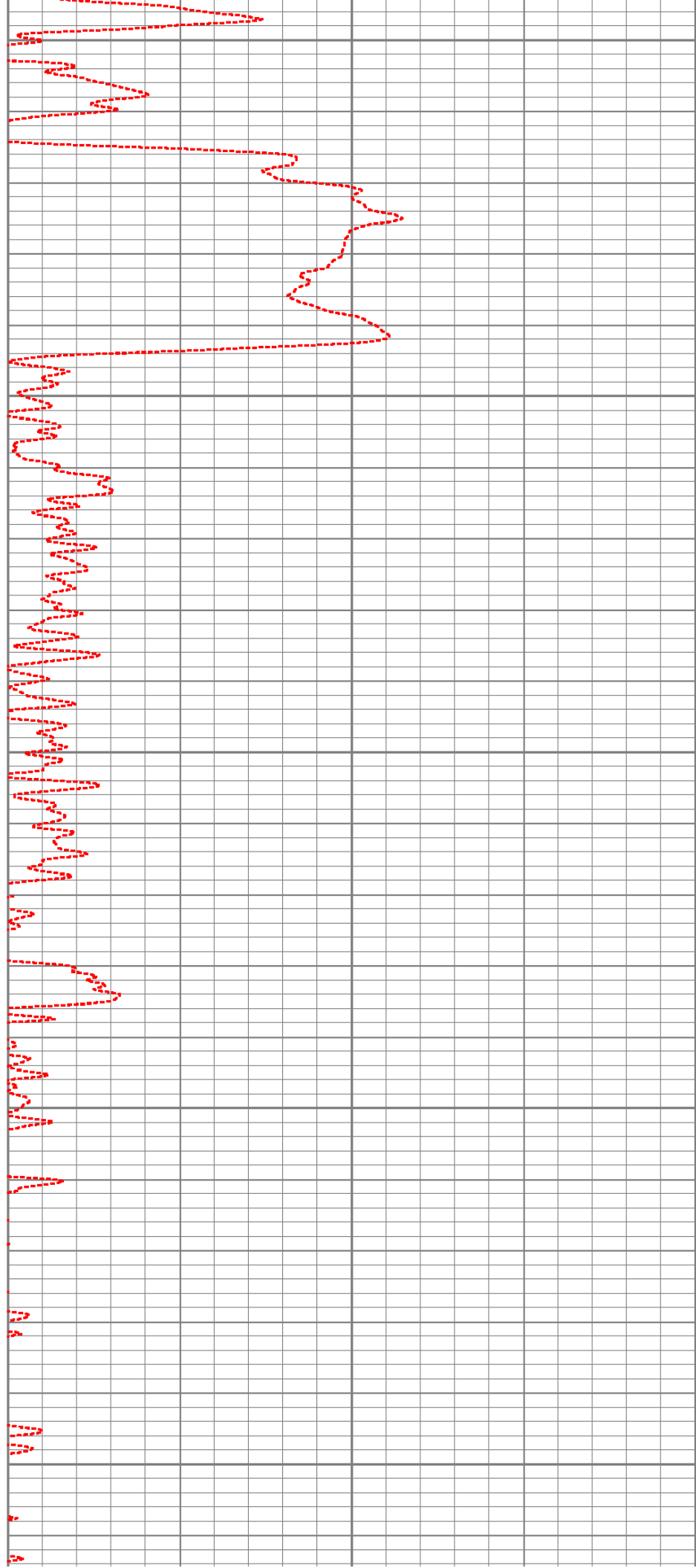
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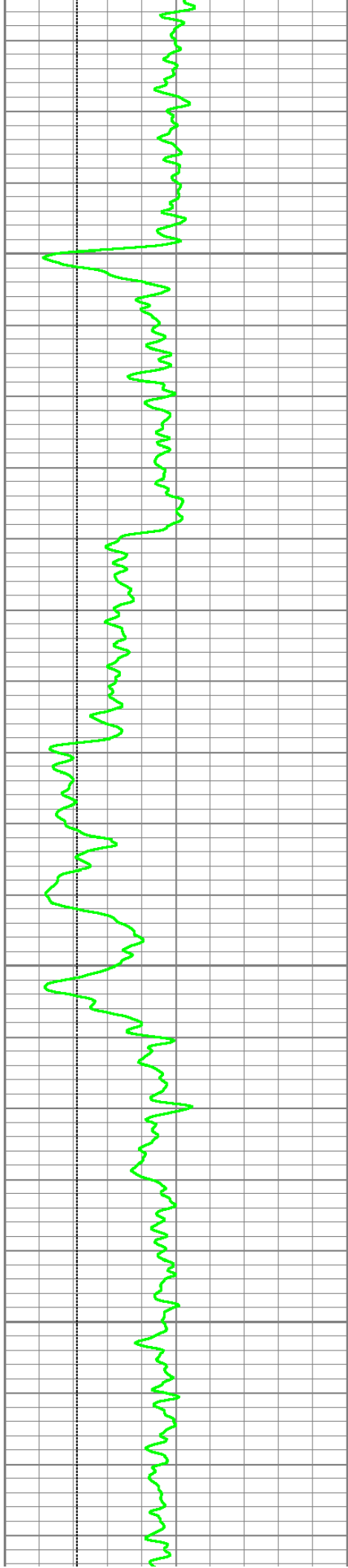
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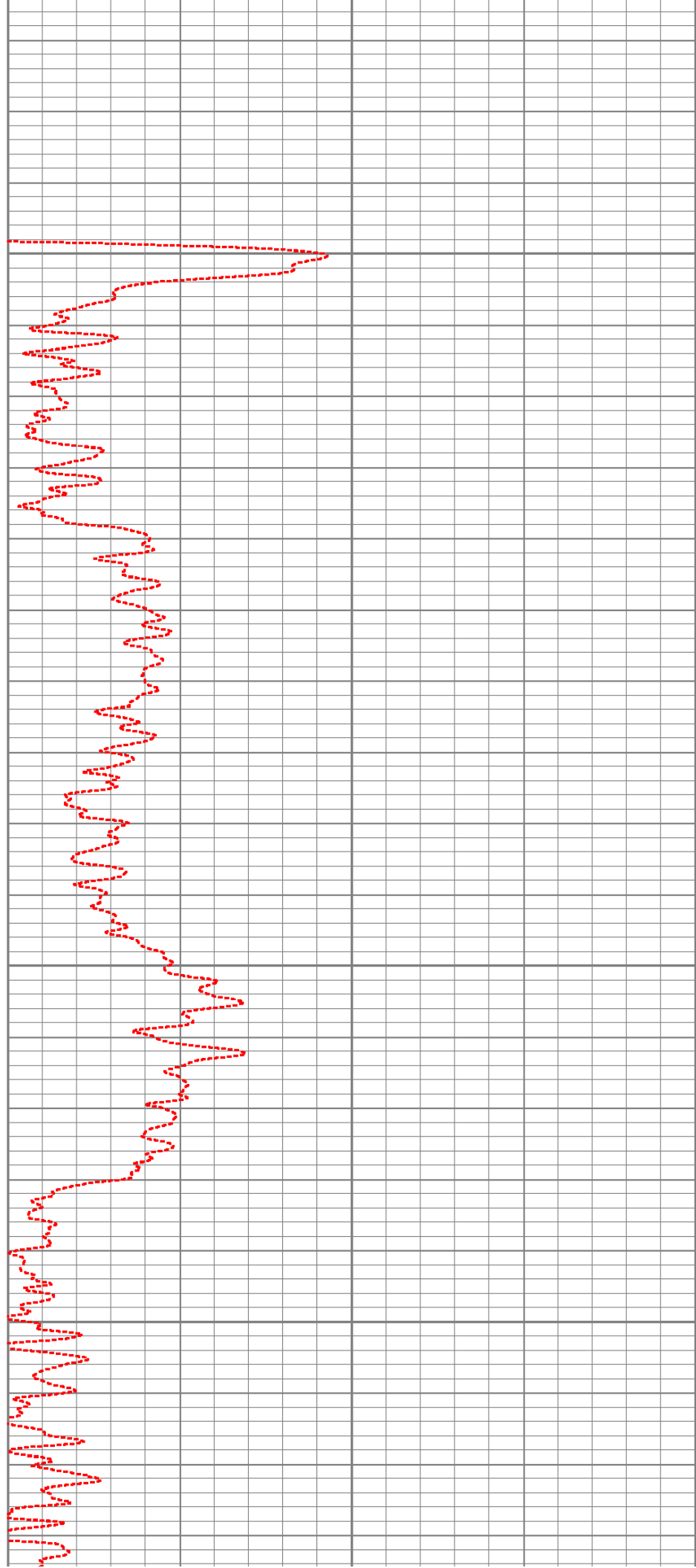


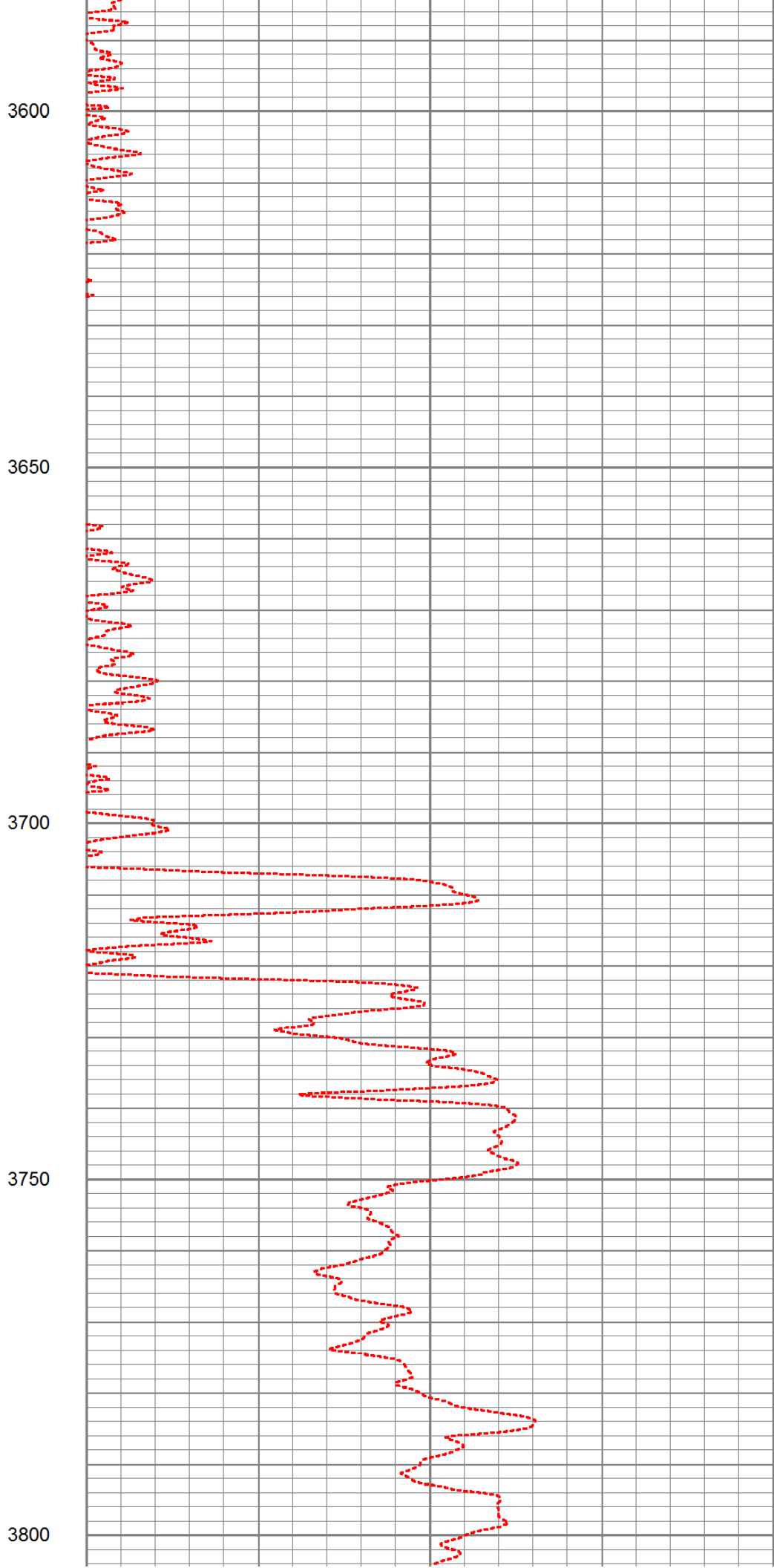
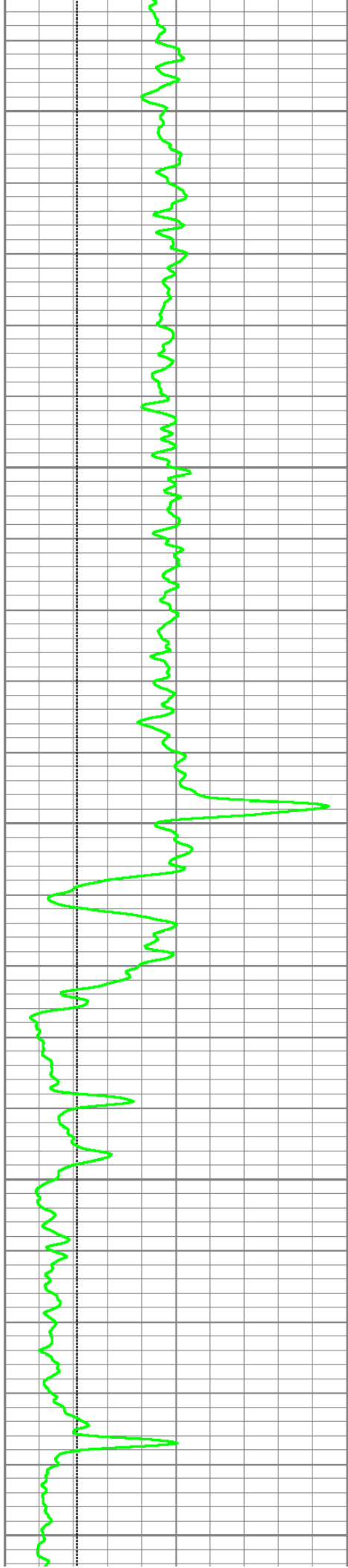
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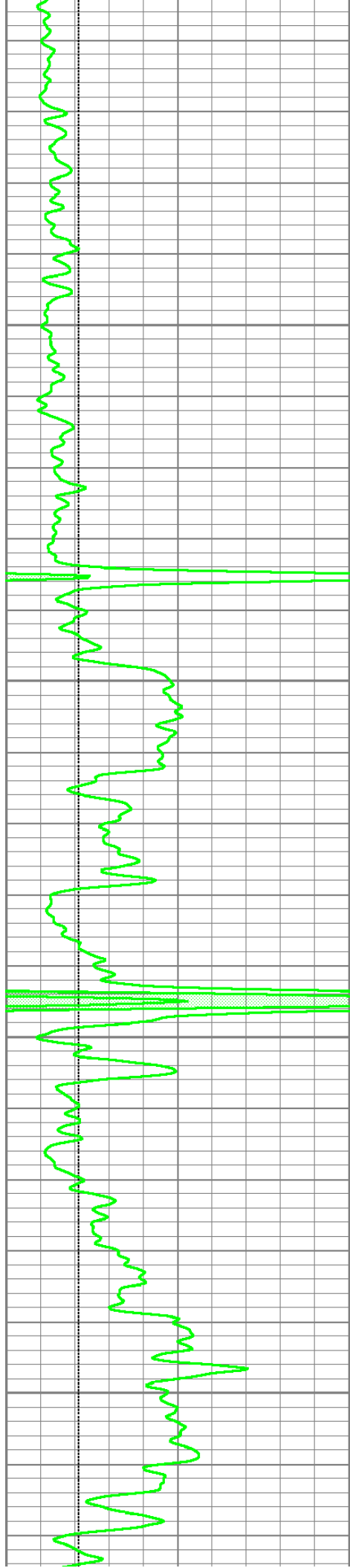
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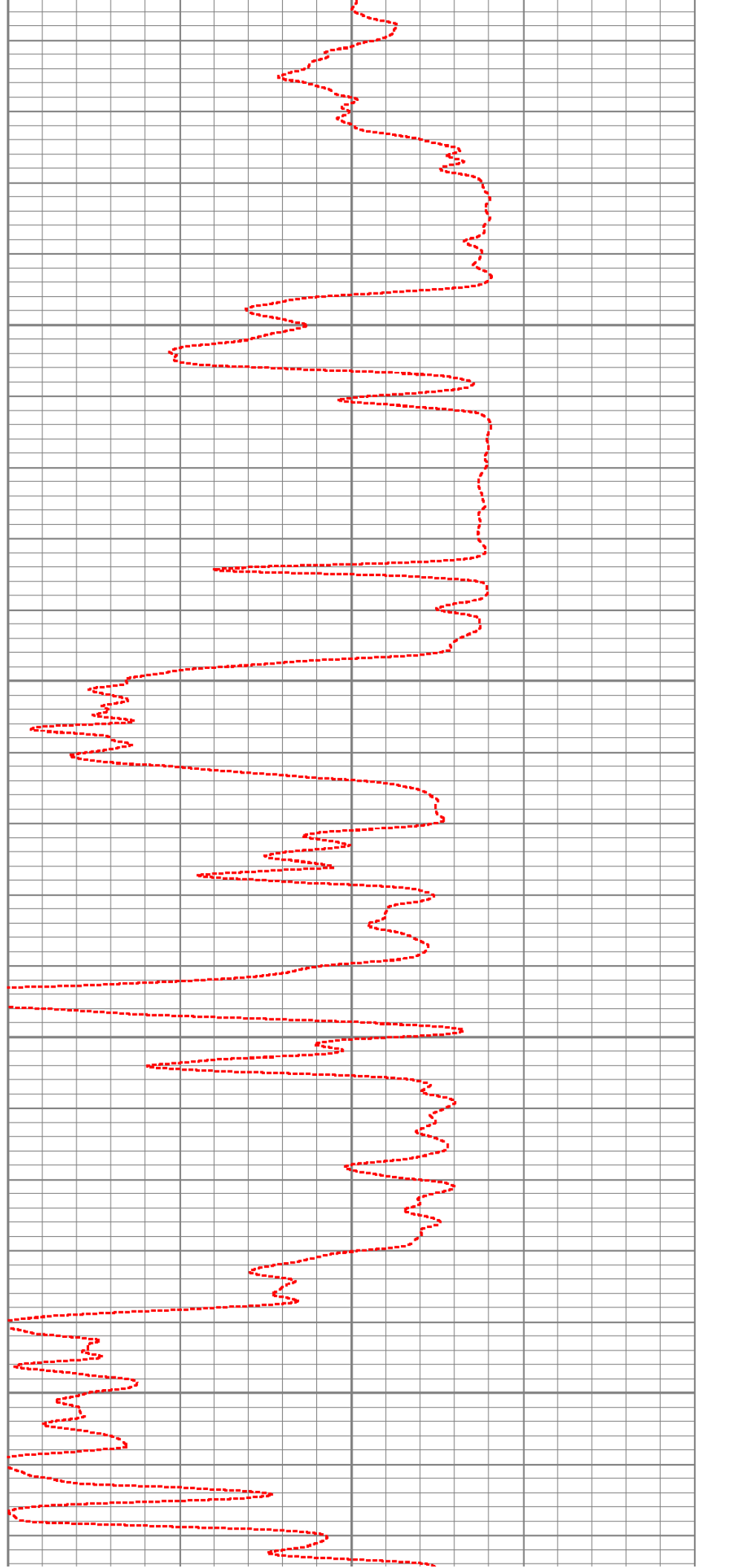


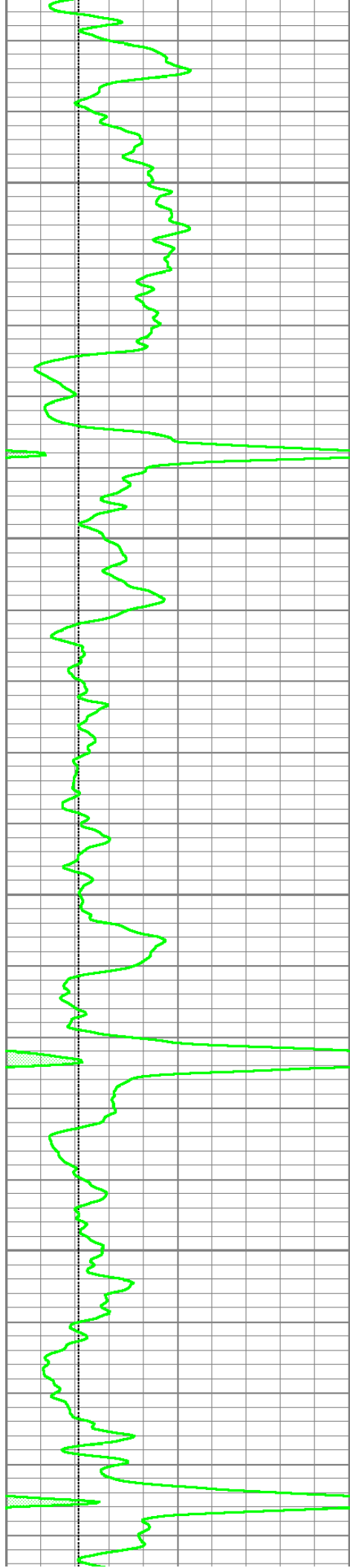
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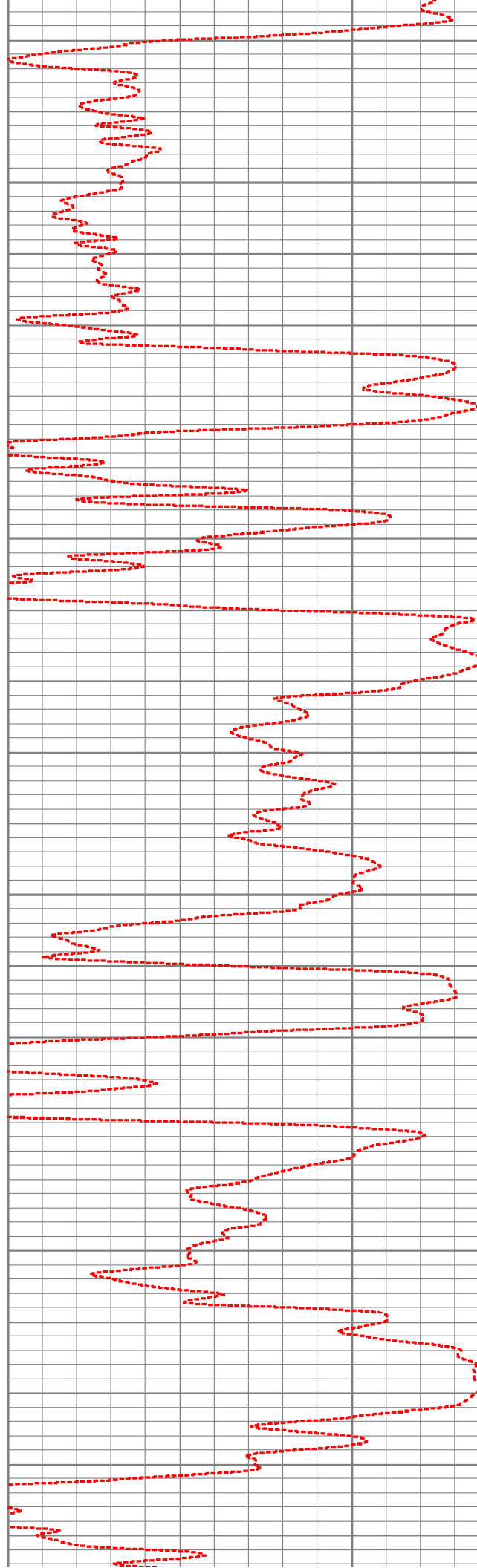


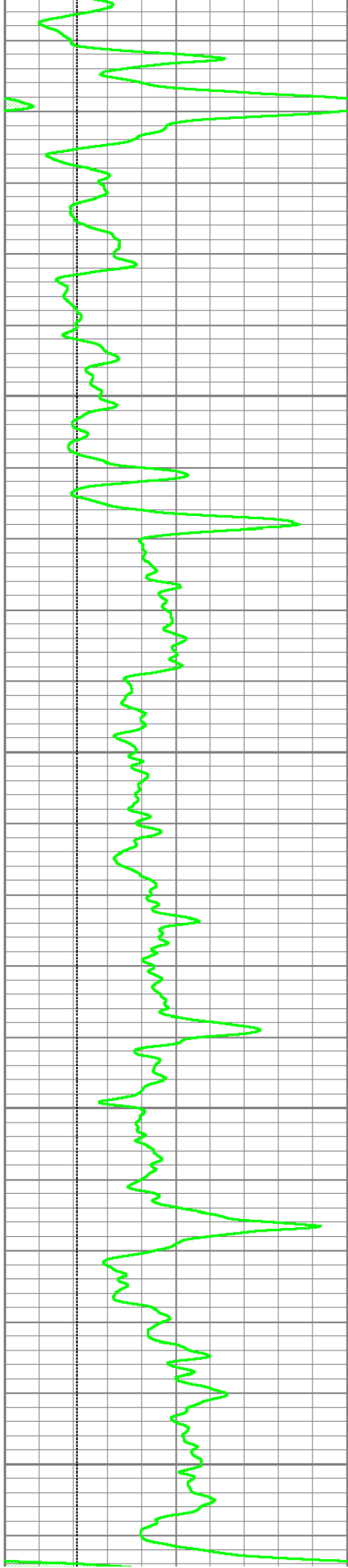
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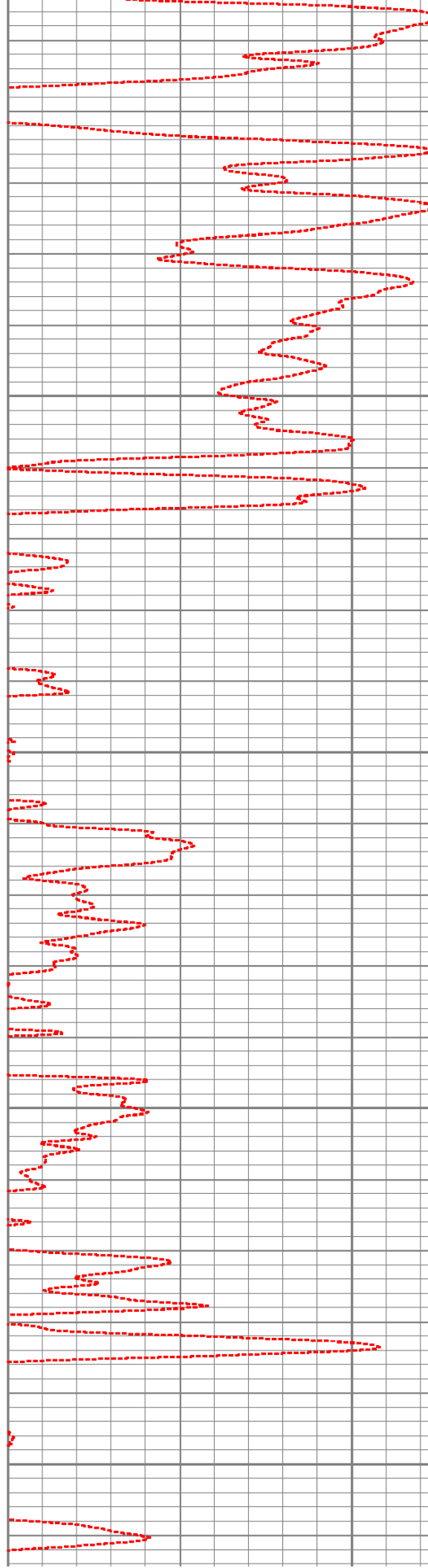
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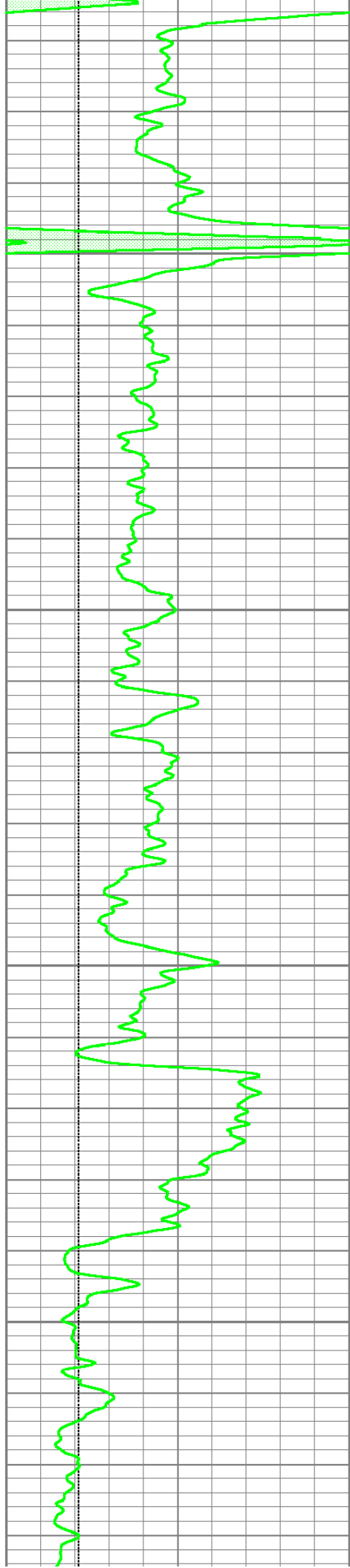
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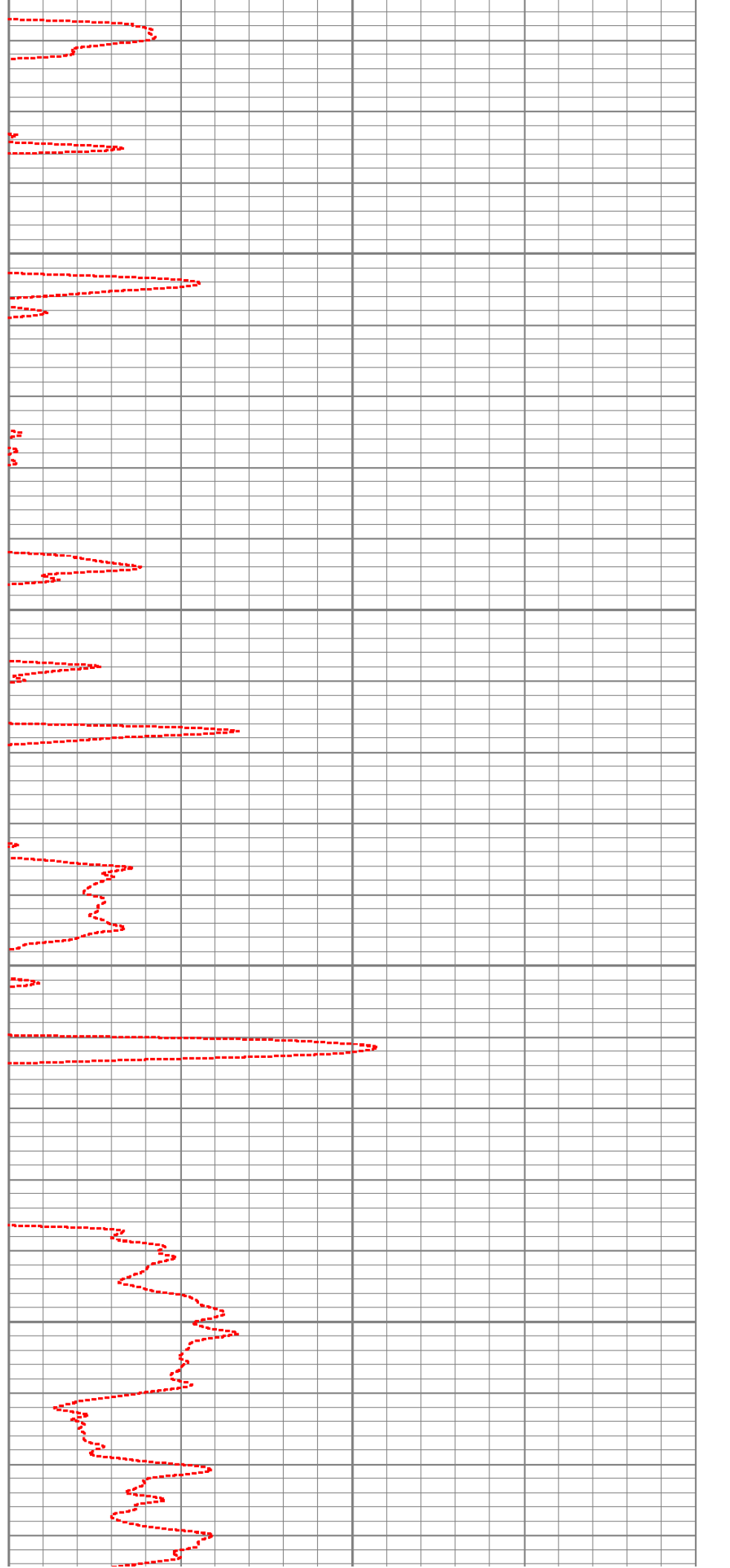


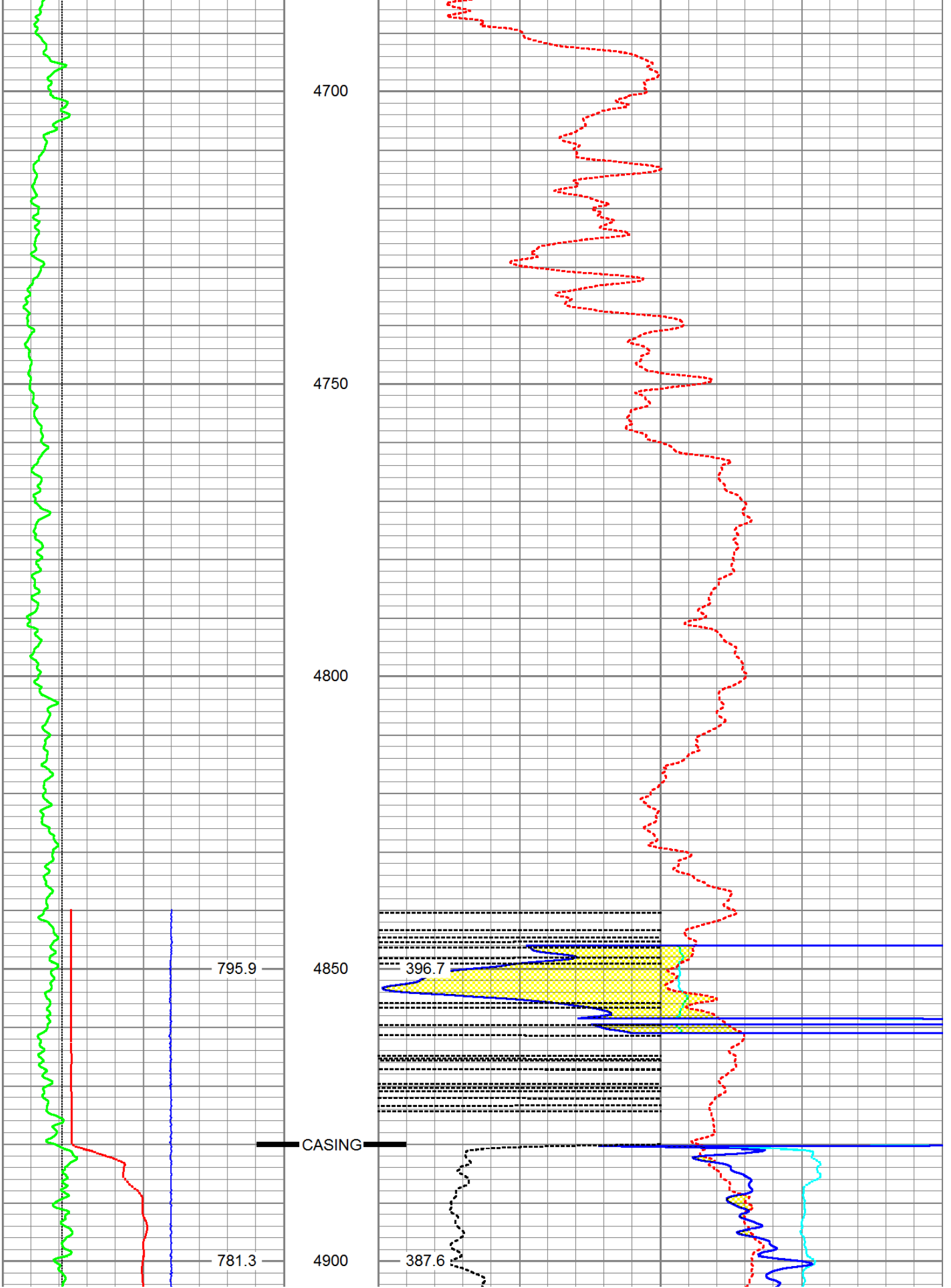
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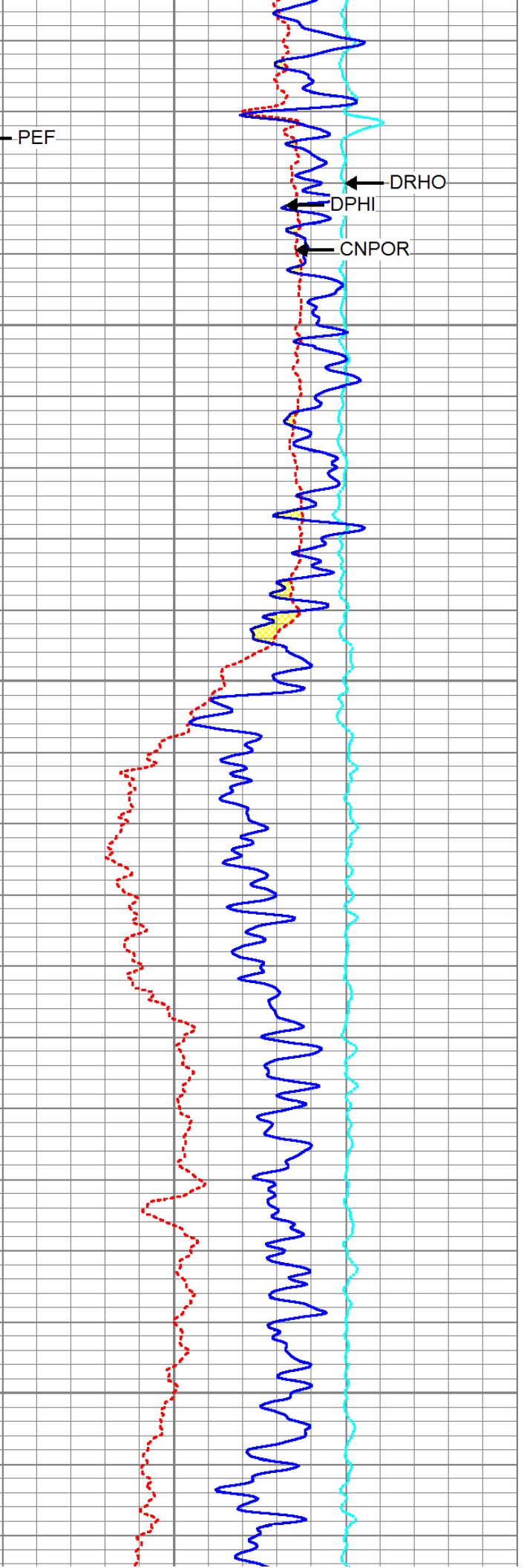
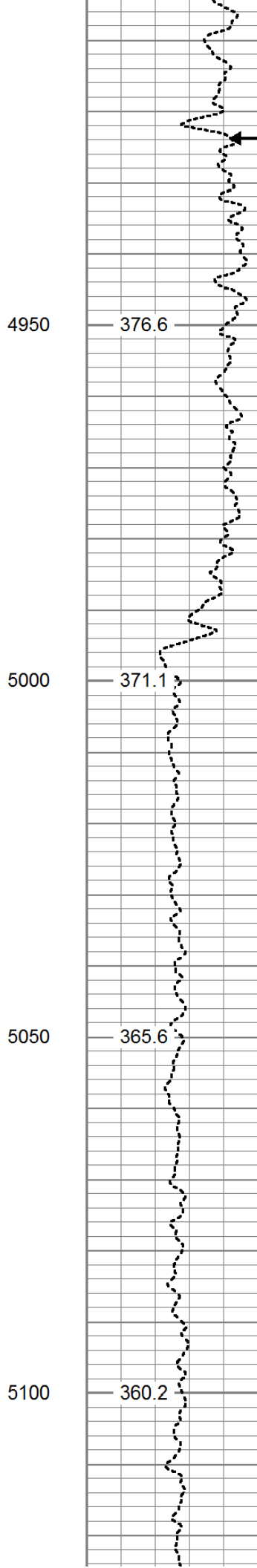
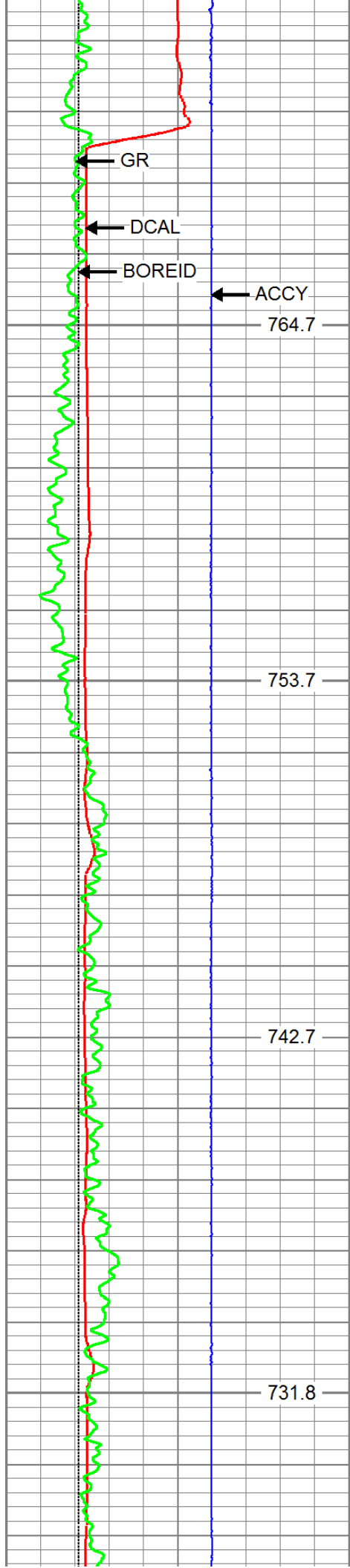
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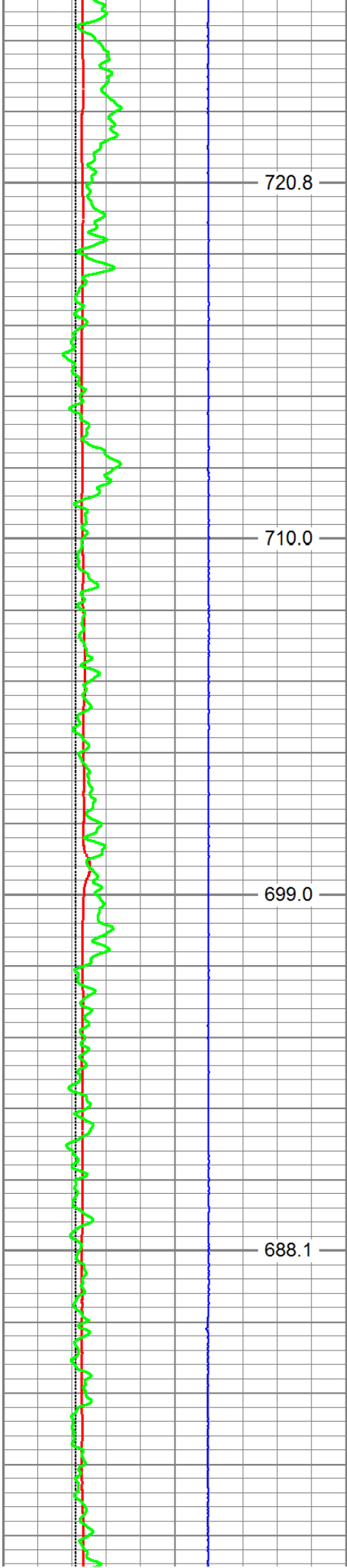
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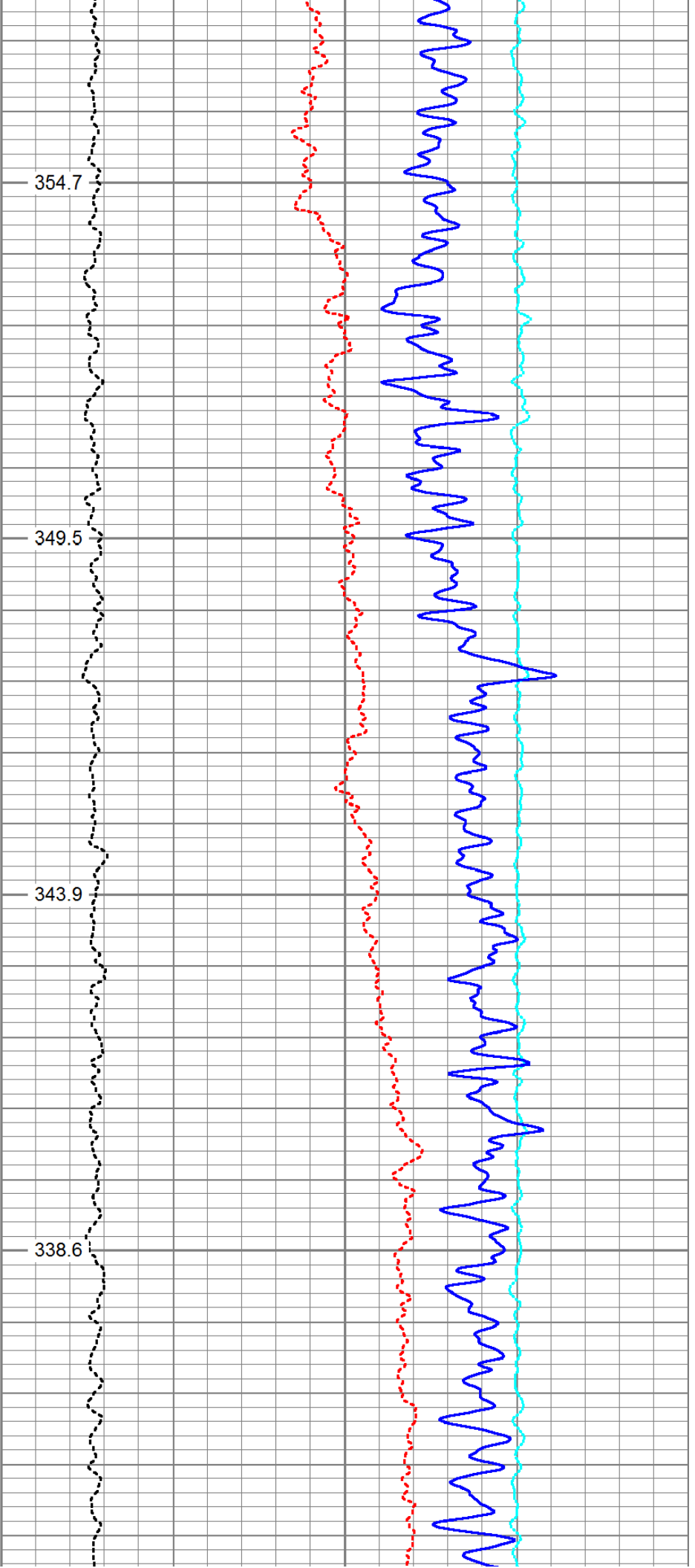


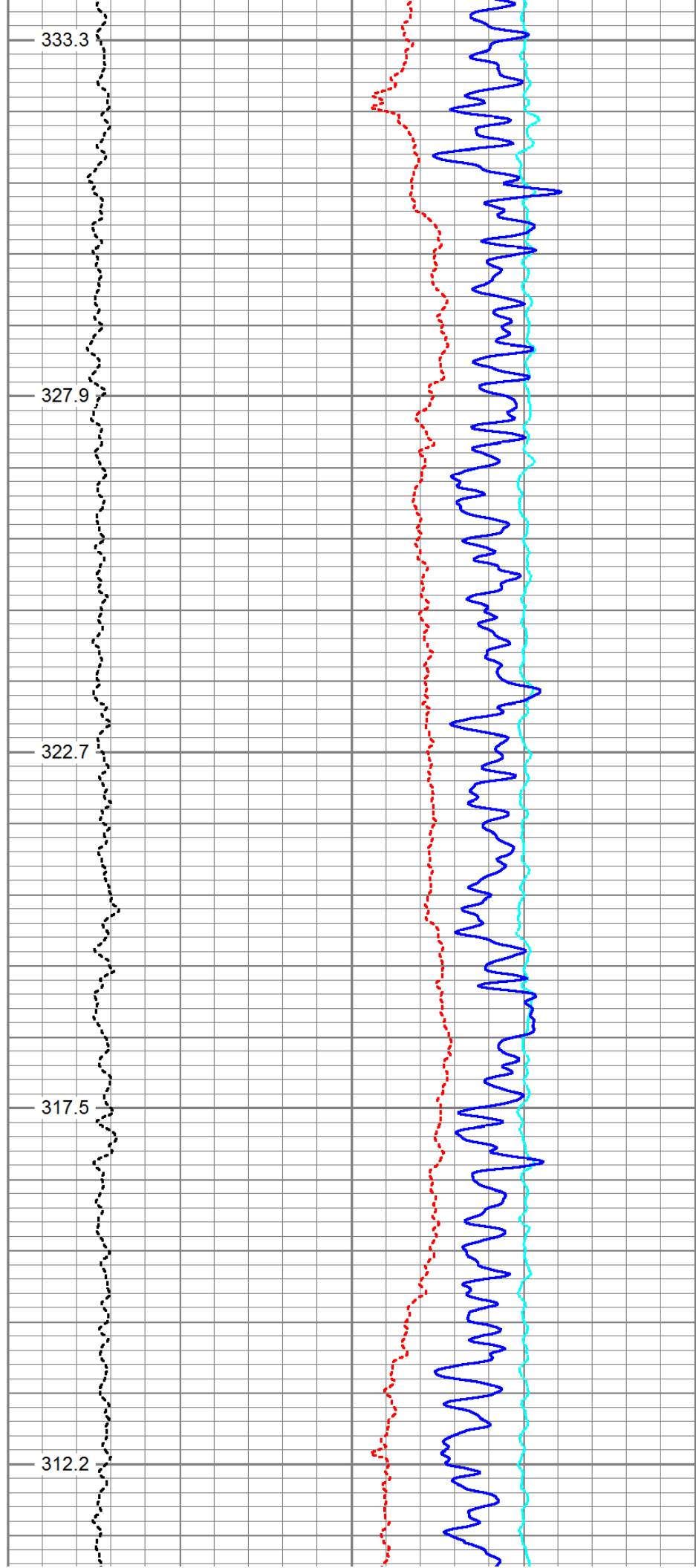
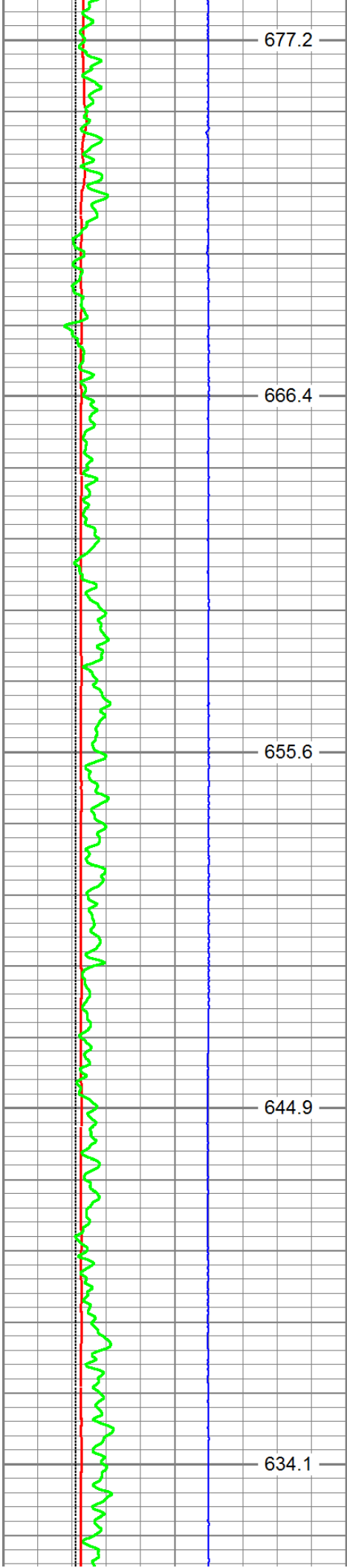
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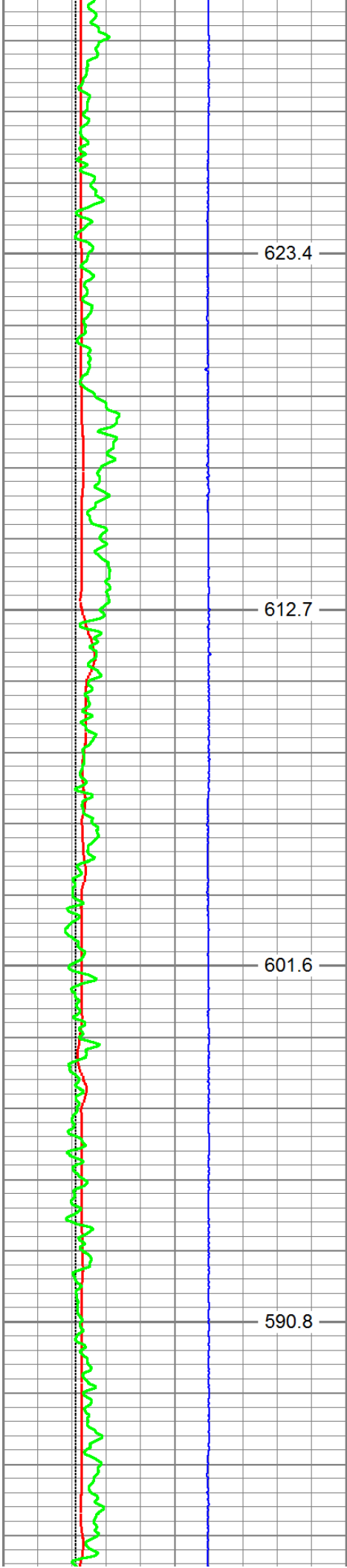
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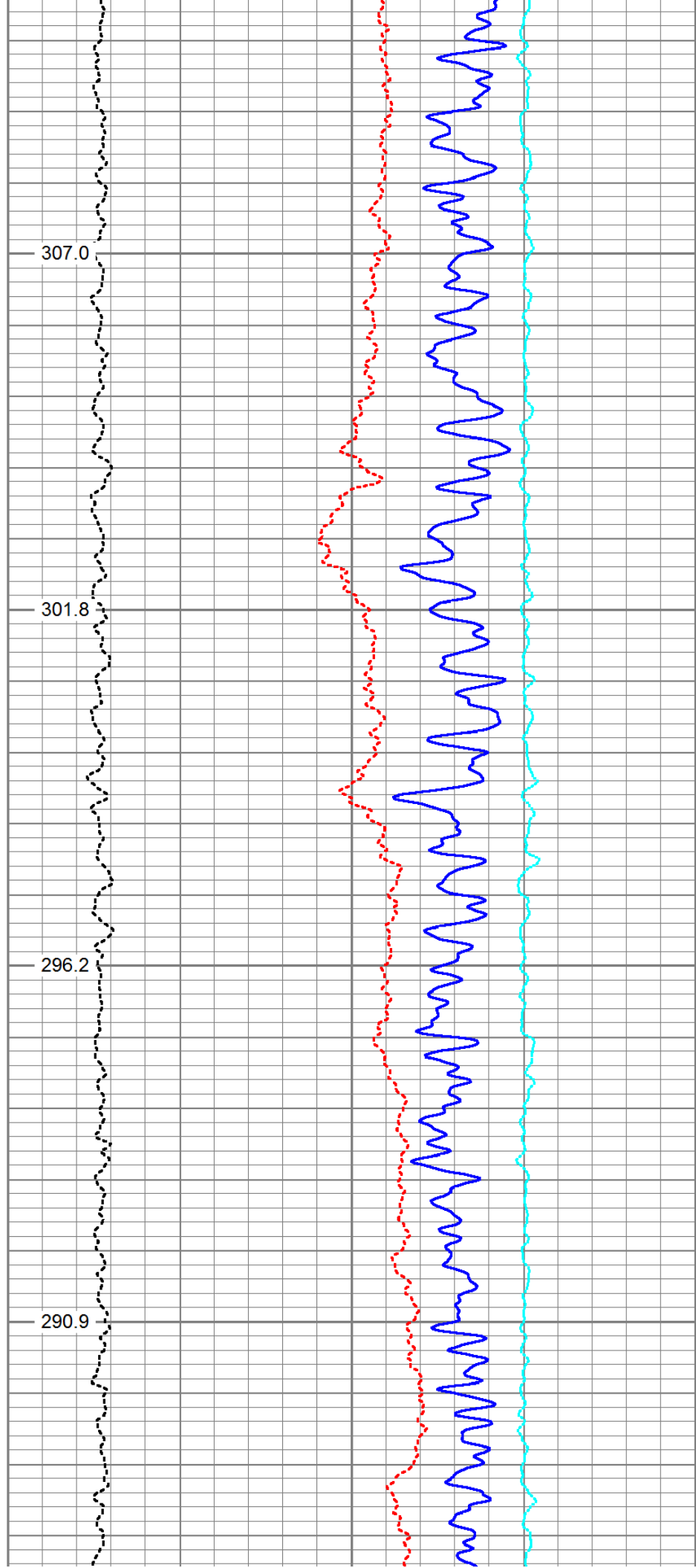


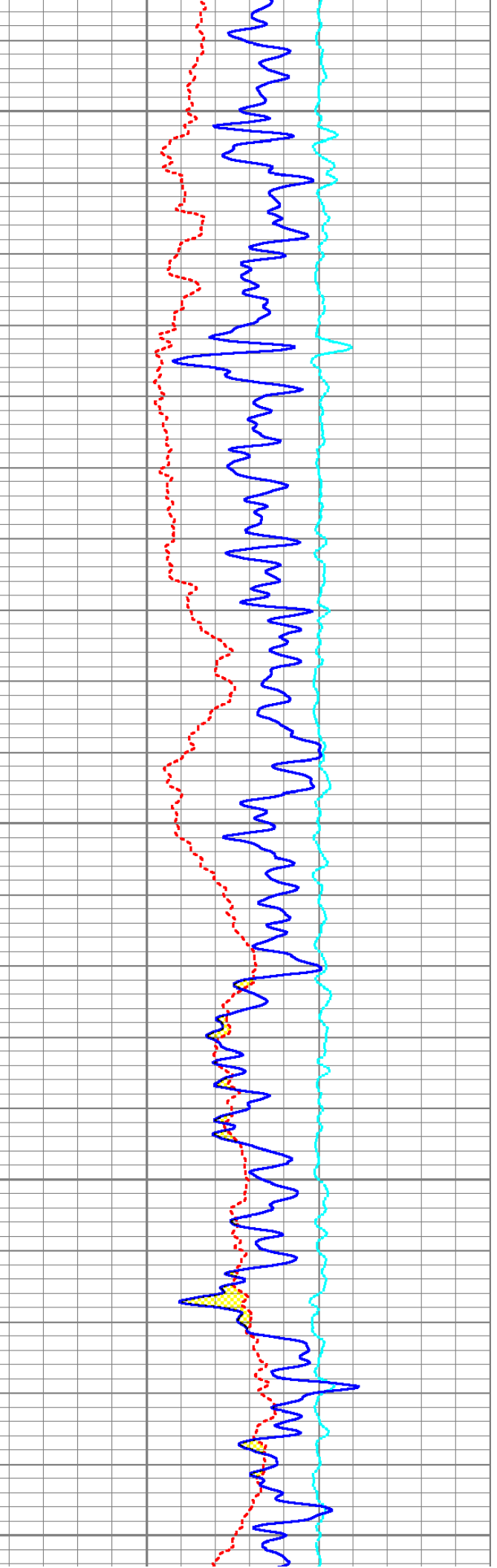
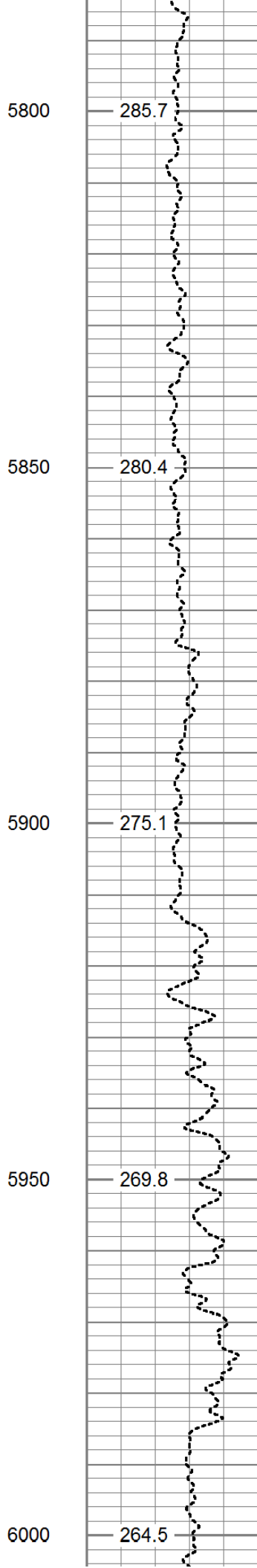
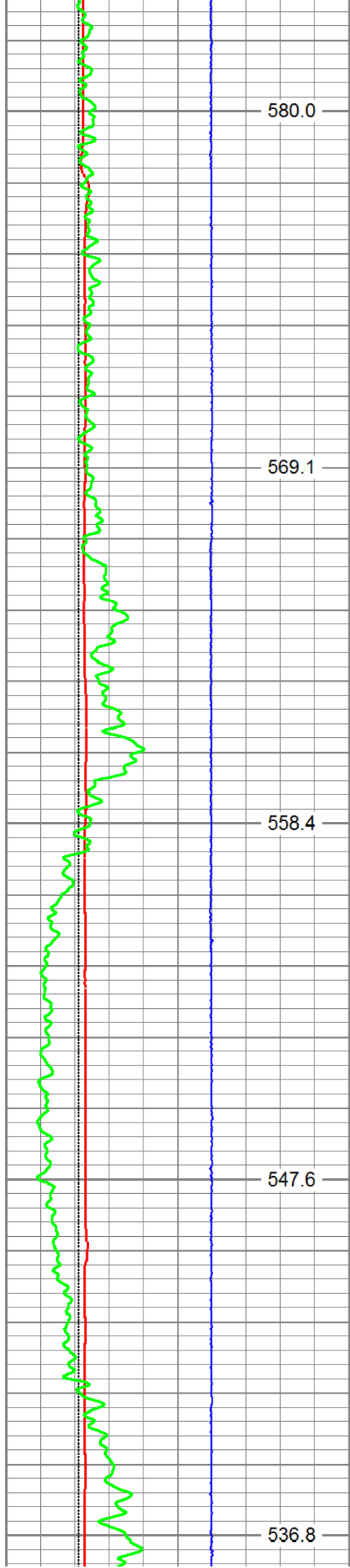
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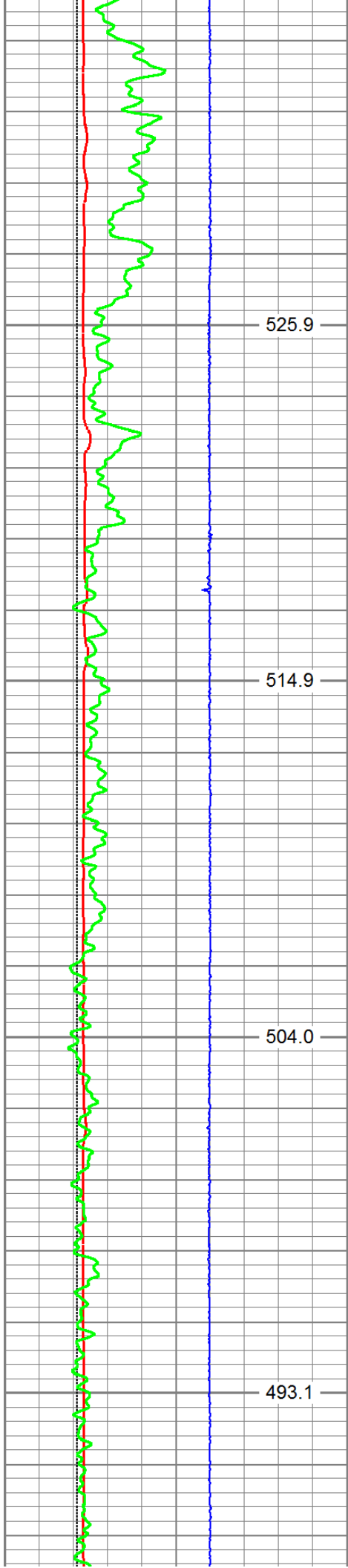
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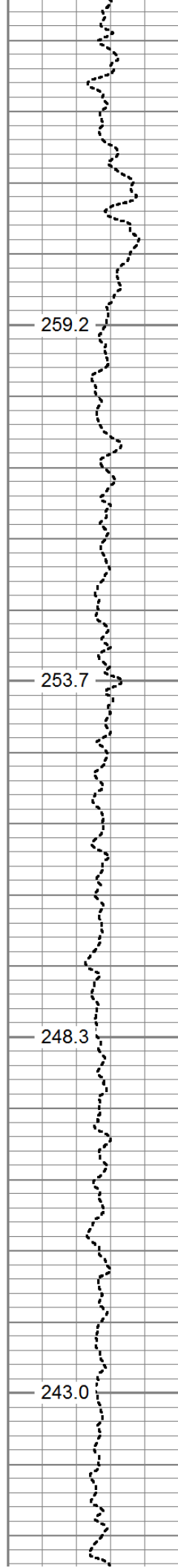


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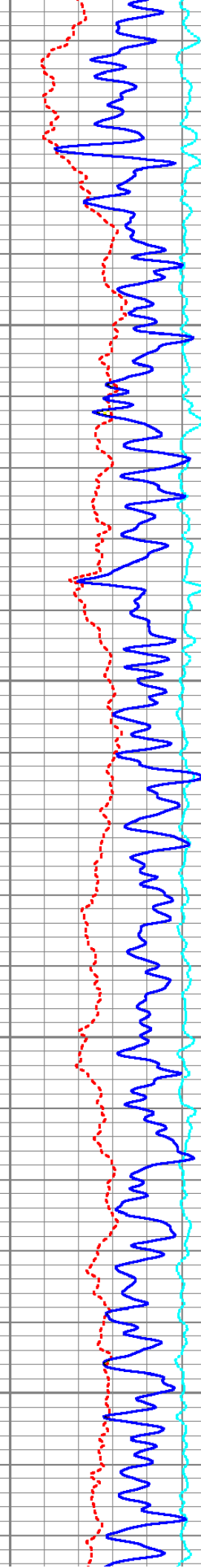


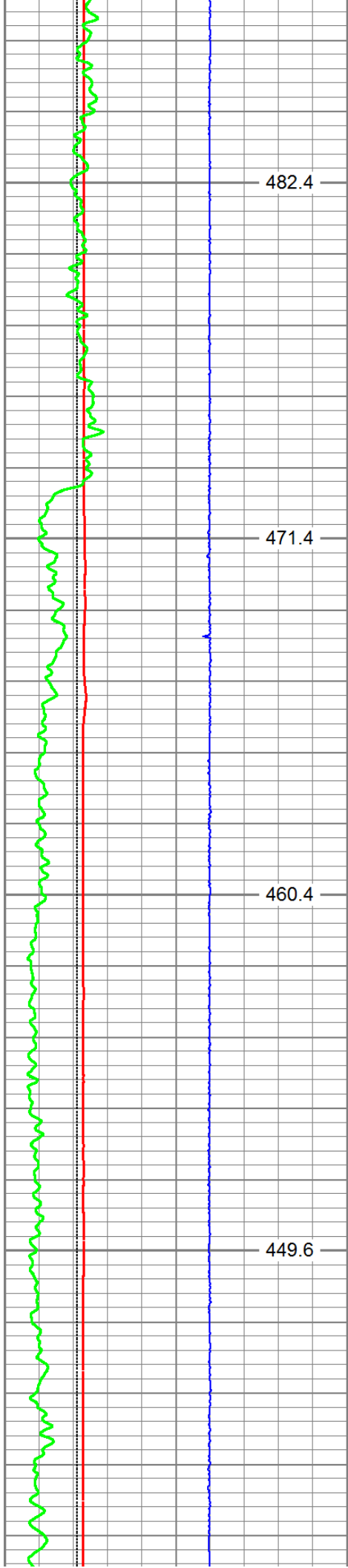
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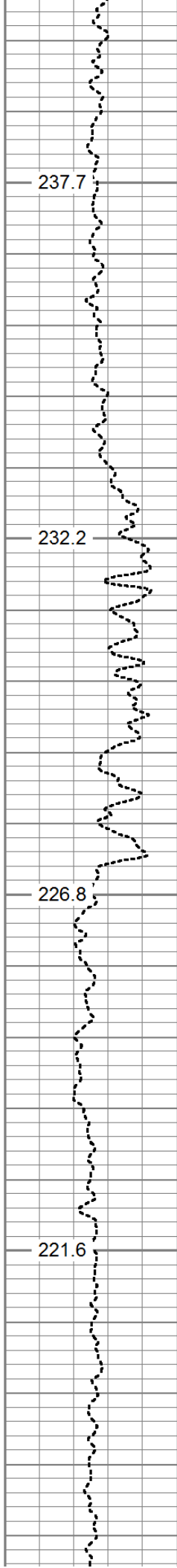


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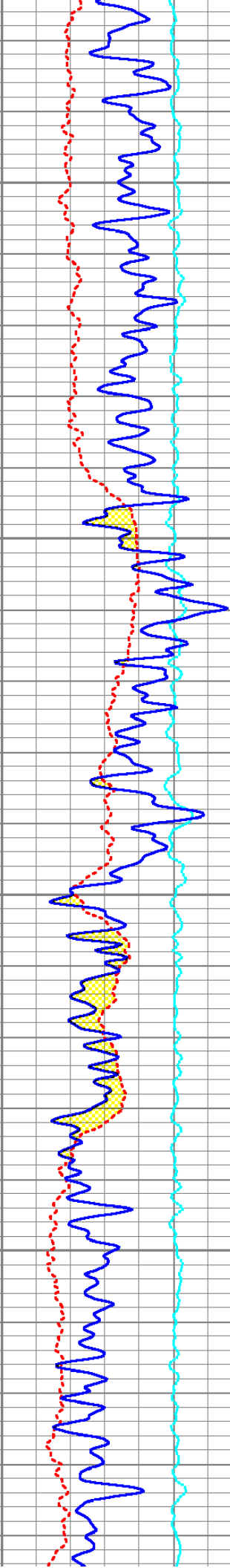


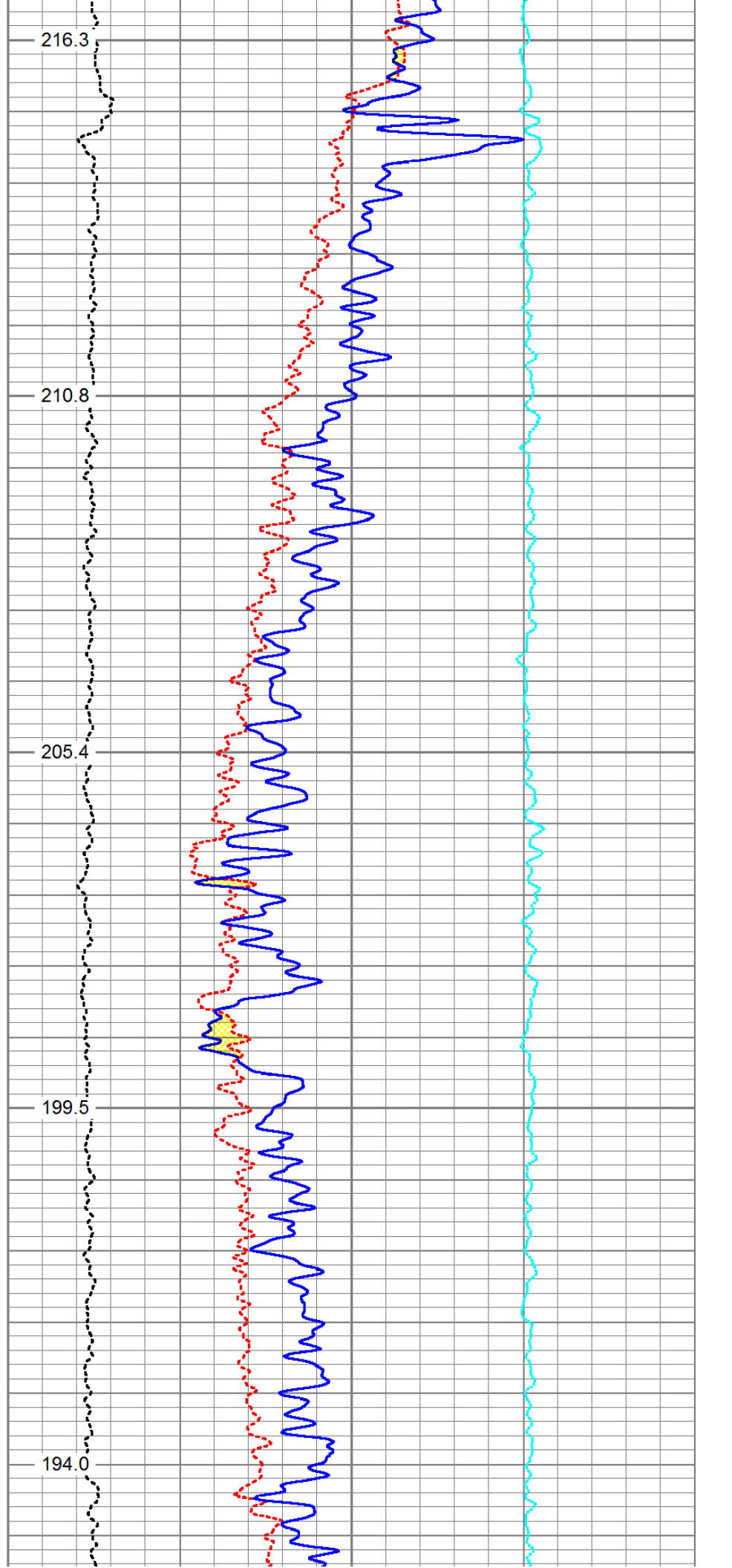
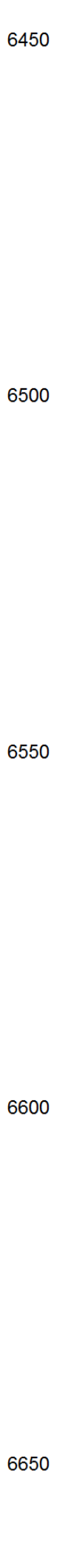
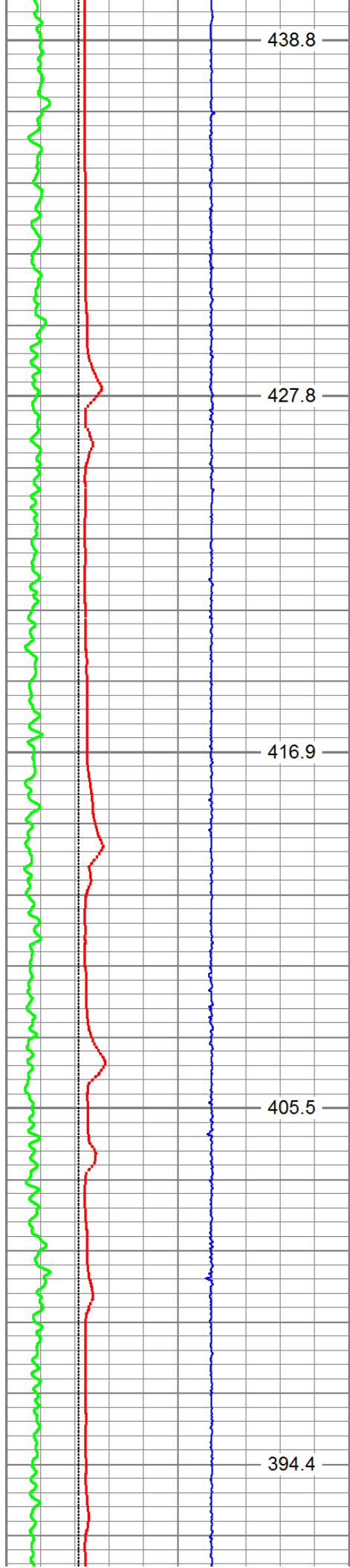
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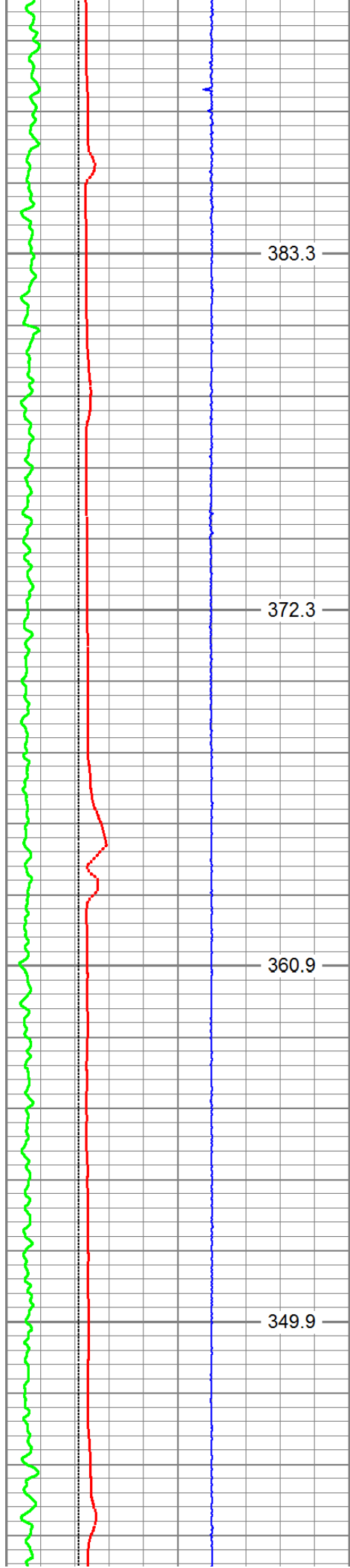
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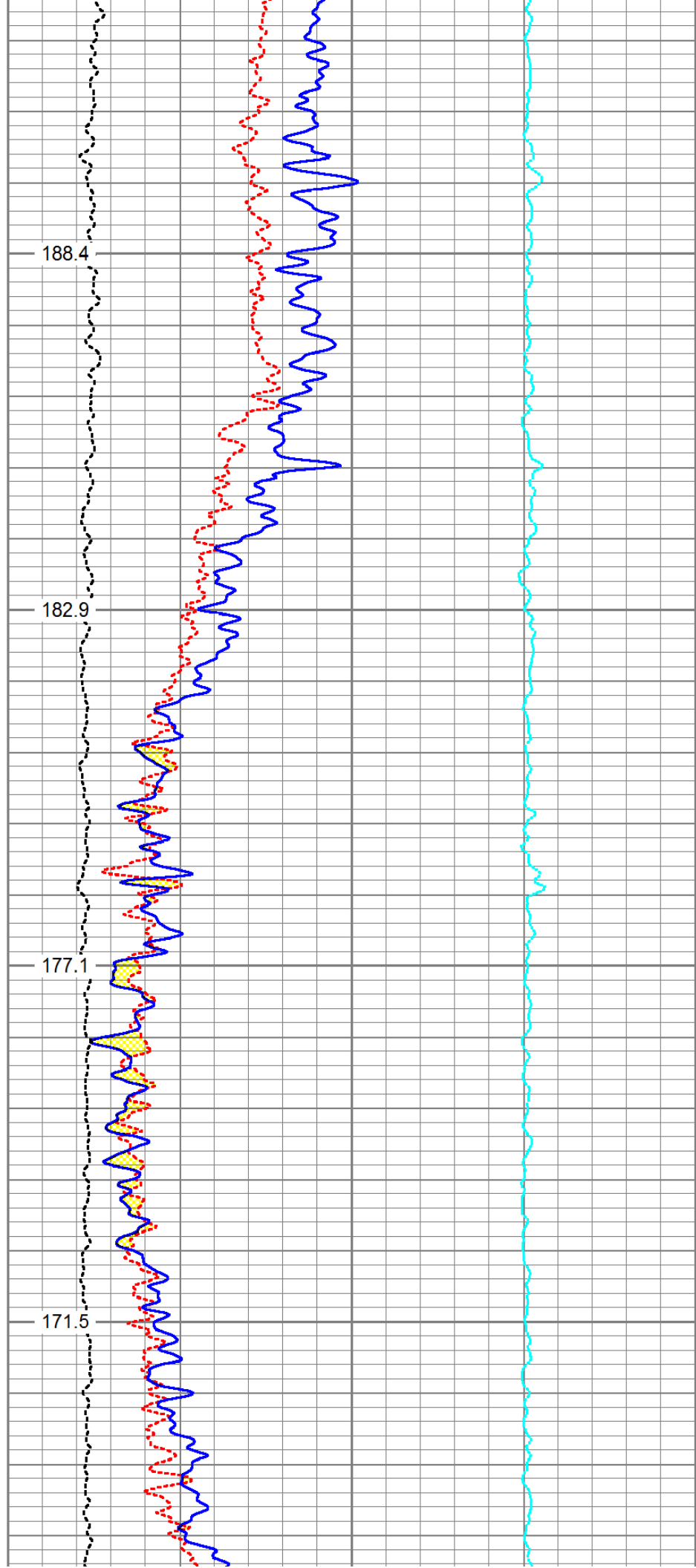


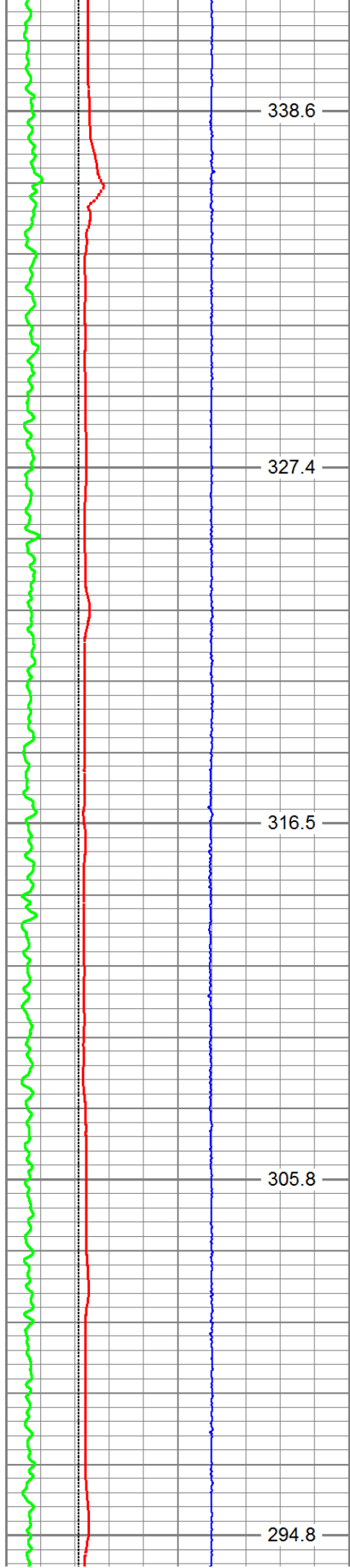
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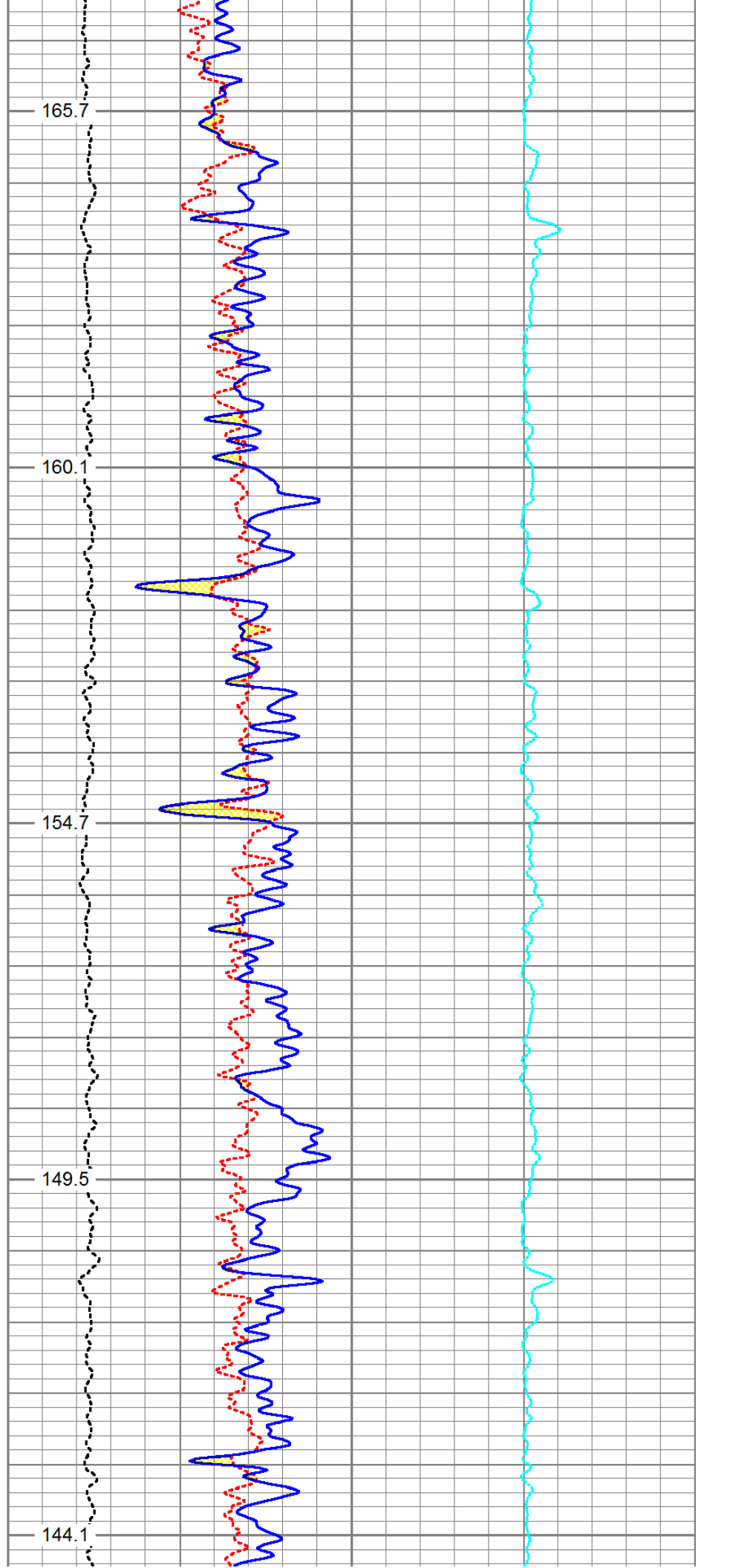
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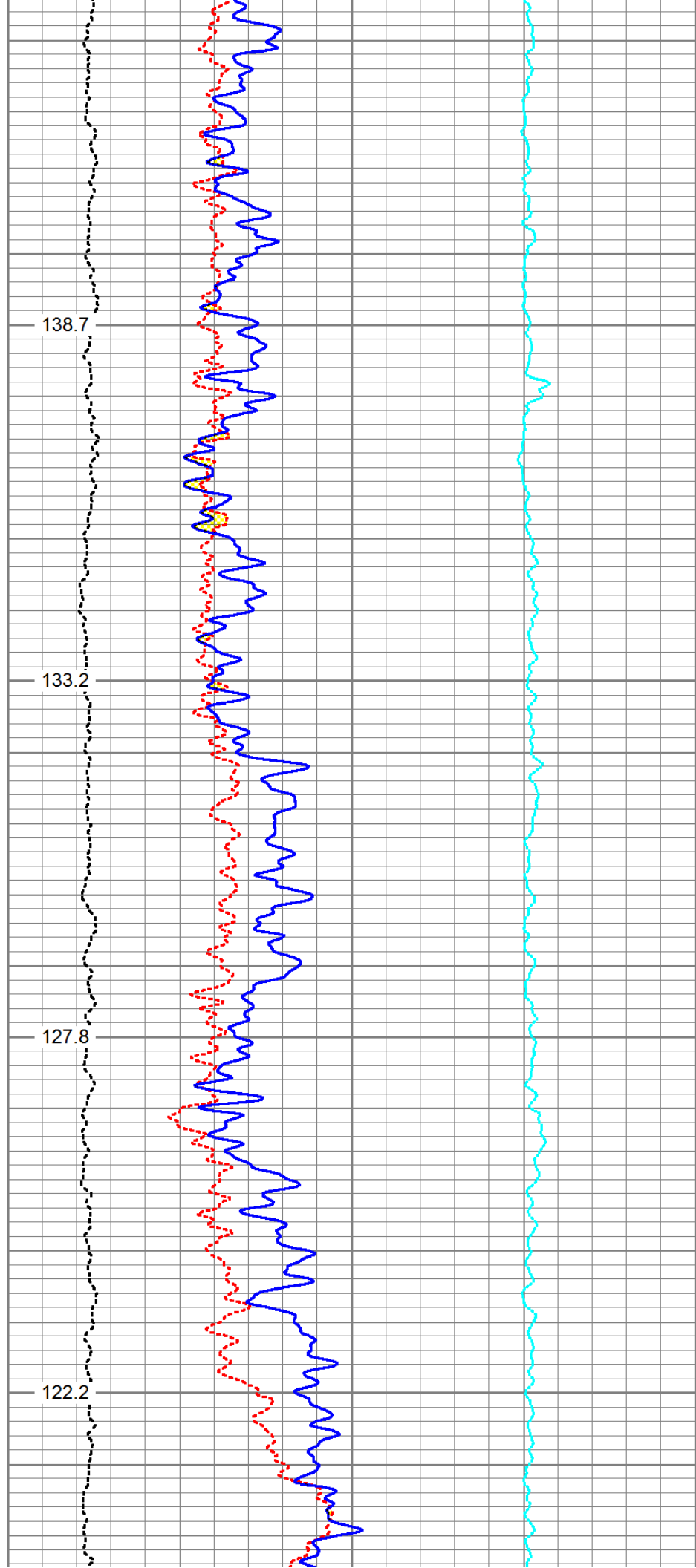
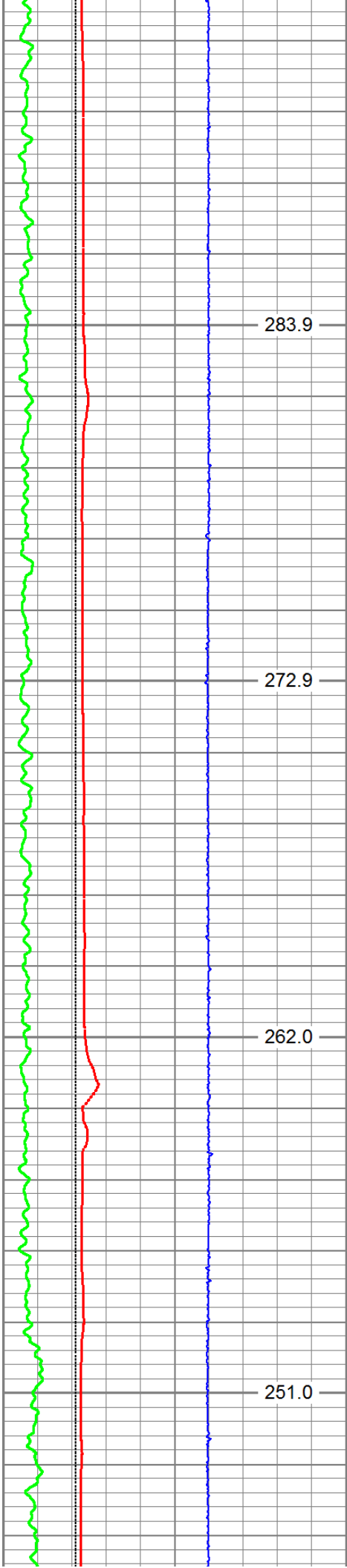
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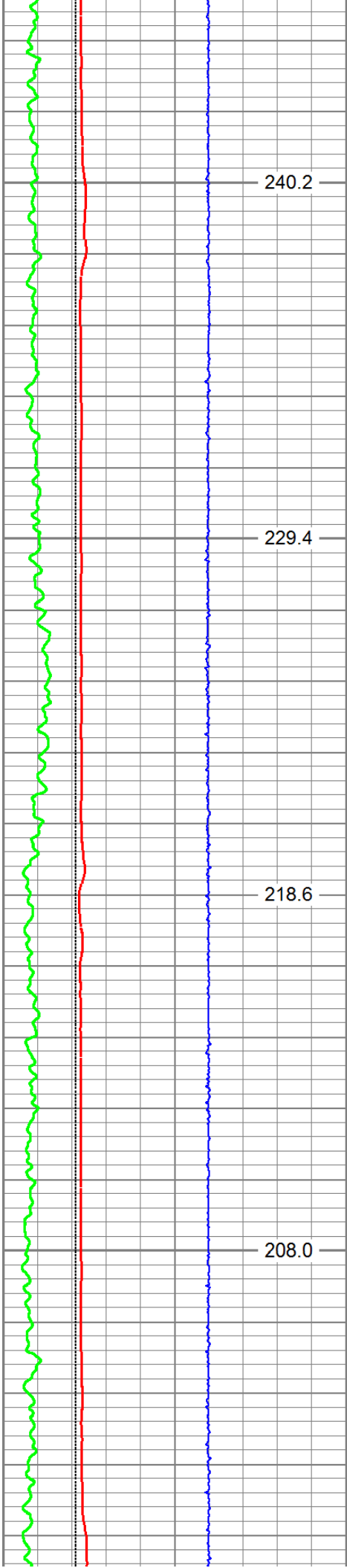
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144.1



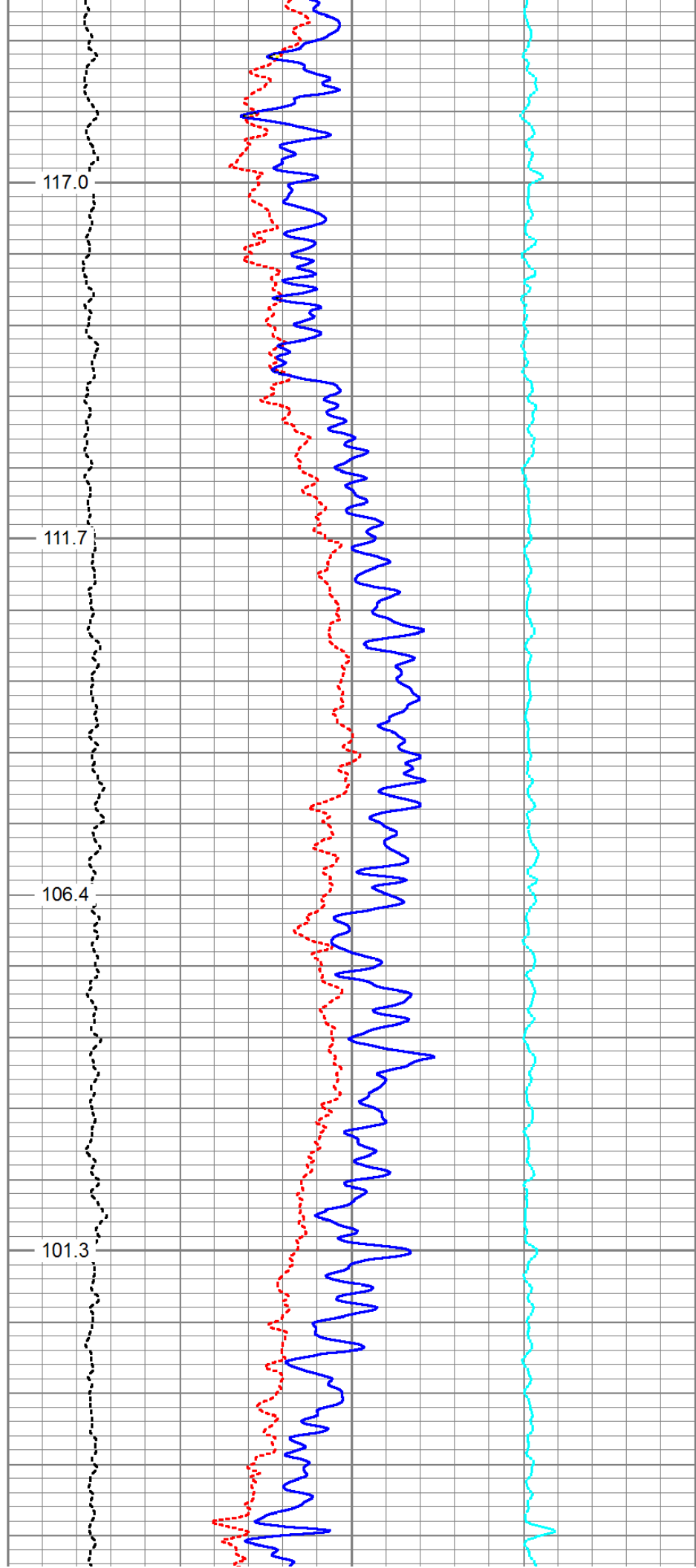


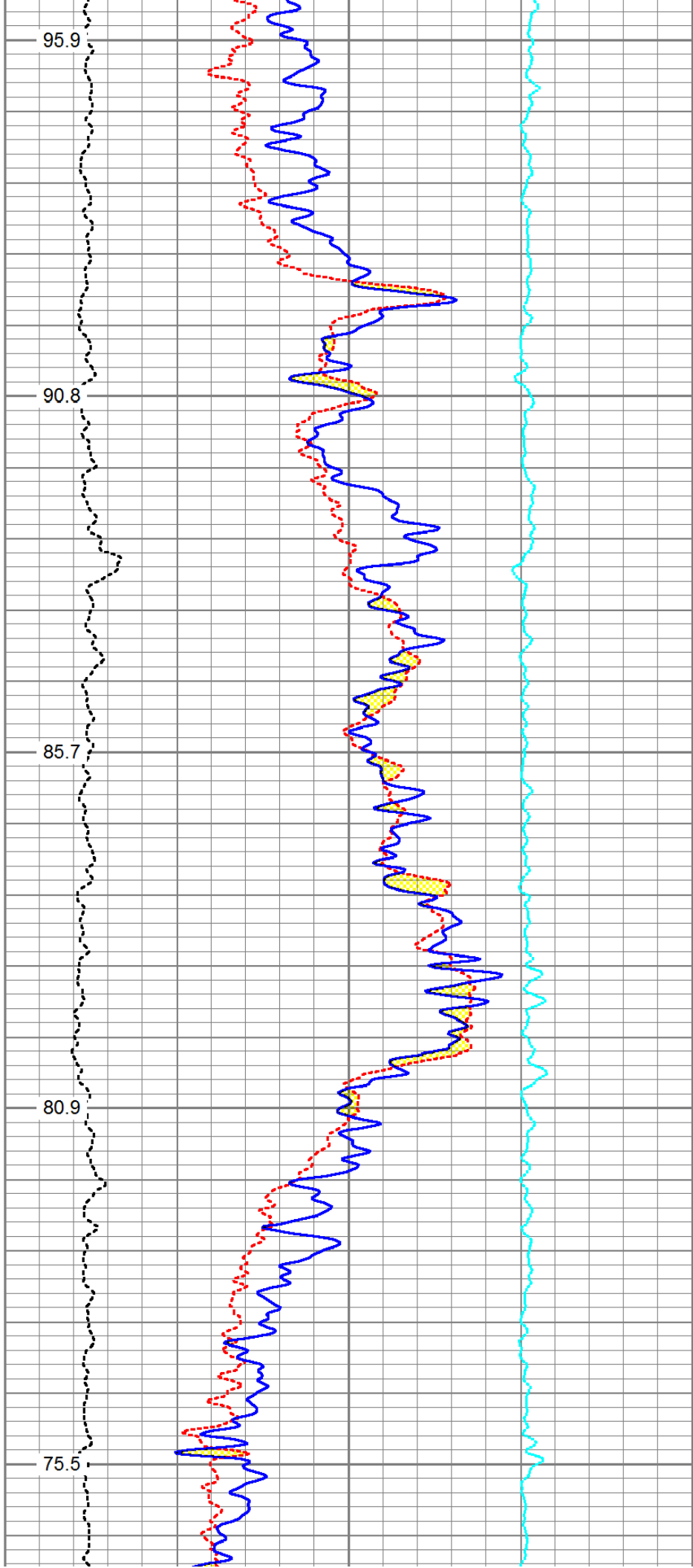
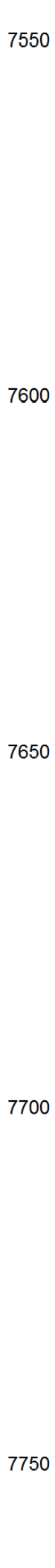
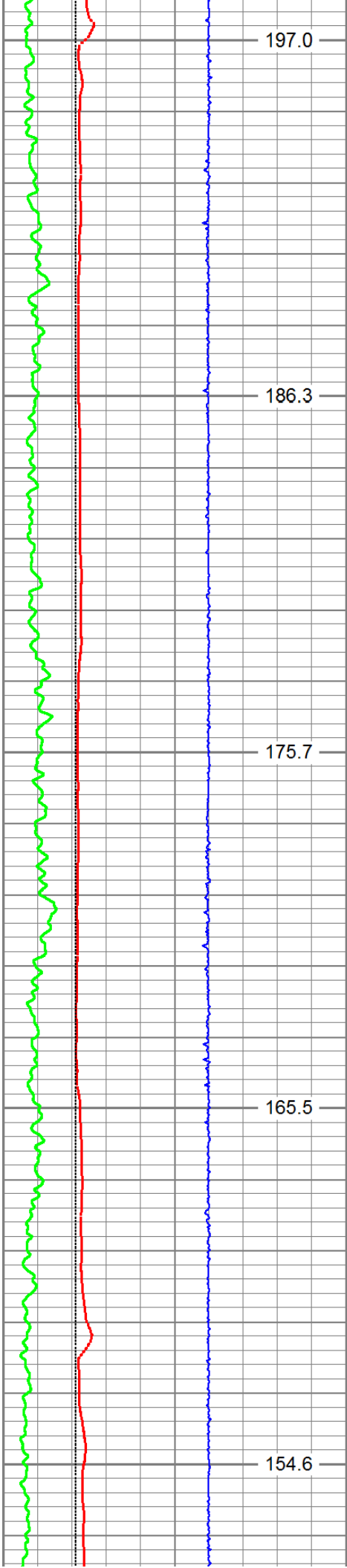
7350

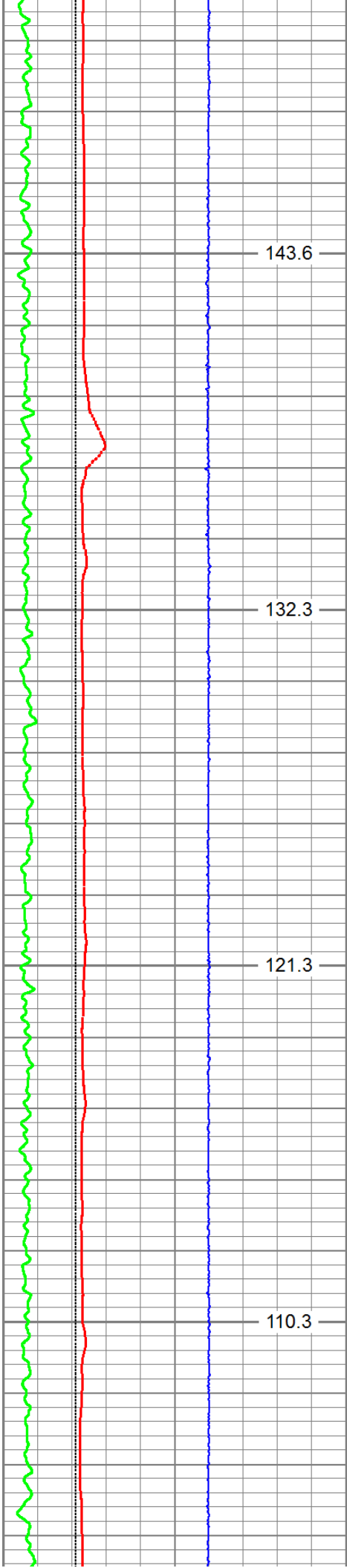
7400

7450

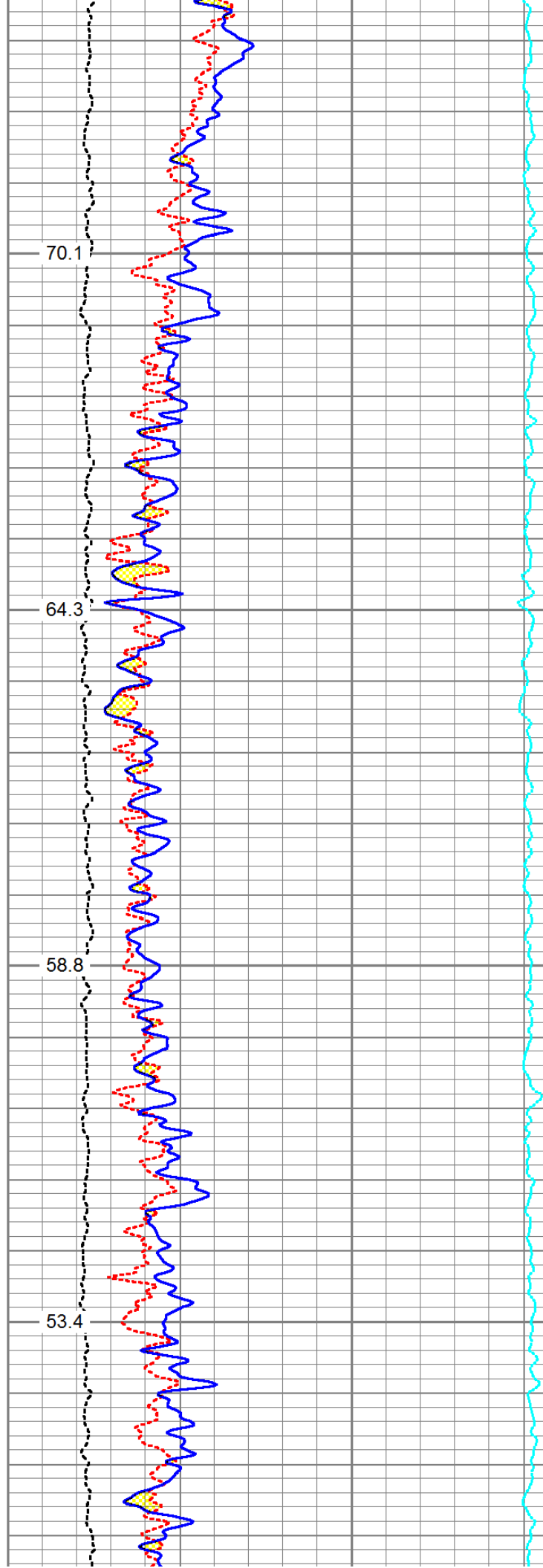
7500

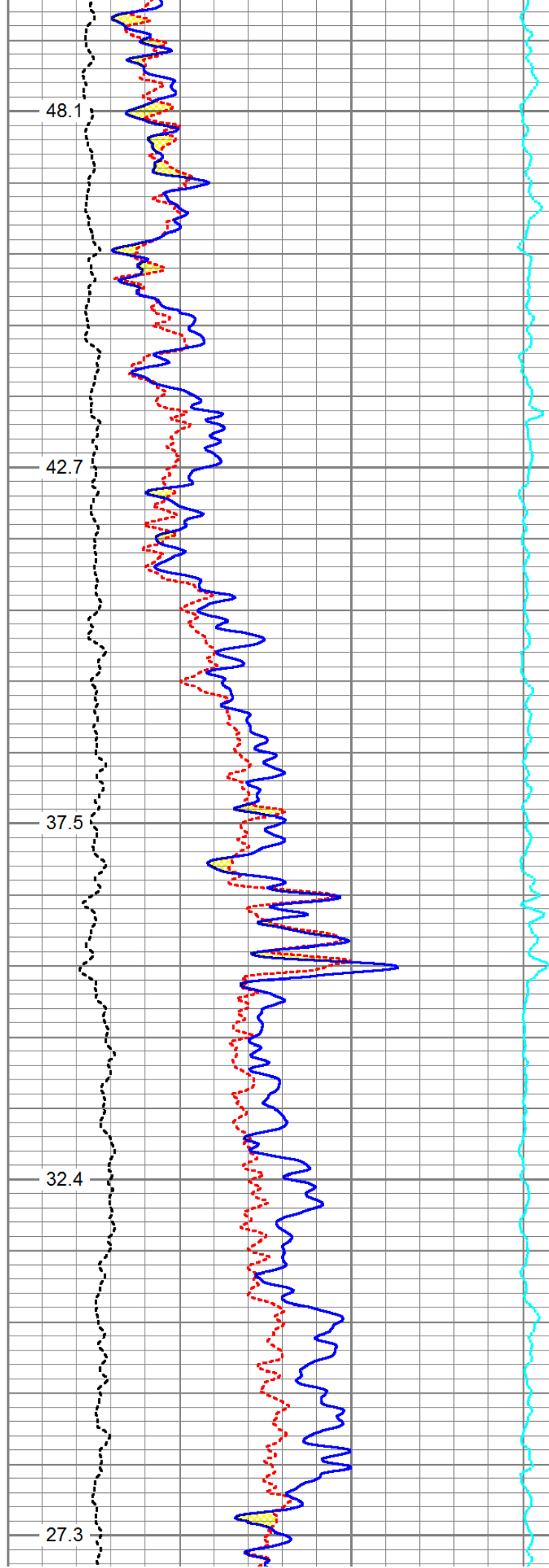
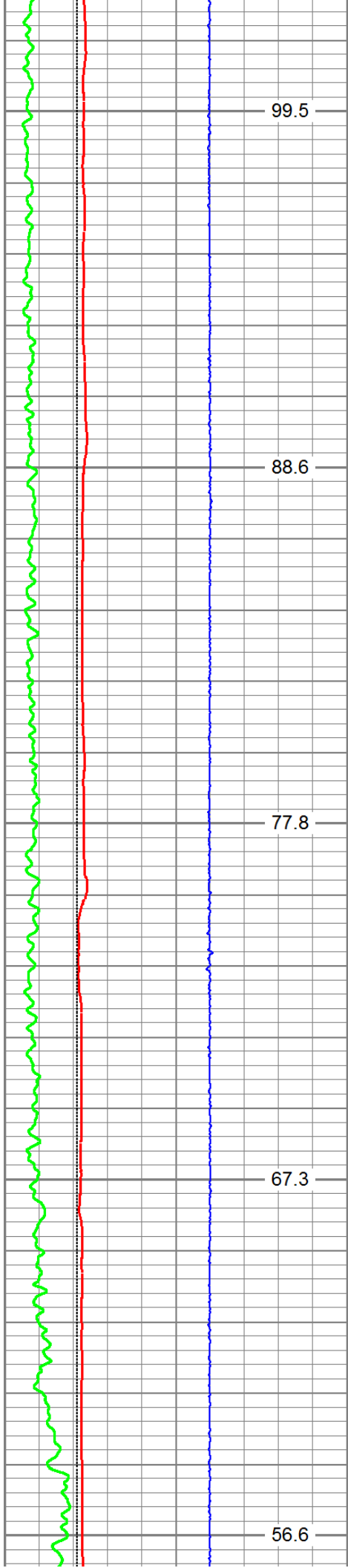


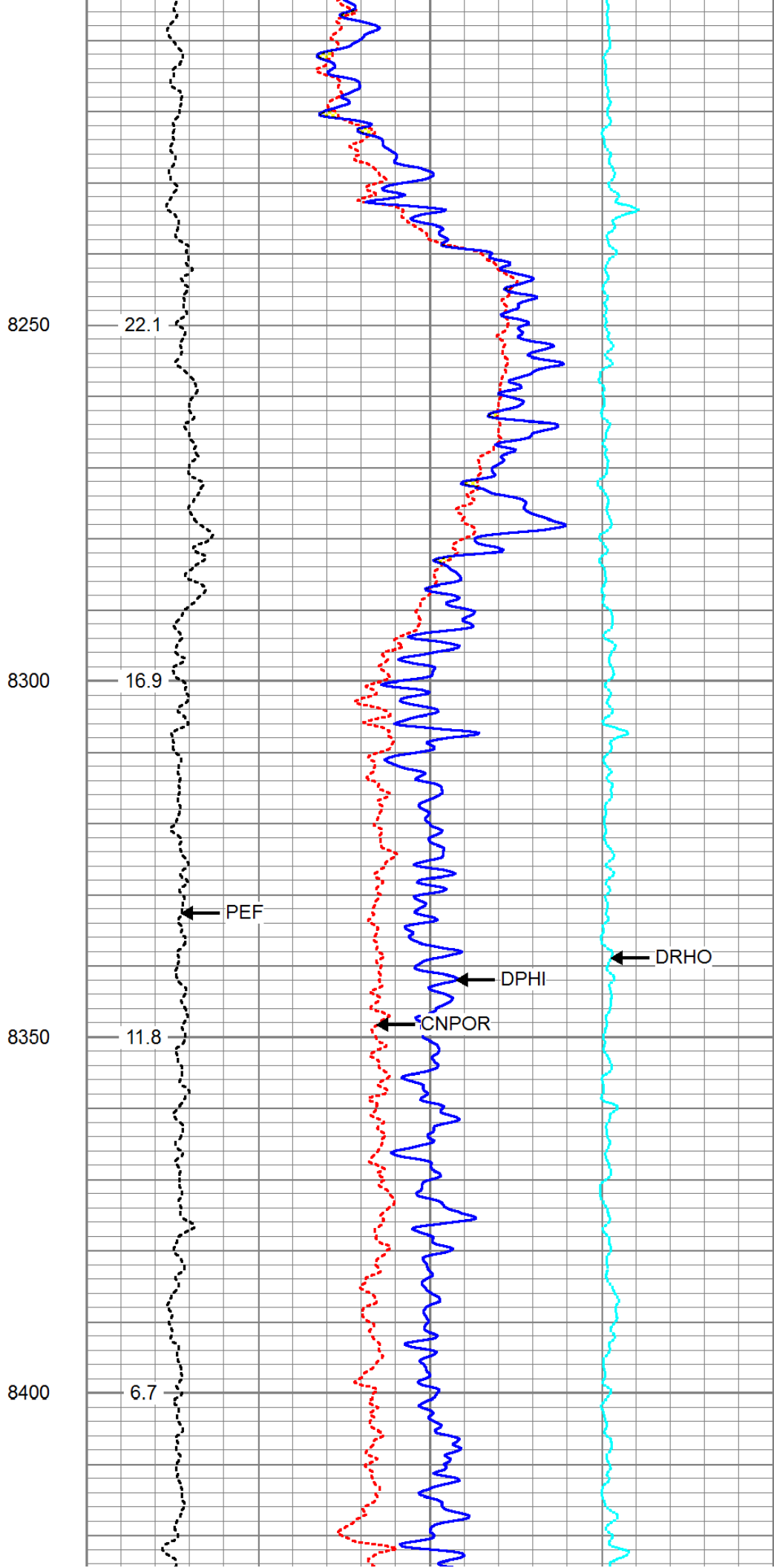
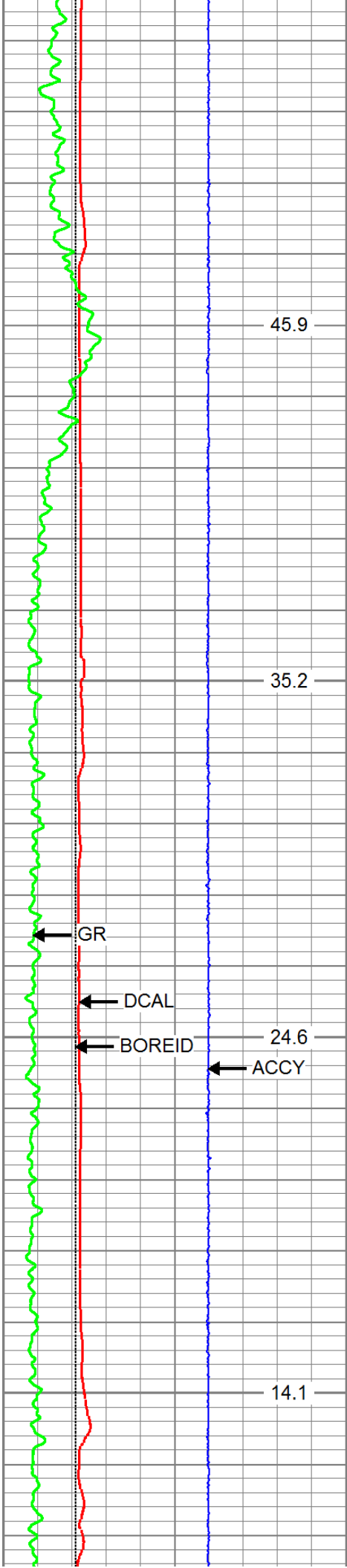


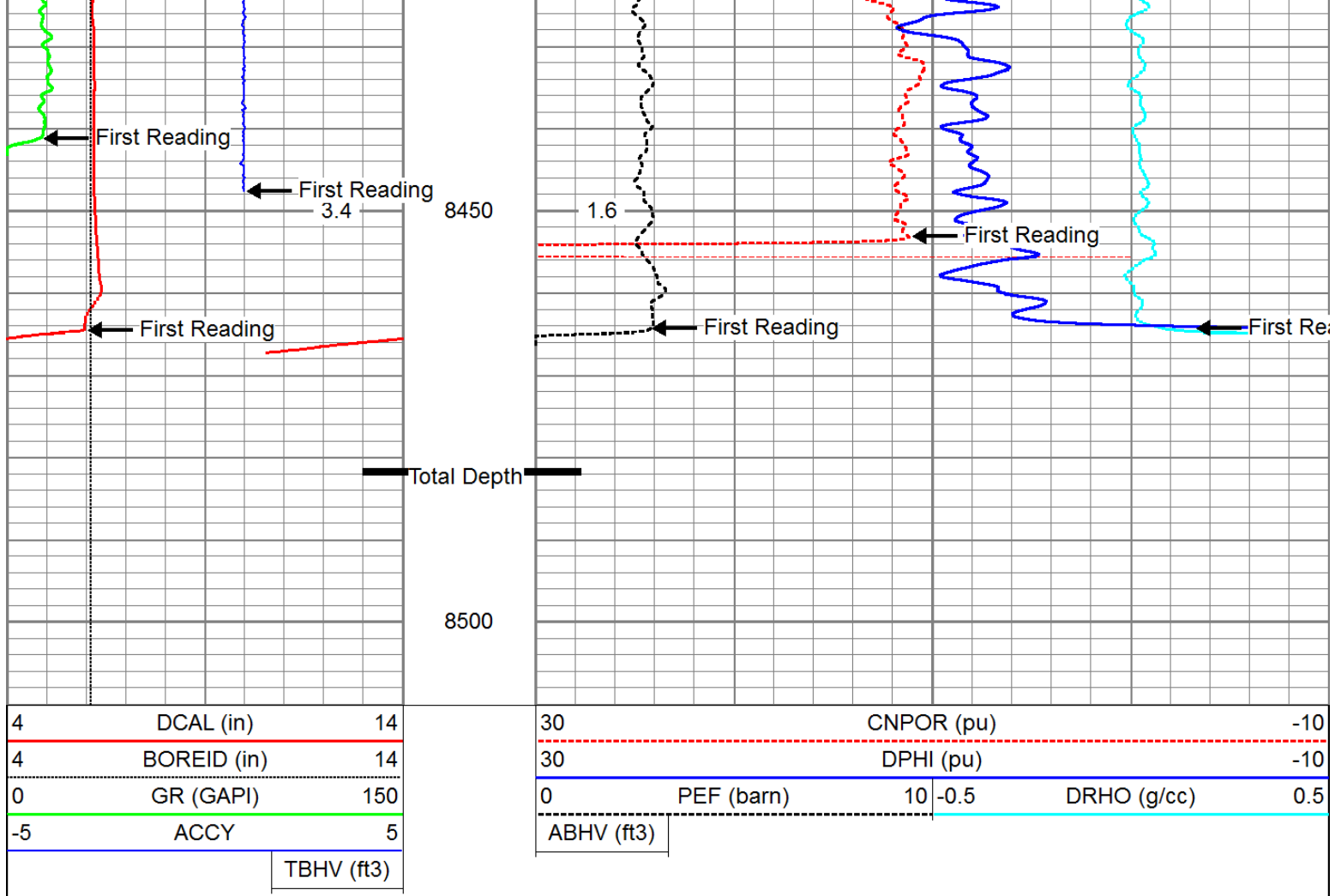


7800
7850
7900
7950









Log Variables

Database: C:\Warrior\Data\cooper_mem.db
 Dataset: field/well/proc1/pass1.5

Top - Bottom

BHCOR	BHFL_TYPE	BHFLRES	BHFLRESSRC	BHIDSRC	BOREID	BOTTEMP
On	WBM	Ohm-m	MUDCELL	CURVE	in	degF
		1			6.125	151
CASED?	CASEOD	CASETHCK	CEMWATERSA	CMNTTHCK	DNBHC?	DPORSEL
No	in	in	kppm	in	NO	RHOB
	4.5	0	0	0		
FLUIDDEN	FRMSALIN	LATNOR	MATRXDEN	MUDSALIN	MudWgt	NPORSEL
g/cc	kppm	Off	g/cc	kppm	lb/gal	Limestone
1	0		2.71	1	8.4	
PEBHC?	PERFS	RESTMPSRC	SO	SRFTEMP	SZCOR	TDEPTH
YES	0	INTERNAL	in	degF	On	ft
			0.5	65		8518
TMPCOR	TOOLPOS					
On	Ec-centered					

Calibration Report

Database File: cooper_mem.db
 Dataset Pathname: proc1/pass1.5
 Dataset Creation: Fri Sep 21 05:00:15 2012

ThruBit Induction Calibration Report

Tool Model-Serial Number: ENP-ENP6R
 Shop Calibration Performed: Wed Jul 25 10:21:11 2012

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-469.0170	[-500.00, -400.00]	168.4420	[-500.00, 500.00]
A2	-139.6900	[-180.00, -100.00]	264.6260	[-500.00, 500.00]
A3	-29.4956	[-50.00, -10.00]	109.7290	[-500.00, 500.00]
A4	-15.6177	[-30.00, -10.00]	268.7780	[-500.00, 500.00]
A5	-13.1078	[-30.00, -10.00]	135.2190	[-500.00, 500.00]
Freq 2				
A1	-246.0200	[-280.00, -180.00]	82.3116	[-500.00, 500.00]
A2	-89.6079	[-130.00, -50.00]	142.8020	[-500.00, 500.00]
A3	-22.0117	[-50.00, -10.00]	21.3310	[-500.00, 500.00]
A4	-18.7072	[-30.00, -10.00]	94.9304	[-500.00, 500.00]
A5	-17.6060	[-30.00, -10.00]	0.3442	[-500.00, 500.00]
Freq 3				
A1	-159.7820	[-180.00, -80.00]	-12.4301	[-500.00, 500.00]
A2	-68.4018	[-130.00, -30.00]	61.8104	[-500.00, 500.00]
A3	-18.1166	[-50.00, -10.00]	-41.0520	[-500.00, 500.00]
A4	-20.1535	[-30.00, -10.00]	-18.3517	[-500.00, 500.00]
A5	-20.0484	[-30.00, -10.00]	-96.4786	[-500.00, 500.00]
Freq 4				
A1	-90.0349	[-120.00, -40.00]	-164.8070	[-500.00, 500.00]
A2	-49.6082	[-110.00, -10.00]	-48.3390	[-500.00, 500.00]
A3	-14.0456	[-50.00, -10.00]	-134.2970	[-500.00, 500.00]
A4	-21.8694	[-30.00, -10.00]	-182.7930	[-500.00, 500.00]
A5	-23.3720	[-30.00, -10.00]	-255.1110	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9898	[0.95, 1.05]	0.0050	[-0.05, 0.05]
A2	0.9893	[0.95, 1.05]	0.0025	[-0.05, 0.05]
A3	0.9901	[0.95, 1.05]	-0.0047	[-0.05, 0.05]
A4	0.9894	[0.95, 1.05]	0.0038	[-0.05, 0.05]
A5	0.9921	[0.95, 1.05]	0.0017	[-0.05, 0.05]
Freq 2				
A1	0.9845	[0.95, 1.05]	-0.0037	[-0.05, 0.05]
A2	0.9838	[0.95, 1.05]	-0.0052	[-0.05, 0.05]
A3	0.9788	[0.95, 1.05]	-0.0052	[-0.05, 0.05]
A4	0.9853	[0.95, 1.05]	-0.0048	[-0.05, 0.05]
A5	0.9890	[0.95, 1.05]	-0.0077	[-0.05, 0.05]
Freq 3				
A1	0.9876	[0.95, 1.05]	-0.0038	[-0.05, 0.05]
A2	0.9872	[0.95, 1.05]	-0.0046	[-0.05, 0.05]
A3	0.9821	[0.95, 1.05]	-0.0050	[-0.05, 0.05]
A4	0.9884	[0.95, 1.05]	-0.0050	[-0.05, 0.05]
A5	0.9942	[0.95, 1.05]	-0.0070	[-0.05, 0.05]
Freq 4				
A1	0.9872	[0.95, 1.05]	-0.0042	[-0.05, 0.05]
A2	0.9868	[0.95, 1.05]	-0.0046	[-0.05, 0.05]
A3	0.9838	[0.95, 1.05]	0.0073	[-0.05, 0.05]

A3	0.9838	[0.95, 1.05]	-0.0073	[-0.05, 0.05]
A4	0.9901	[0.95, 1.05]	-0.0067	[-0.05, 0.05]
A5	1.0041	[0.95, 1.05]	-0.0097	[-0.05, 0.05]
Temperature	35.1620 degC			

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS28D
Source Number:
Shop Calibration Performed: Thu Sep 13 14:37:07 2012

REFERENCE

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

READINGS

Outputs	Counts	Units	Expected
SS1 Background	128.87	cps	[130.00, 170.00]
LS1 Background	142.54	cps	[130.00, 170.00]
LS4 Background	31.21	cps	[27.00, 35.00]
SS1 Aluminium	5148.10	cps	[4500.00, 5500.00]
LS1 Aluminium	918.74	cps	[750.00, 950.00]
LS4 Aluminium	1020.03	cps	[843.00, 1068.00]
SS1 Magnesium	8650.86	cps	[7000.00, 9000.00]
LS1 Magnesium	6109.02	cps	[5250.00, 6250.00]
LS1 Al + Fe	788.82	cps	[650.00, 800.00]
LS4 Al + Fe	455.74	cps	[382.00, 471.00]

RESULTS

SS Slope	1.62	[1.52, 1.77]
LS Slope	0.42	[0.38, 0.45]
PEF K Factor	4.996	[3.510, 6.170]
PEF B Factor	-0.509	[-0.700, -0.410]

Caliper Shop Calibration performed: Thu Sep 13 14:37:07 2012

RESULTS

Reference	Reading	Units
12.00	1937.05	in
9.00	2101.17	in
6.00	2259.77	in

DENSITY PRE-SURVEY CHECK Performed: Wed Sep 19 18:22:30 2012

Outputs	Counts	Units	Expected
SS1 Background	128.51	cps	[125.01, 132.74]
LS1 Background	141.52	cps	[138.27, 146.82]
LS4 Background	31.48	cps	[29.34, 33.09]

CALIPER PRE-SURVEY CHECK Performed: Wed Sep 19 18:14:26 2012

Reference	Readings	Units	Expected
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Reference	Reading	Units	Expected
6.00	6.12	in	[5.80, 6.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number:	ENP-ENP3N
Source Number:	
Calibration Tank Temperature:	84.1 degF
Shop Calibration Performed:	Thu Sep 13 15:37:13 2012

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	3839.0	cps	
LS Counts	120.6	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	31.8282	SS/LS	
Tank Ratio Gain	0.9727		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	43767.7	cps	
LS Counts	3734.8	cps	
Al Ratio Ref	10.797	SS/LS	
Al Ratio	11.399	SS/LS	
Al Ratio Gain	0.95		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Wed Sep 19 18:29:18 2012

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

Gamma Ray Calibration Report

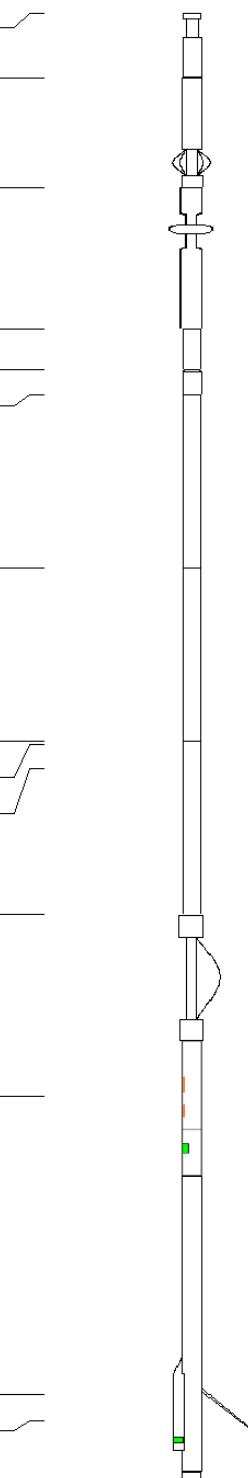
Tool Model-Serial Number:	PS-PS09T
Performed:	Tue Mar 13 14:08:43 2012
Calibrator Value:	162.7 GAPI

Background Reading: 36.1 cps
 Calibrator Reading: 281.0 cps
 Sensitivity: 0.3754 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		TMG-PS (PS09T) ThruBit Telemetry Gamma Ray			
GR	41.04					
GRTEMP	40.20					
ThruBit	35.04		Decentralizer Decentralizer (Small)	4.50	2.13	70.00
CNLSC	28.60		TBN-ENP (ENP3N) ThruBit Neutron	4.77	2.13	63.00
			TBD-PS (PS28D) ThruBit Density	10.48	2.13	91.00
LSW1	18.04					
DCAL	17.13					

A1_P	10.60		TBI-ENP (ENP6R) ThruBit Induction	15.29	2.13	94.00
A2_P	10.10					
A3_P	9.35					
A4_P	8.35					
A5_P	6.60					
Dataset: cooper_mem.db: field/well/proc1/pass1.5 Total Length: 66.92 ft Total Weight: 560.15 lb O.D.: 2.38 in						

	Company	SANDRIDGE ENERGY, INC.
	Well	COOPER 3305 1-27H
	Field	HARPER KS PROSPECT/ MISS LIME
	County	HARPER
	State	KS