ThruBit
A Schlumberger Company

SPECTRAL DENSITY
DUAL SPACED NEUTRON
GAMMA RAY
MEMORY LOG

Company	SANDRIDGE ENERGY
Well	4J RANCH 3408 3-33H
Field	BOUSE
County	HARPER
State	KANSAS

Company SANDRIDGE ENERGY
Well 4J RANCH 3408 3-33H
Field BOUSE
County HARPER State KANSAS

Location: API # : 15-077-21931-01-00
SHL: 220' FSL & 1715' FWL
BHL: 330' FNL & 1980' FWL
SEC 33 TWP 34S RGE 8W

Other Services
THRUBIT
PORTAL BIT

Permanent Datum	G.L.	Elevation	1251'
Log Measured From	D.F.	18' ABOVE PERM DATUM	
Drilling Measured From	D.F.		

Elevation
K.B. 1269'
D.F. 1269'
G.L. 1251'

Date	27 JUNE 2013		
Run Number	ONE		
Depth Driller	9355'		
Depth Logger	9334'		
Bottom Logged Interval	9316'		
Top Log Interval	3000'		
Casing Driller	7" @ 5489'		
Casing Logger	7" @ 5484'		
Bit Size	6.125"		
Type Fluid in Hole	WBM		
Density / Viscosity	8.4 / 27		
pH / Fluid Loss	10.0 / NA		
Source of Sample	FLOW LINE		
Rm @ Meas. Temp	8.24 OHM @ 79 DEGF		
Rmf @ Meas. Temp	6.18 OHM @ 79 DEGF		
Rmc @ Meas. Temp	10.3 OHM @ 79 DEGF		
Source of Rmf / Rmc	CALCULATED		
Rm @ BHT	5.29 OHM @ 129 DEGF		
Time Circulation Stopped	0030 27 JUNE 2013		
Time Logger on Bottom	0145 27 JUNE 2013		
Maximum Recorded Temperature	129 DEGF		
Equipment Number	T011		
Location	OKC, OK		
Recorded By	R. BROOMFIELD		
Witnessed By	MICHAEL KULCHISKY		

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Comments

SERVICE: LEVEL 4- HORIZONTAL MEMORY PUMPDOWN - BIT DEPTH 9276' LOG TO 3000'
ALL SCALES AND PRESENTATION PER CLIENT REQUEST
LIMESTONE POROSITY , 2.71 G/CC, USED FOR POROSITY CALCULATIONS
LOG RAN WITH SWIVEL, DECENTRALIZER AND NO STANDOFFS
TBHV REPRESENTS TOTAL BOREHOLE VOLUME, FT3
ABHV REPRESENTS ANNULAR BOREHOLE VOLUME, FT3, CALCULATED FOR 4.50" CASING
RIGMINDER LITE AND PASON USED TO CREATE DEPTH LOG
LOG DEPTH CORRELATED TO MWD GR PROVIDED BY CUSTOMER

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

Service Ticket No.	2003	API No.	15-077-21931-01-00	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

Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	PS10T	Serial No.	PS35N	Serial No.	PS52D	Serial No.	PS31R
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	9334'	3000'	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

Maximum Deviation	93.63	deg. @	7014'	KOP	3982'	

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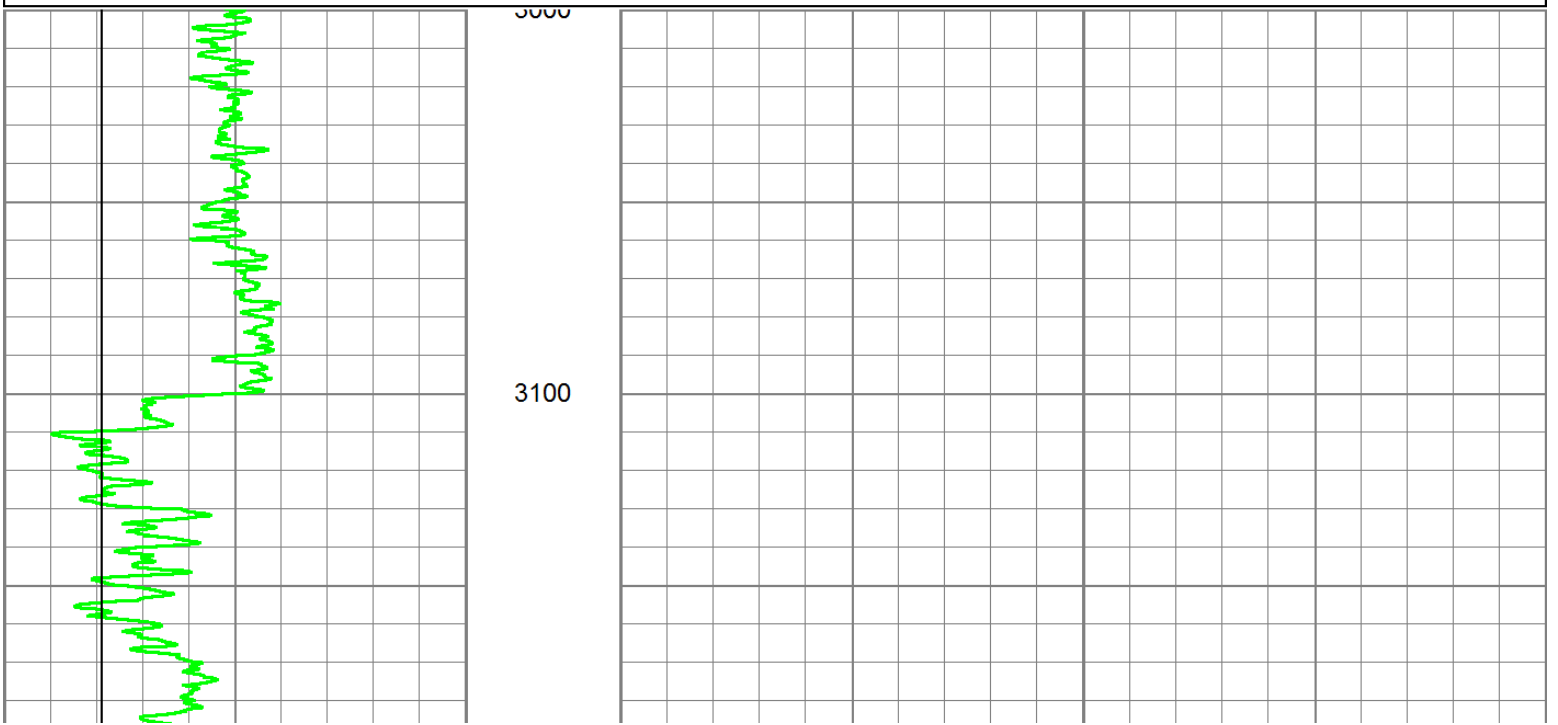
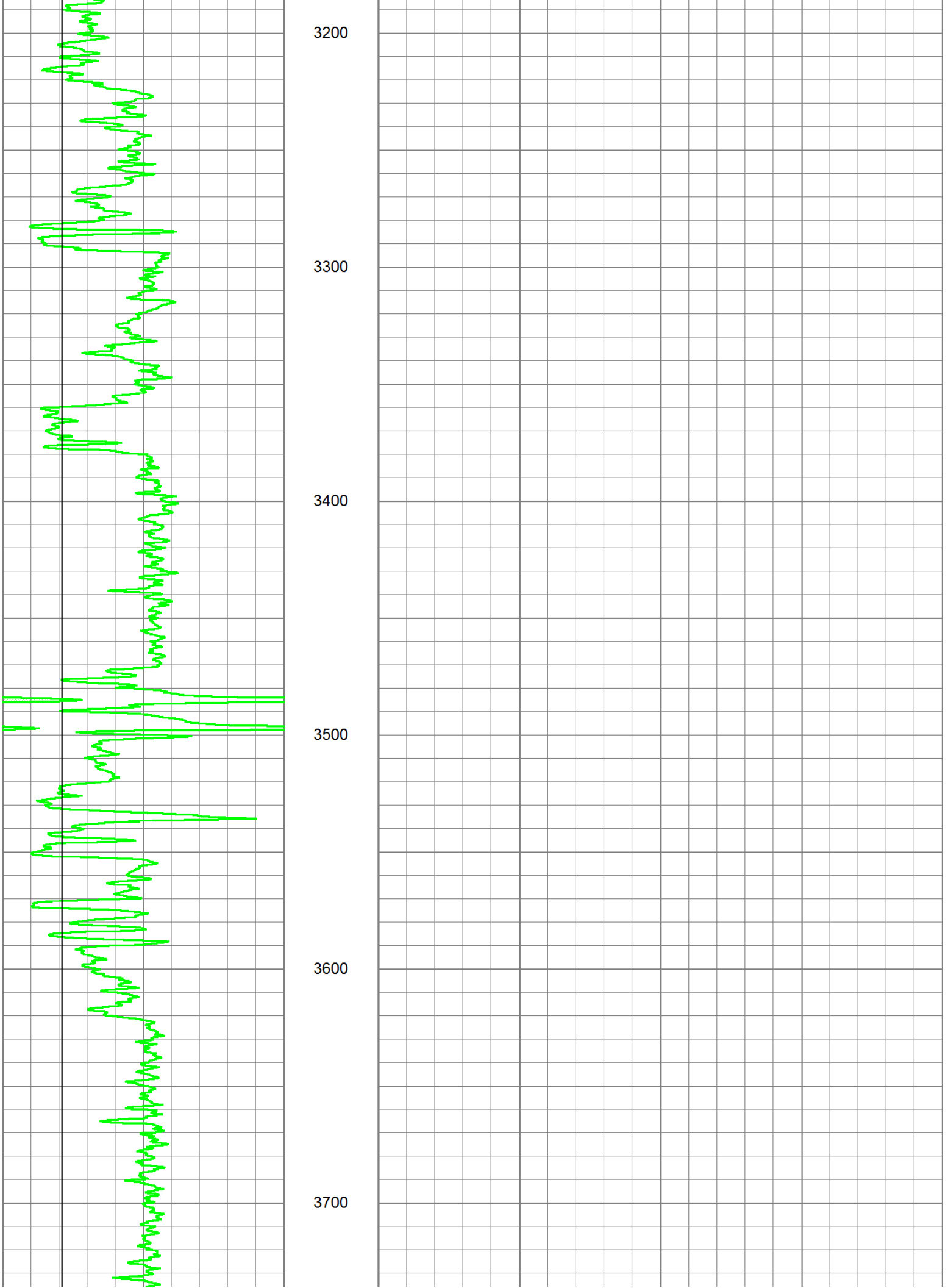
MAIN PASS

Database File: c:\users\t010\desktop\4j ranch 3408 3-33h\sandridge 4j ranch mem2.db
Dataset Pathname: proc1/pass1.2
Presentation Format: 6_2n_chk
Dataset Creation: Thu Jun 27 14:17:51 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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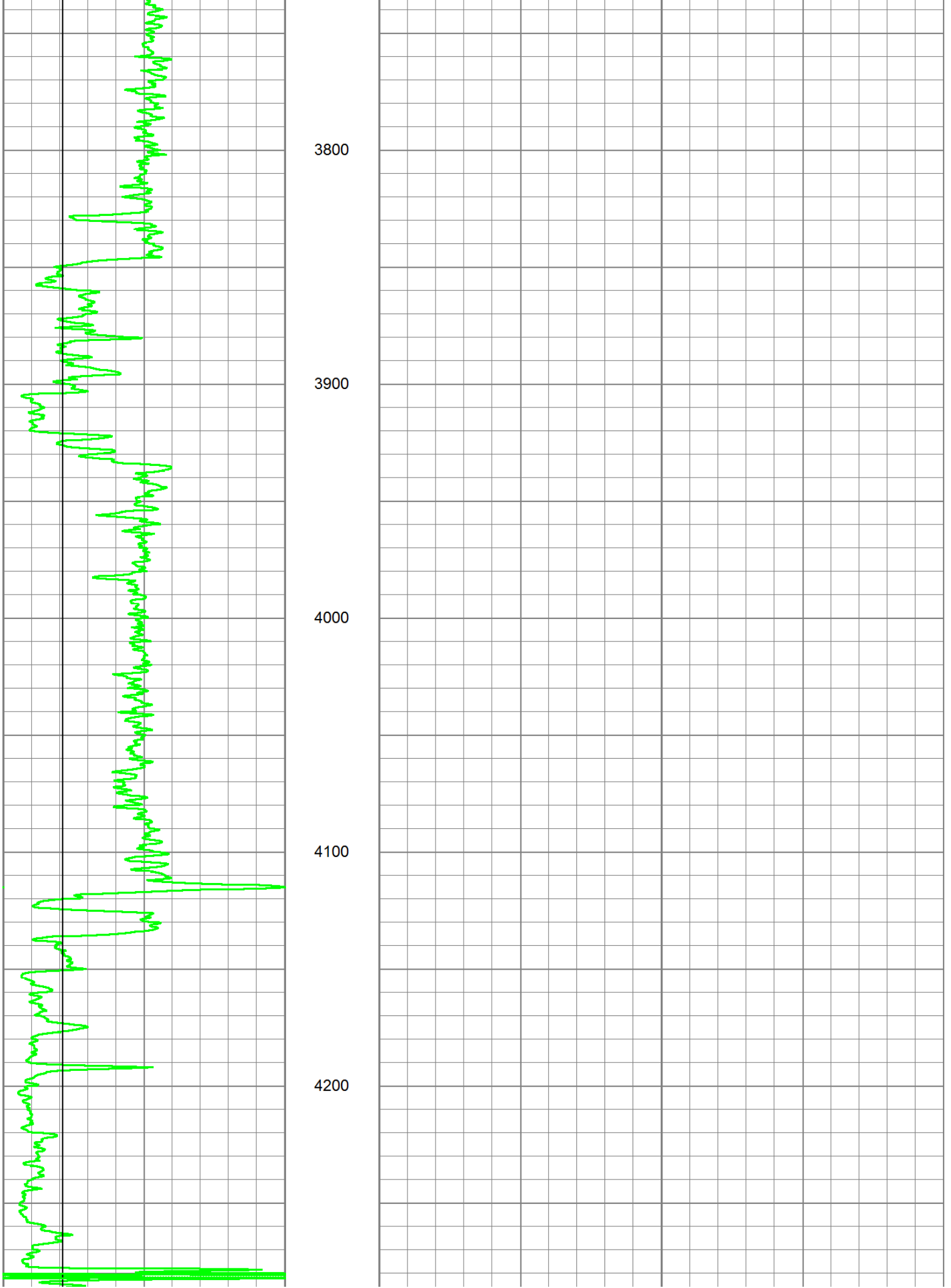
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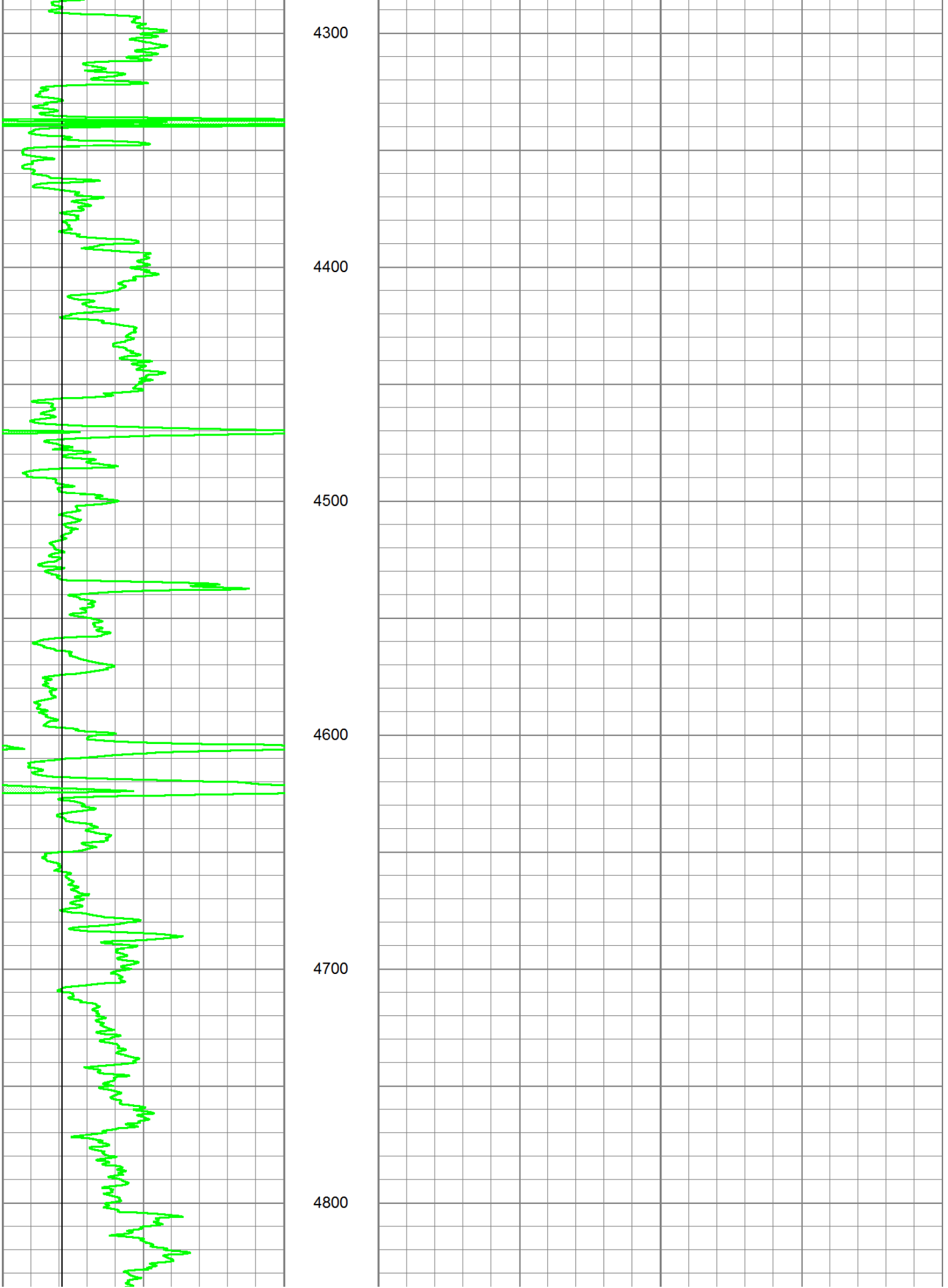
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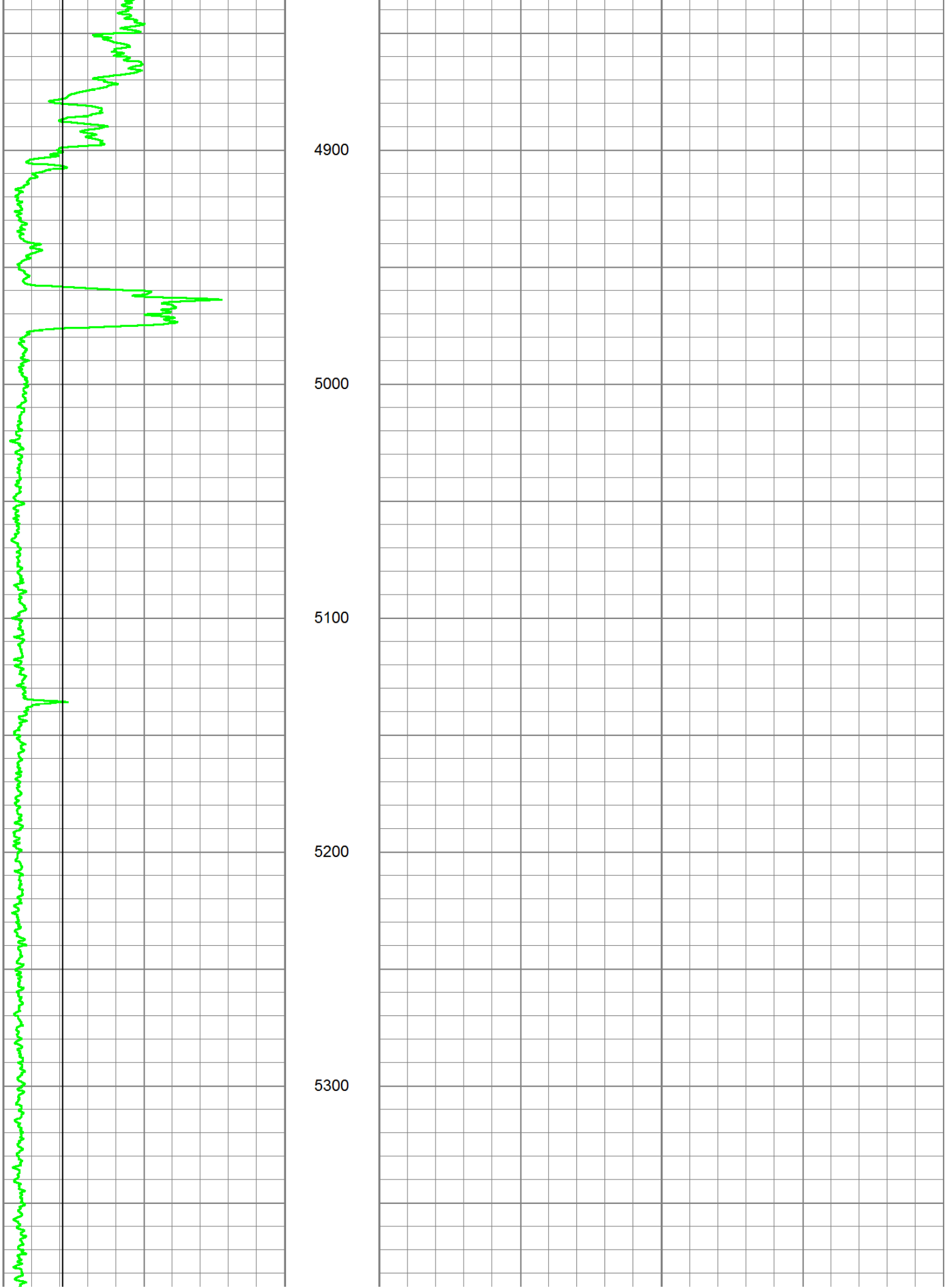
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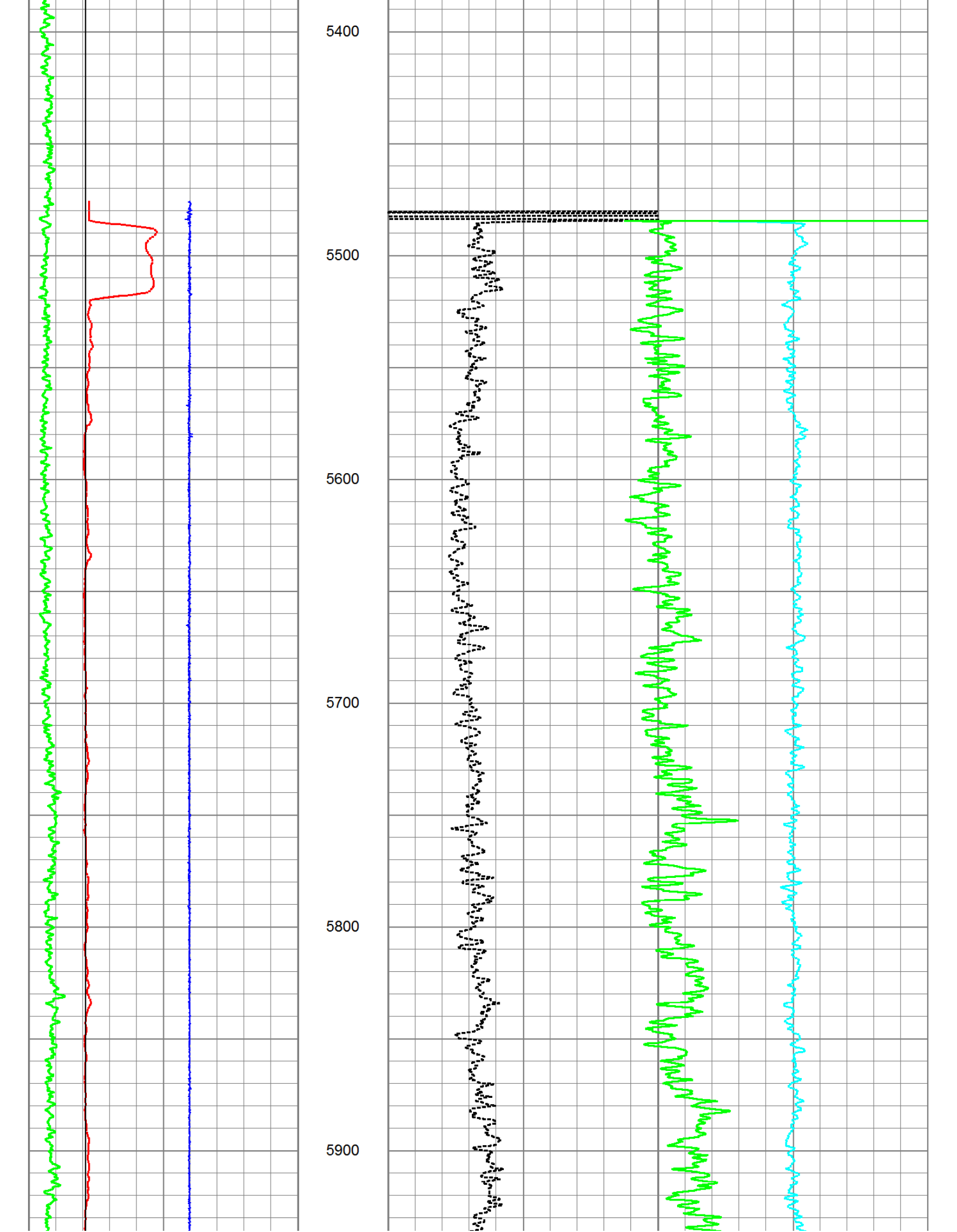
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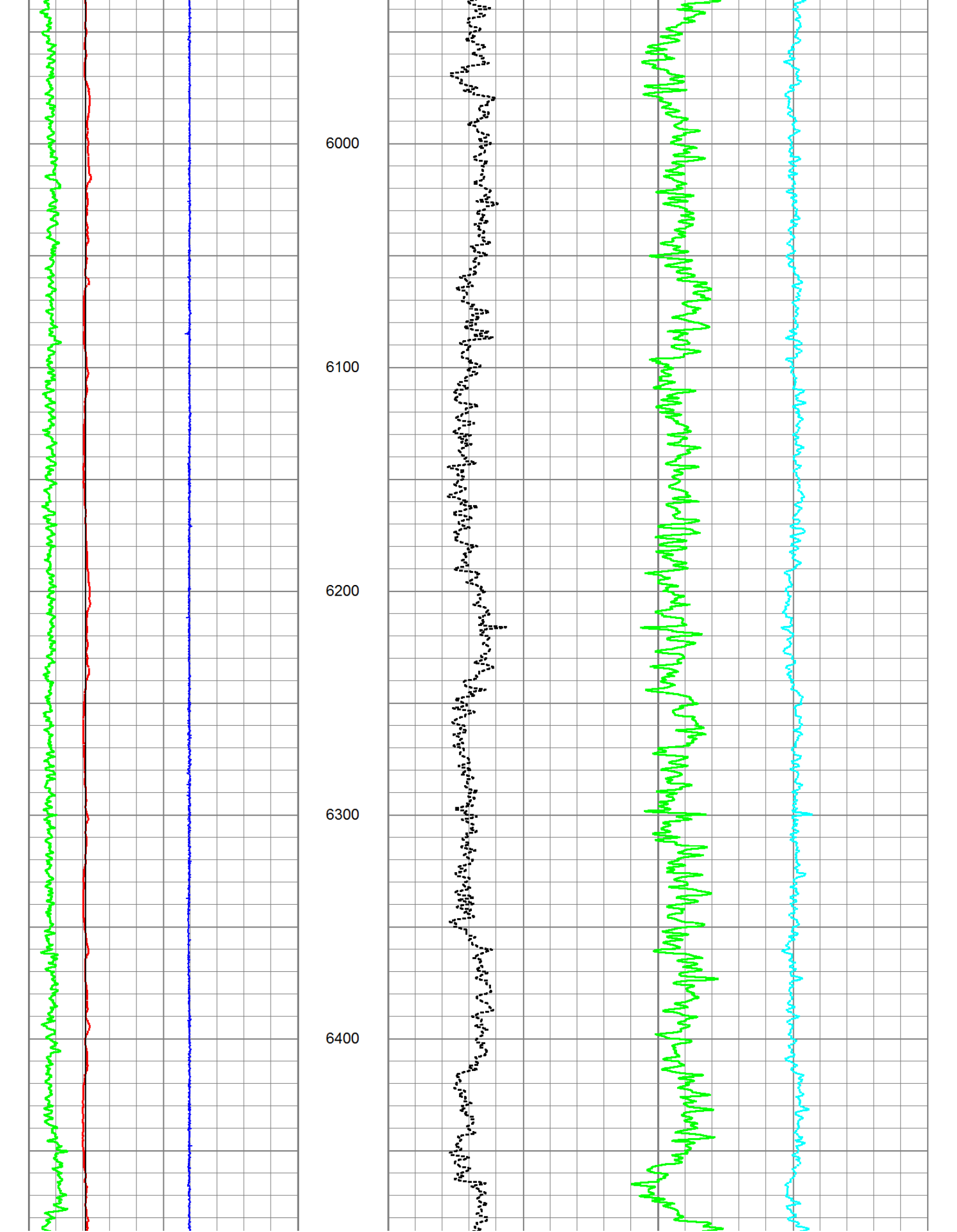
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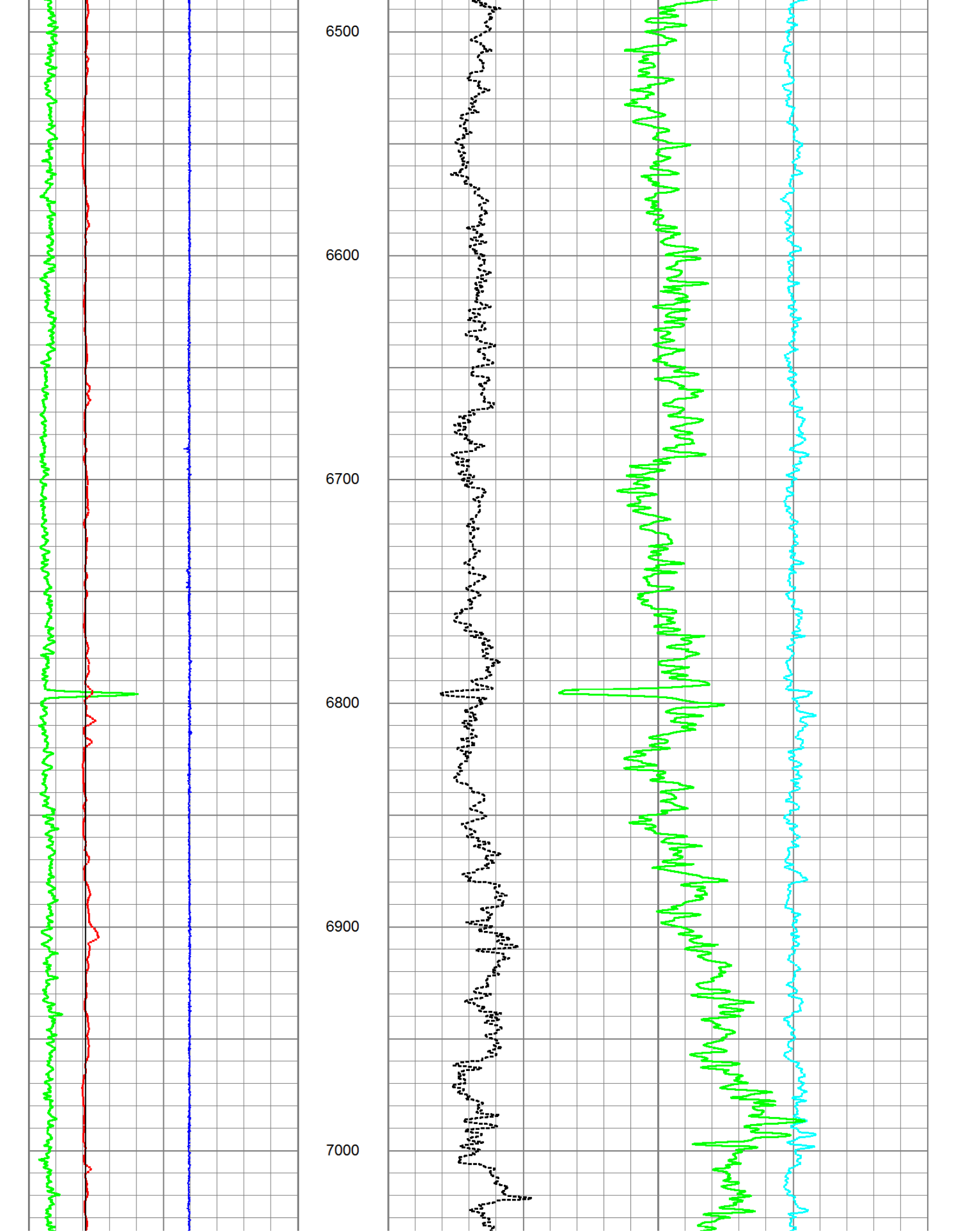
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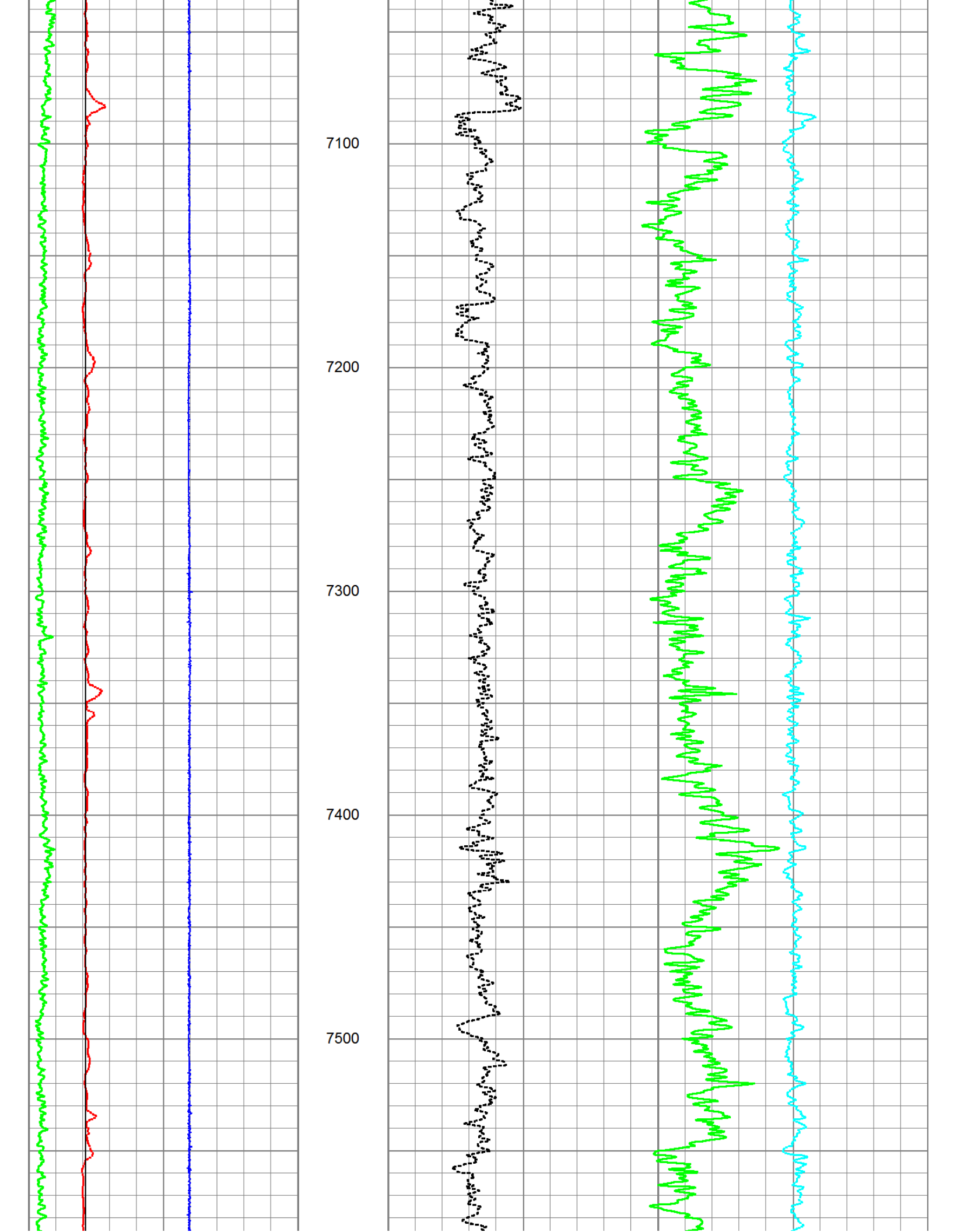
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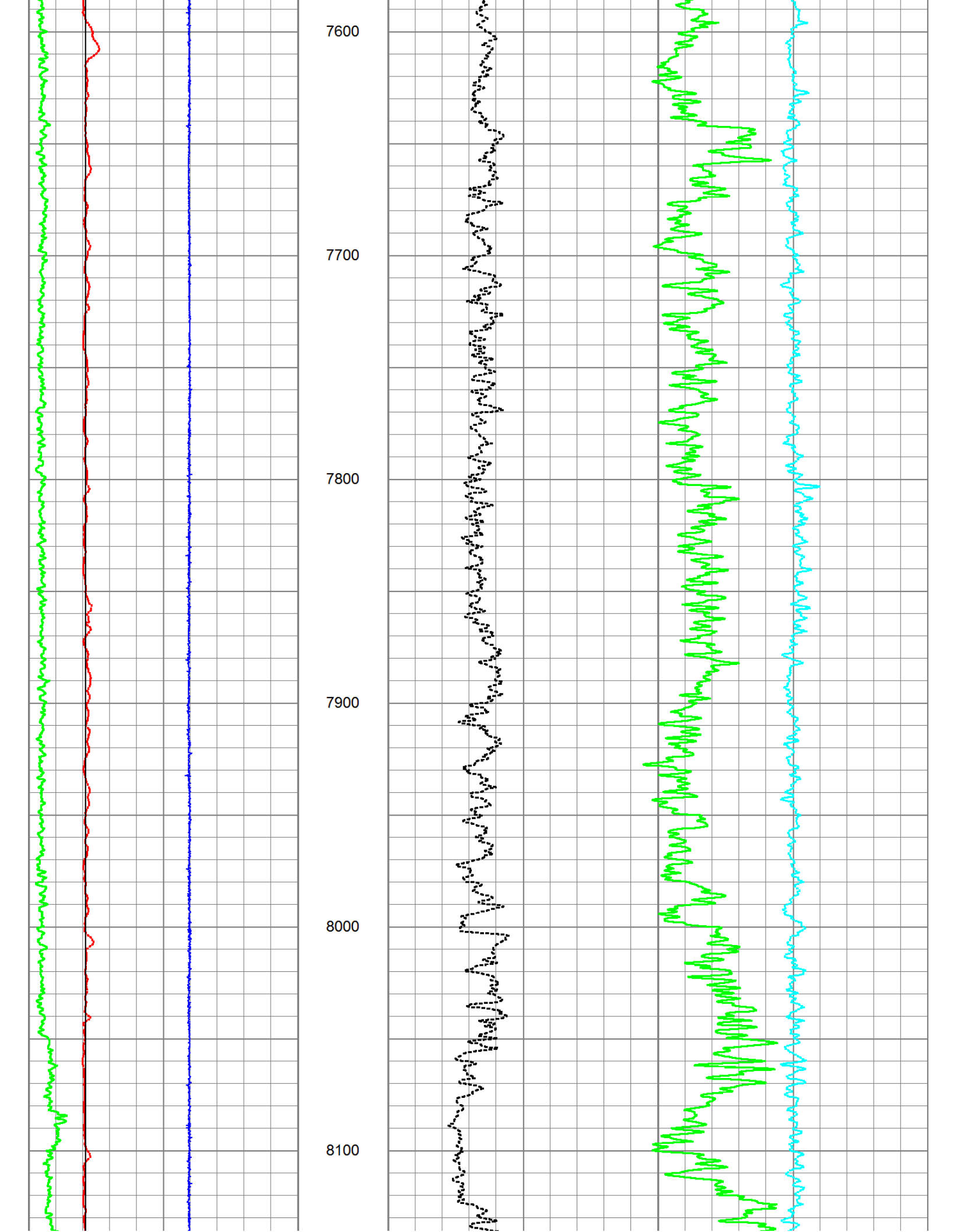
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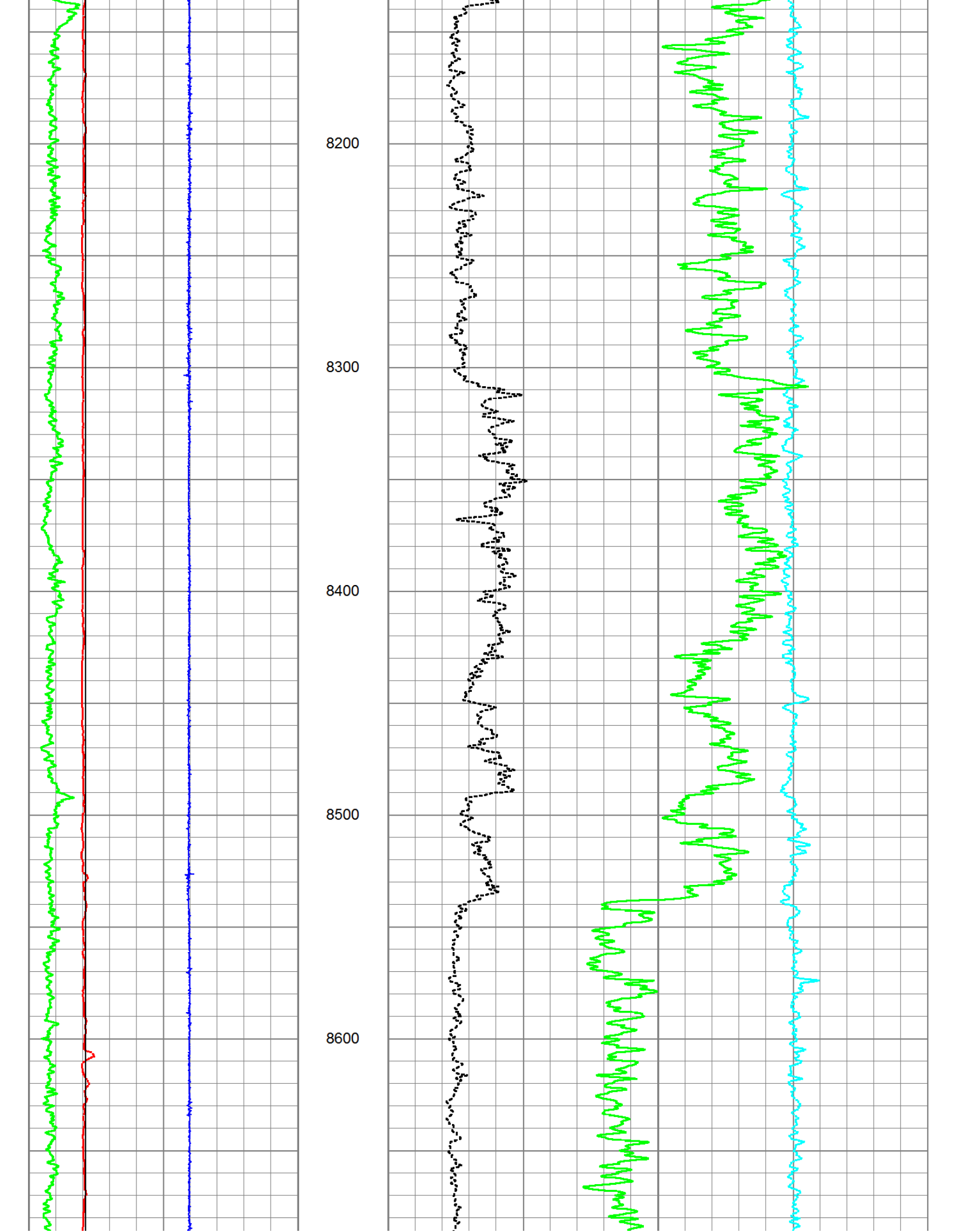
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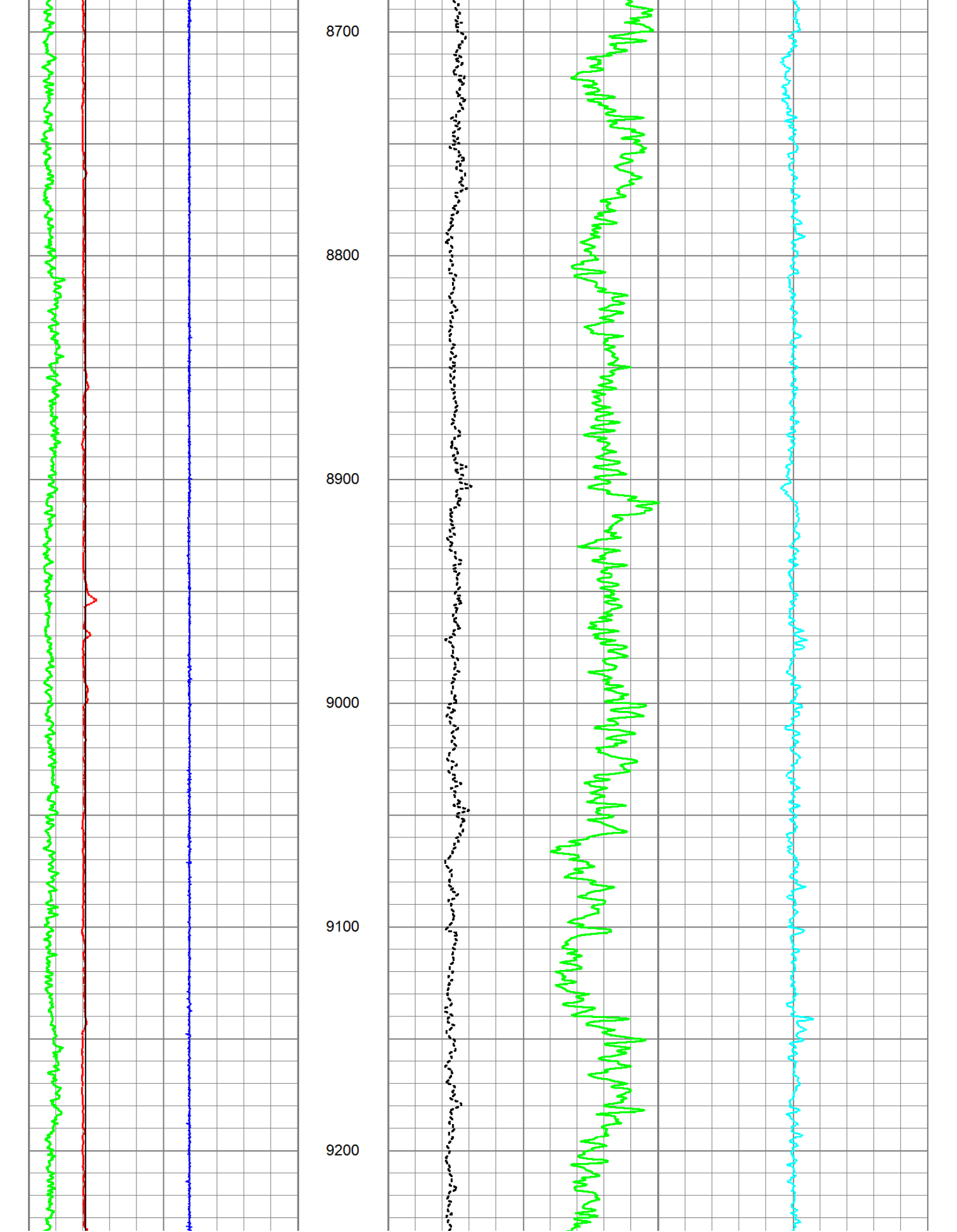
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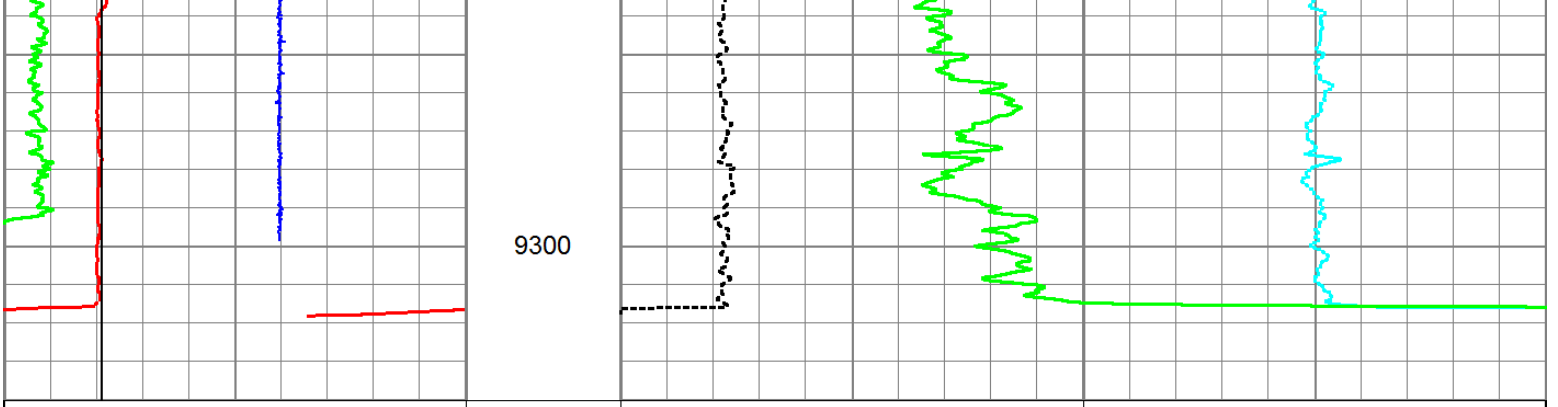

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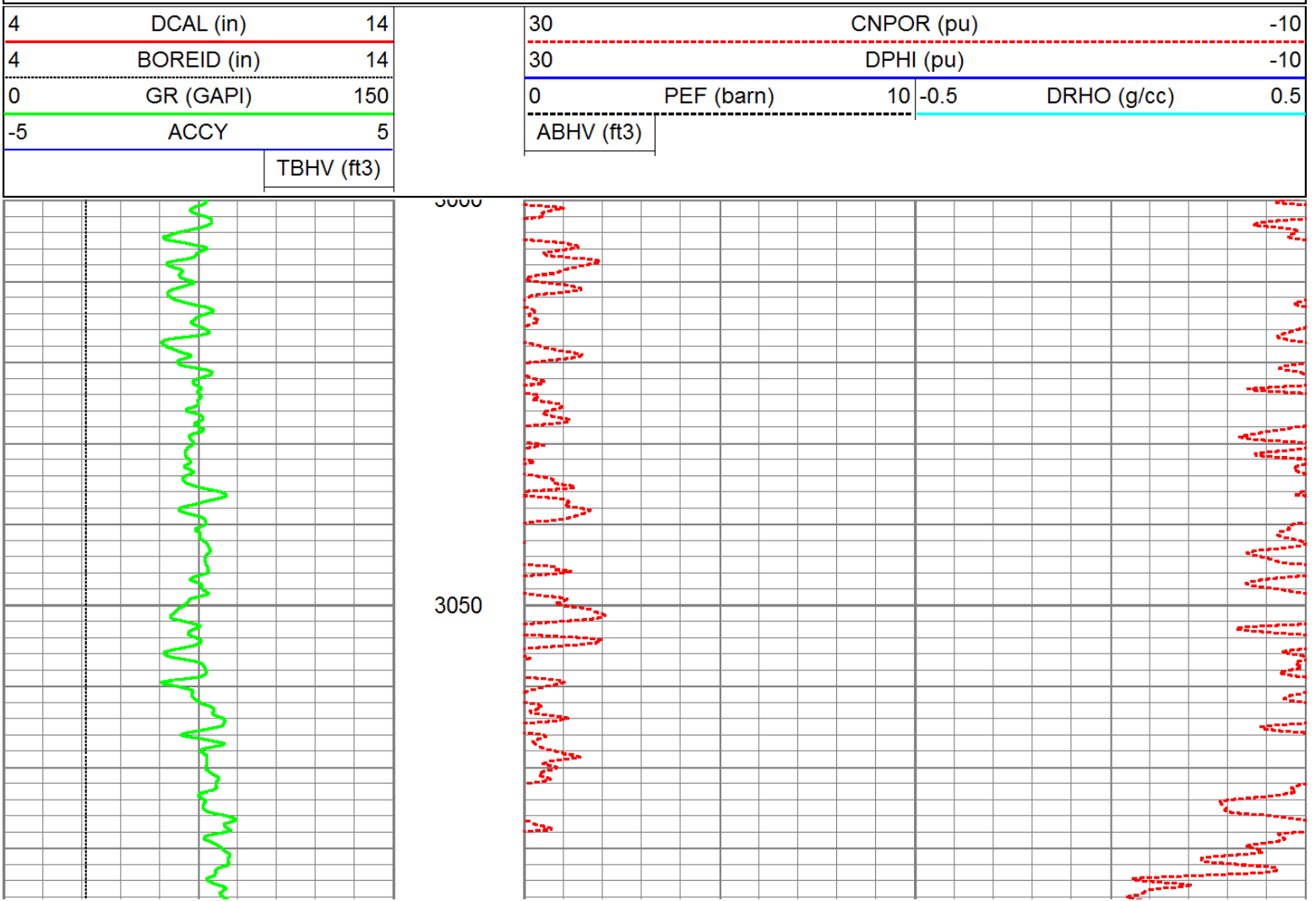

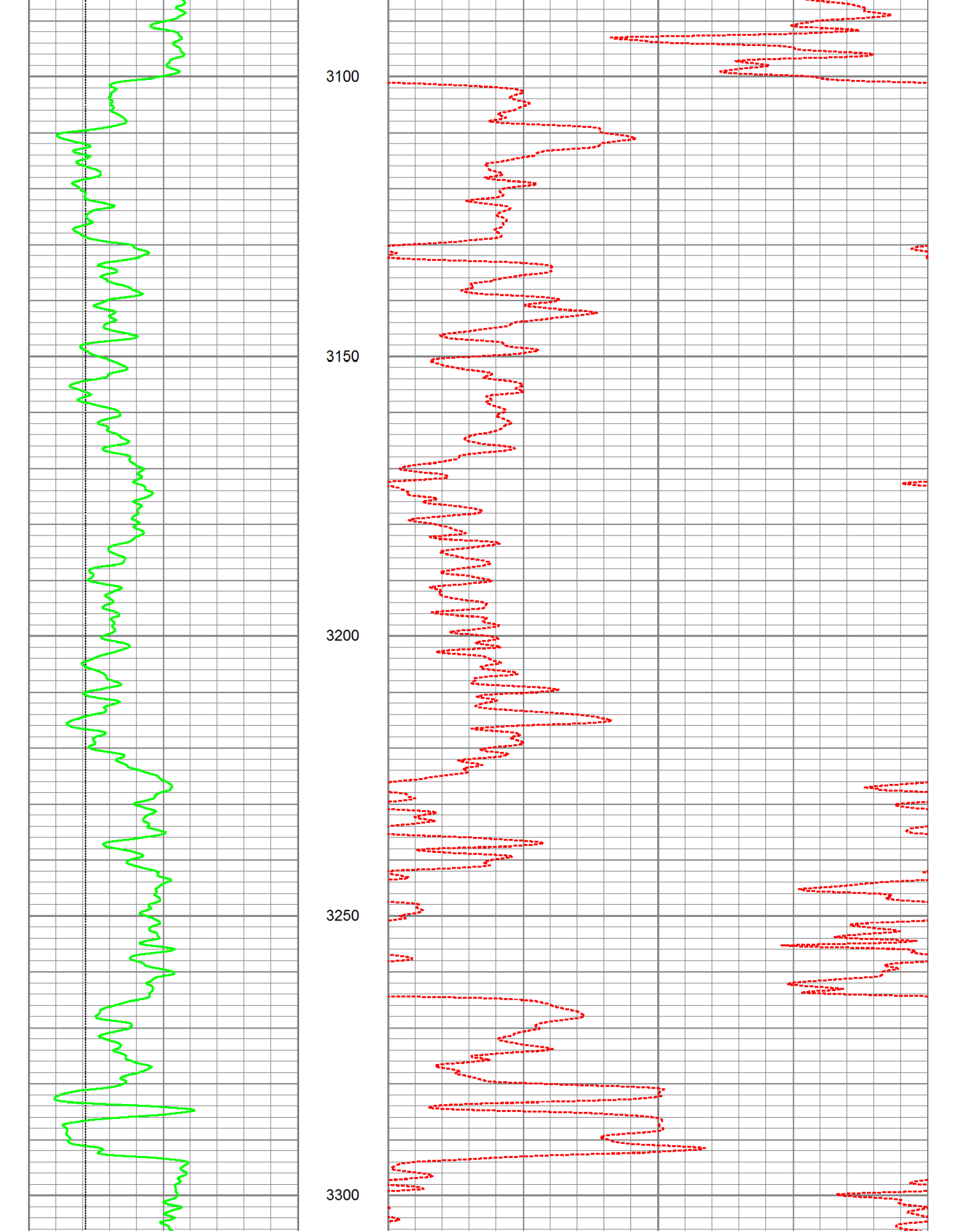
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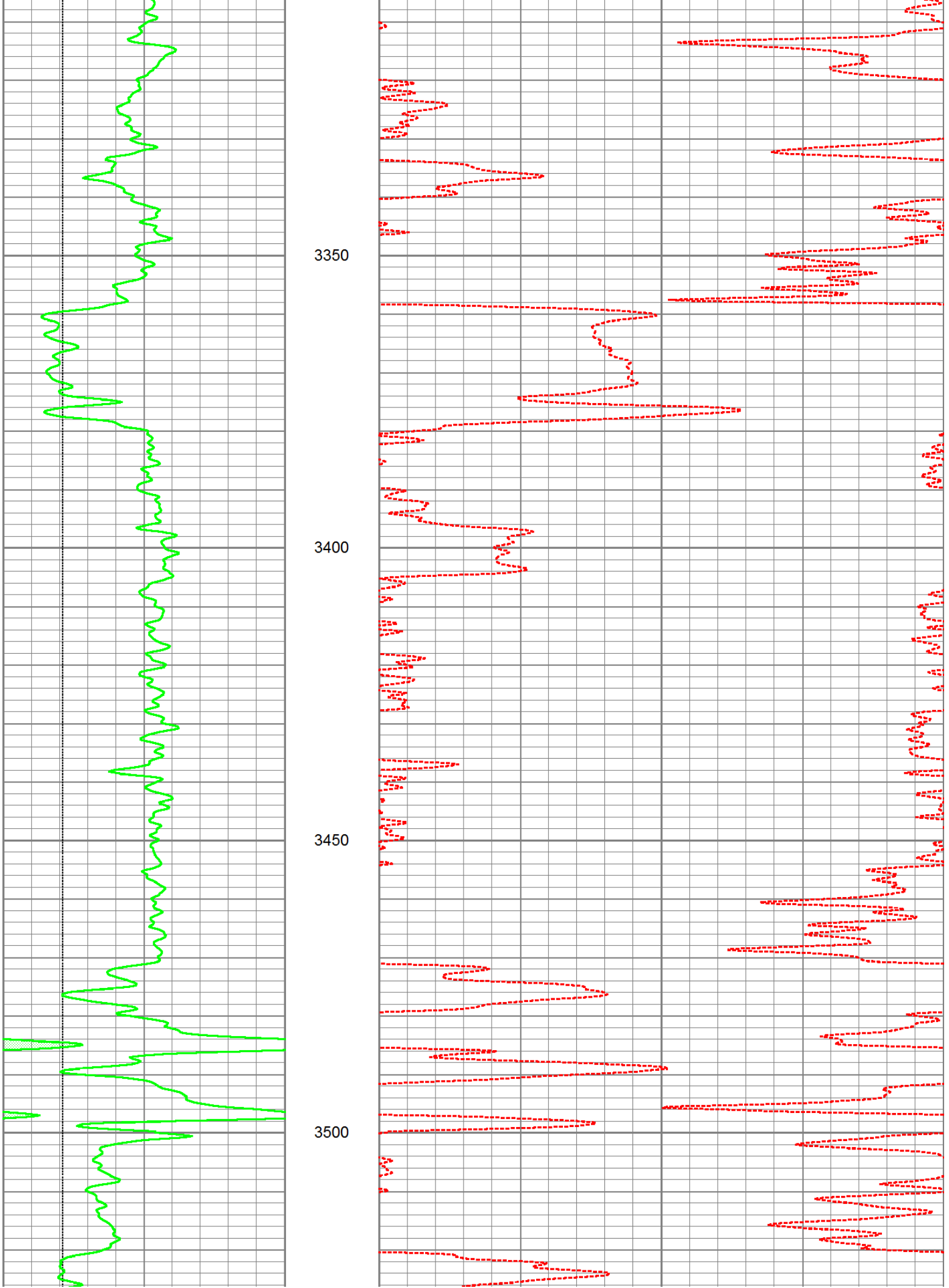
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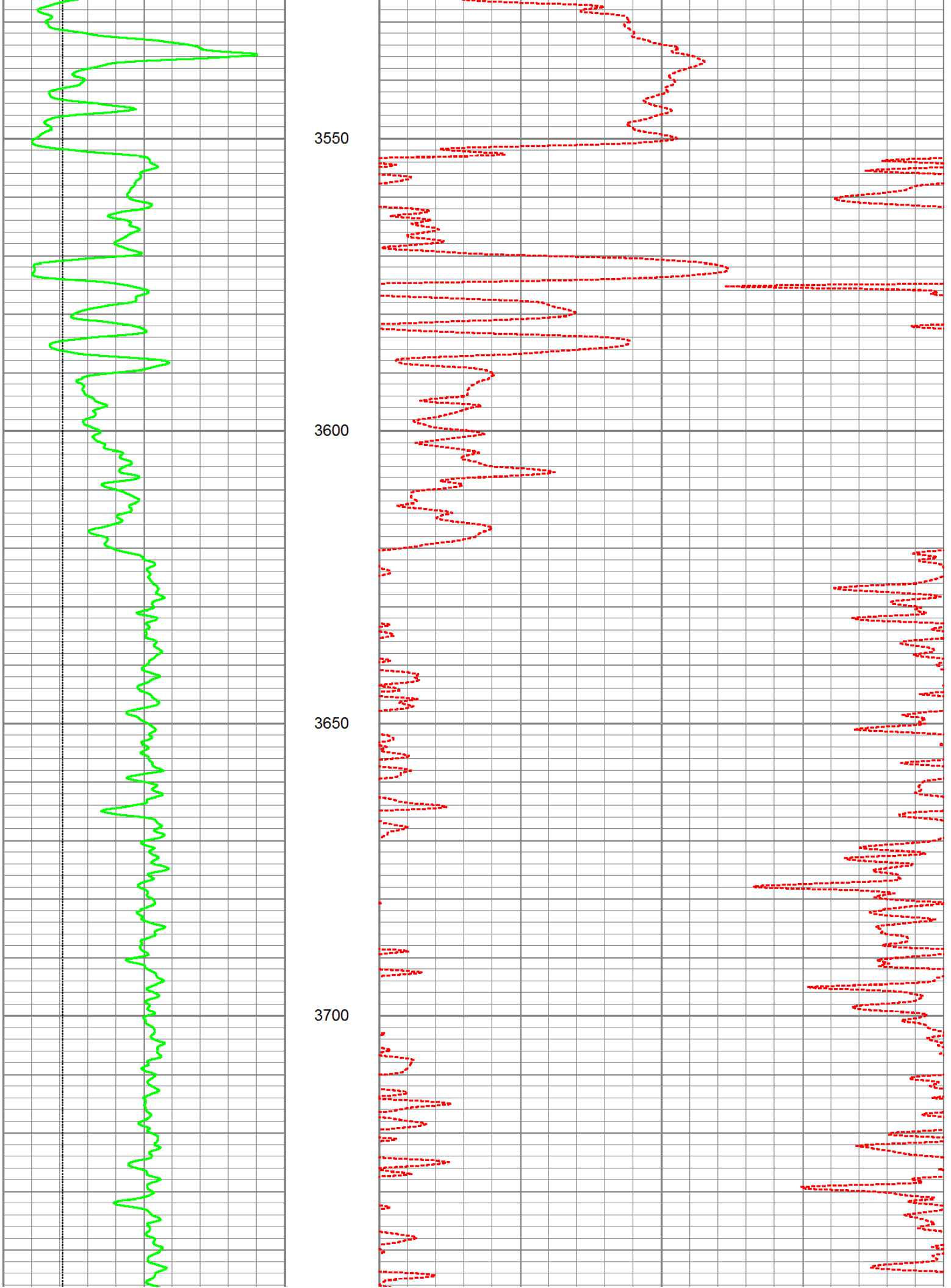
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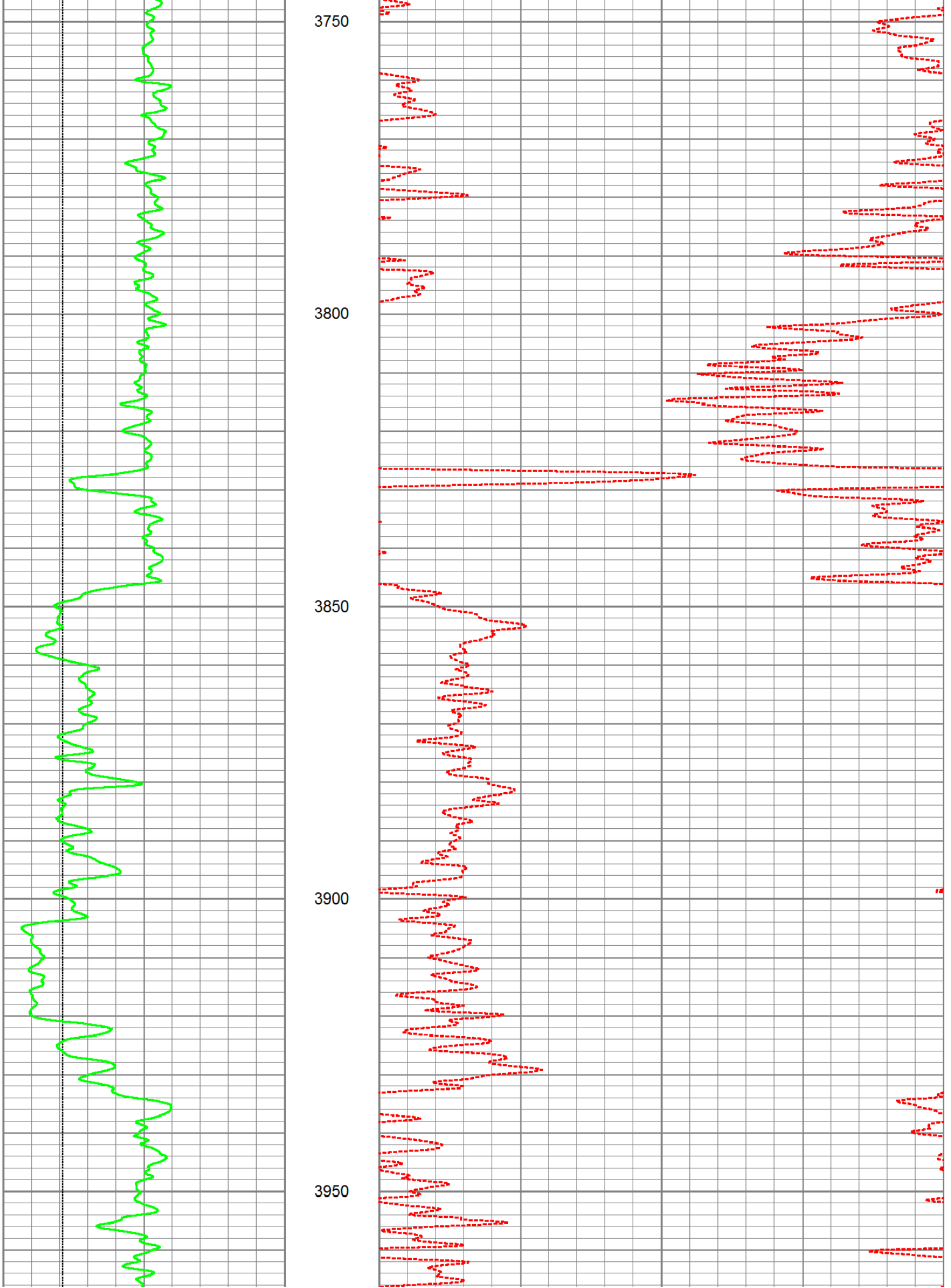
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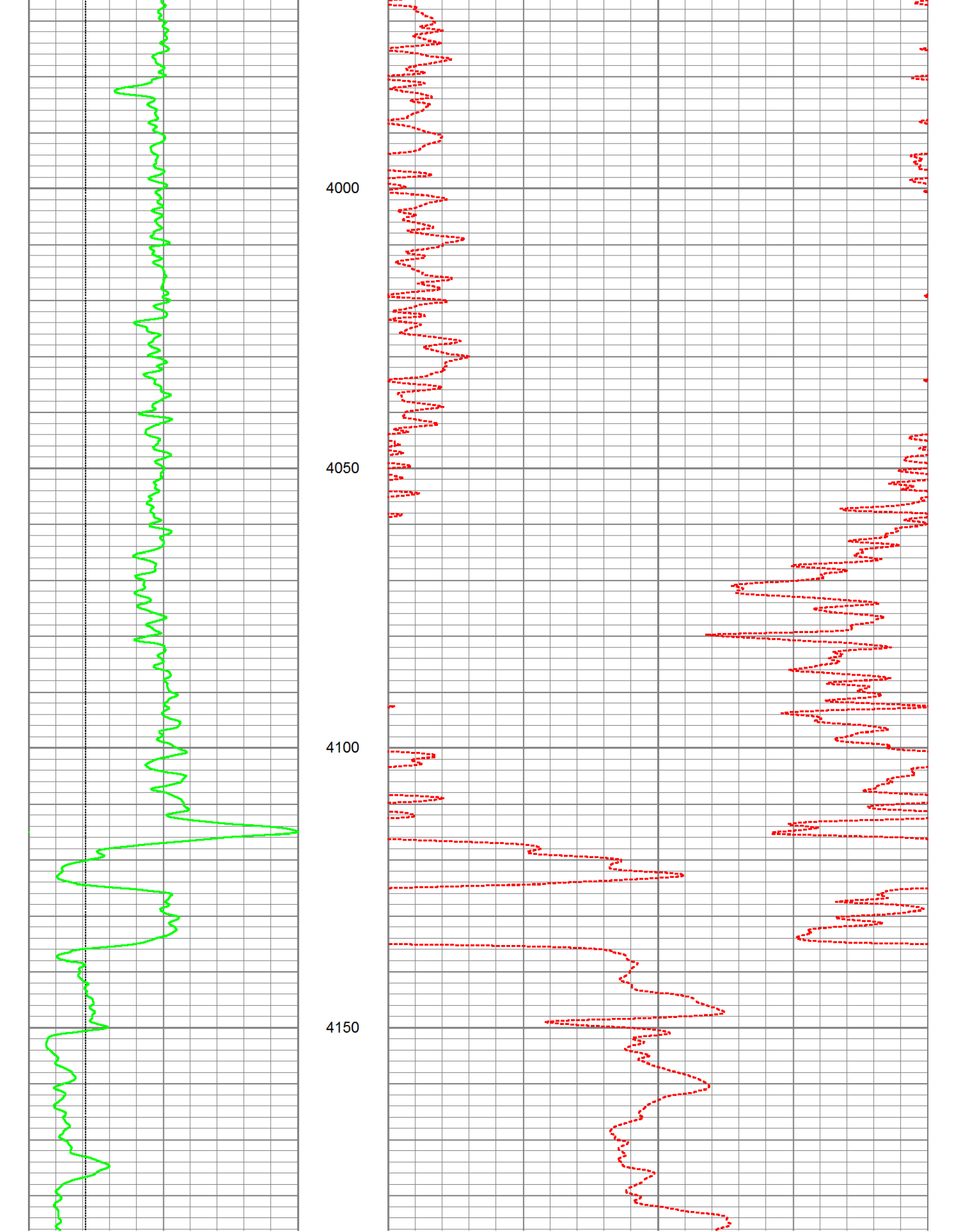
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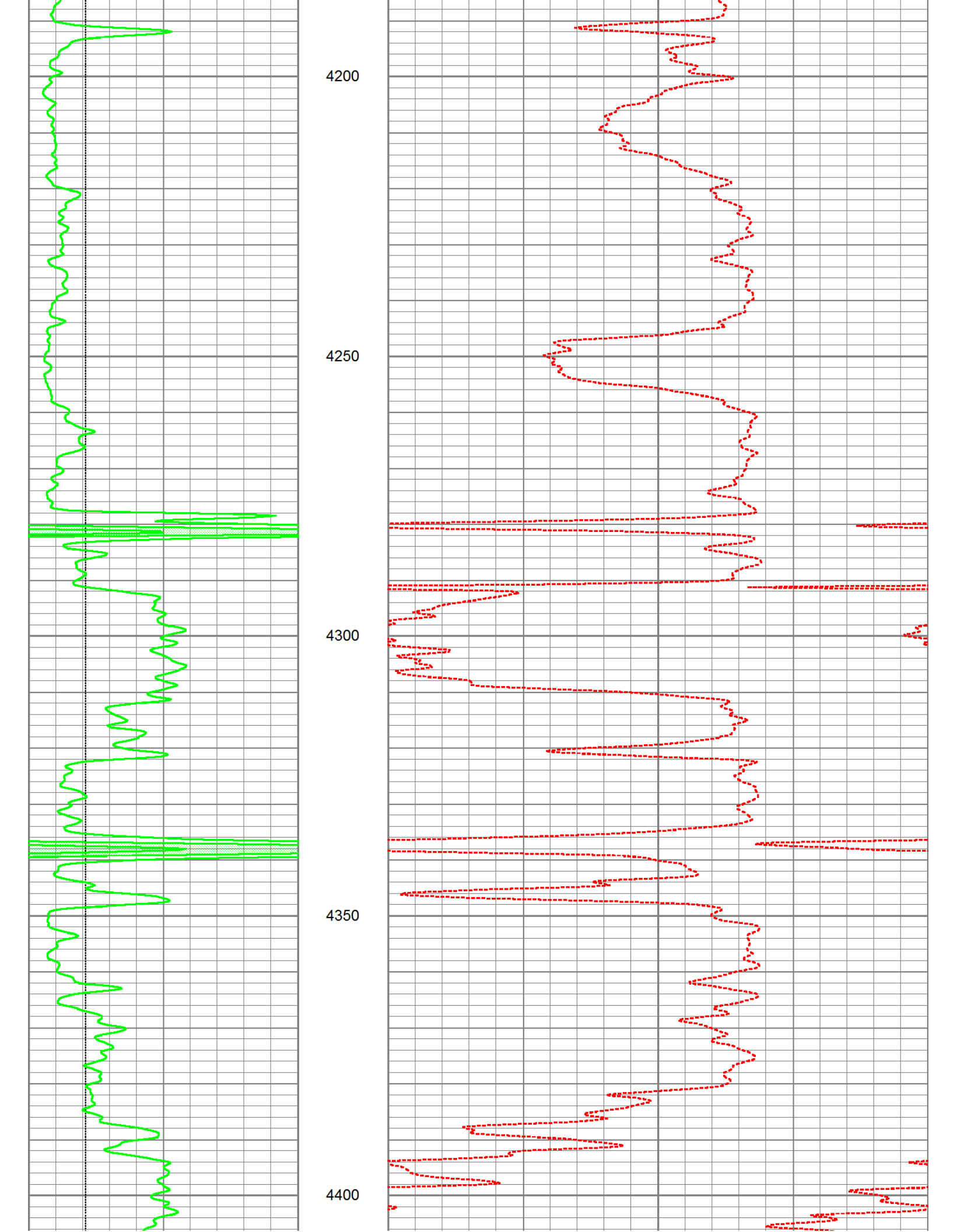
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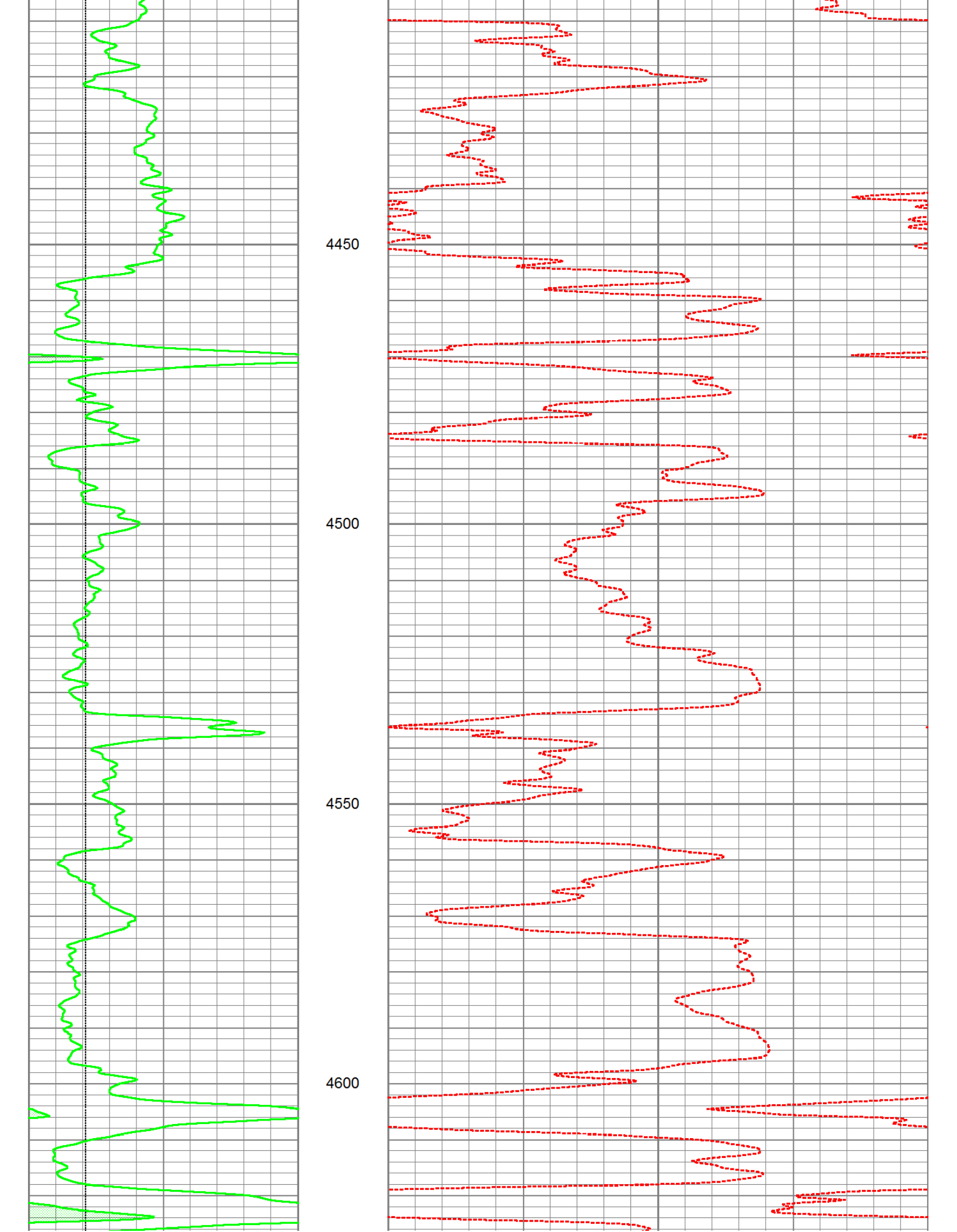
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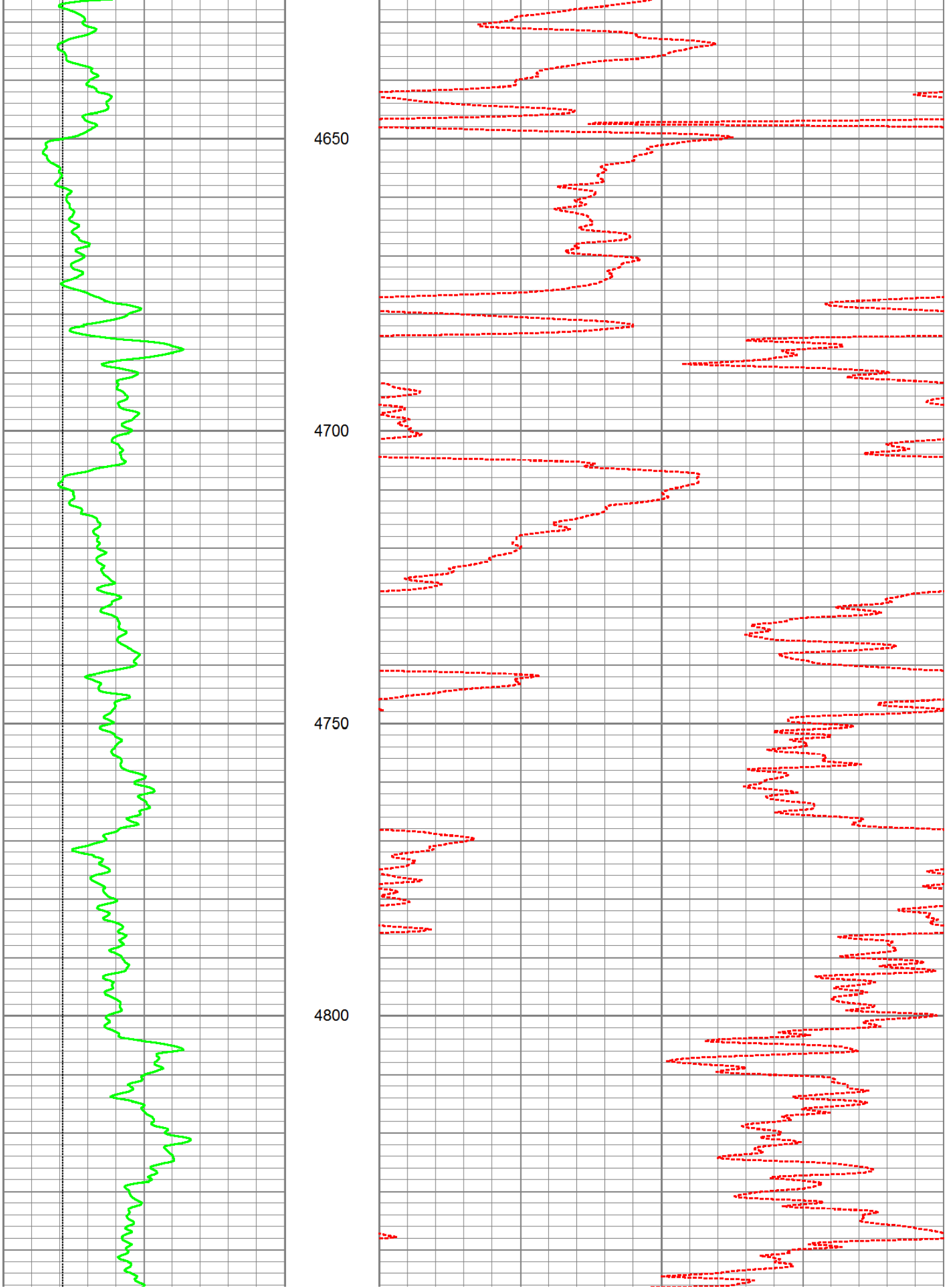
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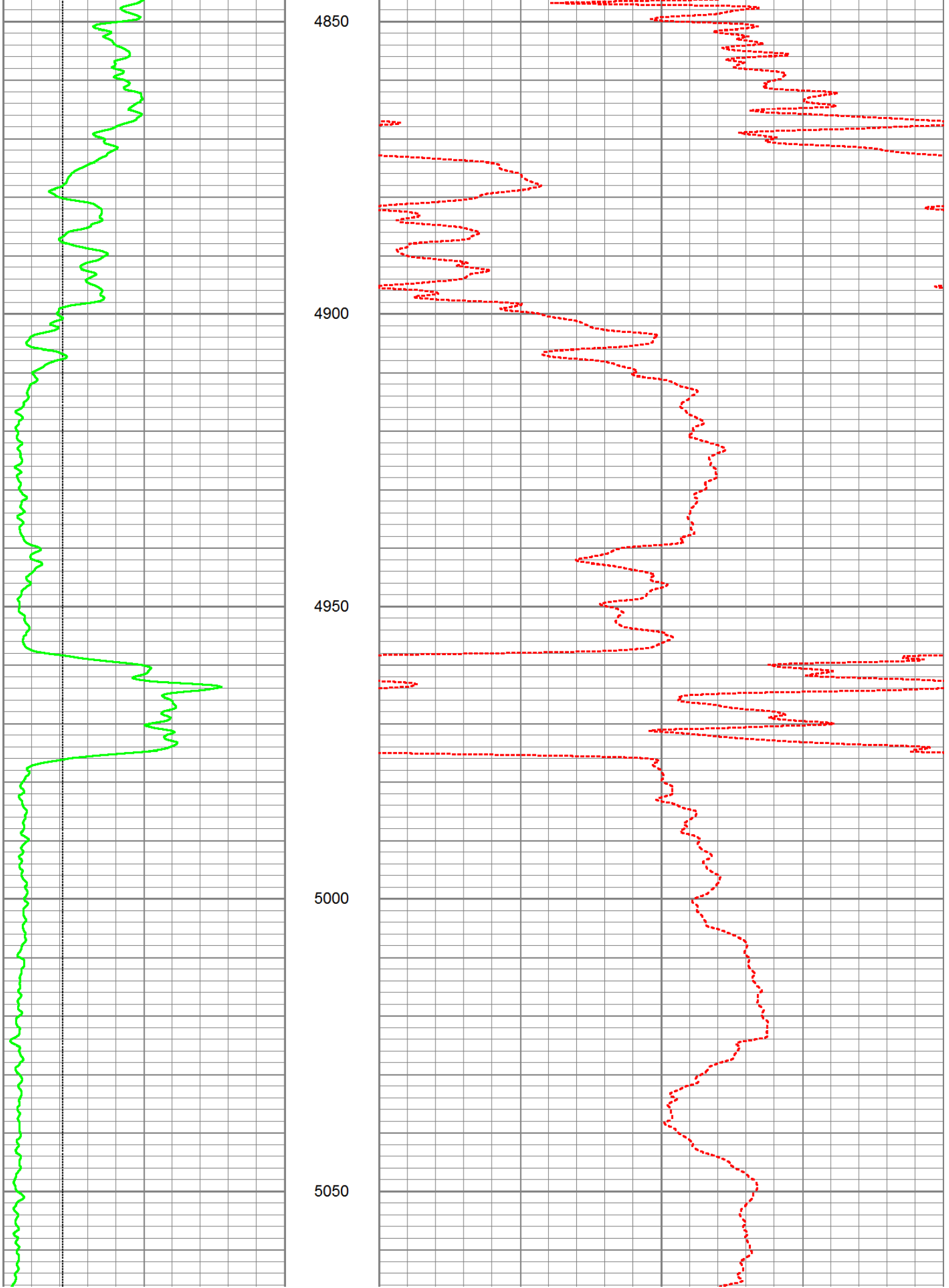
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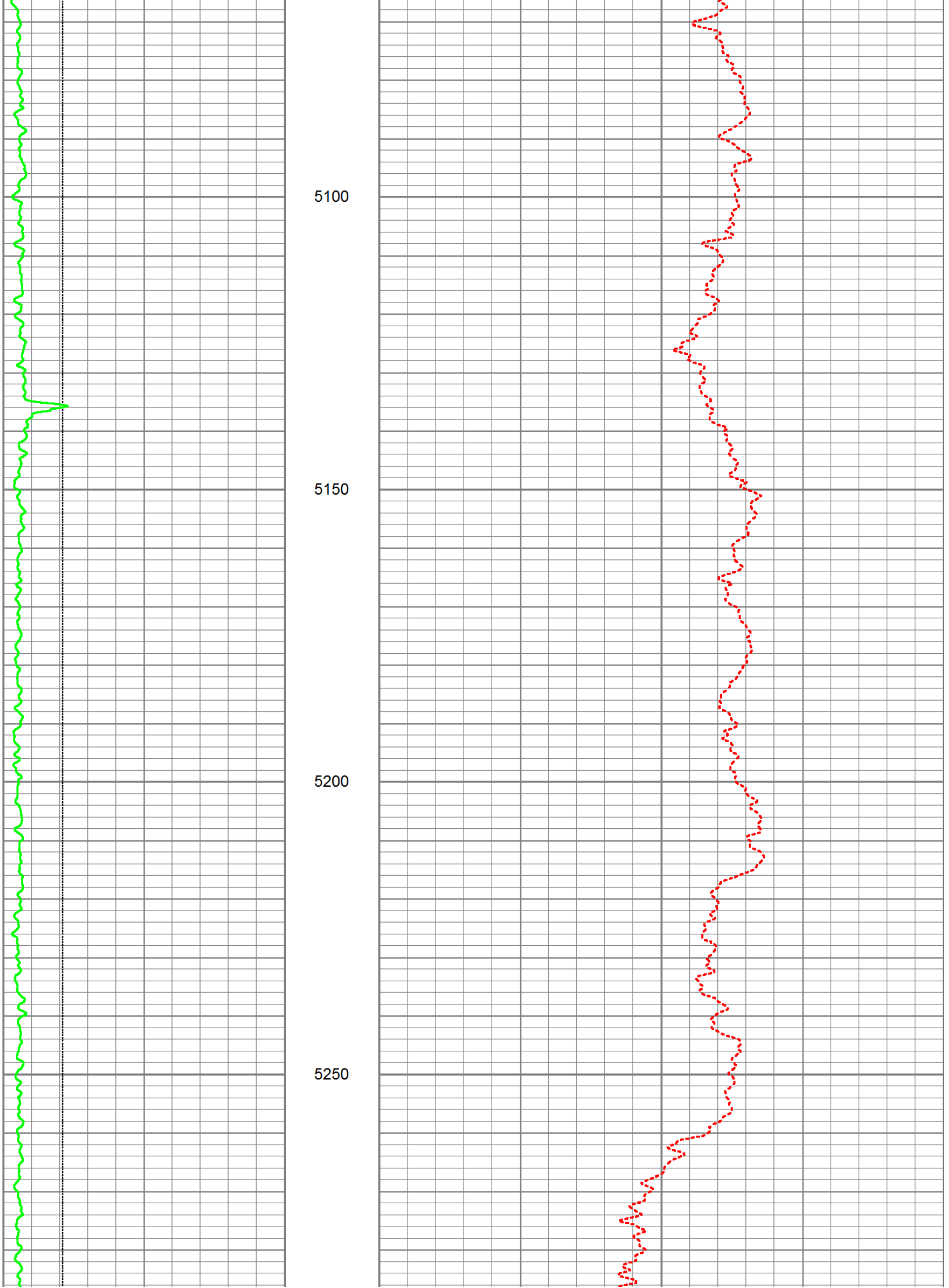
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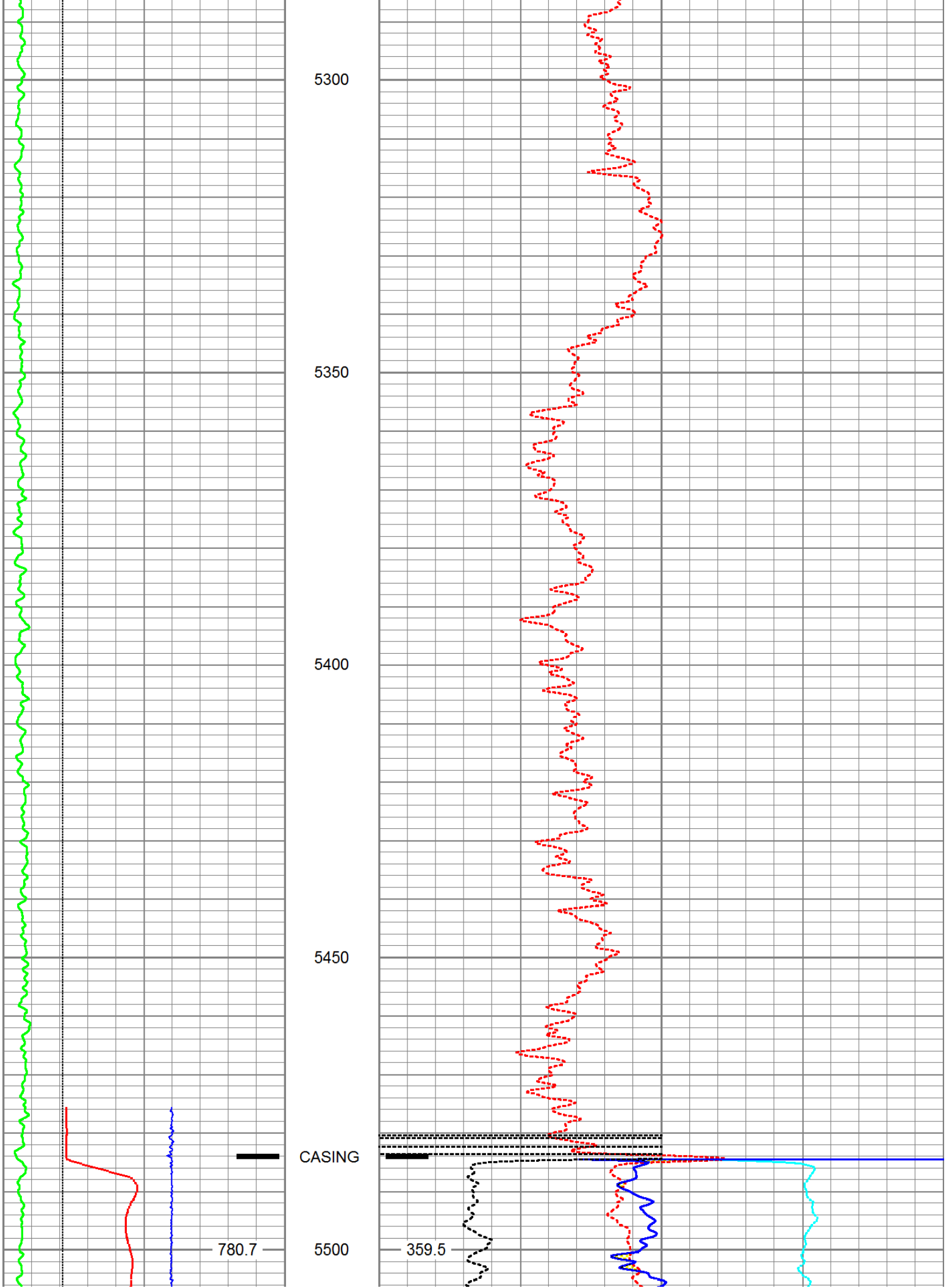
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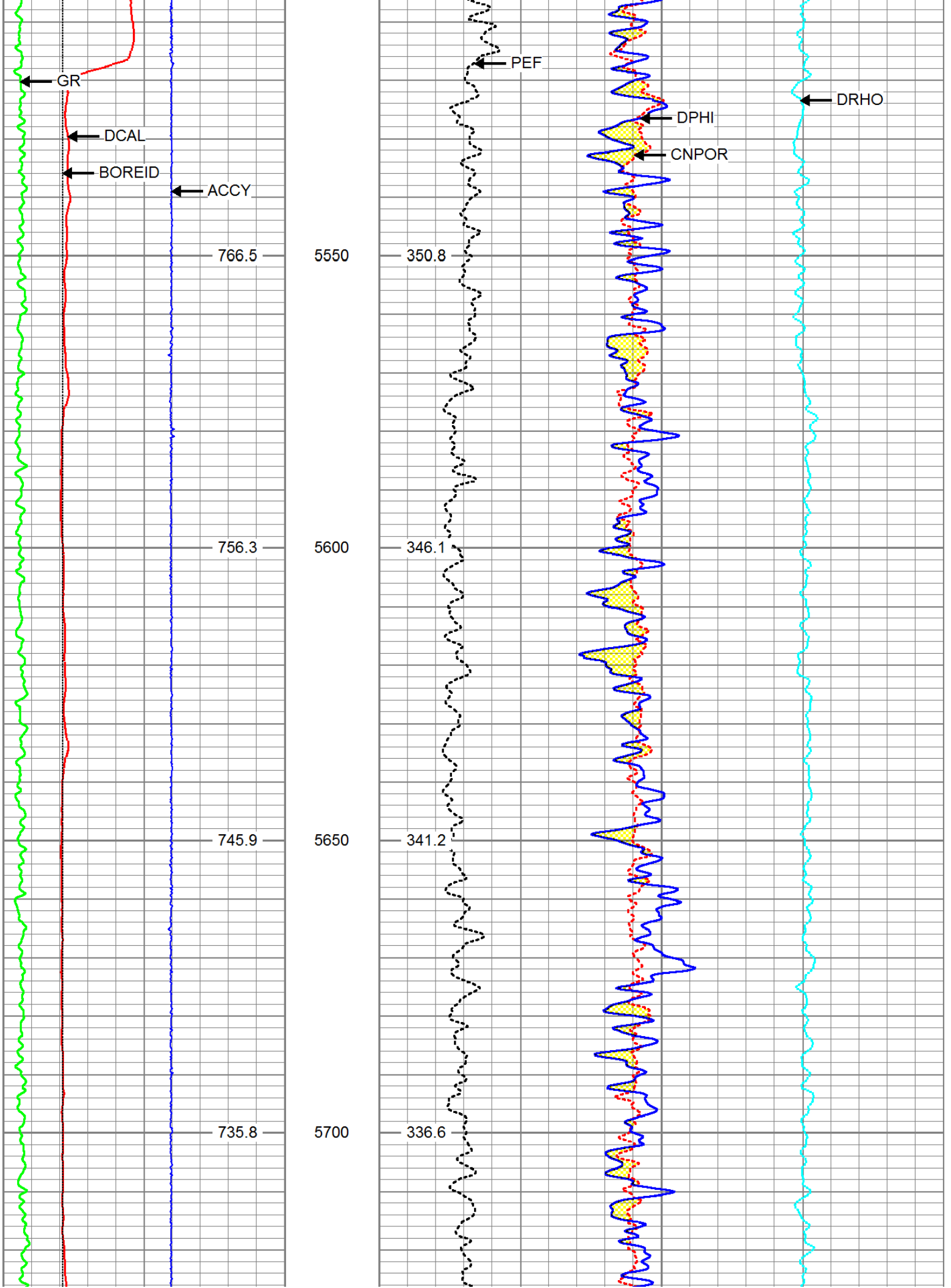
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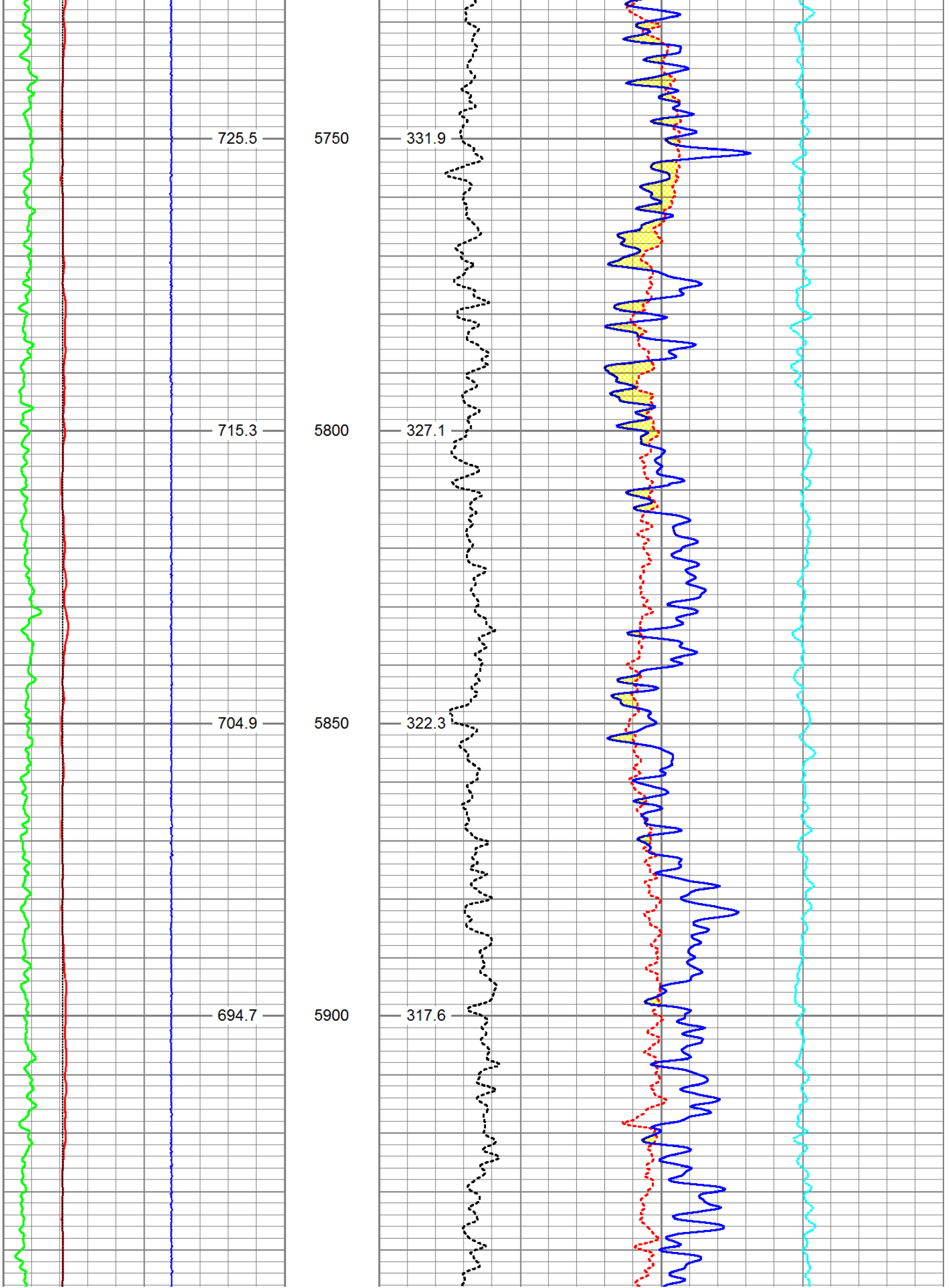
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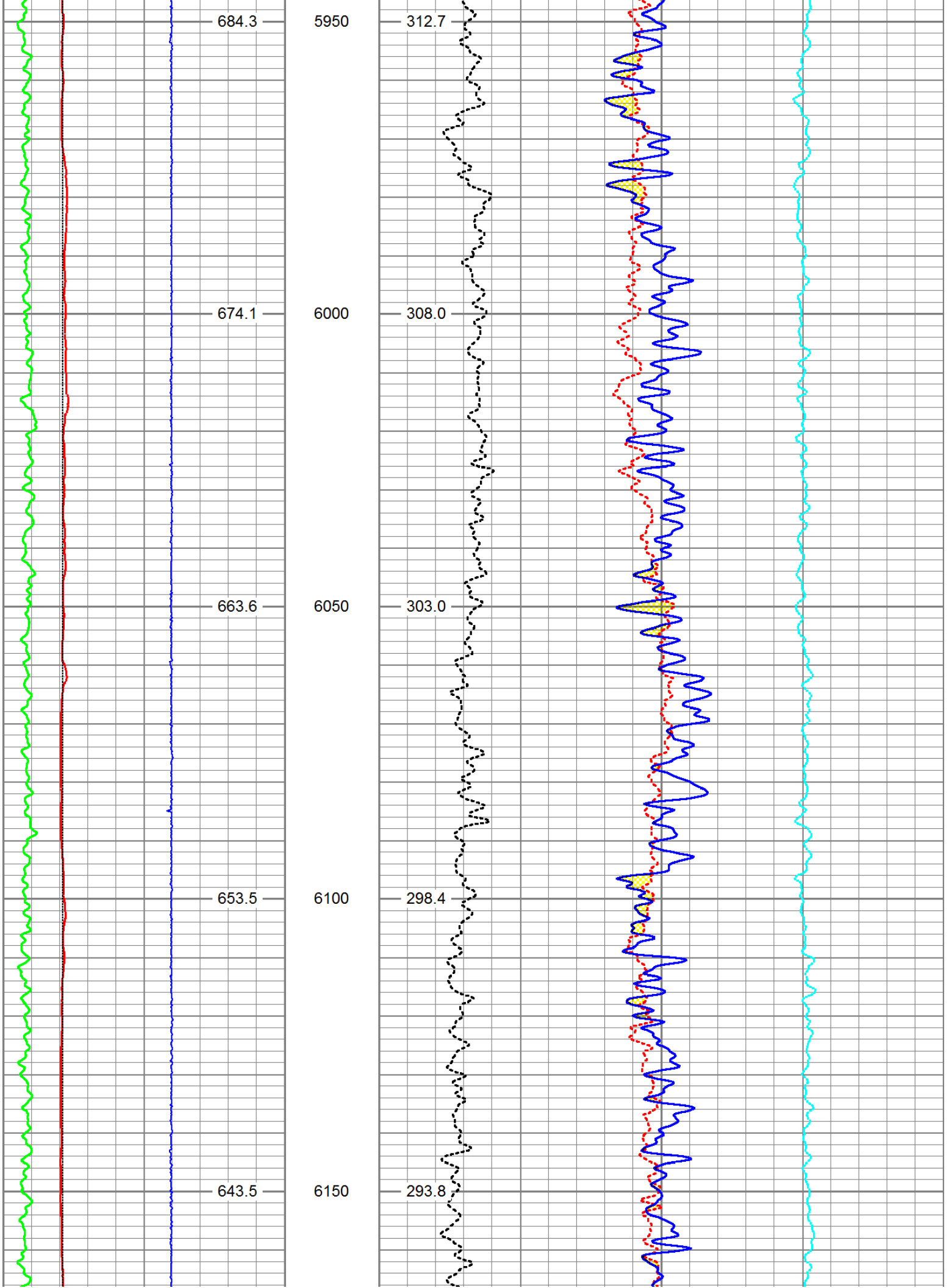
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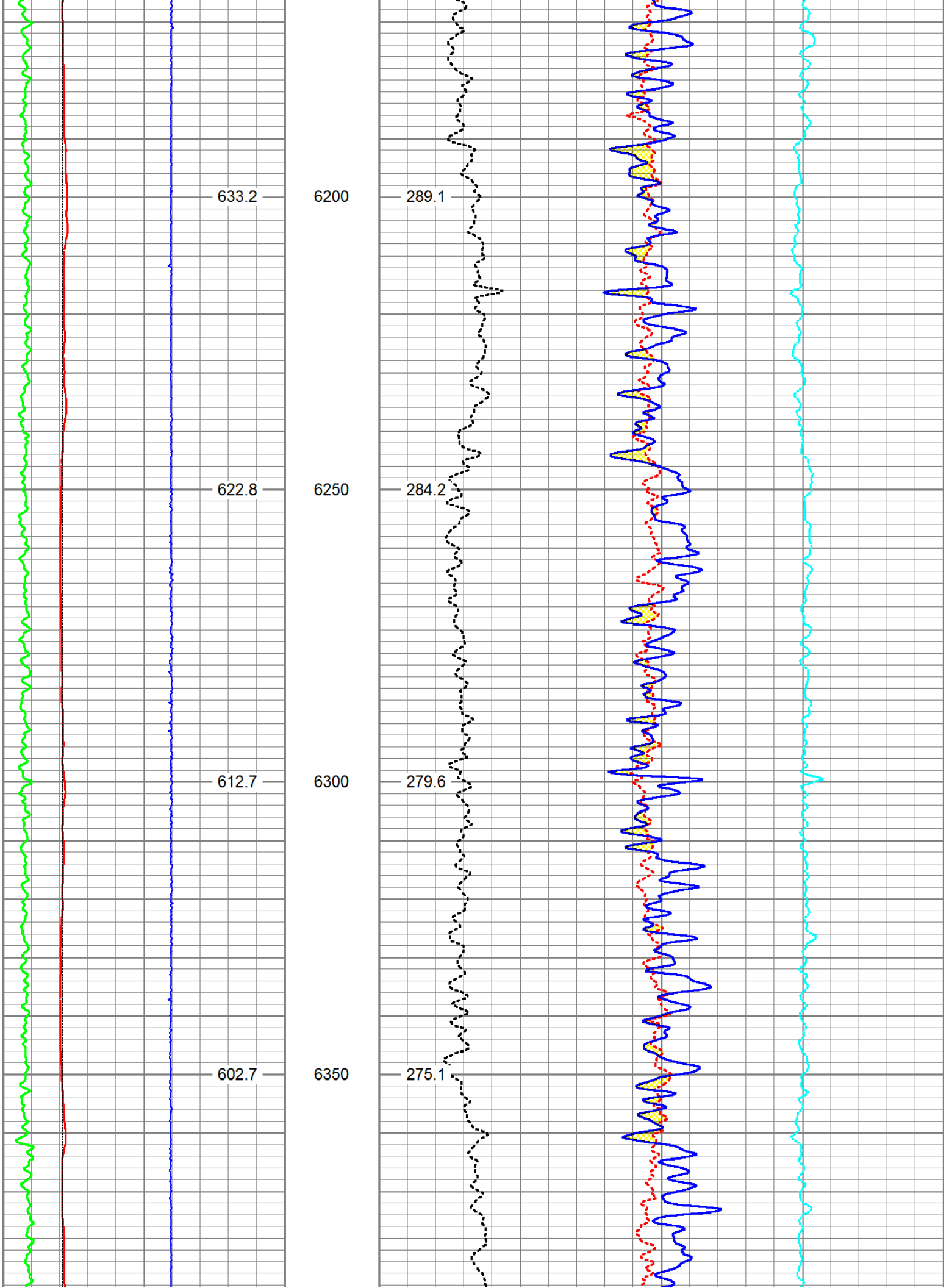
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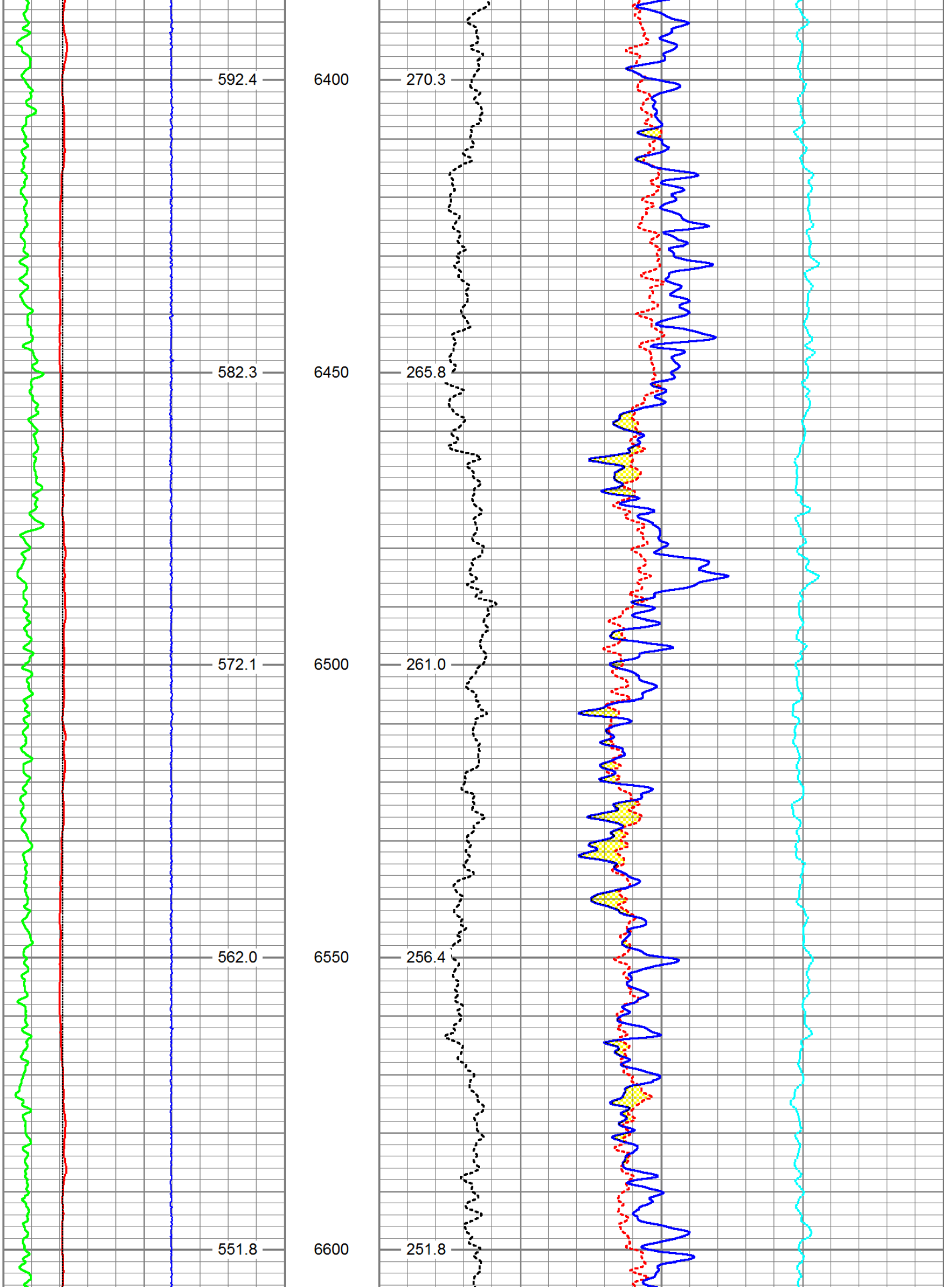
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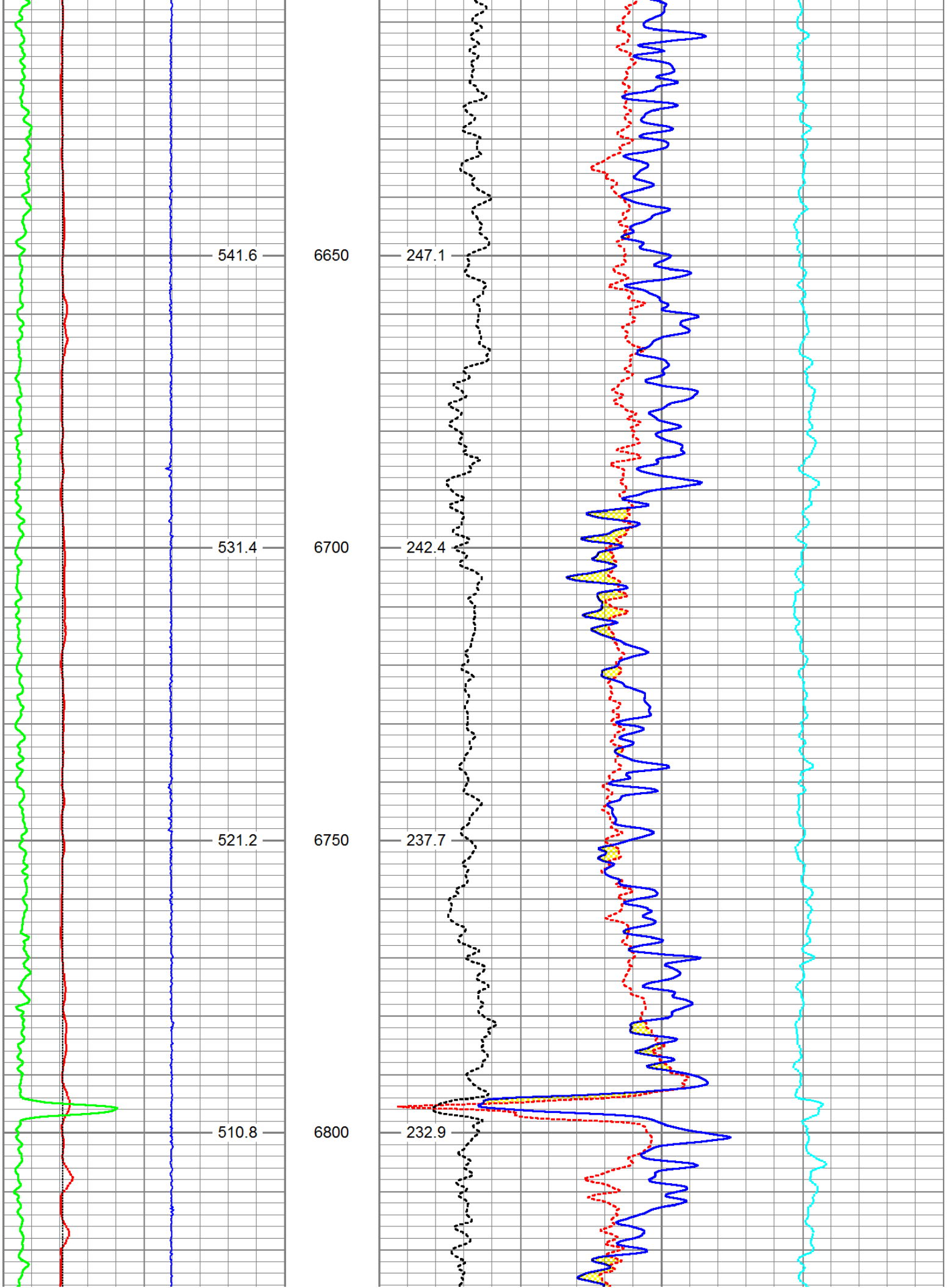
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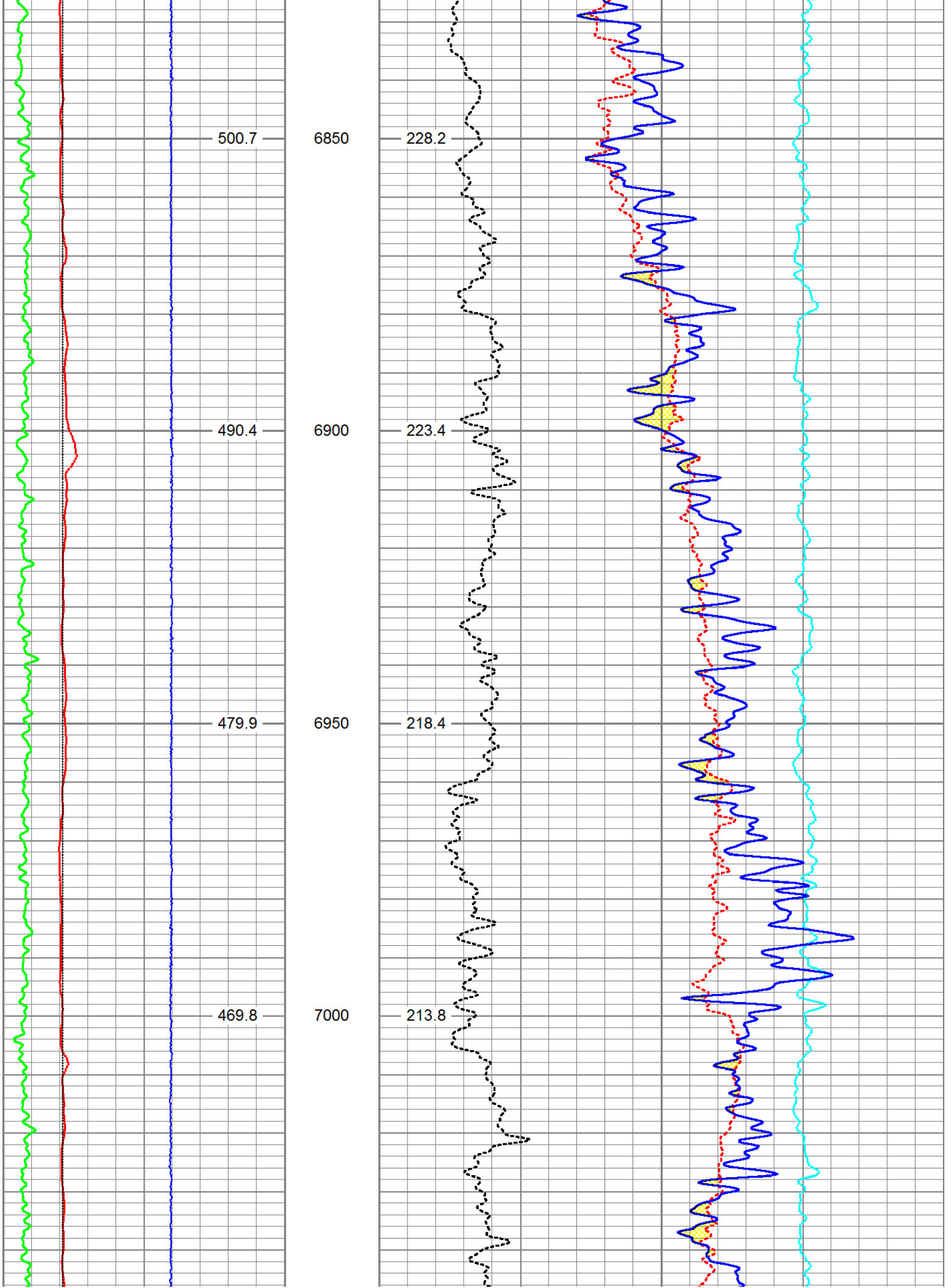
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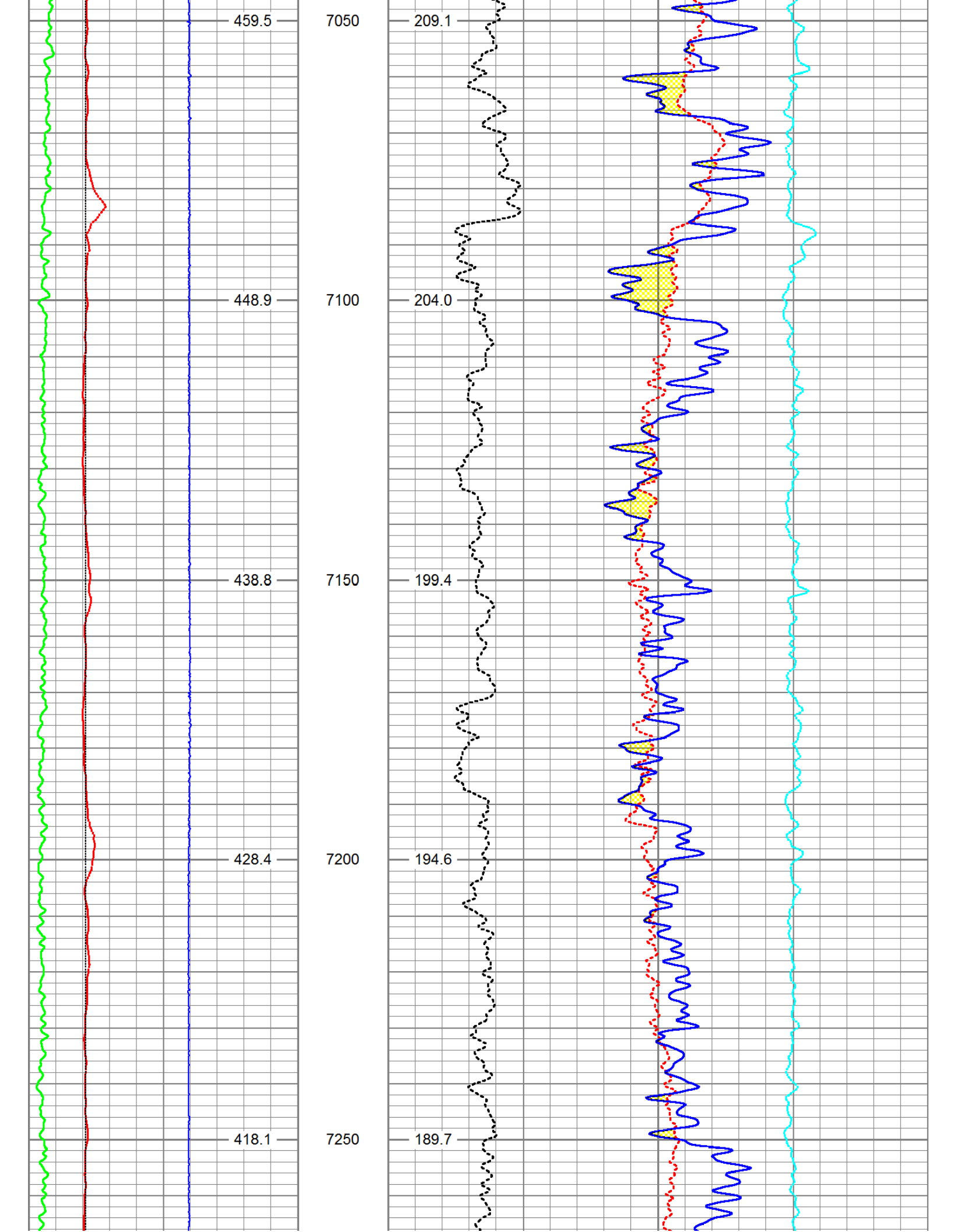
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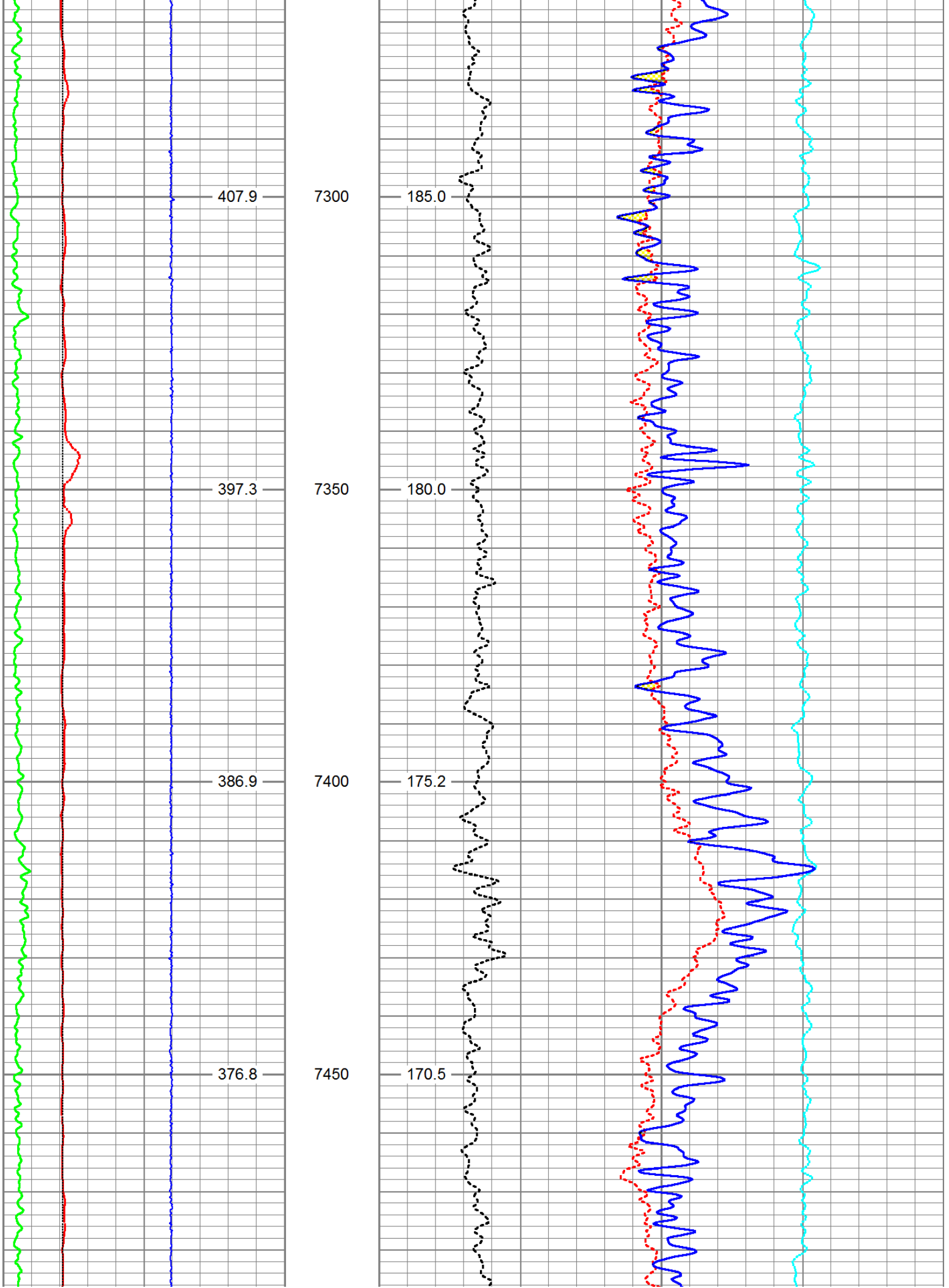
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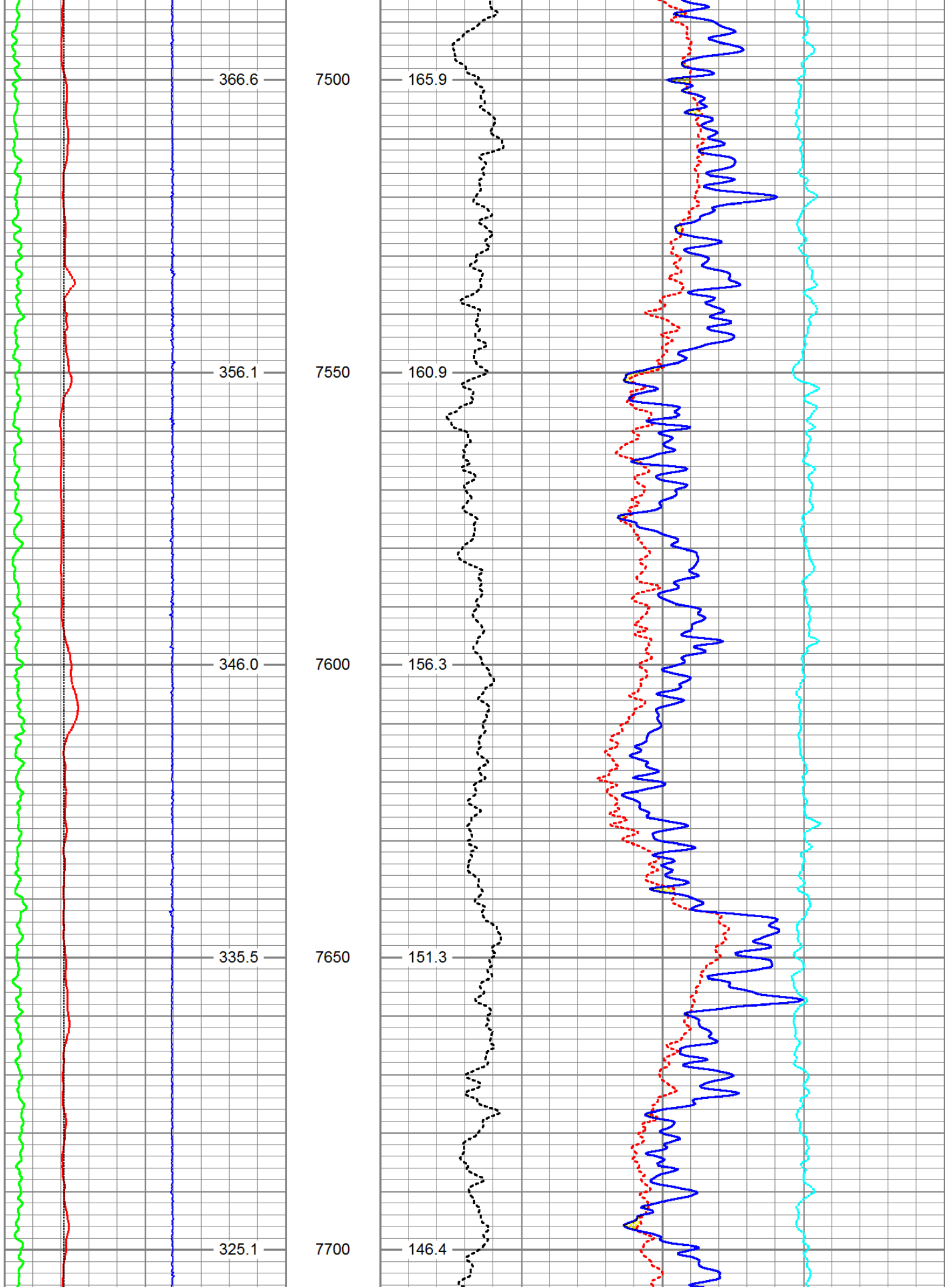
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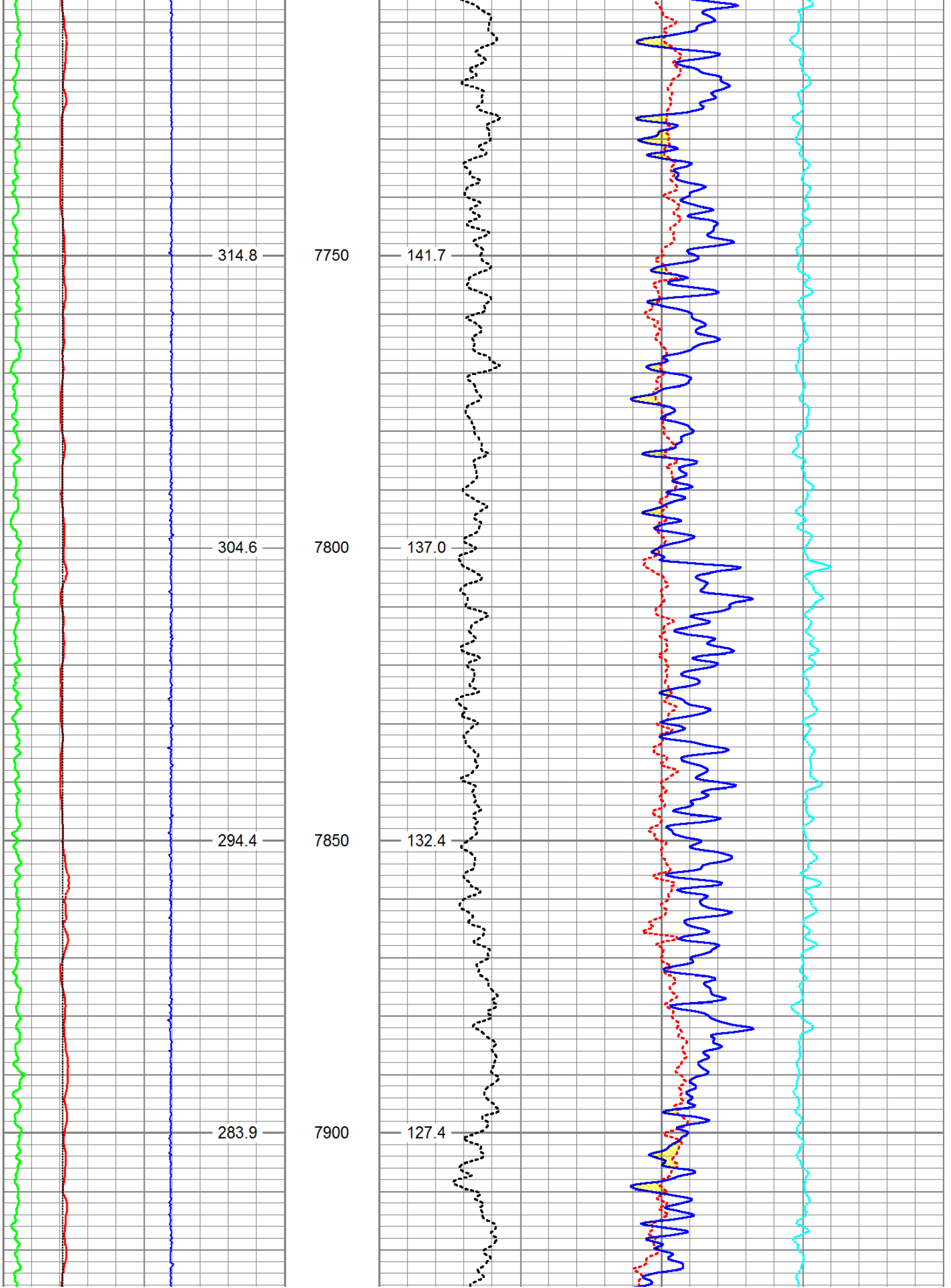
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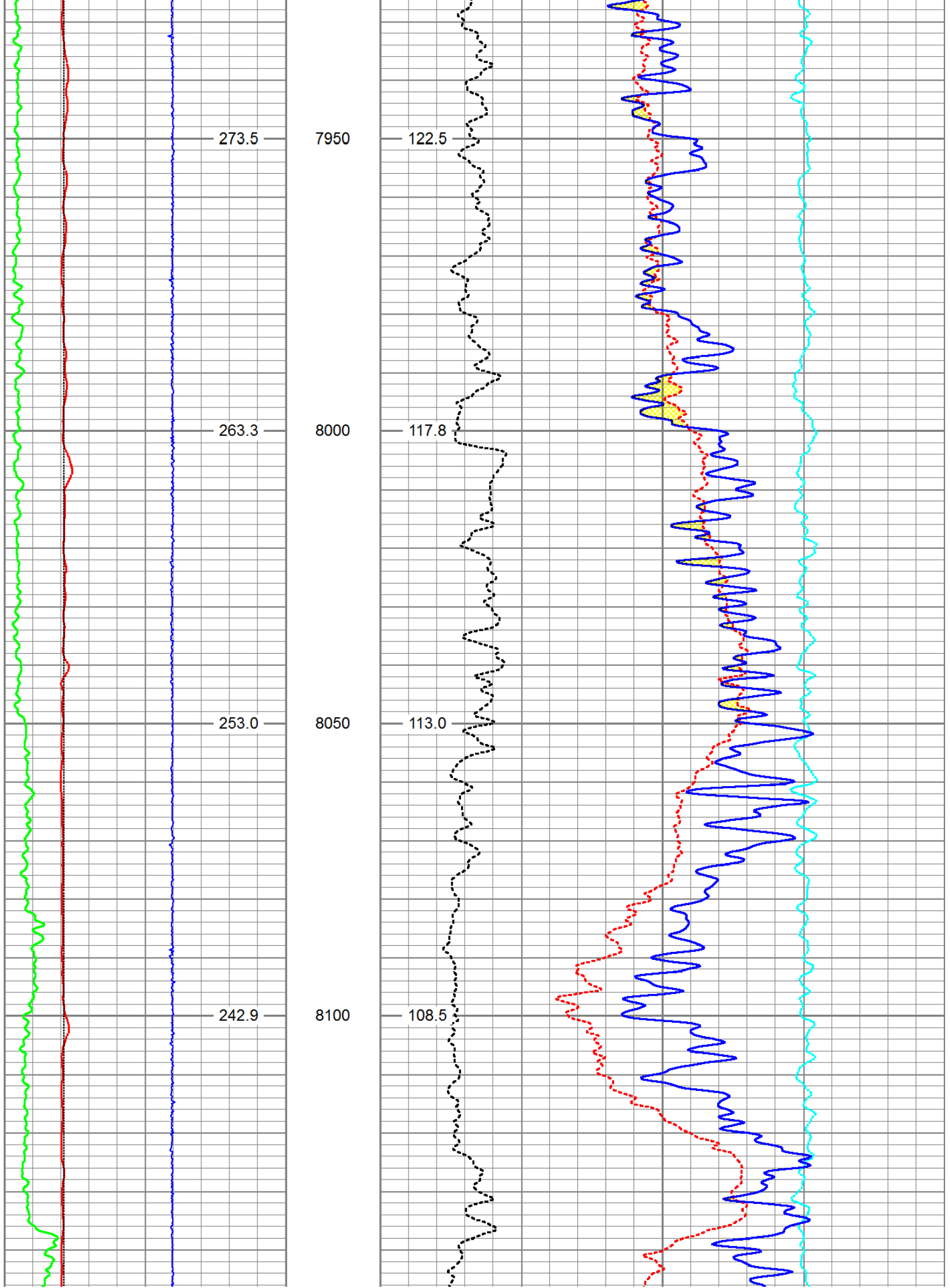
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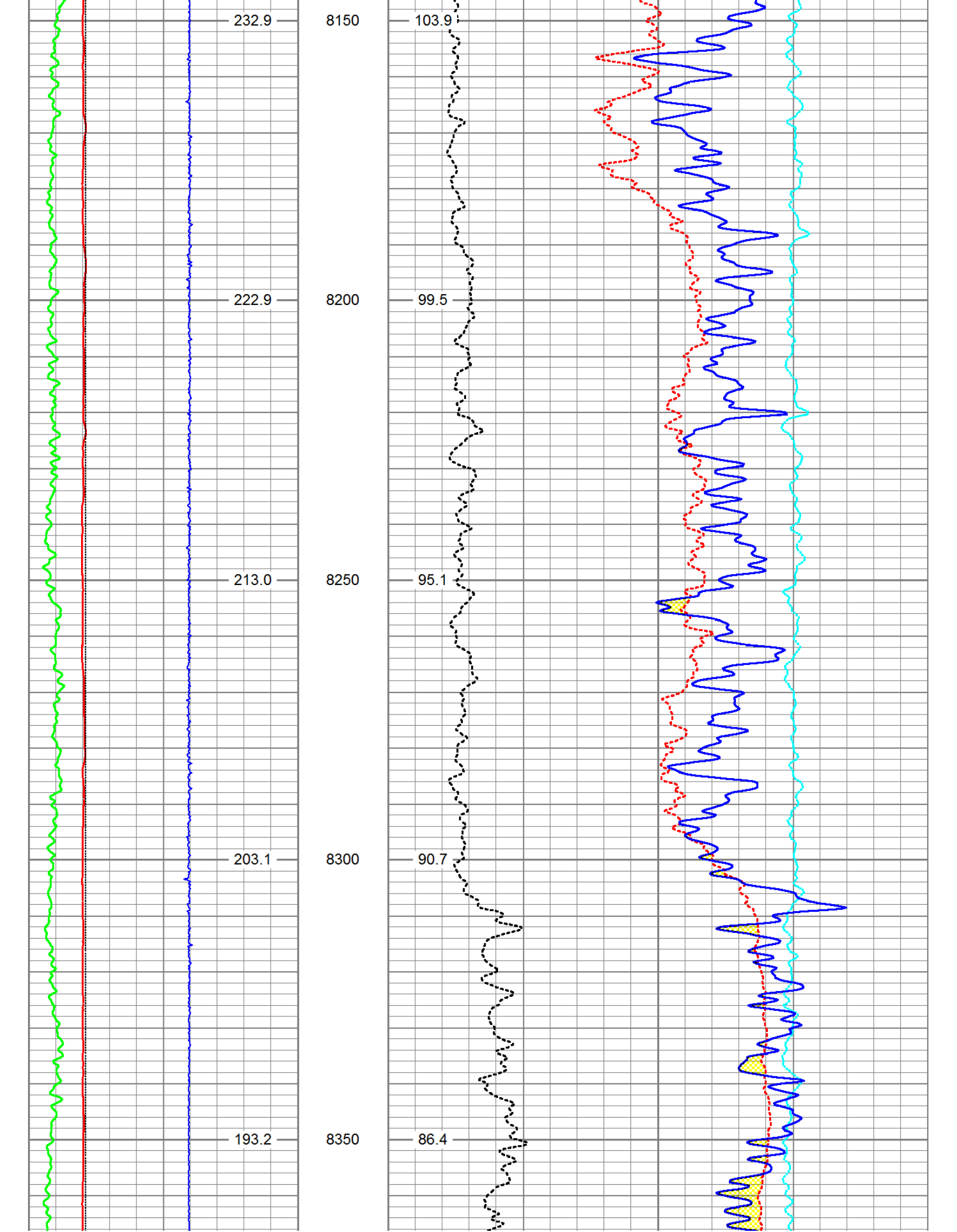
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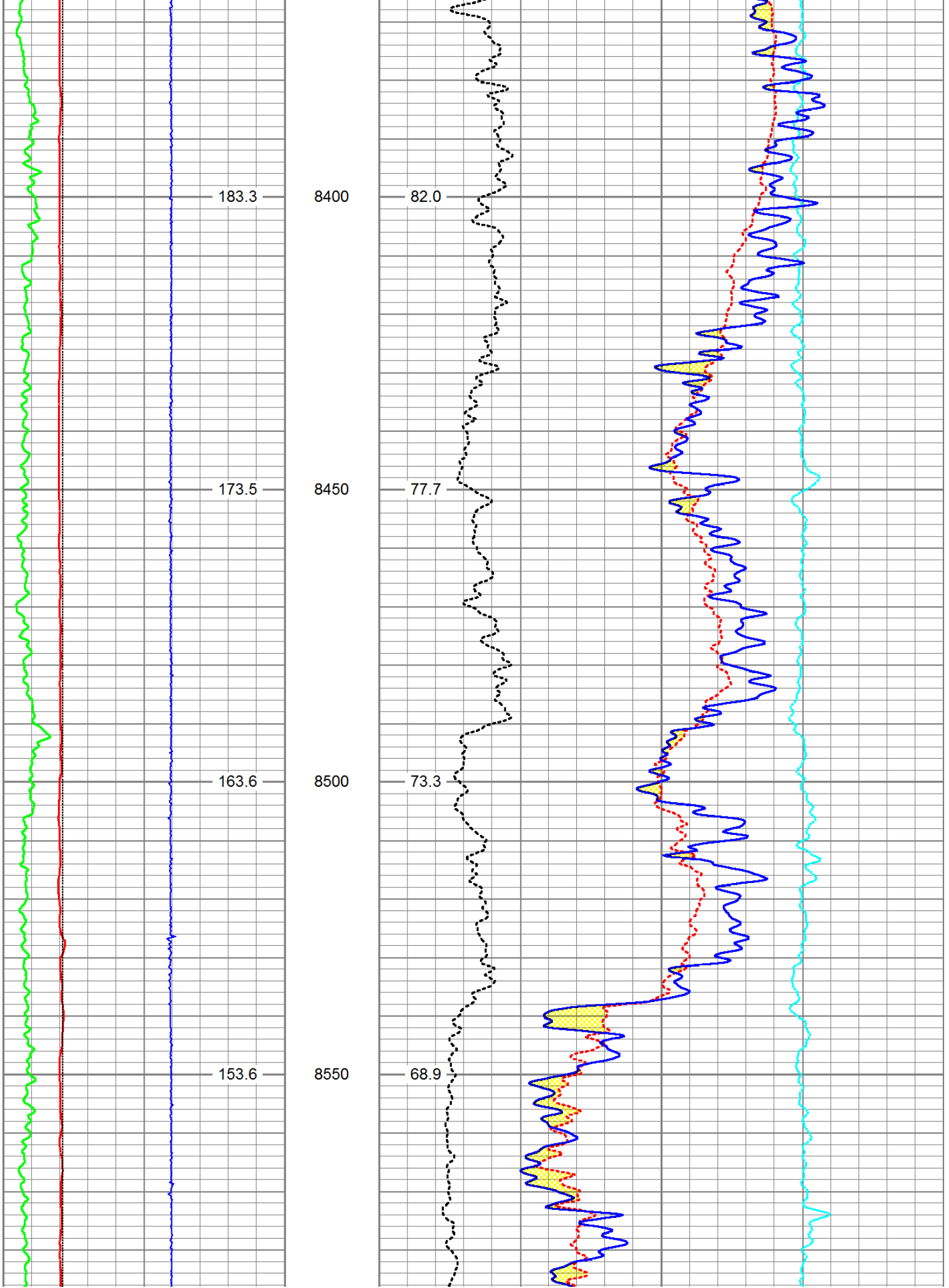
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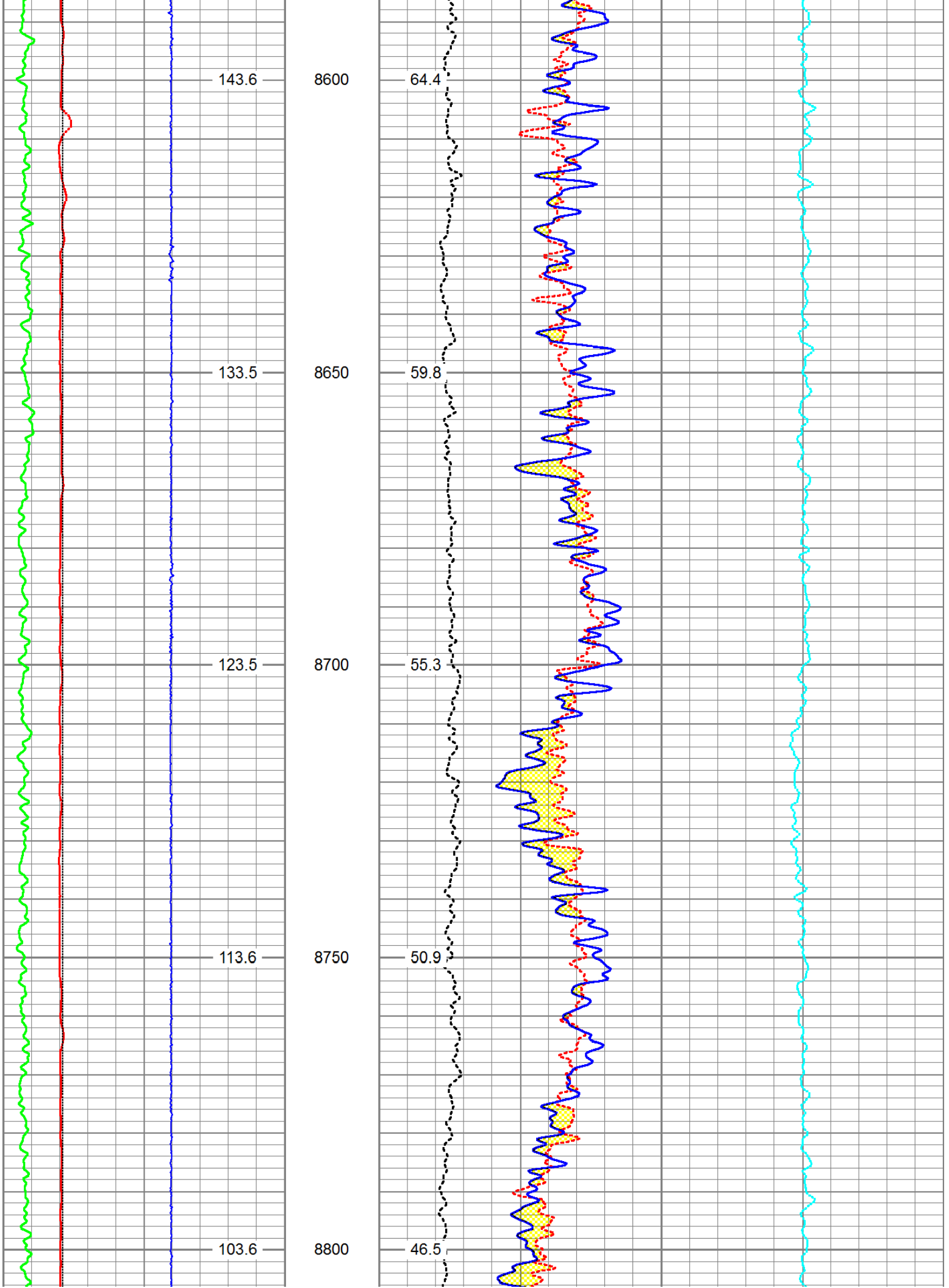
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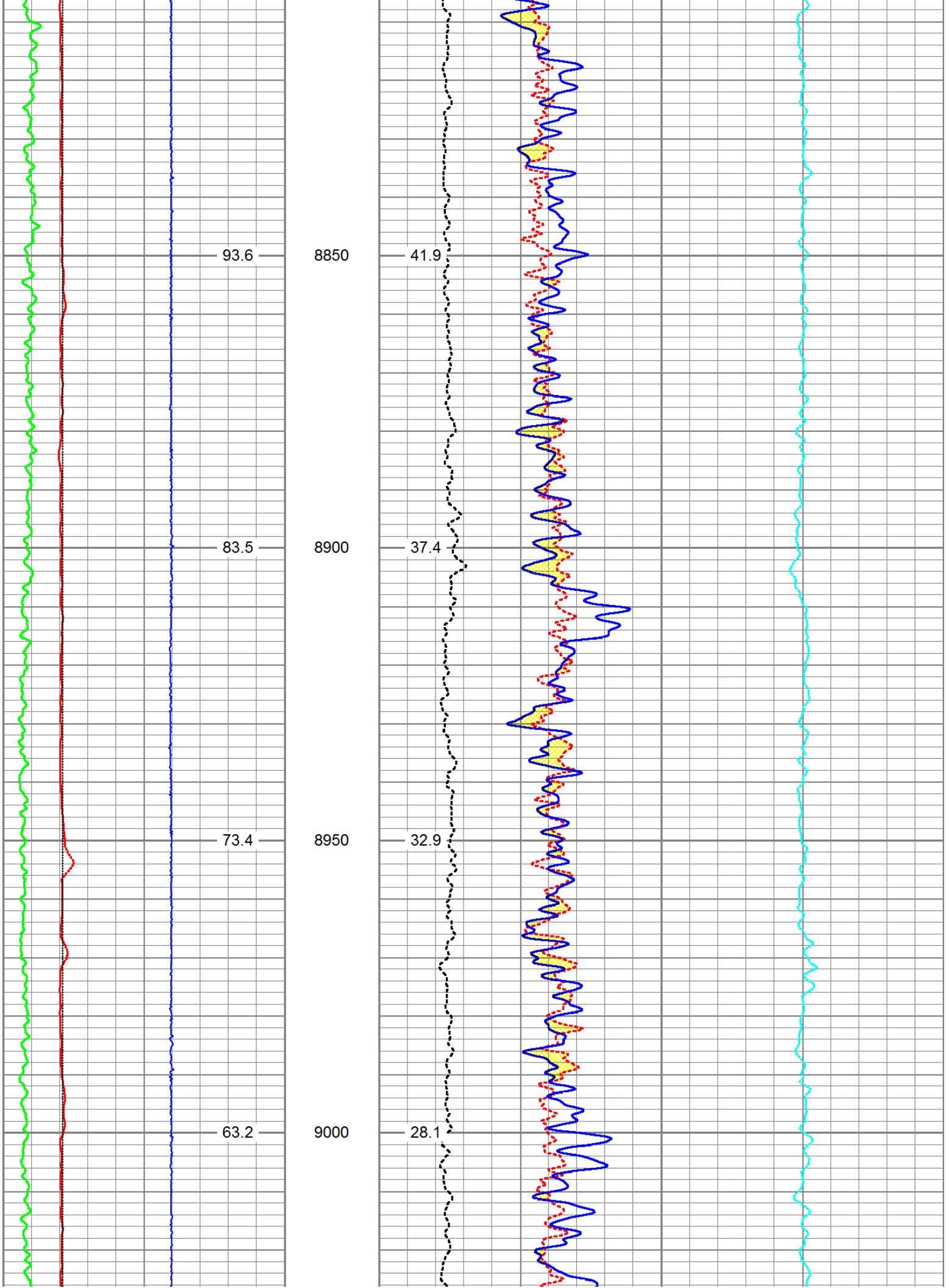
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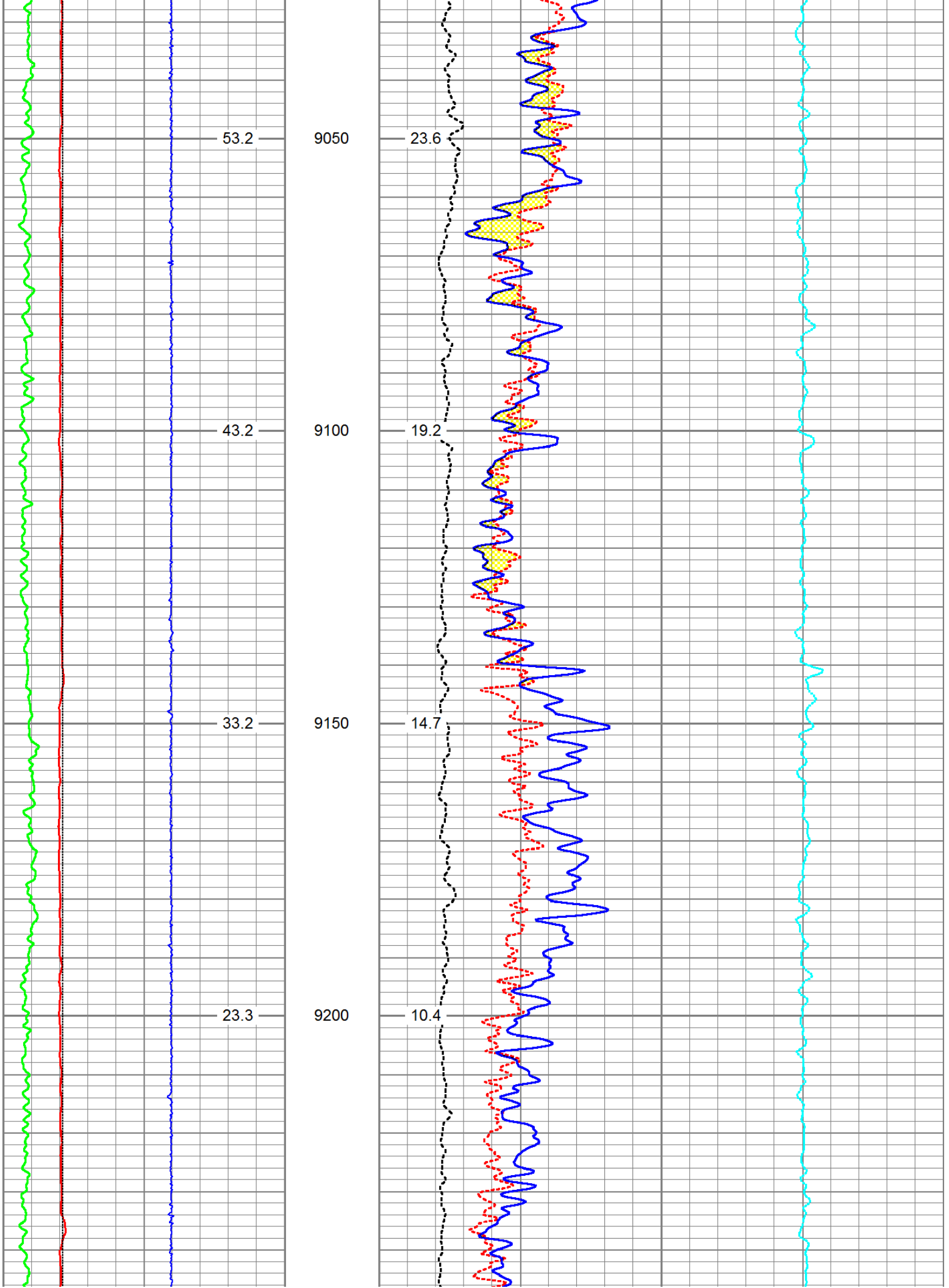
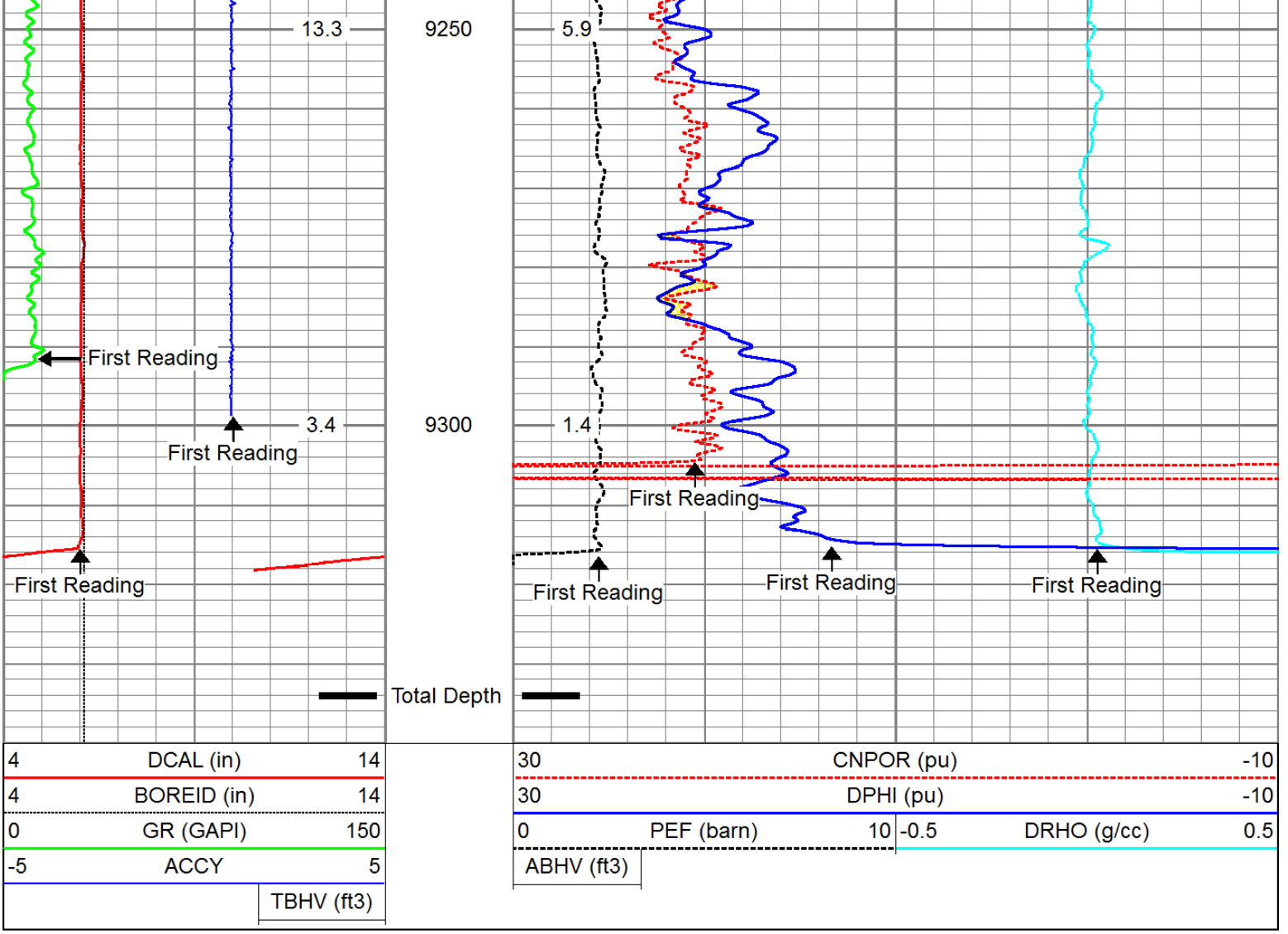
28.1


53.2
9050
23.6
43.2
9100
19.2
33.2
9150
14.7
23.3
9200
10.4



Log Variables

Database:c:\users\t010\desktop\4j ranch 3408 3-33h\sandridge 4j ranch mem2.db
Dataset: field/well/proc1/pass1.2

Top - Bottom

A 1	BHCOR On	BHFL_TYPE WBM	BHFLRES Ohm-m 1	BHFLRESSRC MUDCELL	BHIDSRC CURVE	BOREID in 6.125
BOTTEMP degF 129	CASED? No	CASEOD in 4.5	CASETHCK in 0	CEMWATERSA kppm 0	CMNTTHCK in 0	DNBHC? NO
DPORSEL RHOB	FLUIDDEN g/cc 1	FRMSALIN kppm 0	LATNOR Off	M 2	MATRXDEN g/cc 2.71	MUDSALIN kppm 4
MudWgt lb/gal 4	NPORSEL Limestone	PEBHC? YES	PERFS 0	RESTMPSRC INTERNAL	SO in 0.5	SRFTEMP degF 65
SZCOR On	TDEPTH ft 9352	TMPCOR On	TOOLPOS Free			

Calibration Report

Database File: c:\users\t010\desktop\4j ranch 3408 3-33h\sandridge 4j ranch mem2.db

Dataset Pathname: proc1/pass1.2
Dataset Creation: Thu Jun 27 14:17:51 2013

ThruBit Induction Calibration Report

Tool Model-Serial Number: PS-PS31R

Shop Calibration Performed: Wed Jun 19 10:12:58 2013

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-462.1450	[-500.00, -400.00]	-12.6076	[-500.00, 500.00]
A2	-145.2930	[-180.00, -100.00]	147.4280	[-500.00, 500.00]
A3	-27.9186	[-50.00, -10.00]	-96.7329	[-500.00, 500.00]
A4	-15.6632	[-30.00, -10.00]	273.6140	[-500.00, 500.00]
A5	-14.4051	[-30.00, -10.00]	108.6260	[-500.00, 500.00]
Freq 2				
A1	-244.4100	[-280.00, -180.00]	-39.3764	[-500.00, 500.00]
A2	-93.6198	[-130.00, -50.00]	69.2823	[-500.00, 500.00]
A3	-20.1718	[-50.00, -10.00]	-114.3700	[-500.00, 500.00]
A4	-19.1041	[-30.00, -10.00]	96.8636	[-500.00, 500.00]
A5	-18.5044	[-30.00, -10.00]	-19.7682	[-500.00, 500.00]
Freq 3				
A1	-153.1930	[-180.00, -80.00]	-99.5953	[-500.00, 500.00]
A2	-70.9510	[-130.00, -30.00]	10.9301	[-500.00, 500.00]
A3	-16.1377	[-50.00, -10.00]	-140.2860	[-500.00, 500.00]
A4	-20.2900	[-30.00, -10.00]	-17.1267	[-500.00, 500.00]
A5	-21.5769	[-30.00, -10.00]	-112.3690	[-500.00, 500.00]
Freq 4				
A1	-86.8059	[-120.00, -40.00]	-220.8280	[-500.00, 500.00]
A2	-52.8721	[-110.00, -10.00]	-77.4492	[-500.00, 500.00]
A3	-12.6785	[-50.00, -10.00]	-200.4370	[-500.00, 500.00]
A4	-24.5917	[-30.00, -10.00]	-187.7310	[-500.00, 500.00]
A5	-28.6308	[-30.00, -10.00]	-278.2820	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9955	[0.95, 1.05]	-0.0055	[-0.05, 0.05]
A2	0.9870	[0.95, 1.05]	0.0017	[-0.05, 0.05]
A3	1.0035	[0.95, 1.05]	-0.0062	[-0.05, 0.05]
A4	0.9858	[0.95, 1.05]	0.0048	[-0.05, 0.05]
A5	0.9959	[0.95, 1.05]	0.0002	[-0.05, 0.05]
Freq 2				
A1	0.9909	[0.95, 1.05]	-0.0118	[-0.05, 0.05]
A2	0.9822	[0.95, 1.05]	-0.0065	[-0.05, 0.05]
A3	0.9928	[0.95, 1.05]	-0.0072	[-0.05, 0.05]
A4	0.9816	[0.95, 1.05]	-0.0033	[-0.05, 0.05]
A5	0.9930	[0.95, 1.05]	-0.0096	[-0.05, 0.05]
Freq 3				
A1	0.9960	[0.95, 1.05]	-0.0068	[-0.05, 0.05]
A2	0.9876	[0.95, 1.05]	-0.0027	[-0.05, 0.05]
A3	0.9980	[0.95, 1.05]	-0.0033	[-0.05, 0.05]
A4	0.9854	[0.95, 1.05]	0.0004	[-0.05, 0.05]
A5	0.9992	[0.95, 1.05]	-0.0064	[-0.05, 0.05]
Freq 4				

A1	0.9863	[0.95, 1.05]	0.0060	[-0.05, 0.05]
A2	0.9778	[0.95, 1.05]	0.0087	[-0.05, 0.05]
A3	0.9904	[0.95, 1.05]	0.0061	[-0.05, 0.05]
A4	0.9748	[0.95, 1.05]	0.0121	[-0.05, 0.05]
A5	0.9980	[0.95, 1.05]	0.0021	[-0.05, 0.05]

Temperature 36.1191 degC

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS52D

Source Number:

Shop Calibration Performed: Thu Jun 20 09:21:33 2013

REFERENCE

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

READINGS

Outputs	Counts	Units	Expected
SS1 Background	133.60	cps	[130.00, 170.00]
LS1 Background	132.62	cps	[130.00, 170.00]
LS4 Background	28.92	cps	[27.00, 35.00]
SS1 Aluminium	4711.53	cps	[4500.00, 5500.00]
LS1 Aluminium	845.31	cps	[750.00, 950.00]
LS4 Aluminium	987.34	cps	[843.00, 1068.00]
SS1 Magnesium	7824.88	cps	[7000.00, 9000.00]
LS1 Magnesium	5546.57	cps	[5250.00, 6250.00]
LS1 Al + Fe	730.93	cps	[650.00, 800.00]
LS4 Al + Fe	440.28	cps	[382.00, 471.00]

RESULTS

SS Slope	1.65	[1.52, 1.77]
LS Slope	0.42	[0.38, 0.45]
PEF K Factor	5.270	[3.510, 6.170]
PEF B Factor	-0.517	[-0.700, -0.410]

Caliper Shop Calibration performed: Thu Jun 20 09:21:33 2013

RESULTS

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

DENSITY PRE-SURVEY CHECK Performed: Fri Jun 21 10:29:13 2013

Outputs	Counts	Units	Expected
SS1 Background	133.47	cps	[129.59, 137.61]
LS1 Background	133.19	cps	[128.64, 136.60]
LS4 Background	28.77	cps	[27.18, 30.65]

CALIPER PRE-SURVEY CHECK Performed: Fri Jun 21 10:22:10 2013

Reference	Readings	Units	Expected
6.00	5.89	in	[5.80, 6.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number: PS-PS35N
Source Number:

Calibration Tank Temperature: 79.9 degF
Shop Calibration Performed: Wed Jun 19 09:46:25 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	2786.0	cps	
LS Counts	91.9	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	30.3172	SS/LS	
Tank Ratio Gain	1.0211		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	32700.6	cps	
LS Counts	2996.8	cps	
Al Ratio Ref	10.797	SS/LS	
Al Ratio	11.142	SS/LS	
Al Ratio Gain	0.97		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Fri Jun 21 10:26:44 2013

Outputs	Measured	Units	Expected
SS Counts	0.0	cps	<10
LS Counts	0.1	cps	<4

Gamma Ray Calibration Report

Tool Model-Serial Number: PS-PS10T

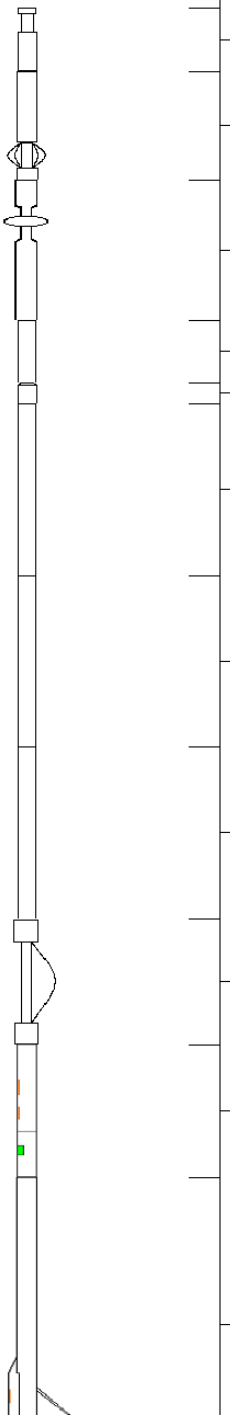
Performed: Thu Jun 20 12:02:36 2013

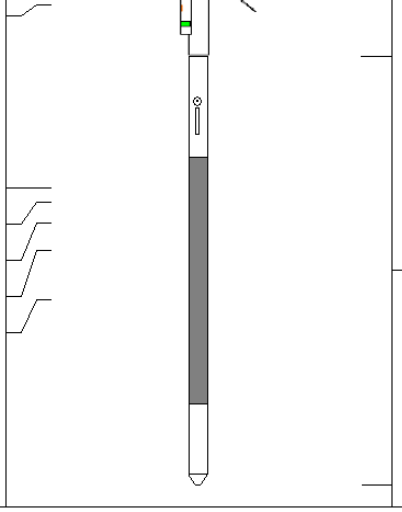
Calibrator Value:	162.7	GAPI
Background Reading:	65.9	cps
Calibrator Reading:	472.7	cps
Sensitivity:	0.3750	GAPI/cps

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	67.59		Cablehead-S Solid Weakpoint	2.31	2.13	5.00
Thrubit	65.28					
			PSBDOT	3.87	2.25	35.00
Thrubit	61.41					
			HangOff_Tool	5.00	2.38	60.00
Thrubit	56.41					
			Swivel	2.25	2.06	25.00
Thrubit	54.16		10-1	0.75	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 (PS10T) 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
			TBD-PS (PS52D) Thrubit Density	10.48	2.13	91.00
LSW1	18.04					



DCAL	17.13				
A1_P	10.60				
A2_P	10.10				
A3_P	9.35	TBI-PS (PS31R) Thrubit Induction	15.29	2.13	94.00
A4_P	8.35				
A5_P	6.60				

Dataset:	sandridge 4j ranch mem2.db: field/well/proc1/pass1.2
Total Length:	67.59 ft
Total Weight:	570.15 lb
O.D.	2.38 in

ThruBit
A Schlumberger Company

Company	SANDRIDGE ENERGY
Well	4J Ranch 3408 3-33H
Field	BOUSE
County	HARPER
State	KANSAS