



**Compensated Neutron  
Litho Density  
Micro Electric  
Log**

Company	O'Brien Energy Resources Corporation	
Well	Preedy East 1A-10	
Field	Borchers Northwest	
County	Meade	State
State	Kansas	
Location:	1650' FNL & 968' FWL W2 NE SW NW	API #: 15-119-21452
SEC	10	TWP
		33S
		RGE
		29W
Permanent Datum	G.L.	Elevation 2635 ft.
Log Measured From	K.B.	12 ft. above perm. datum
Drilling Measured From	K.B.	
		Elevation 2647 ft.
		D.F. 2646 ft.
		G.L. 2635 ft.
Other Services	IAT	

Date	12-Apr-2021
Run Number	One
Depth Driller	6320'
Depth Logger	6320'
Bottom Logged Interval	6305'
Top Log Interval	4000'
Casing Driller	8 5/8" @ 1572'
Casing Logger	1572'
Bit Size	7 7/8"
Type Fluid in Hole	WBM
Density / Viscosity	9.1 / 70
pH / Fluid Loss	11.0 / 6.4
Source of Sample	Flowline
Rm @ Meas. Temp	1.076 @ 75°F
Rmt @ Meas. Temp	0.807 @ 75°F
Rmc @ Meas. Temp	1.344 @ 75°F
Source of Rmf / Rmc	Calculated
Rm @ BHT	0.699 @ 119°F
Time Circulation Stopped	16:30
Time Logger on Bottom	21:00
Maximum Recorded Temperature	119°F
Equipment Number	11007
Location	OKC, OK.
Recorded By	H. Garcia
Witnessed By	Mr. D. Greathouse
	Mr. P. Debenham

<<< Fold Here >>>

**Equipment and Log Data**

Service Order: T7-210412

Gamma		Density		Neutron		Sonic		IAT	
Run No.	One	Run No.	One	Run No.	One	Run No.	One	Run No.	One
Serial No.	049	Serial No.	110	Serial No.	071	Serial No.	NA	Serial No.	110
O.D.	3.375 in.	Source No.	70997B	Source No.	1414NC	Centralizers	NA	Standoffs	2 @ 0.5"
		O.D.	4.5 in.	O.D.	3.375 in.	O.D.	3.375 in.	O.D.	3.875 in.

**Logging Pass Data**

General			Gamma		Density			Neutron			Sonic			IAT	
			Scales		Scales			Scales			Scales			Scales	
Run	Depths		Left	Right	Left	Right	Matrix	Left	Right	Matrix	Left	Right	Matrix	Left	Right
One	SCG	TD	0	150	0.3	-0.1	2.71 g/cc	0.3	-0.1	Lime	NA	NA	NA	0.2	2000

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**

Toolstring ran as per diagram.  
 Density is presented on a 2.71 g/cc Matrix, Neutron is presented on a Limestone Matrix.  
 Chlorides: 3000 mg/L  
 LCM: 6 lb/bbl  
 Annular Volume computed using 5.5" Casing.

YOUR CREW TODAY: J. Bennett / M. Thomas

THANK YOU FOR CHOOSING WIRELINE LOGGING SOLUTIONS. OKLAHOMA CITY, OK. (405) 445-7135.

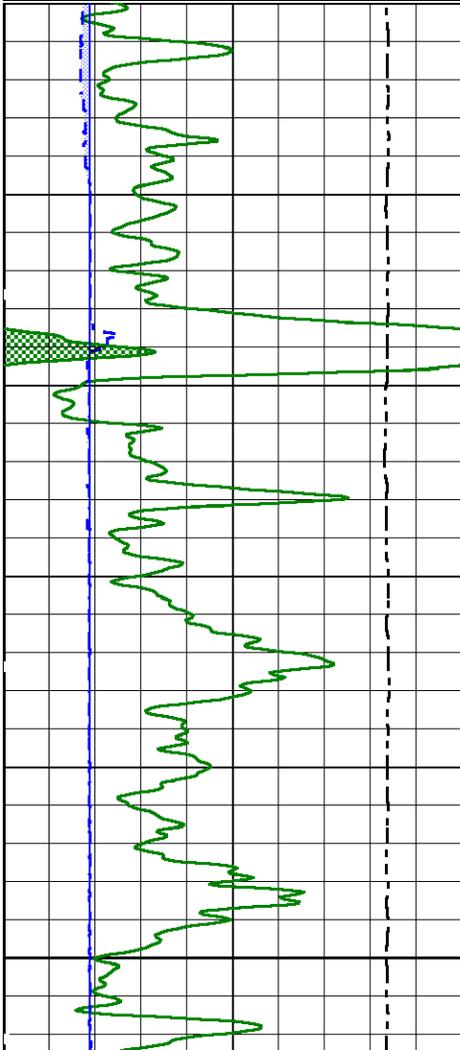


# High Resolution LS Pass

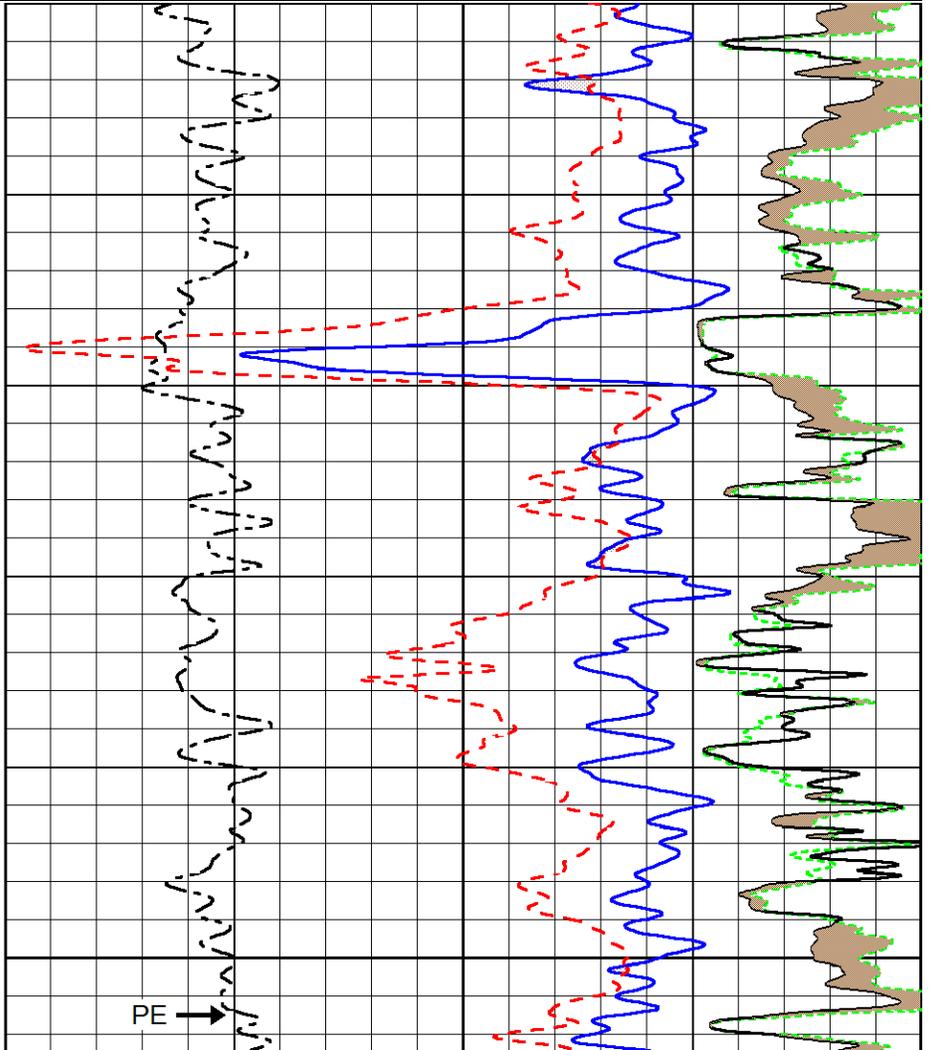
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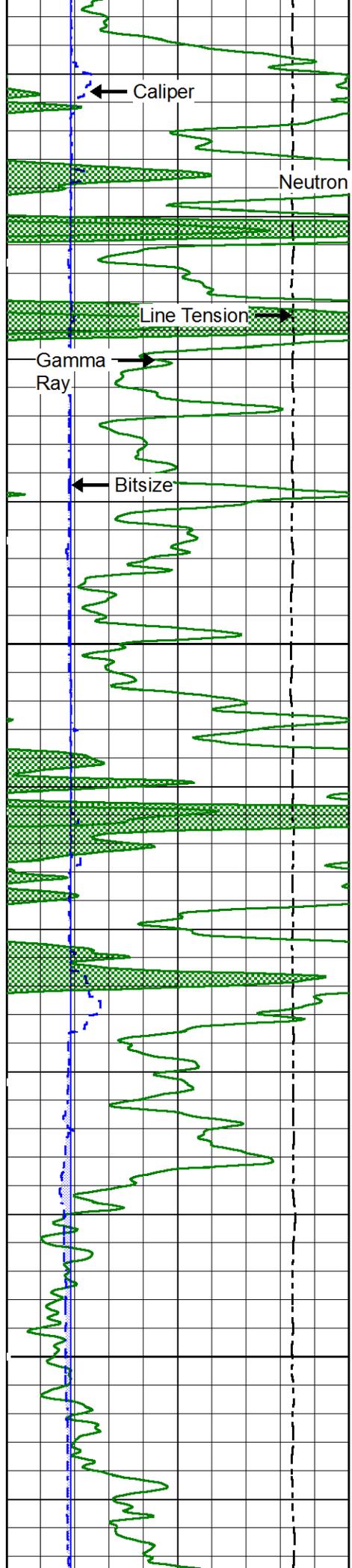
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6	Caliper (in)	16
6	Bitsize (in)	16
Line Tension		
	10000 (lb)	0

0.3	Density Porosity (2.71 Matrix)	-0.1
0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10
0	Micro Normal (Ohm-m)	40
0	Micro Inverse (Ohm-m)	40

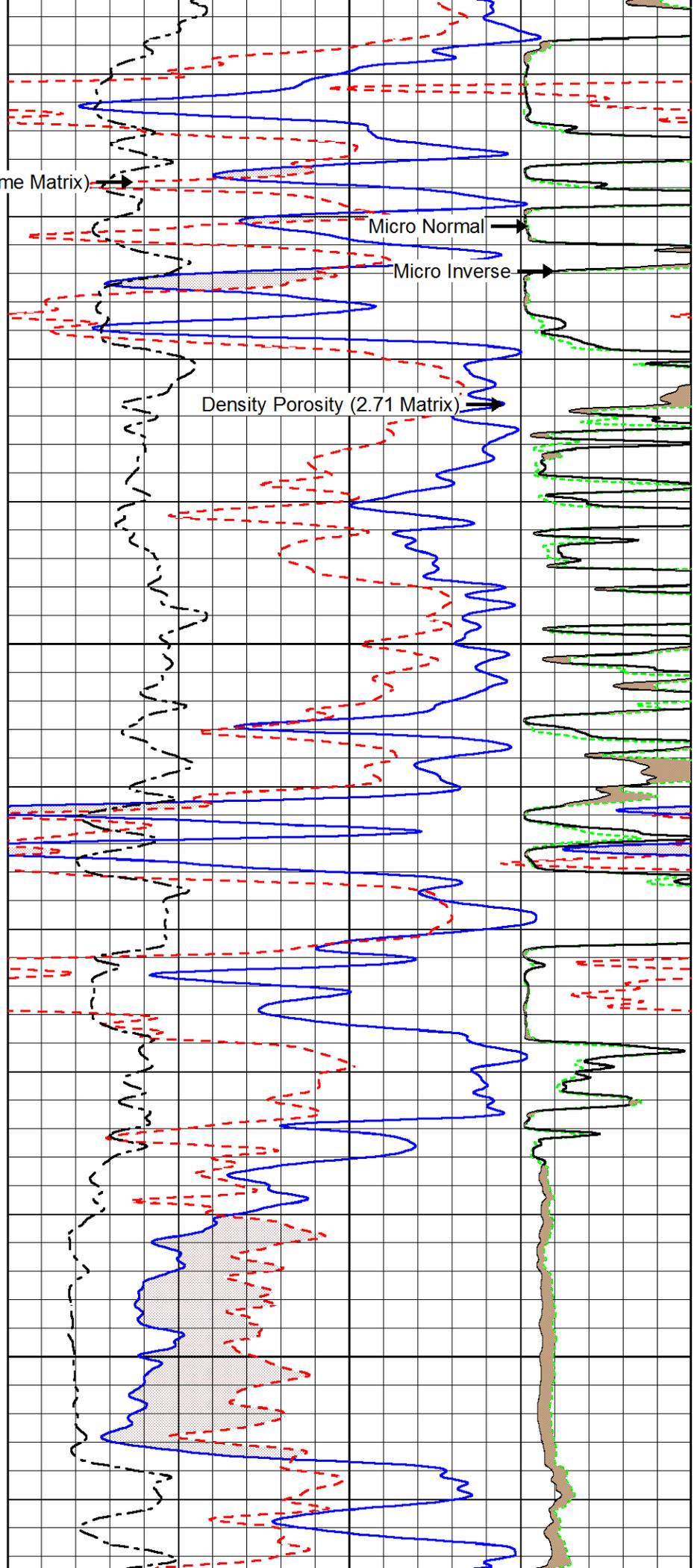


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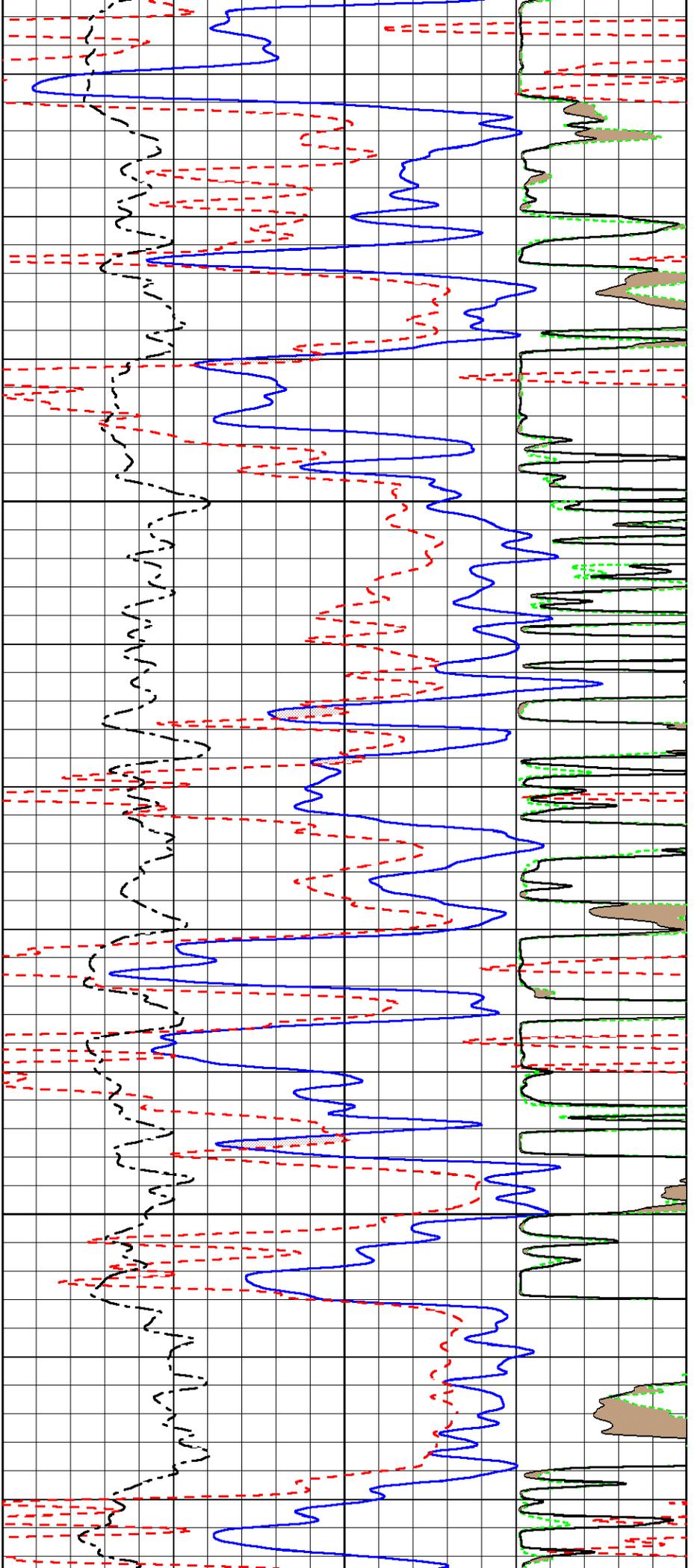
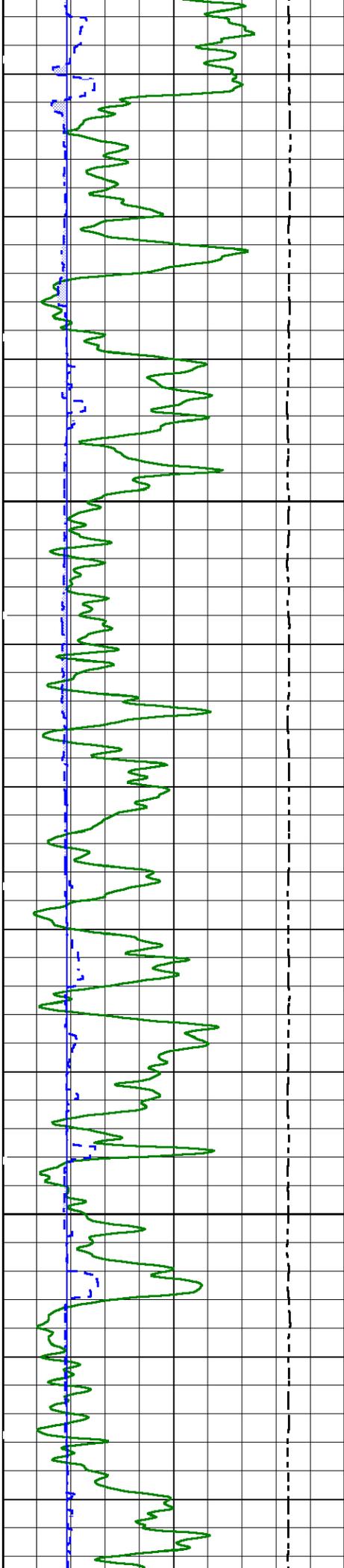




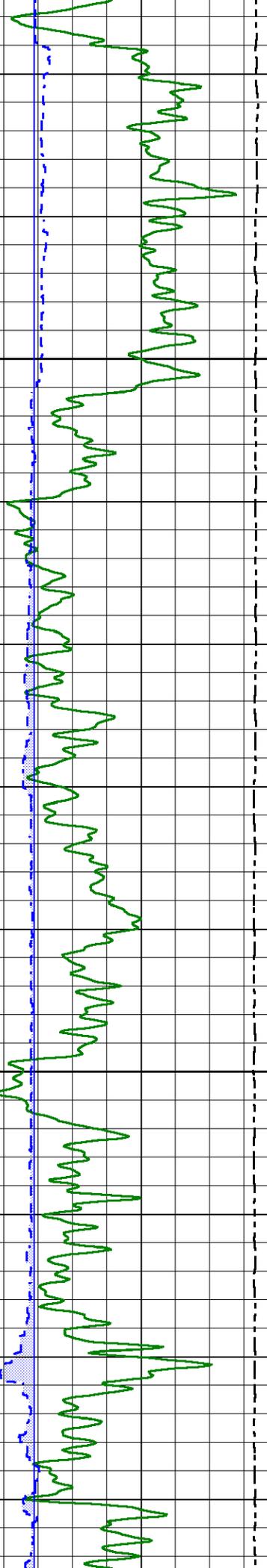
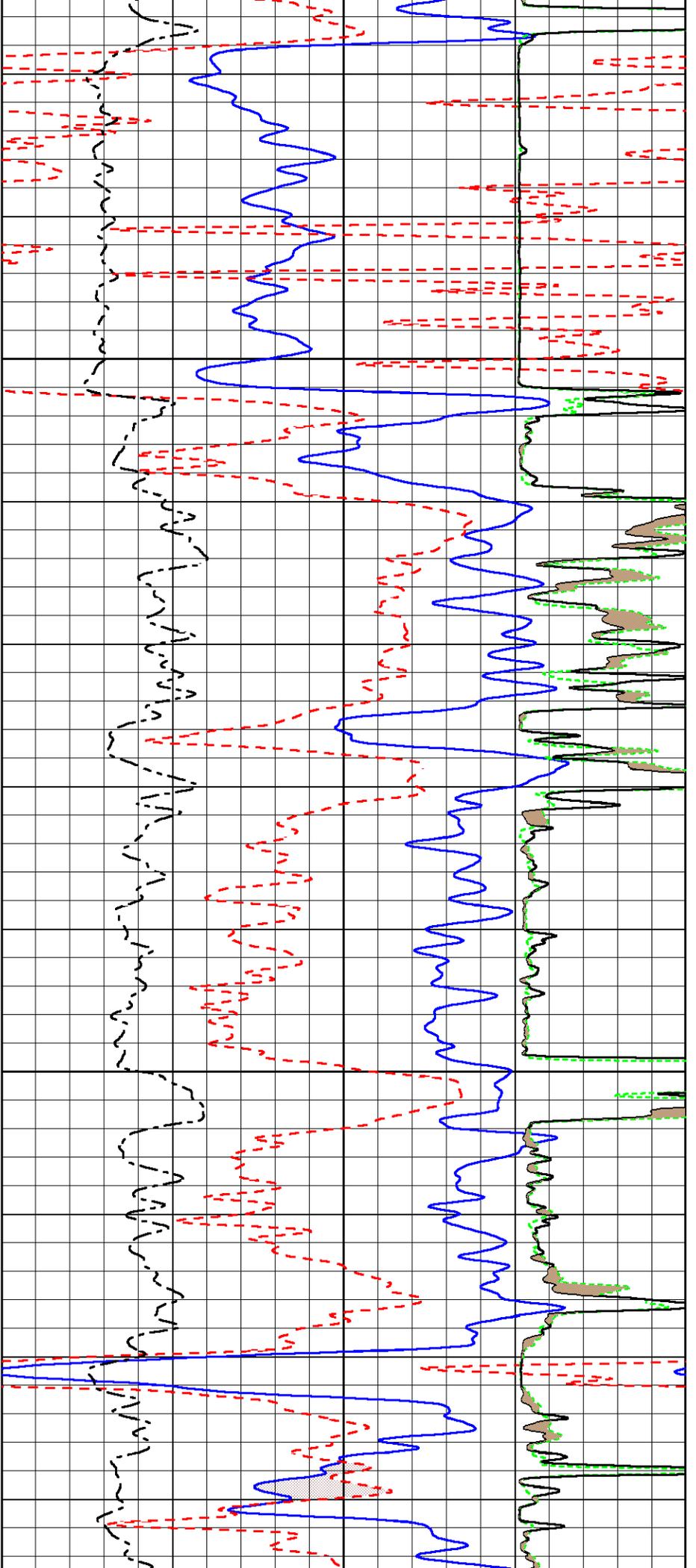
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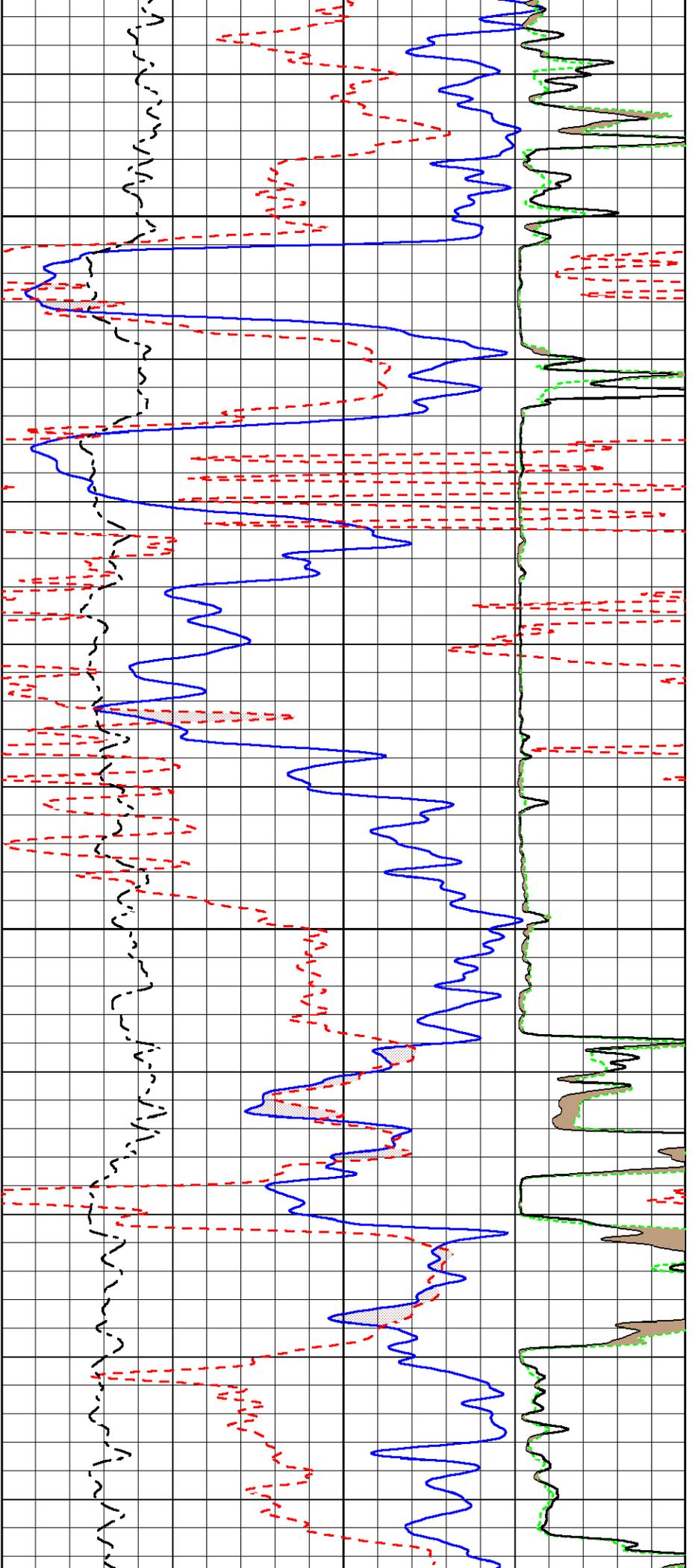
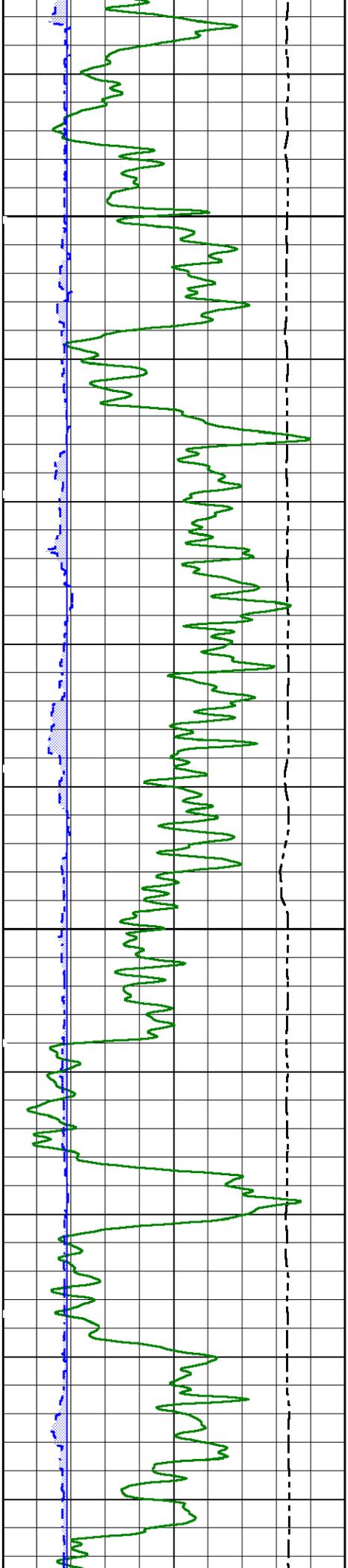
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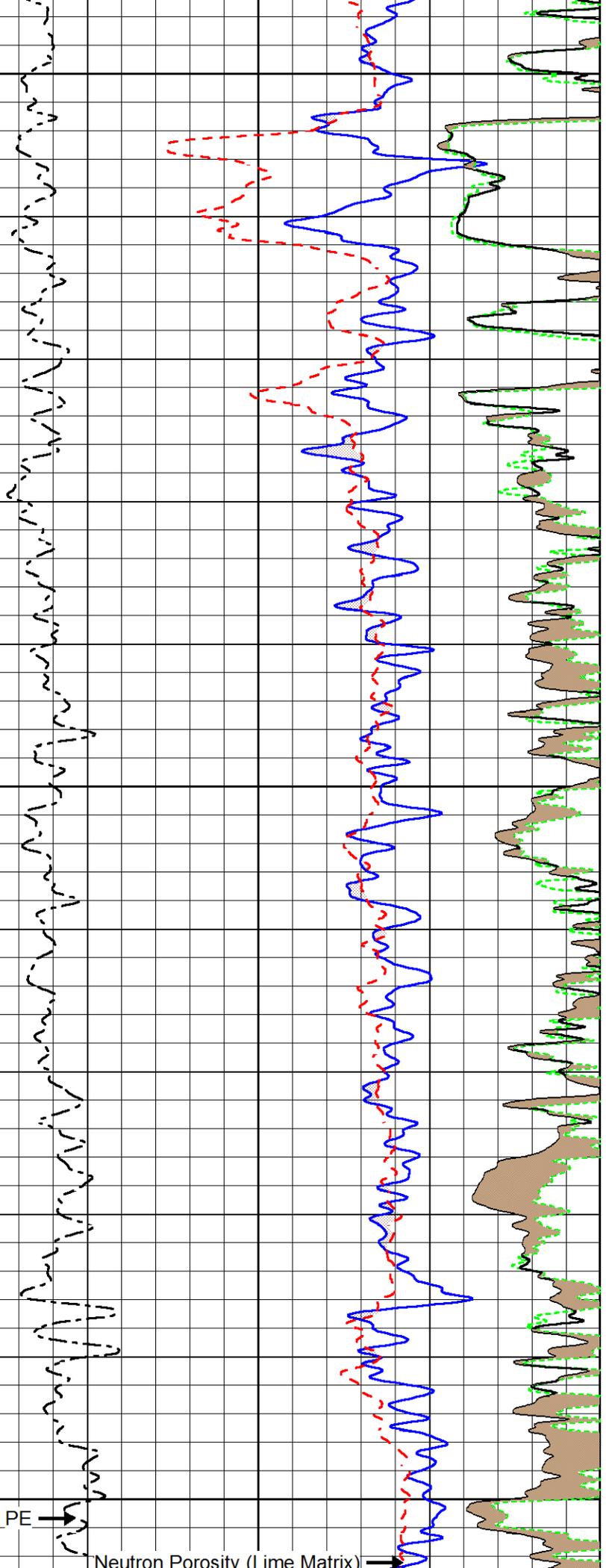
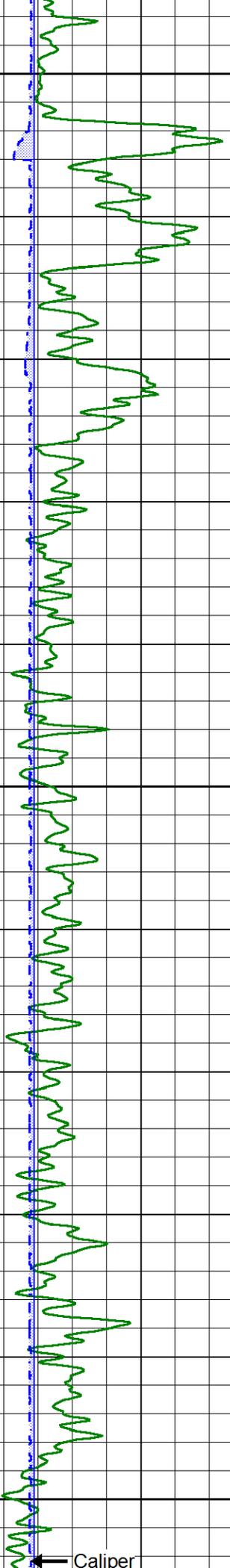
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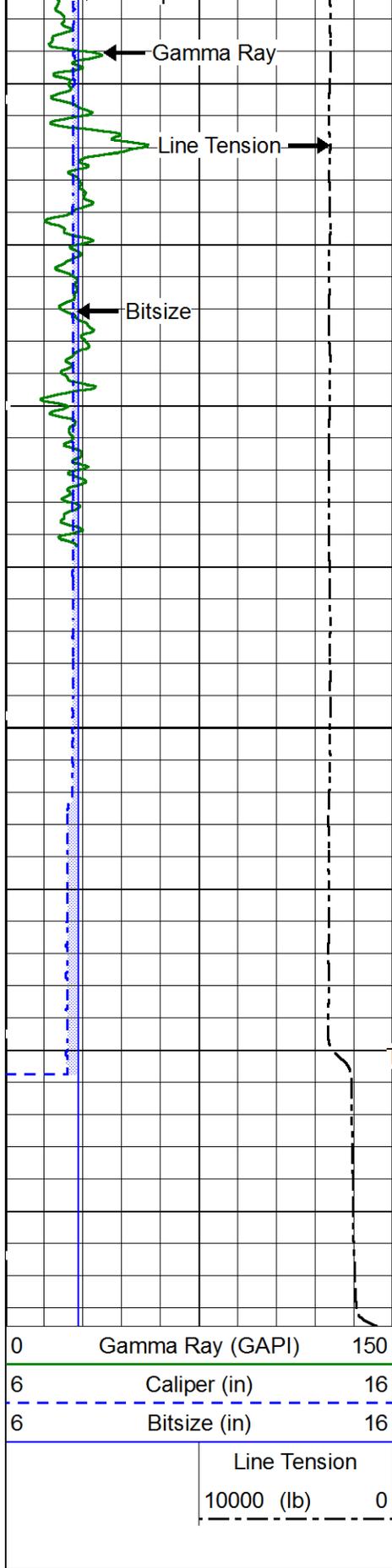


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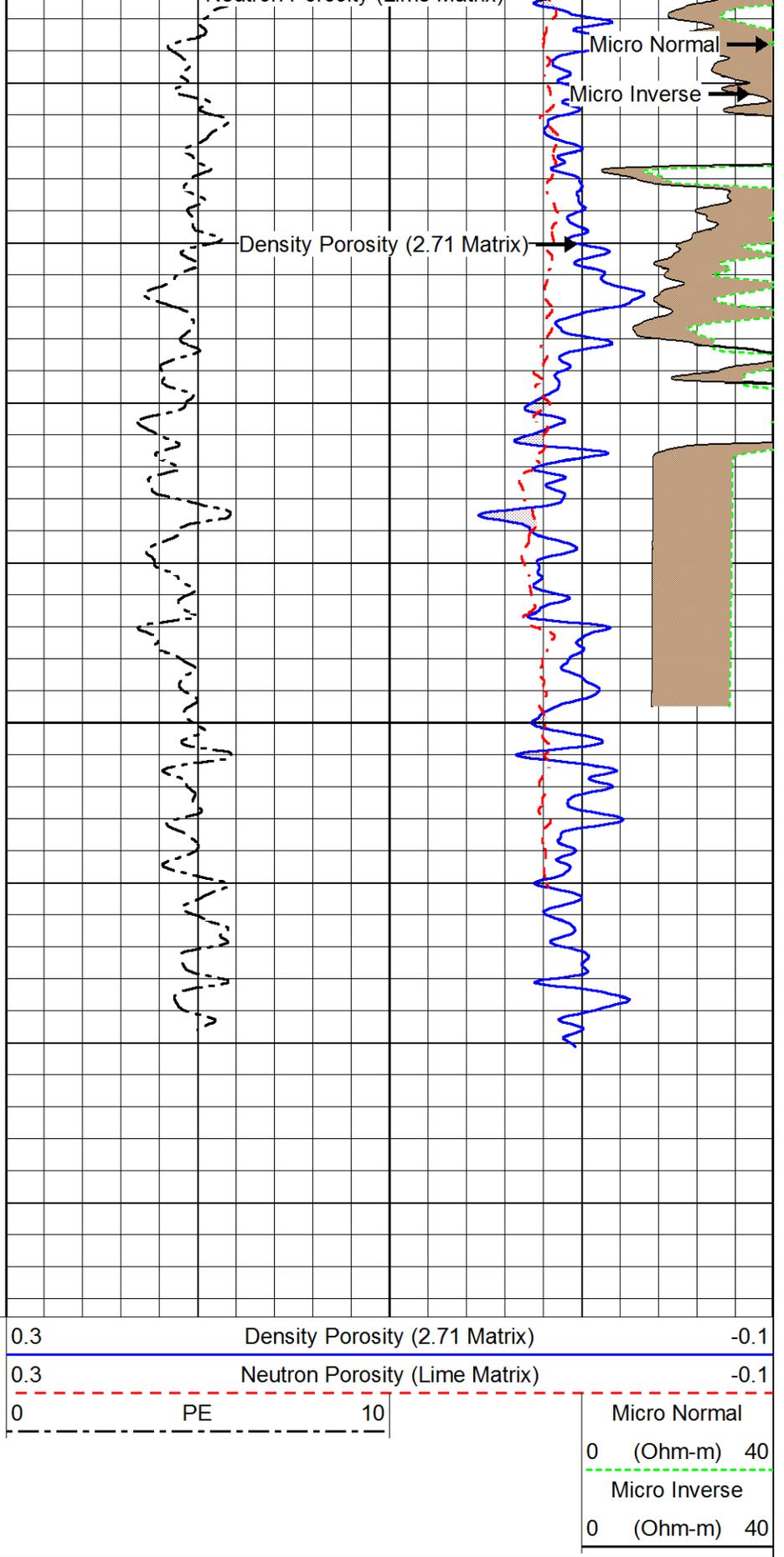


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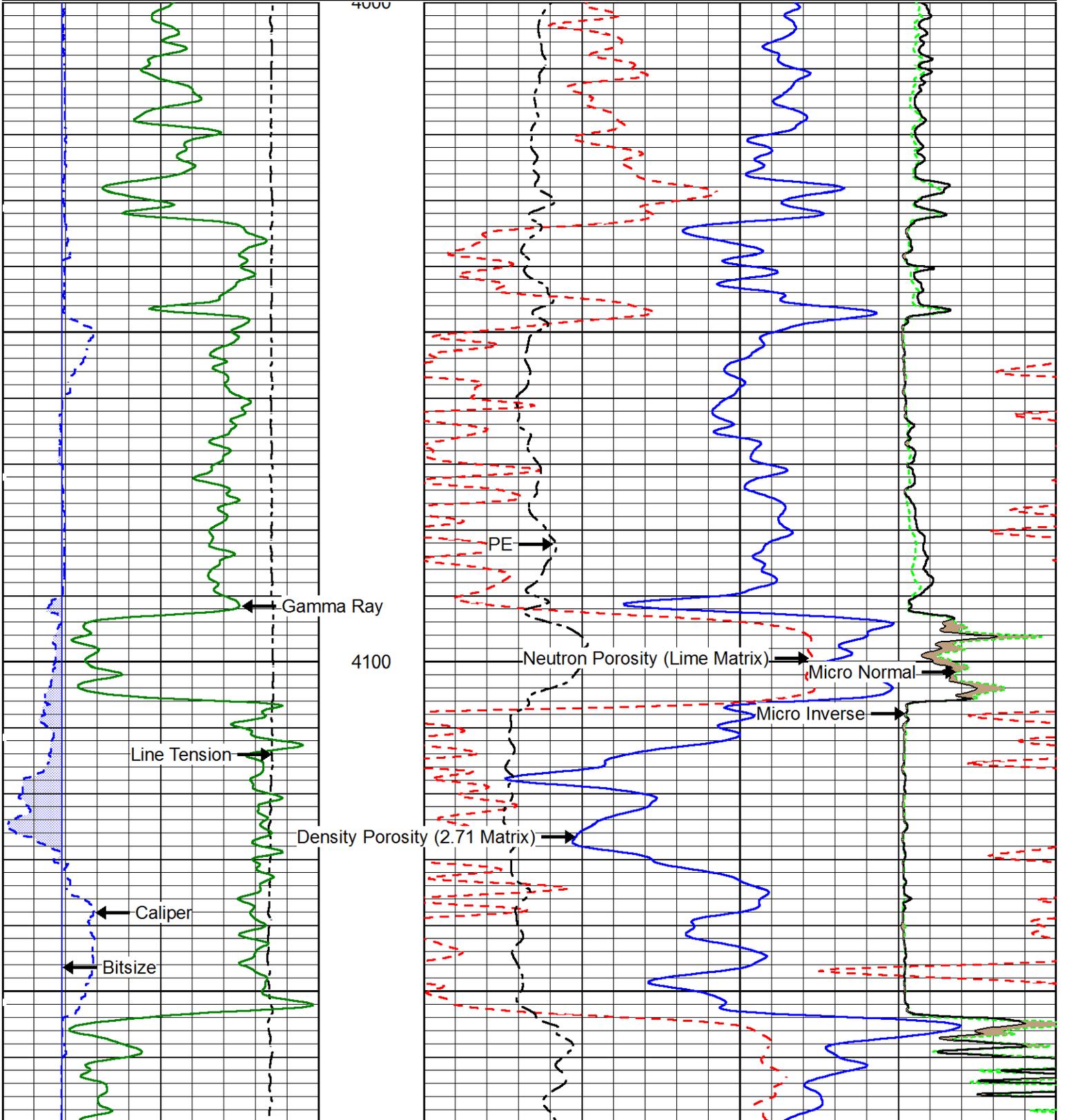
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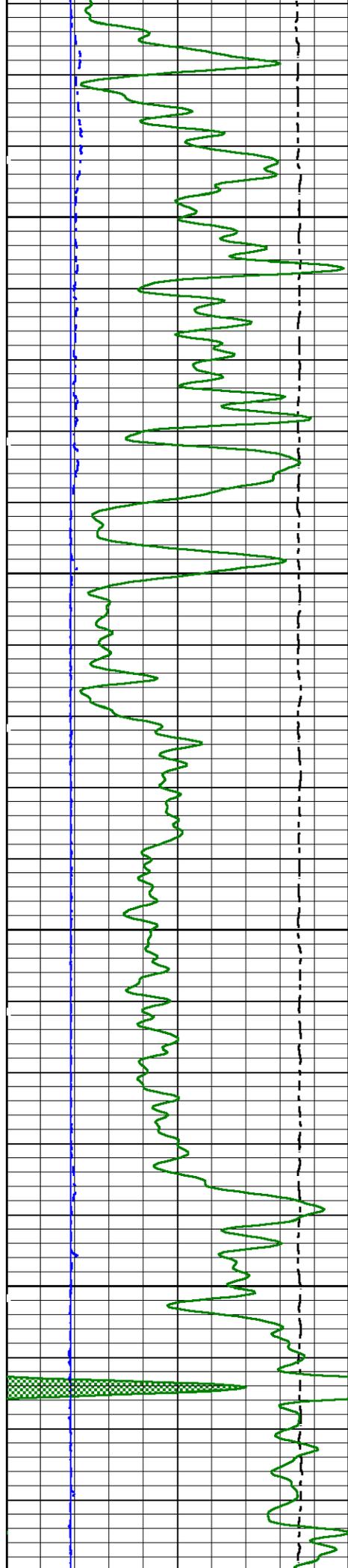


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 Presentation Format okc-porols-melrt-base  
 Dataset Creation Tue Apr 13 00:30:21 2021  
 Charted by Depth in Feet scaled 1:240

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6	Bitsize (in)	16
Line Tension		
10000 (lb)		0

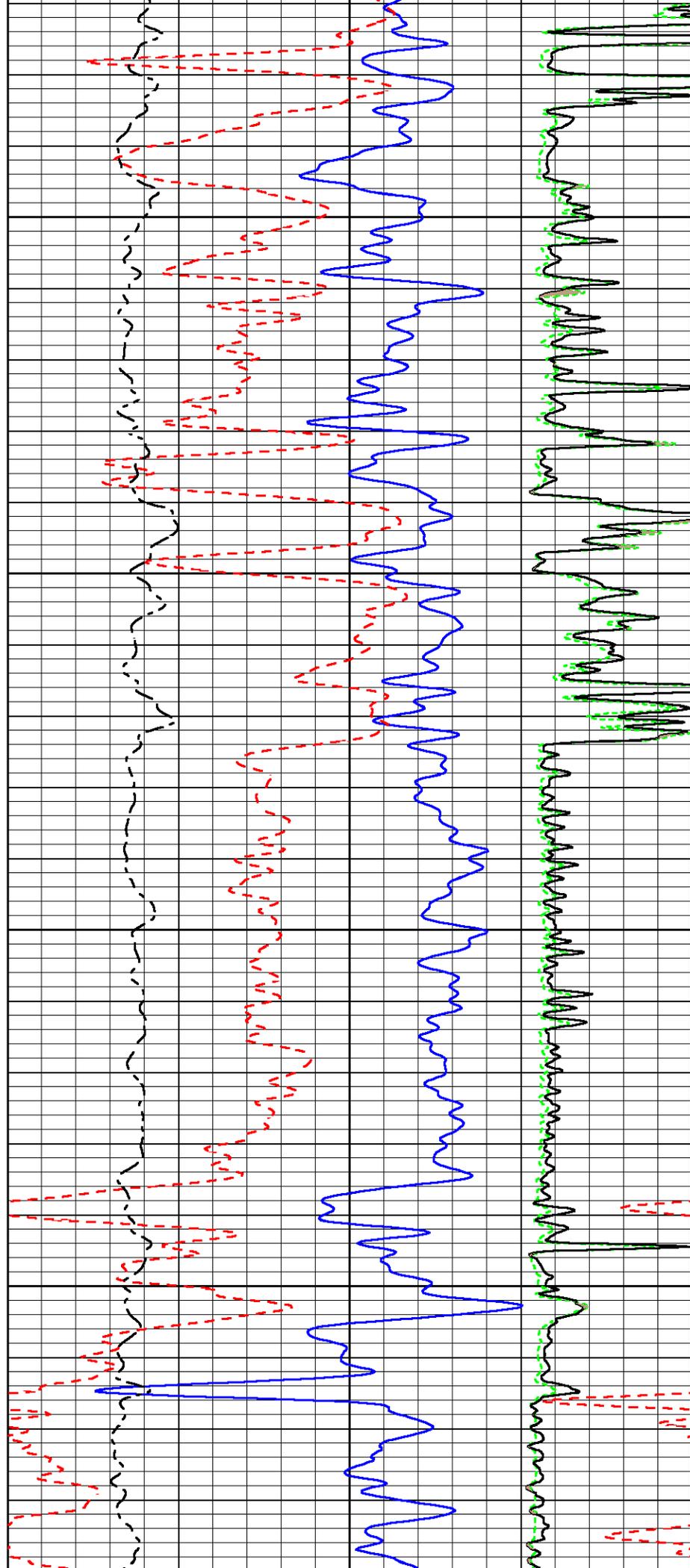
0.3	Density Porosity (2.71 Matrix)	-0.1
0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10
0	Micro Normal (Ohm-m)	40
0	Micro Inverse (Ohm-m)	40

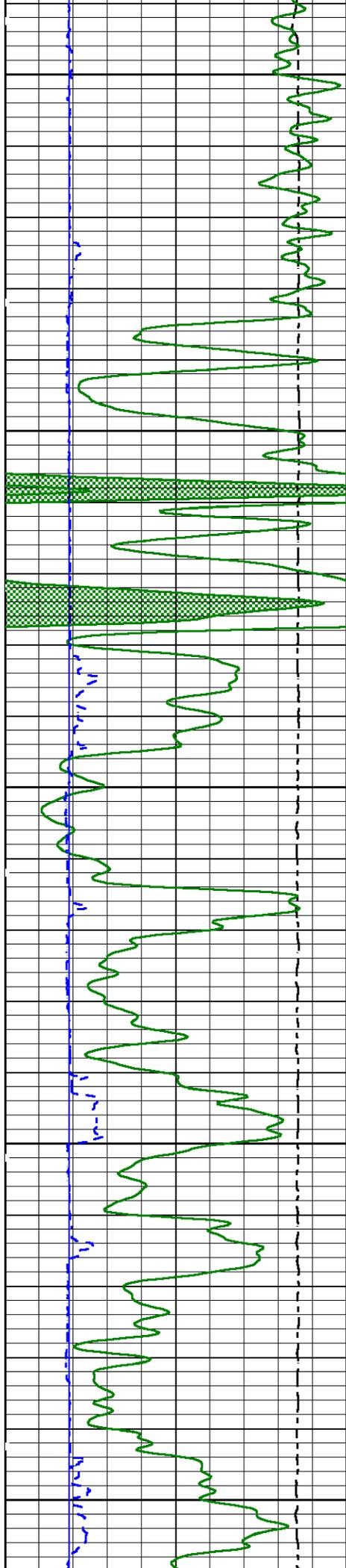




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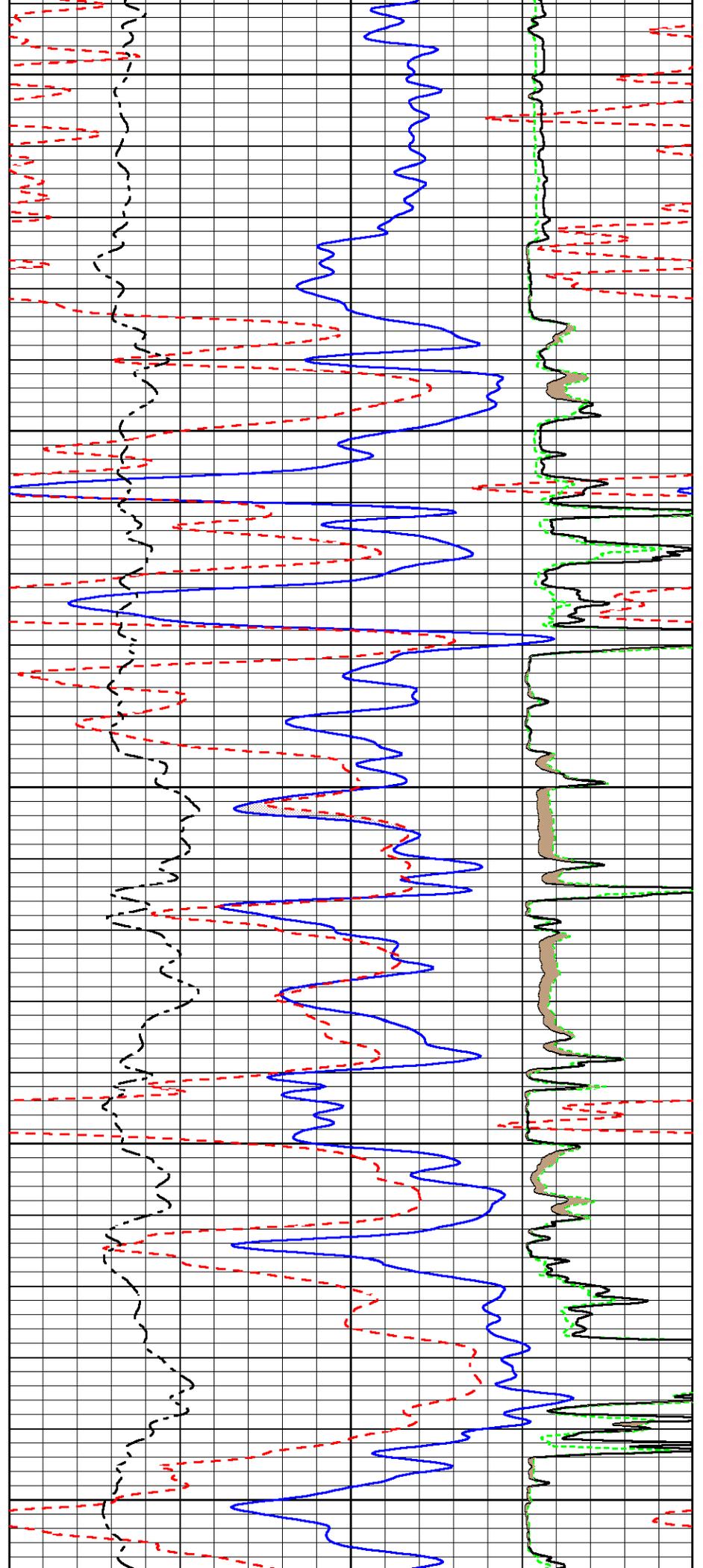


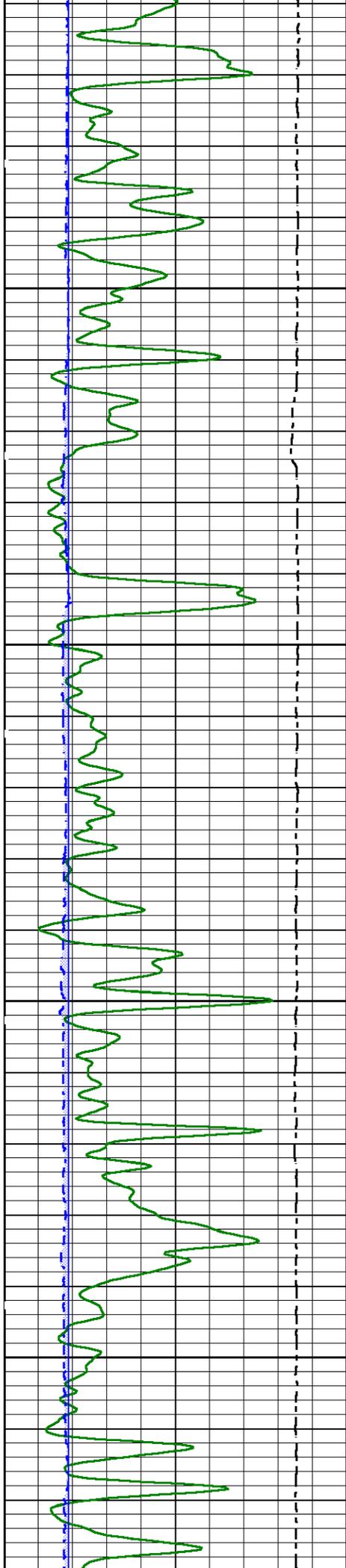


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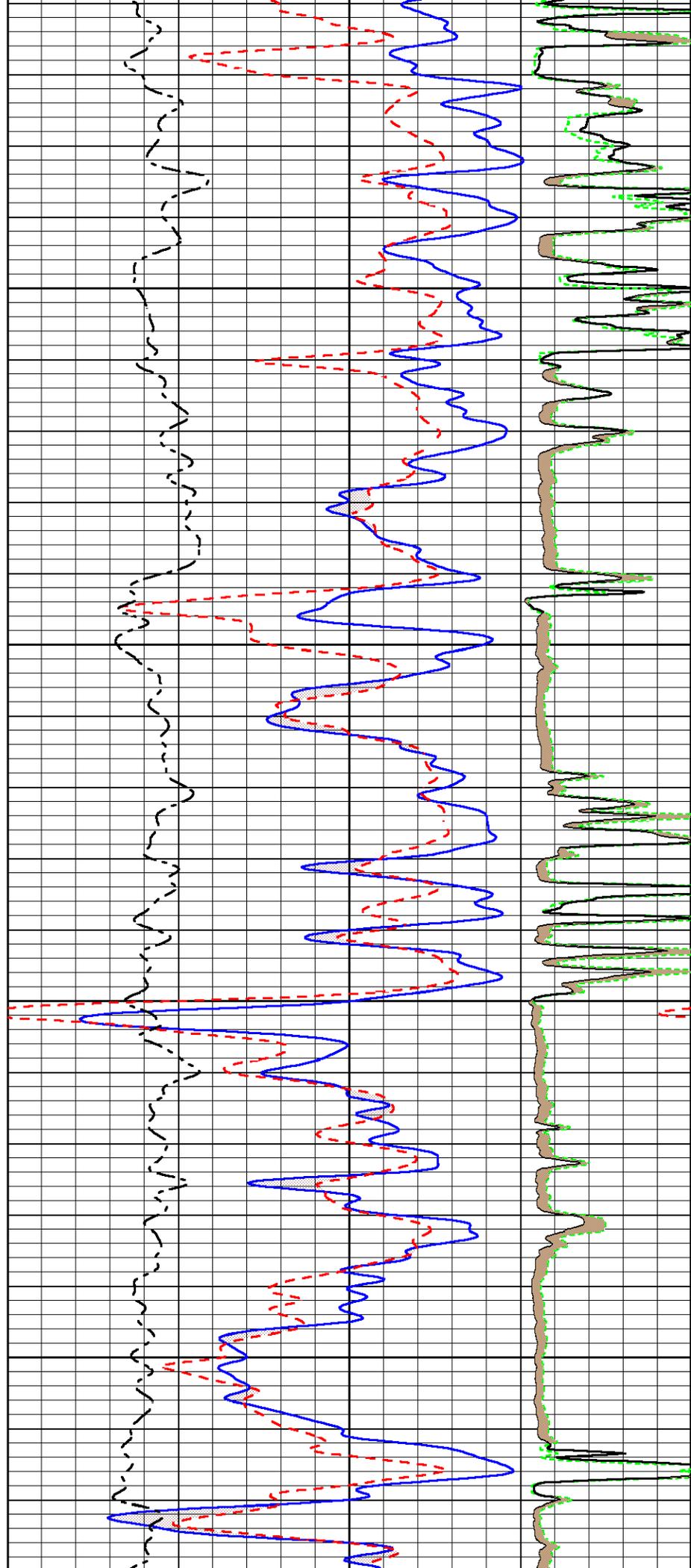
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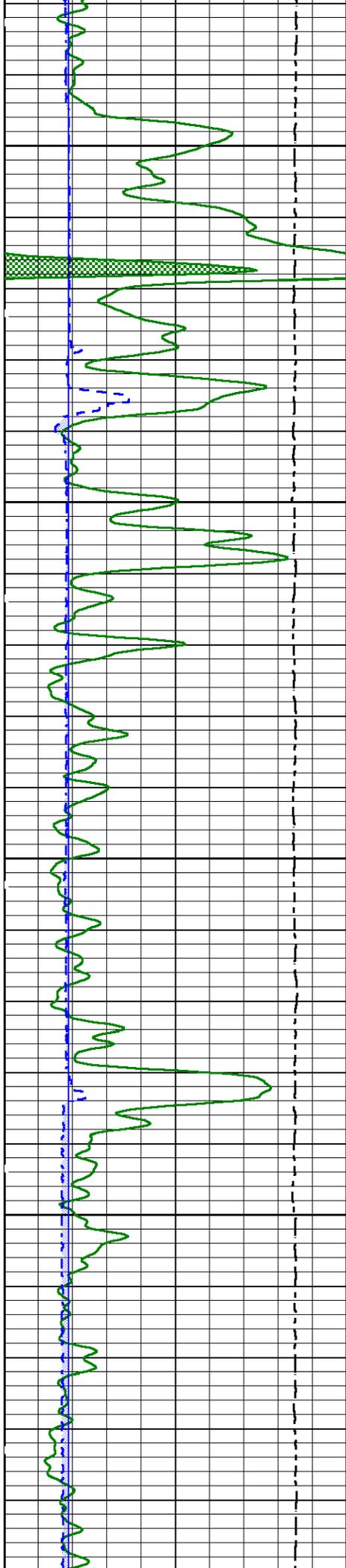




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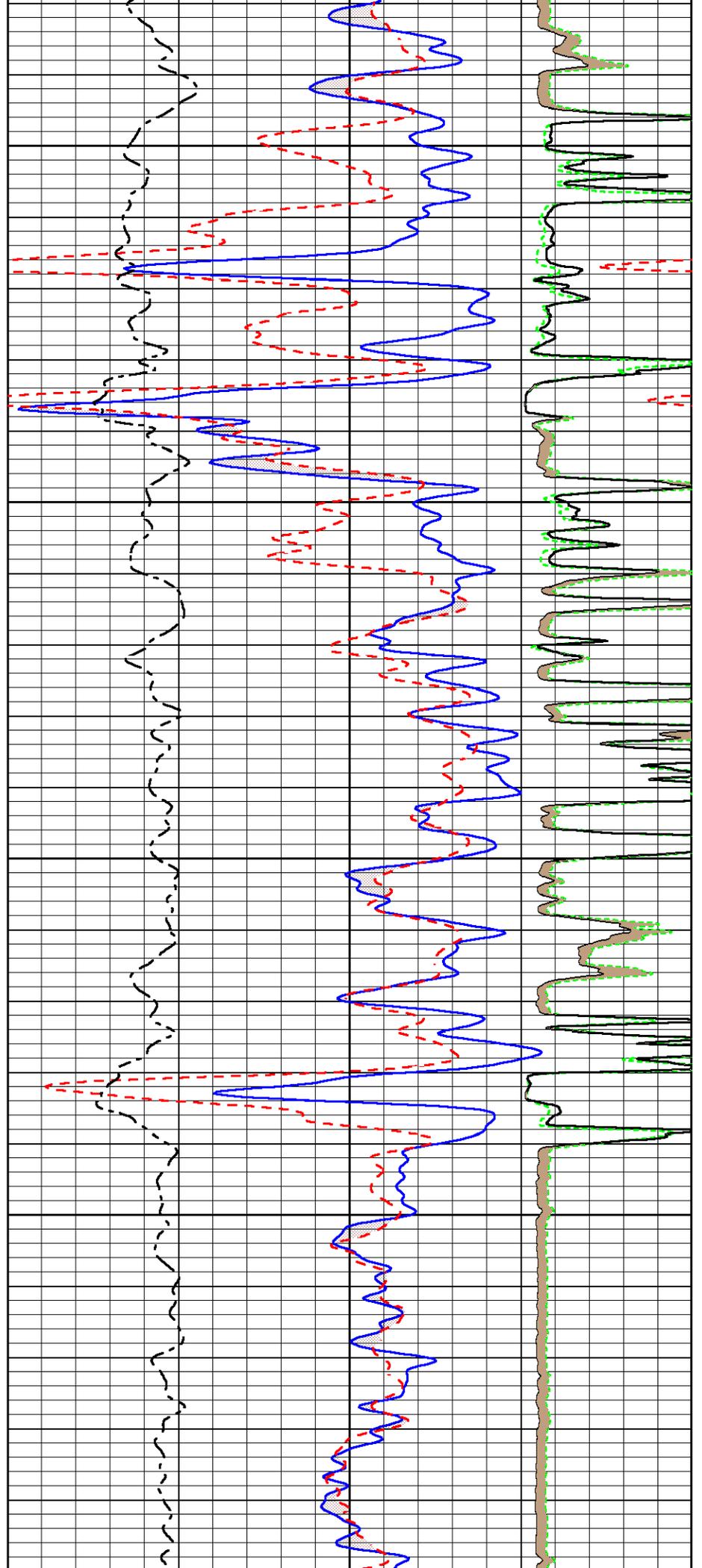
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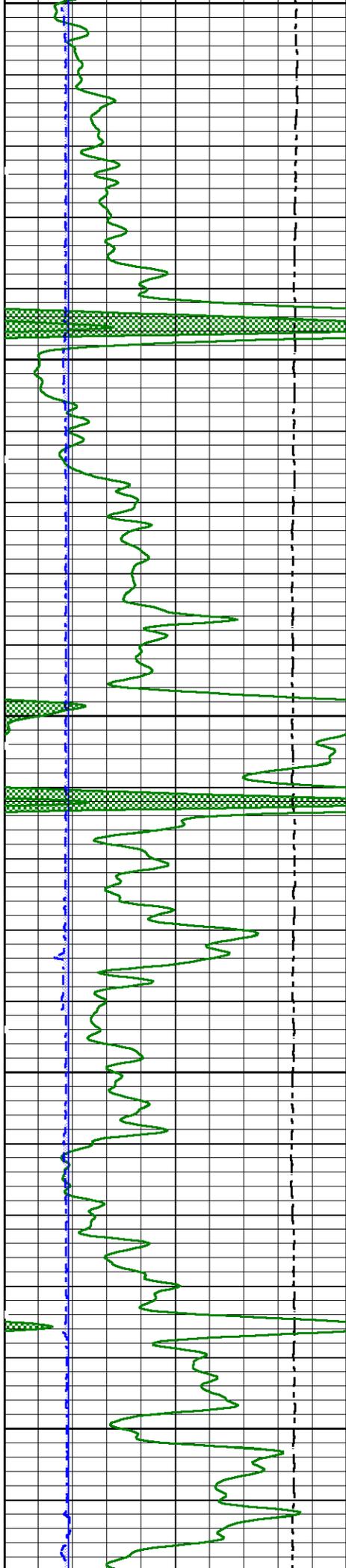




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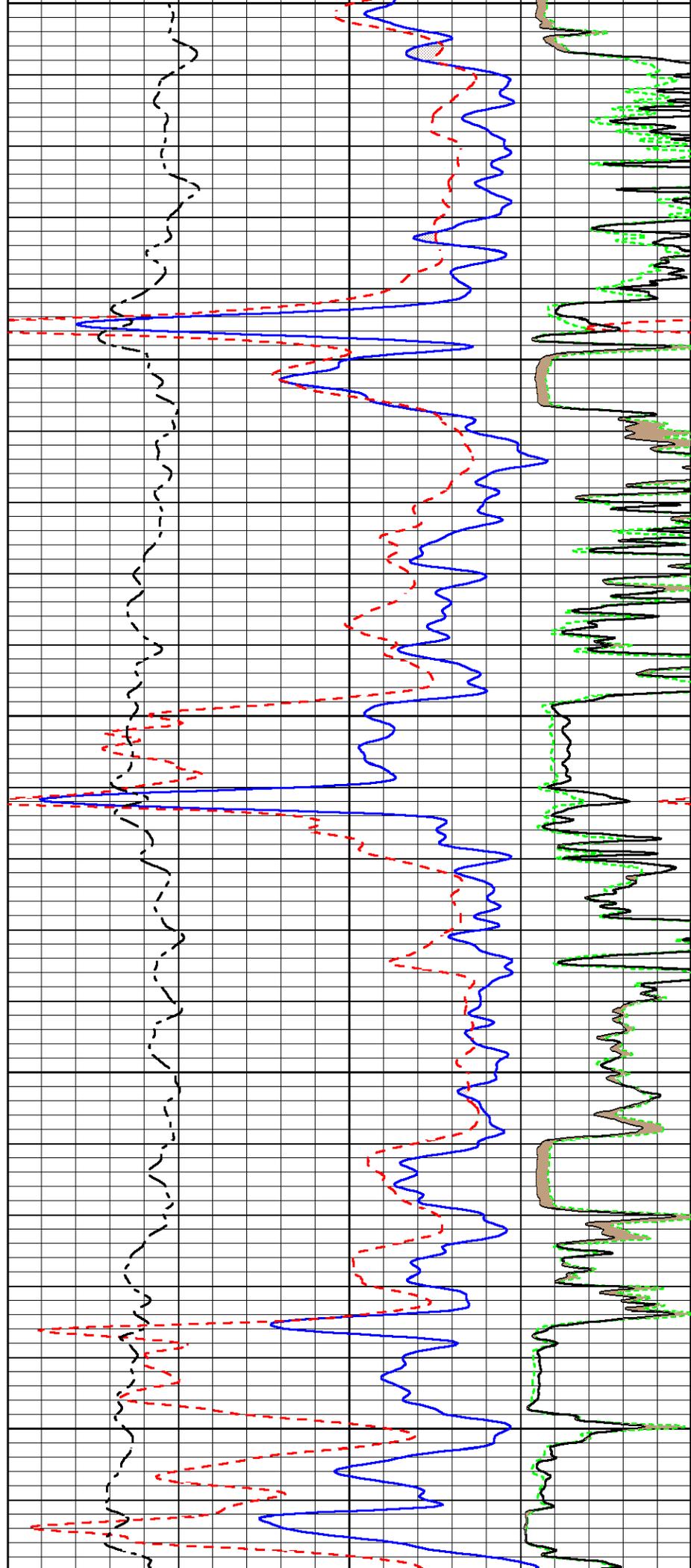
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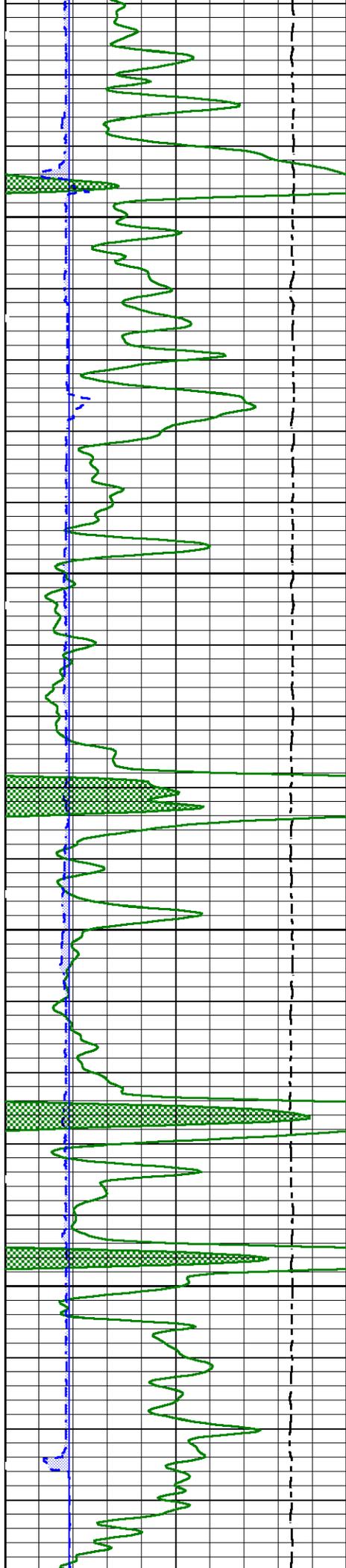




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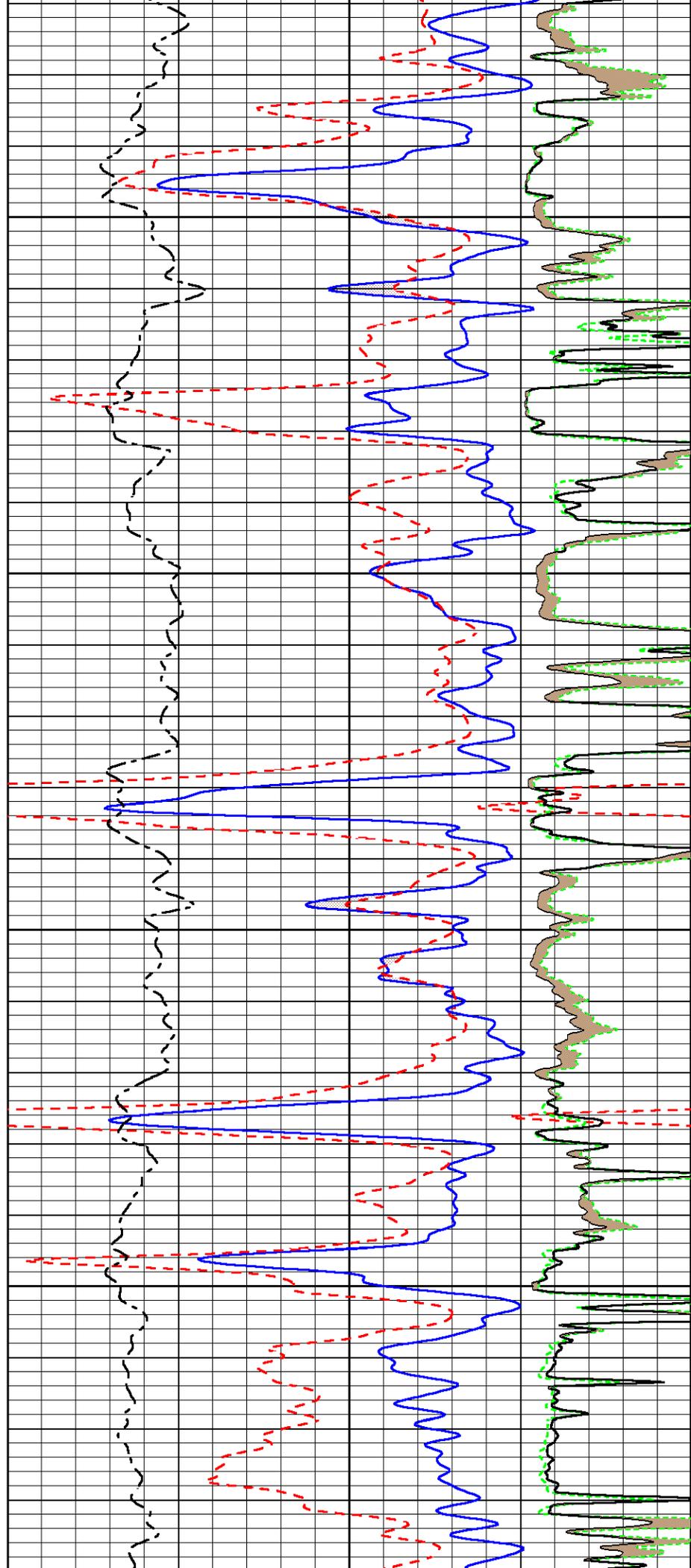
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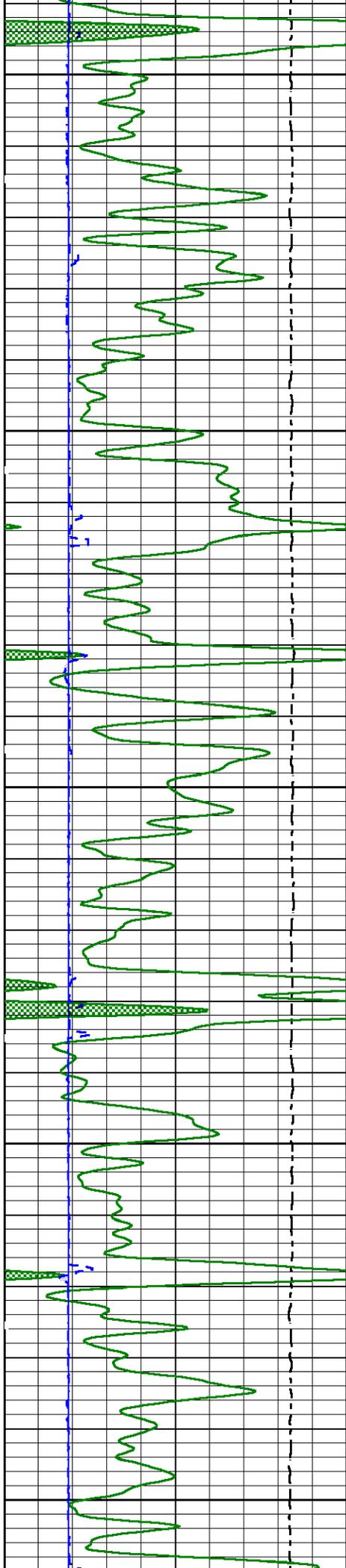




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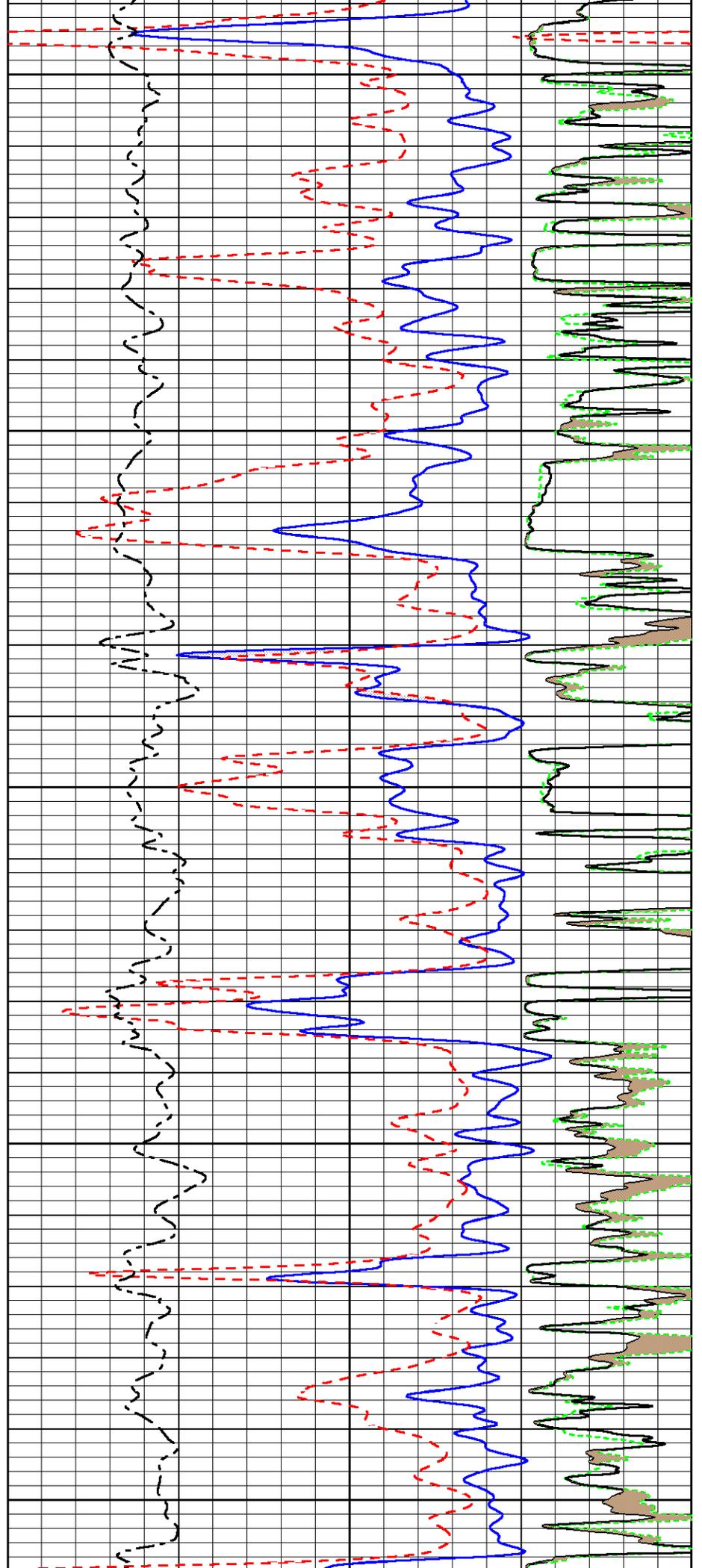


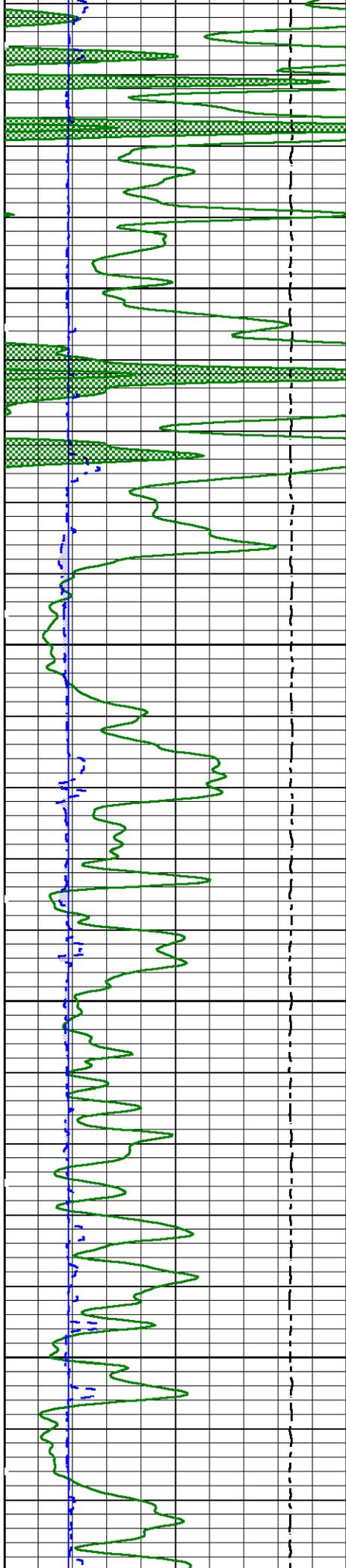


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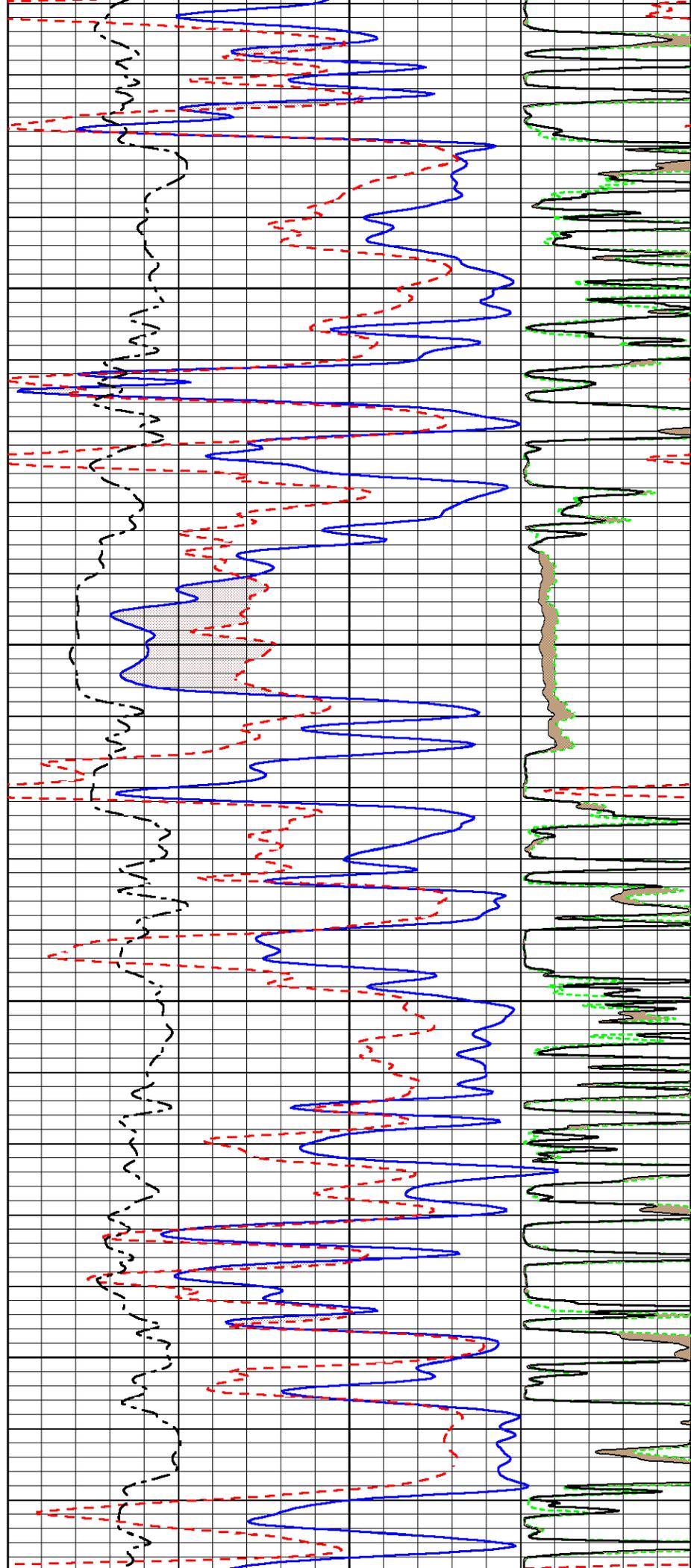
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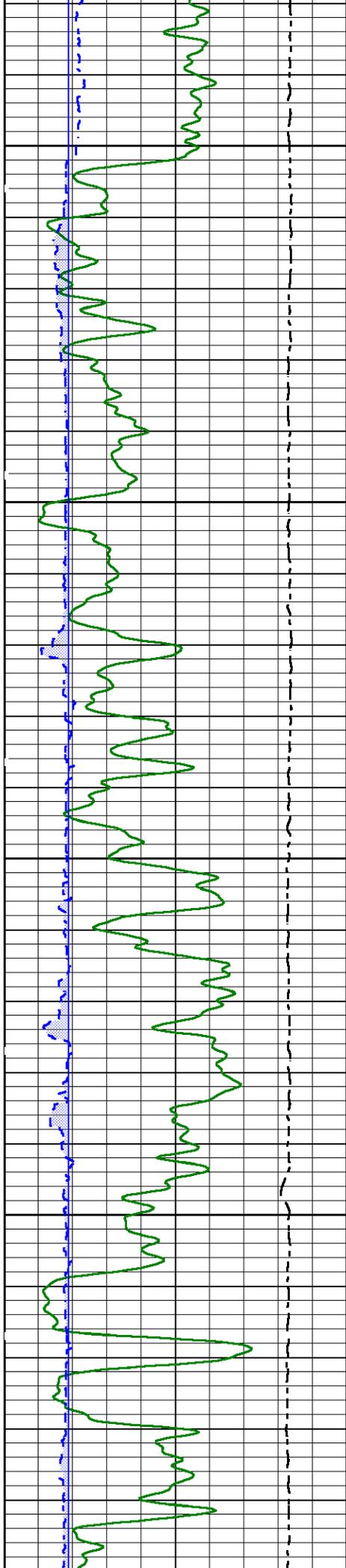




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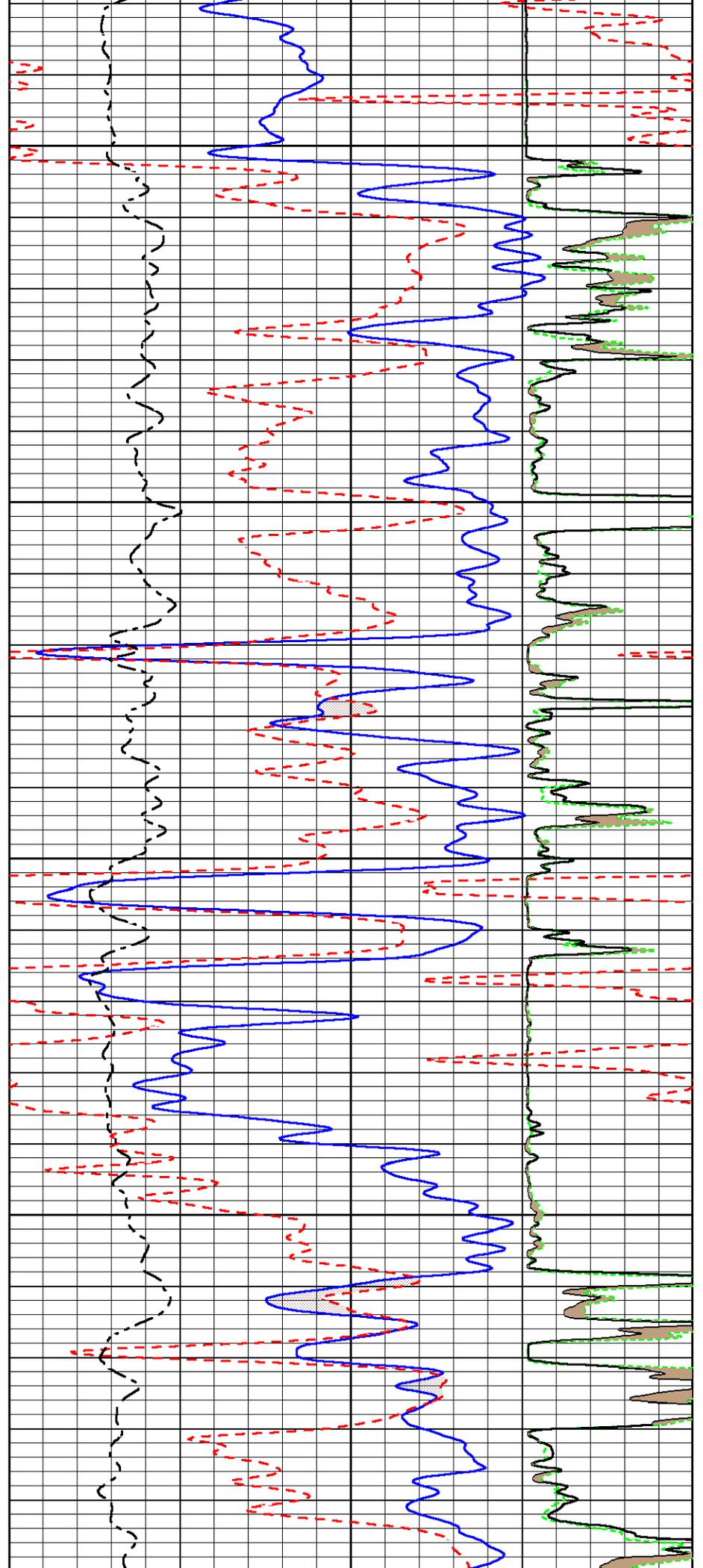
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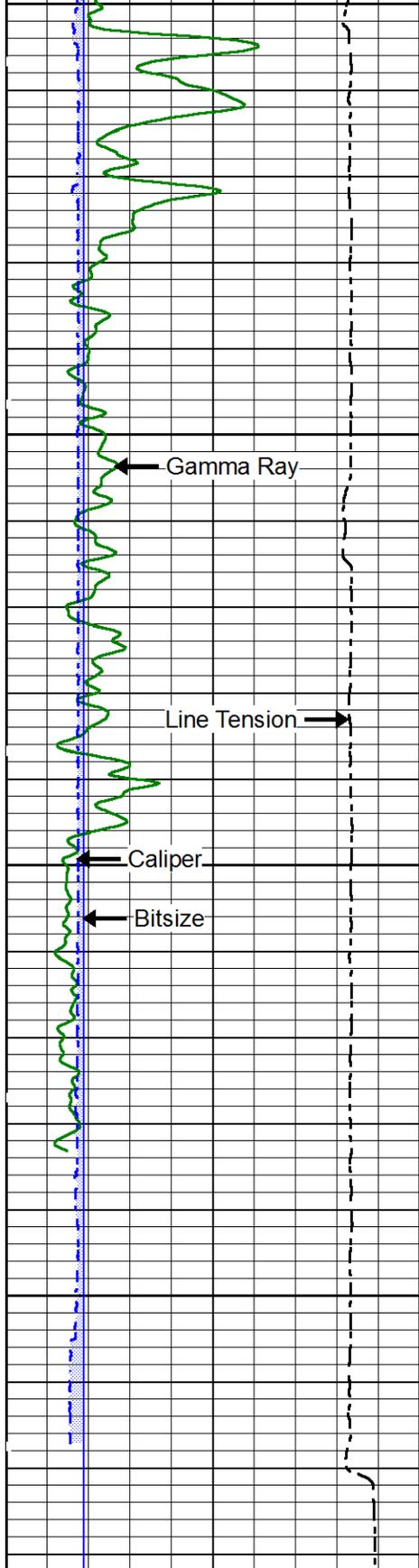




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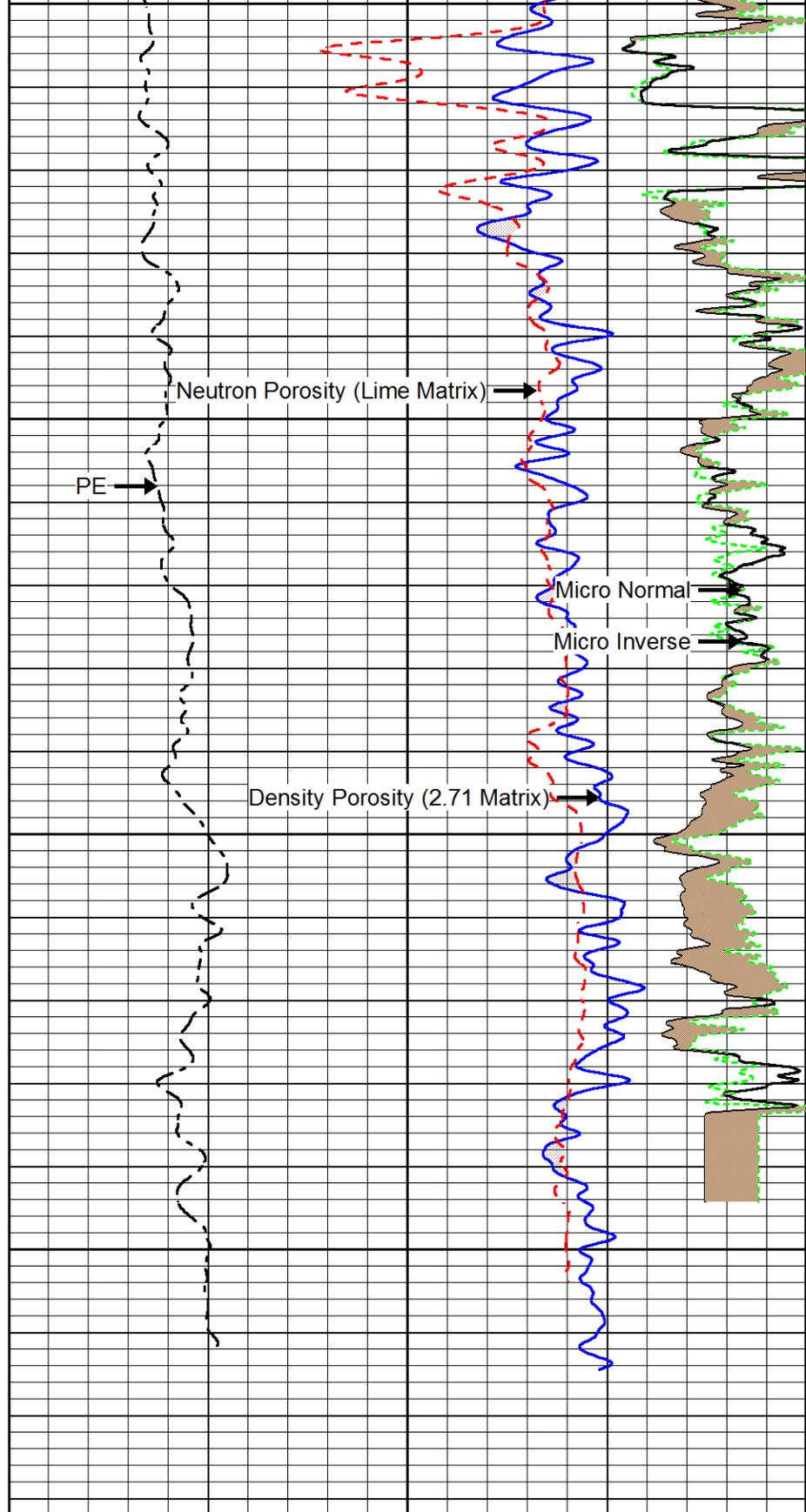


6200

6300

Total Depth

0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
6	Bitsize (in)	16
	Line Tension	
	10000 (lb)	0



0.3	Density Porosity (2.71 Matrix)	-0.1
0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10
	Micro Normal	
0	(Ohm-m)	40
	Micro Inverse	
0	(Ohm-m)	40

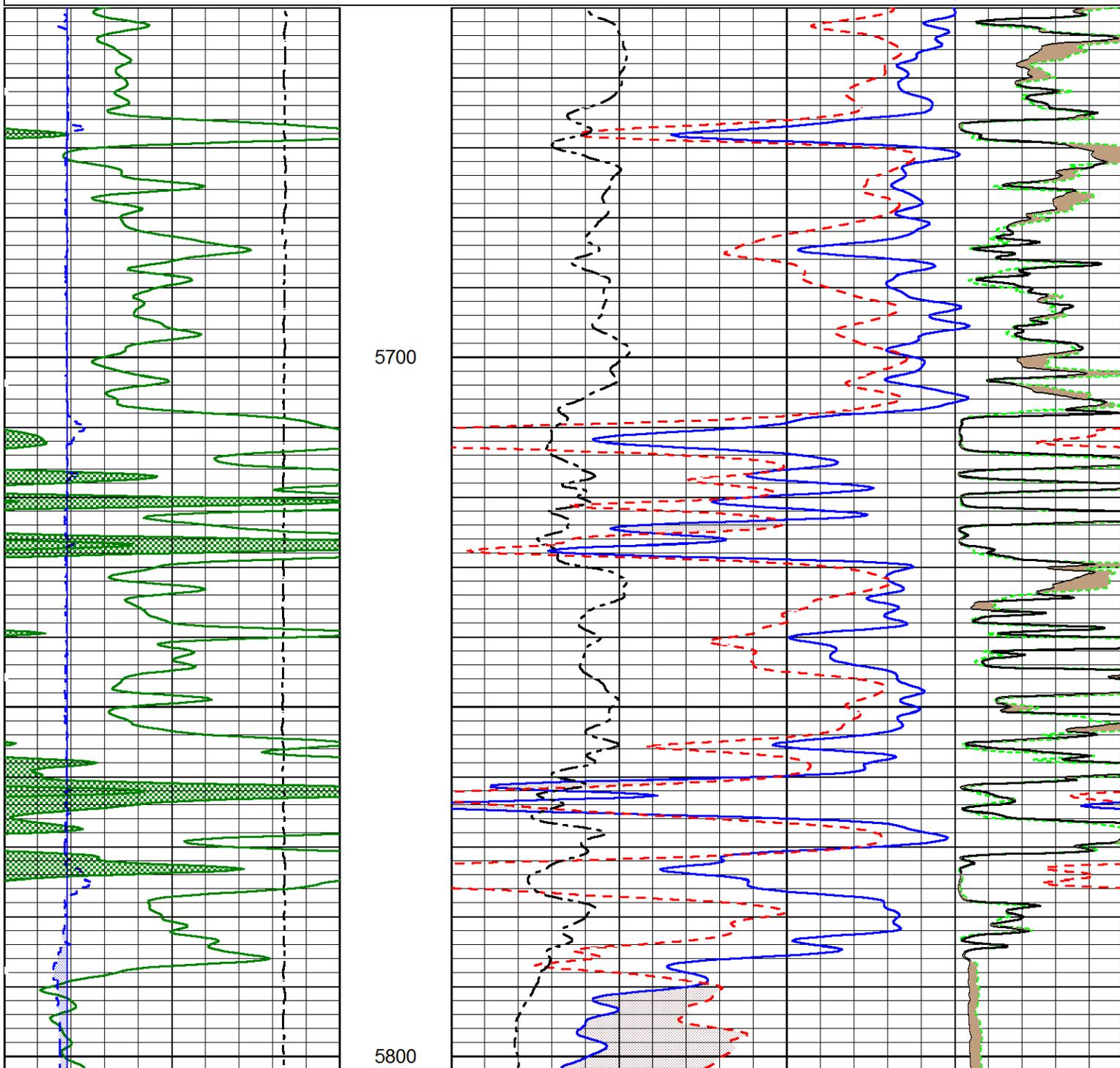
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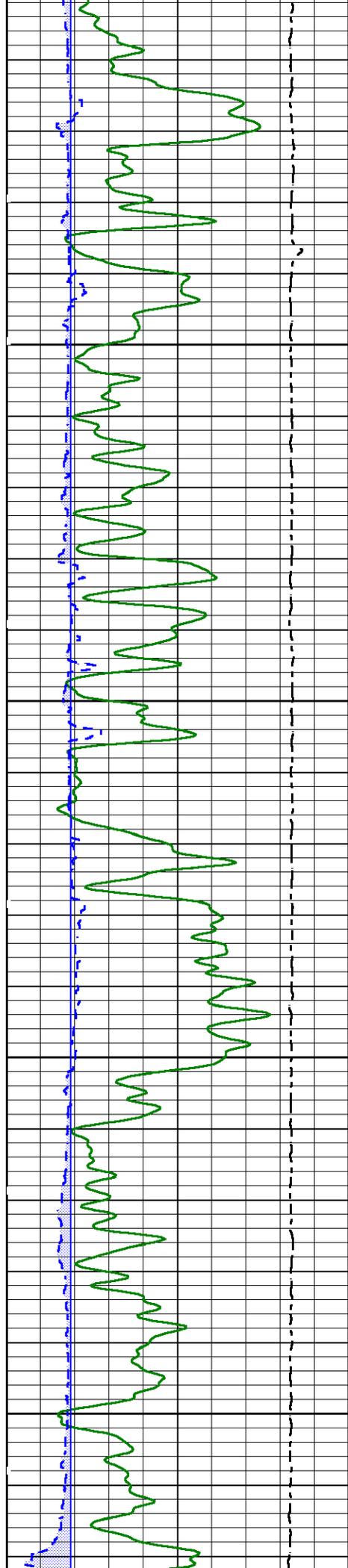
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 Dataset Pathname pass3  
 Presentation Format okc-porols-melrt-base  
 Dataset Creation Mon Apr 12 21:00:31 2021 by Log Sondex  
 Charted by Depth in Feet scaled 1:240

0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
6	Bitsize (in)	16
Line Tension		
10000 (lb)		0

0.3	Density Porosity (2.71 Matrix)	-0.1
0.3	Neutron Porosity (Lime Matrix)	-0.1
0	PE	10

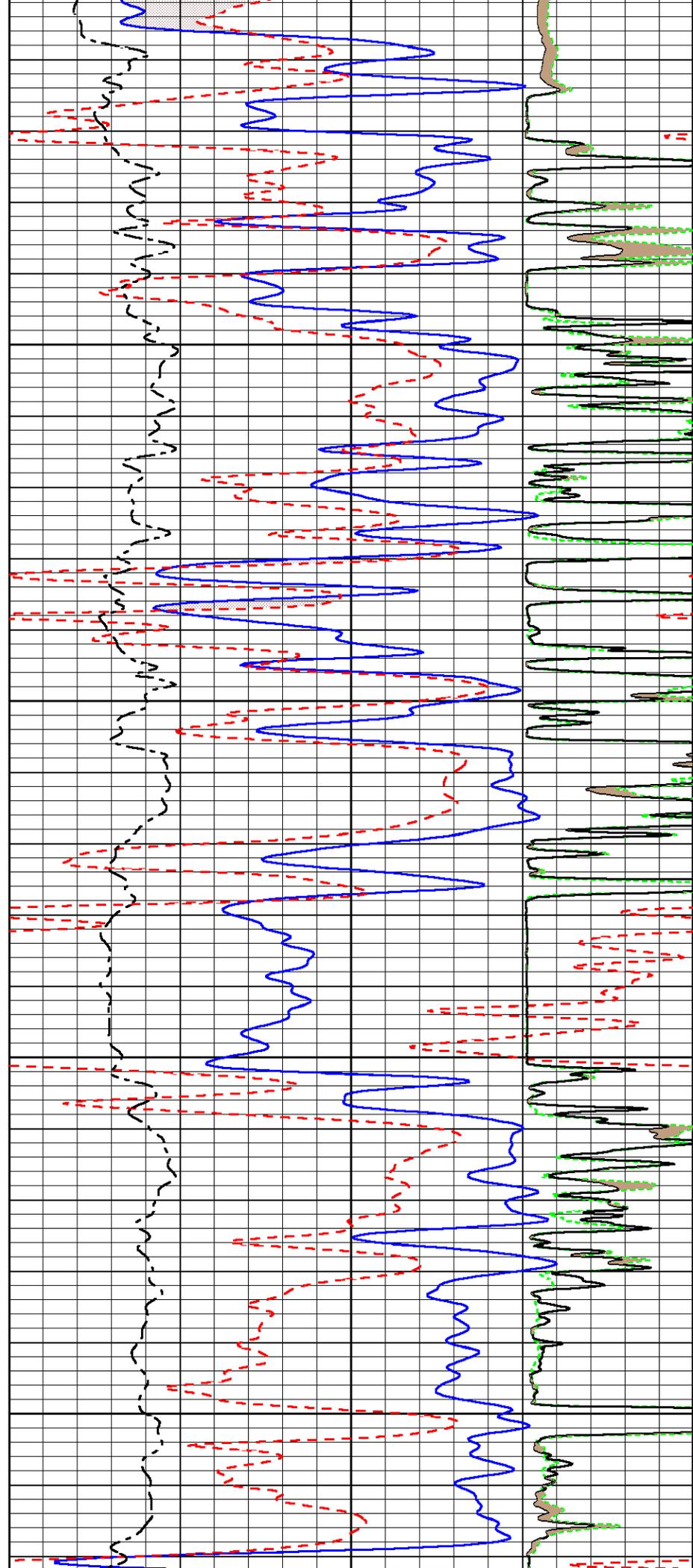
Micro Normal	
0 (Ohm-m)	40
Micro Inverse	
0 (Ohm-m)	40

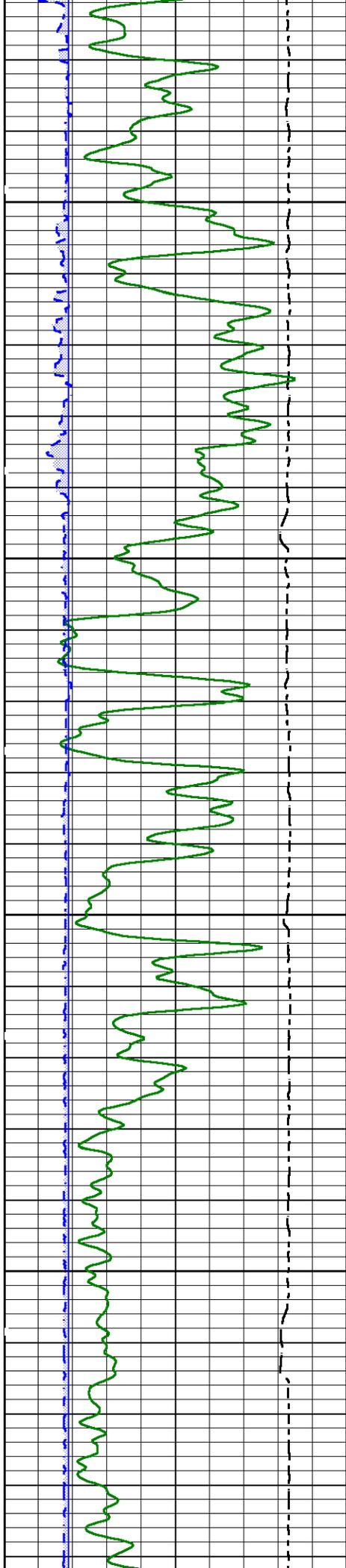




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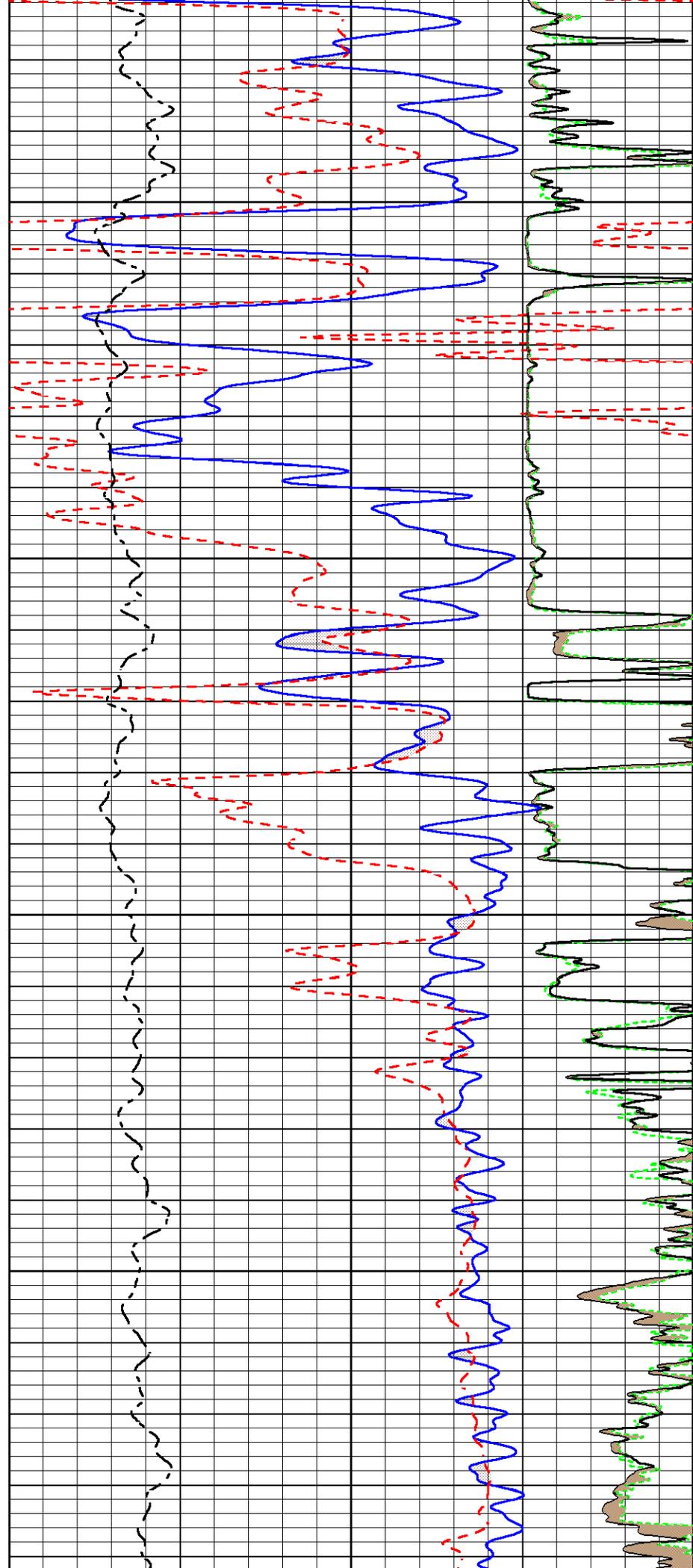
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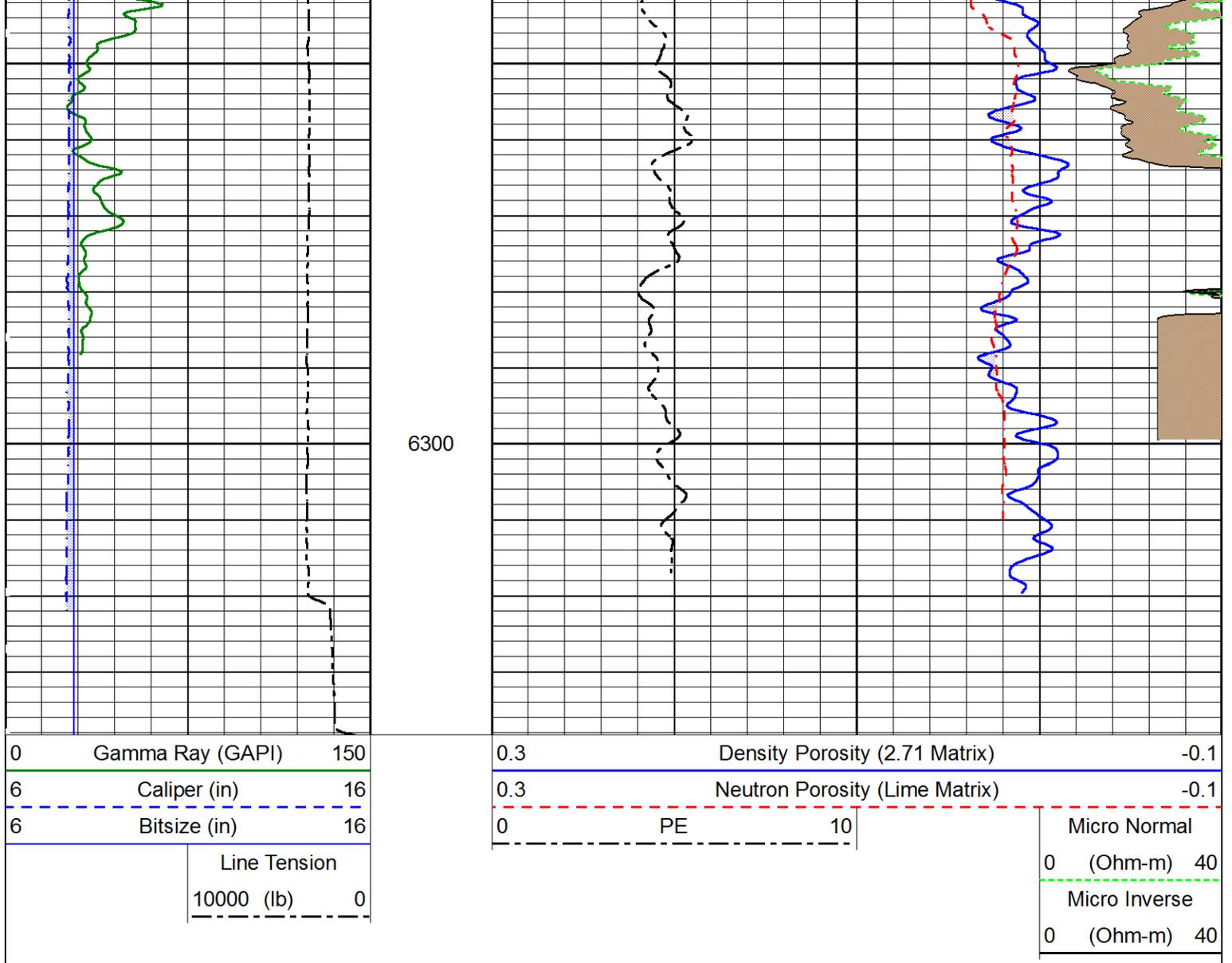




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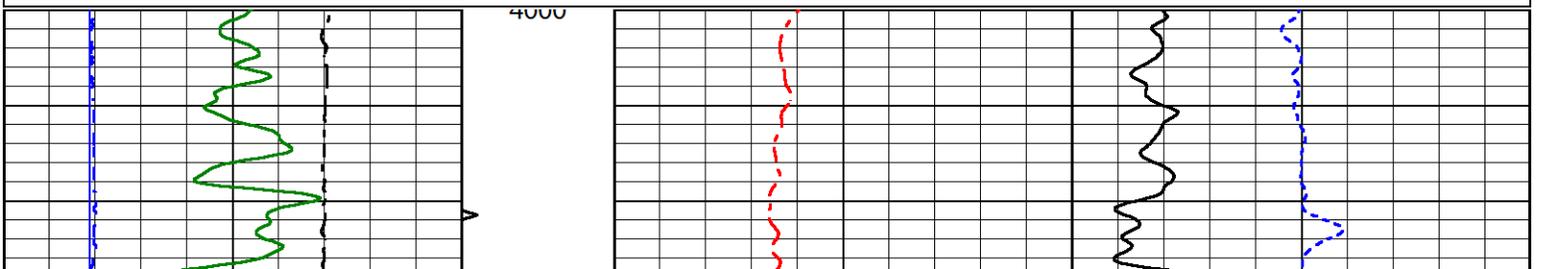


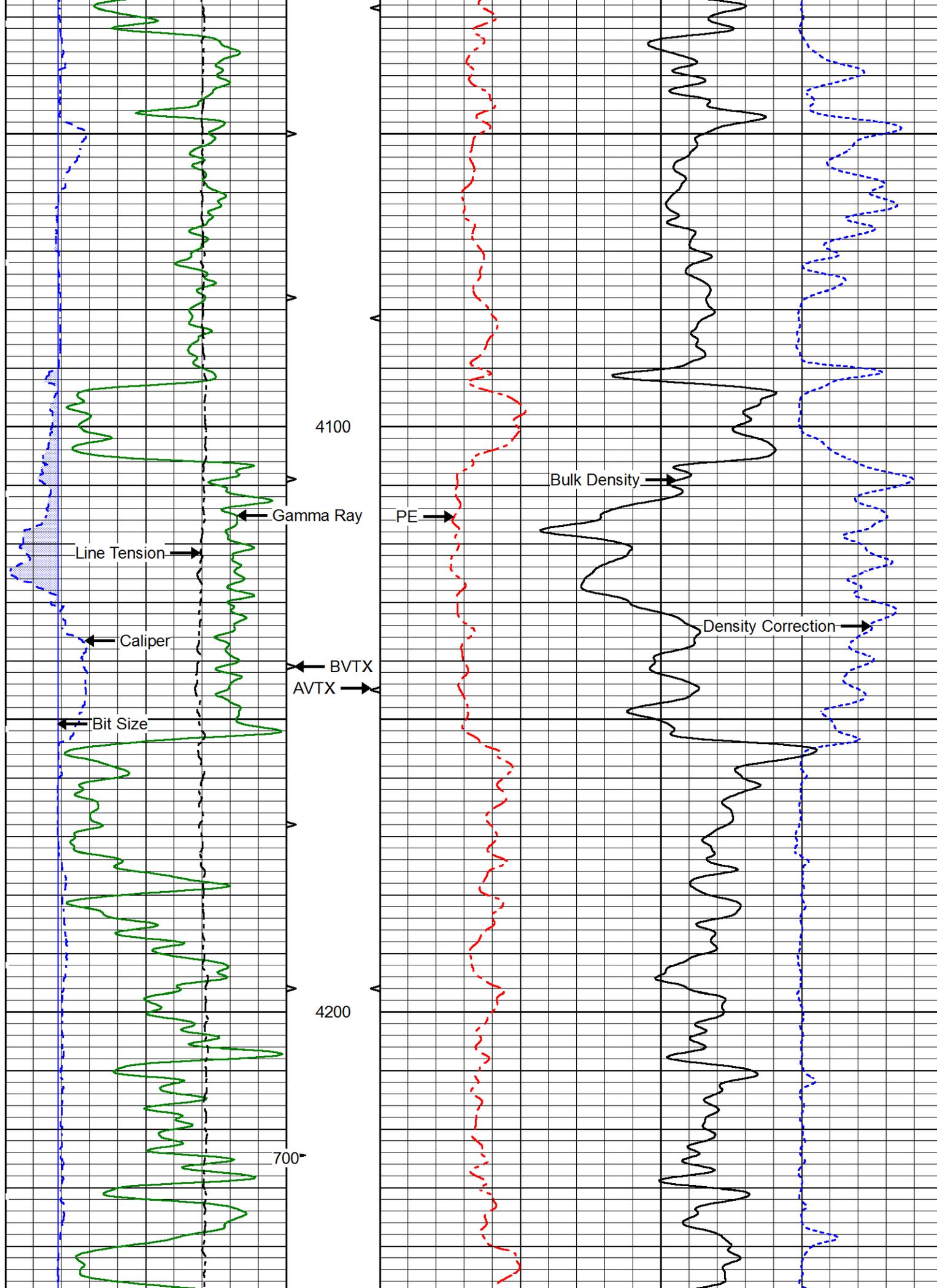


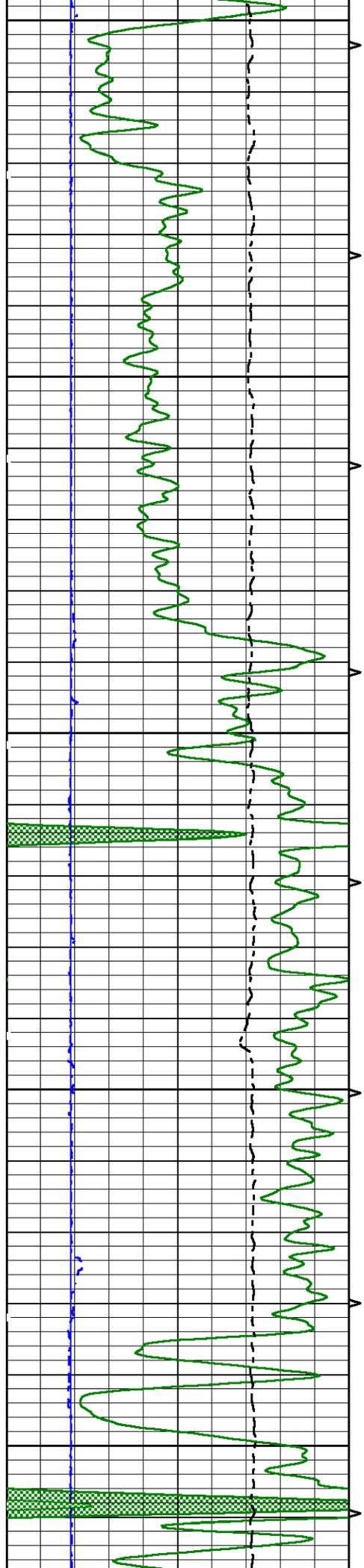
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 Dataset Pathname pass5.1  
 Presentation Format okc-bulk-base  
 Dataset Creation Tue Apr 13 00:30:21 2021  
 Charted by Depth in Feet scaled 1:240

0	Gamma Ray (GAPI)	150	2	Bulk Density (g/cc)	3
6	Caliper (in)	16	0	PE	10
10000	Line Tension (lb)	0	-0.25	Density Correction (g/cc)	0.25
6	Bit Size (in)	16			

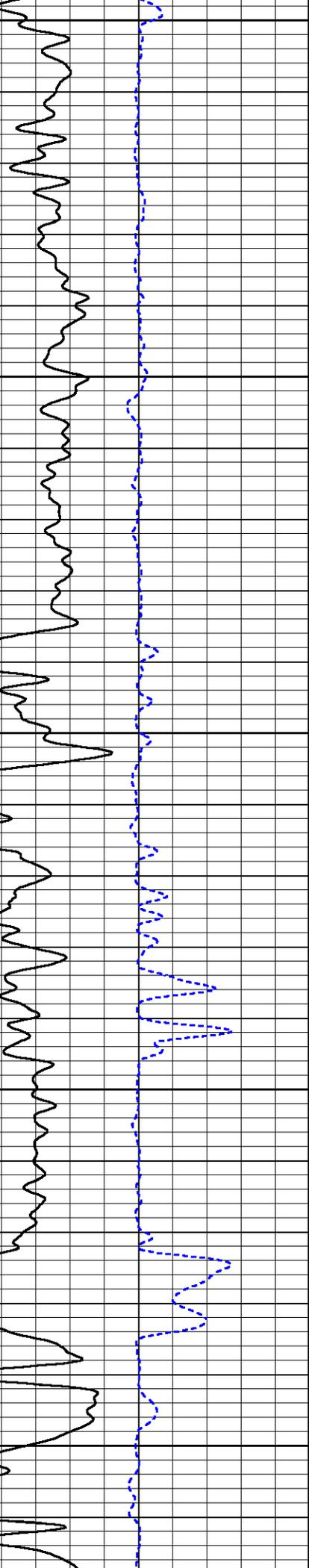
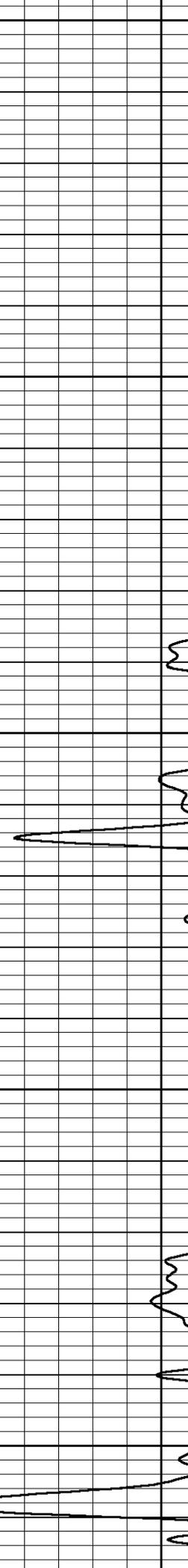
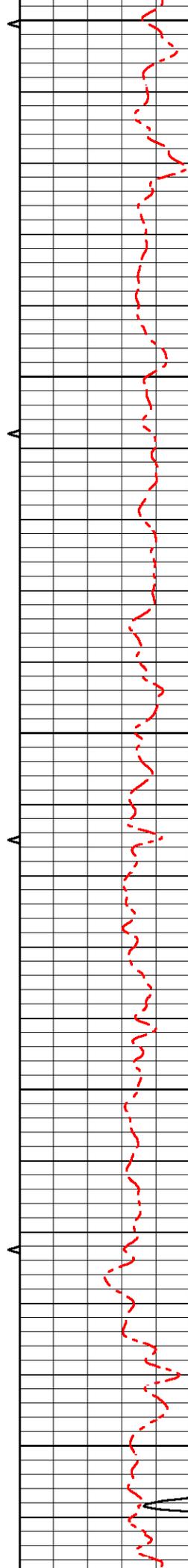


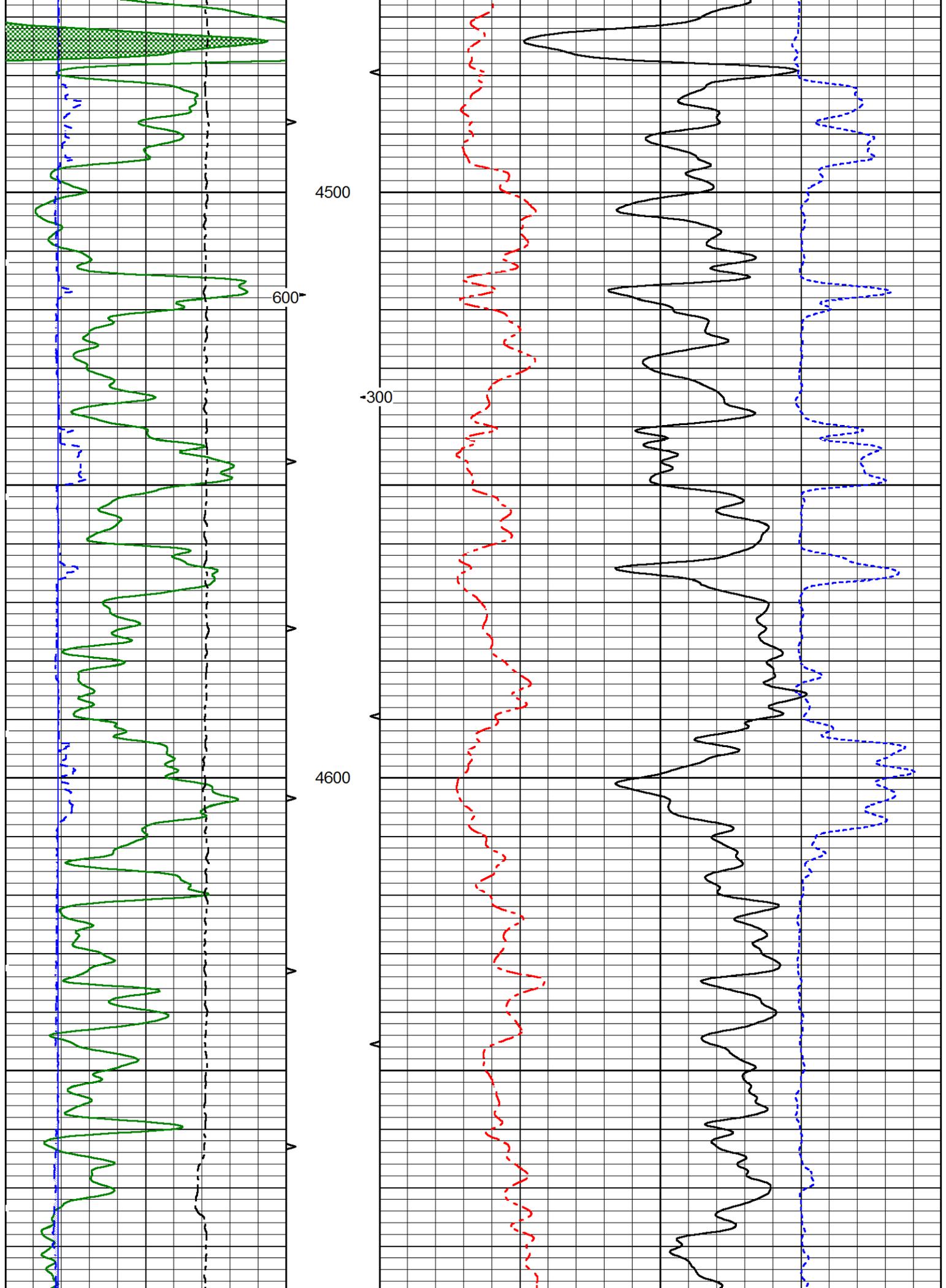


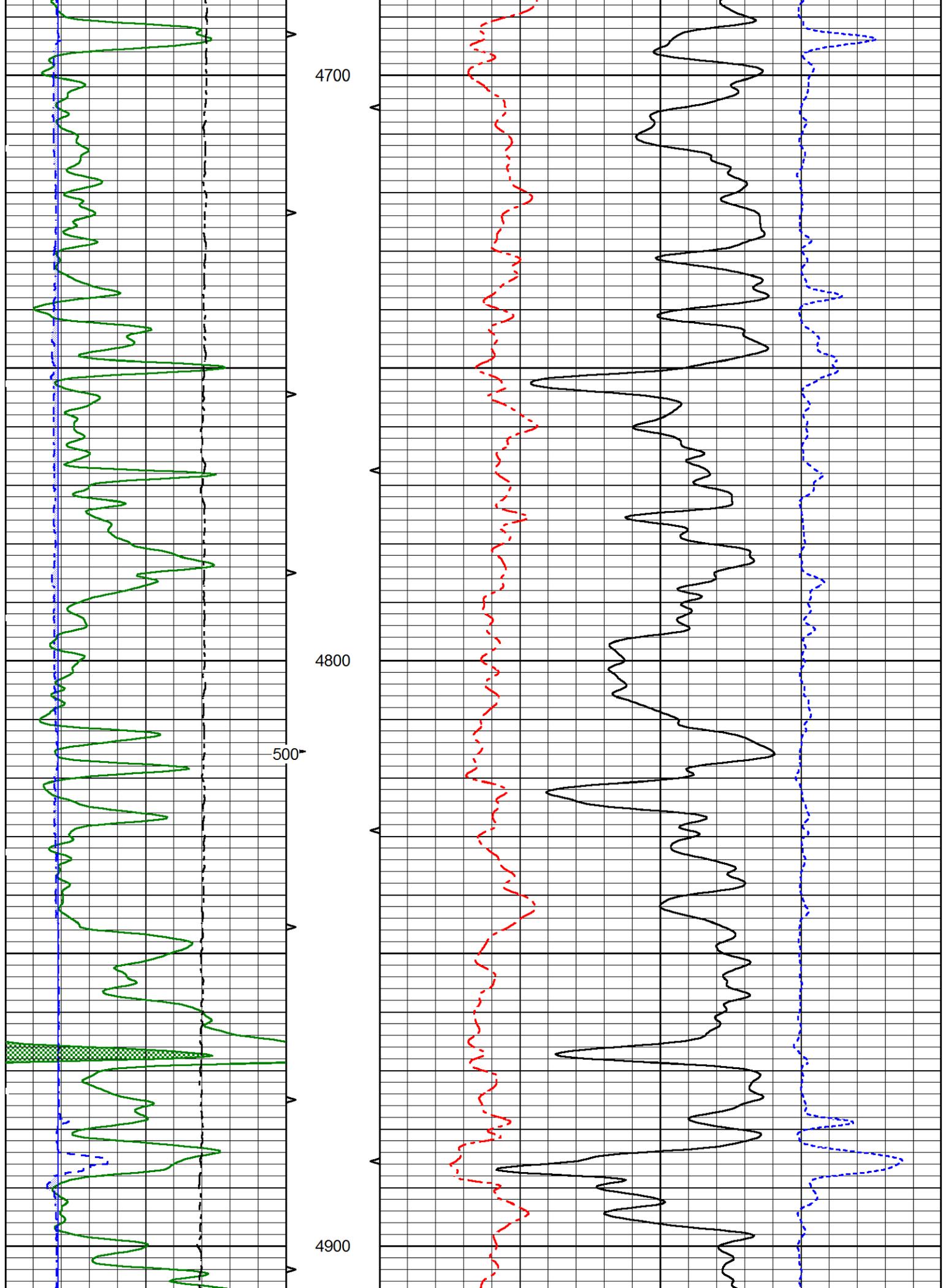


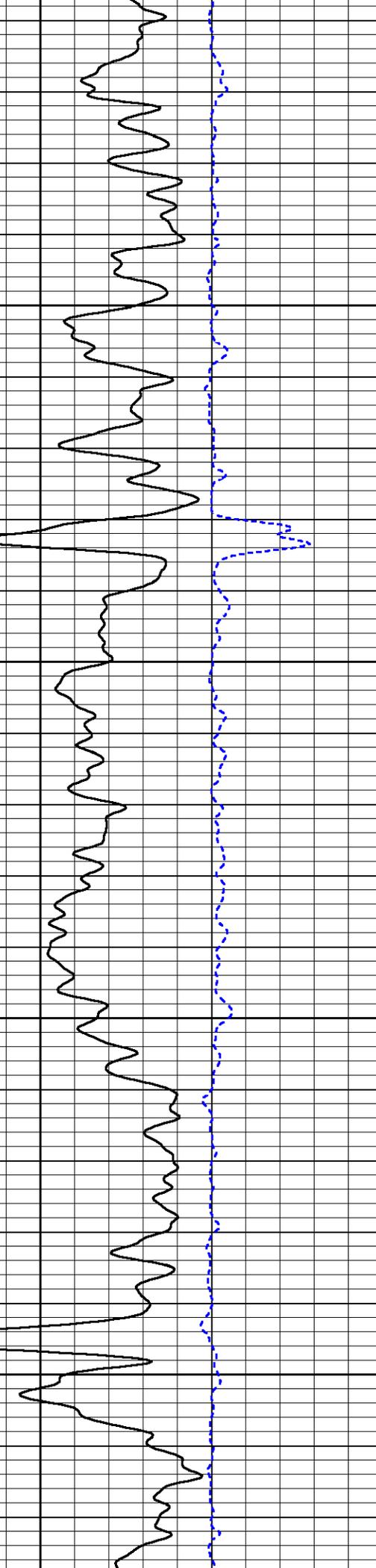
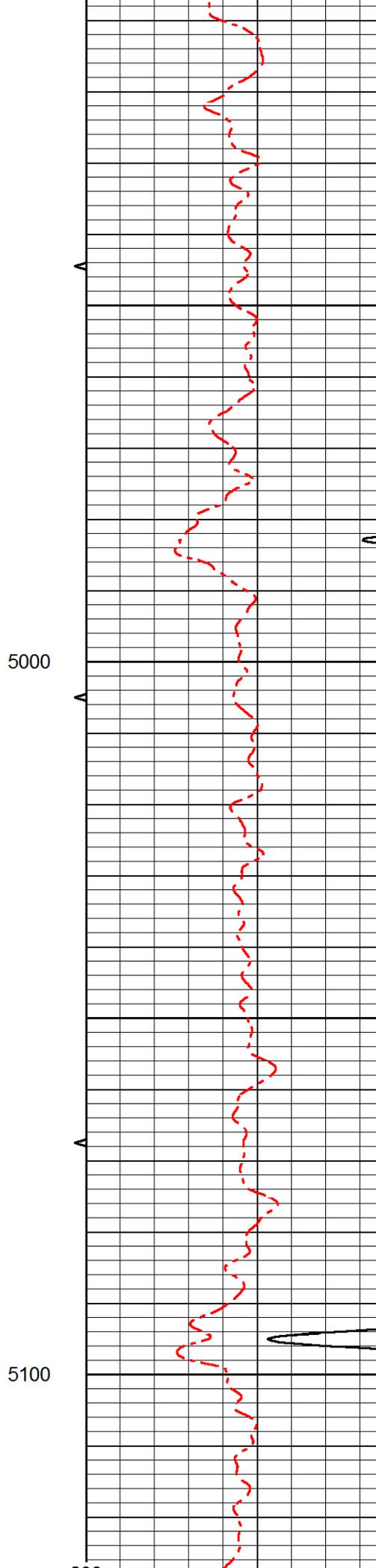
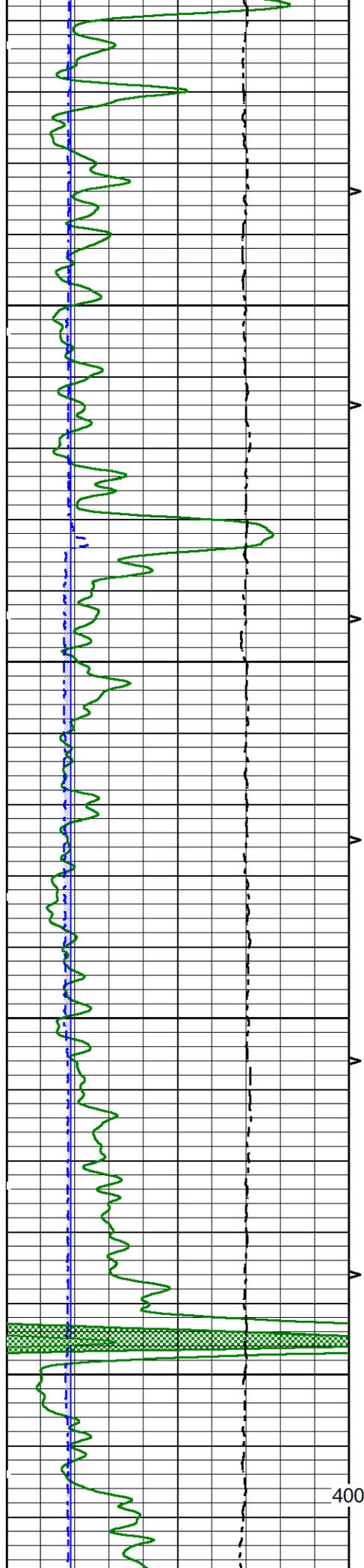
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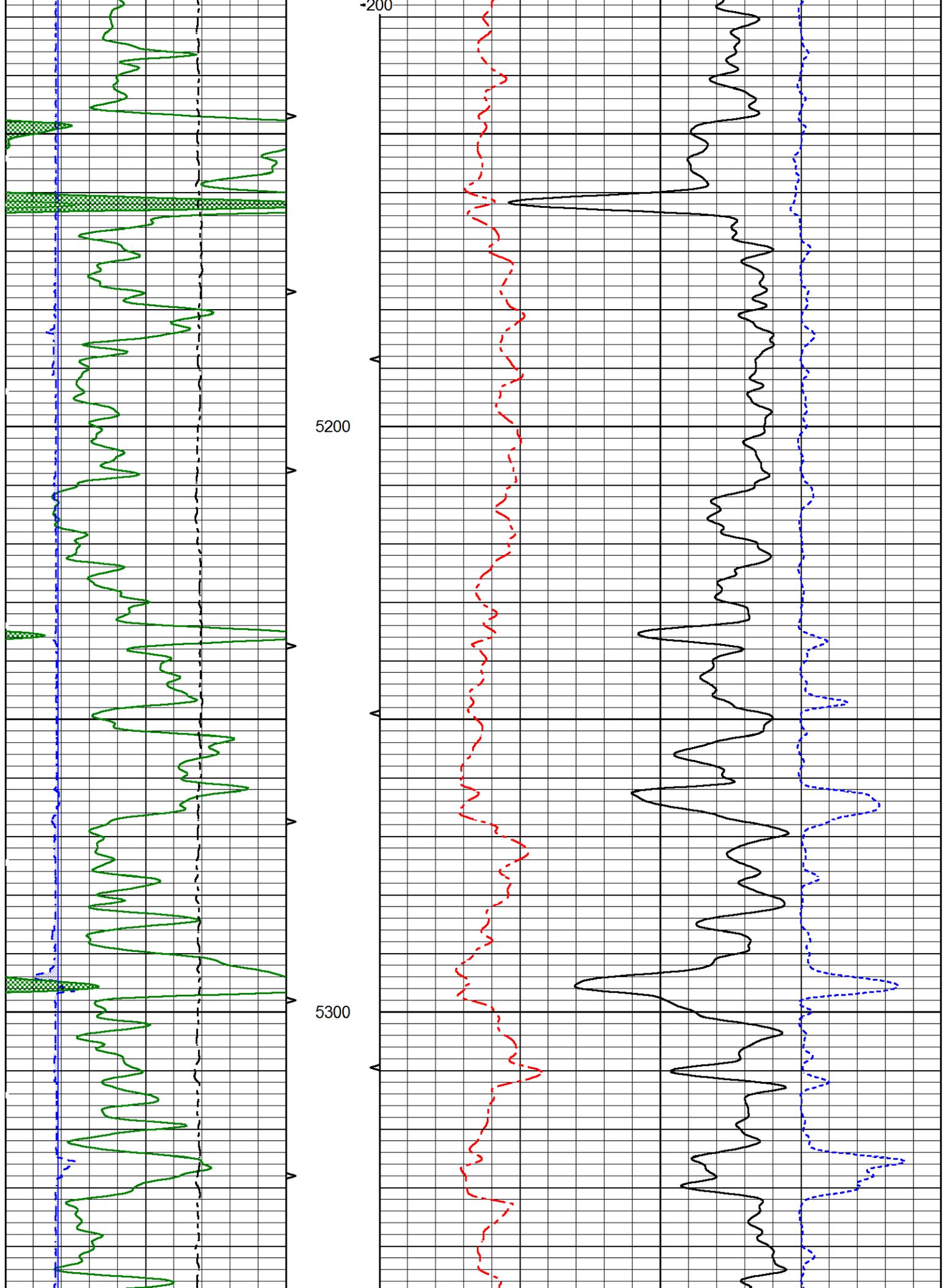
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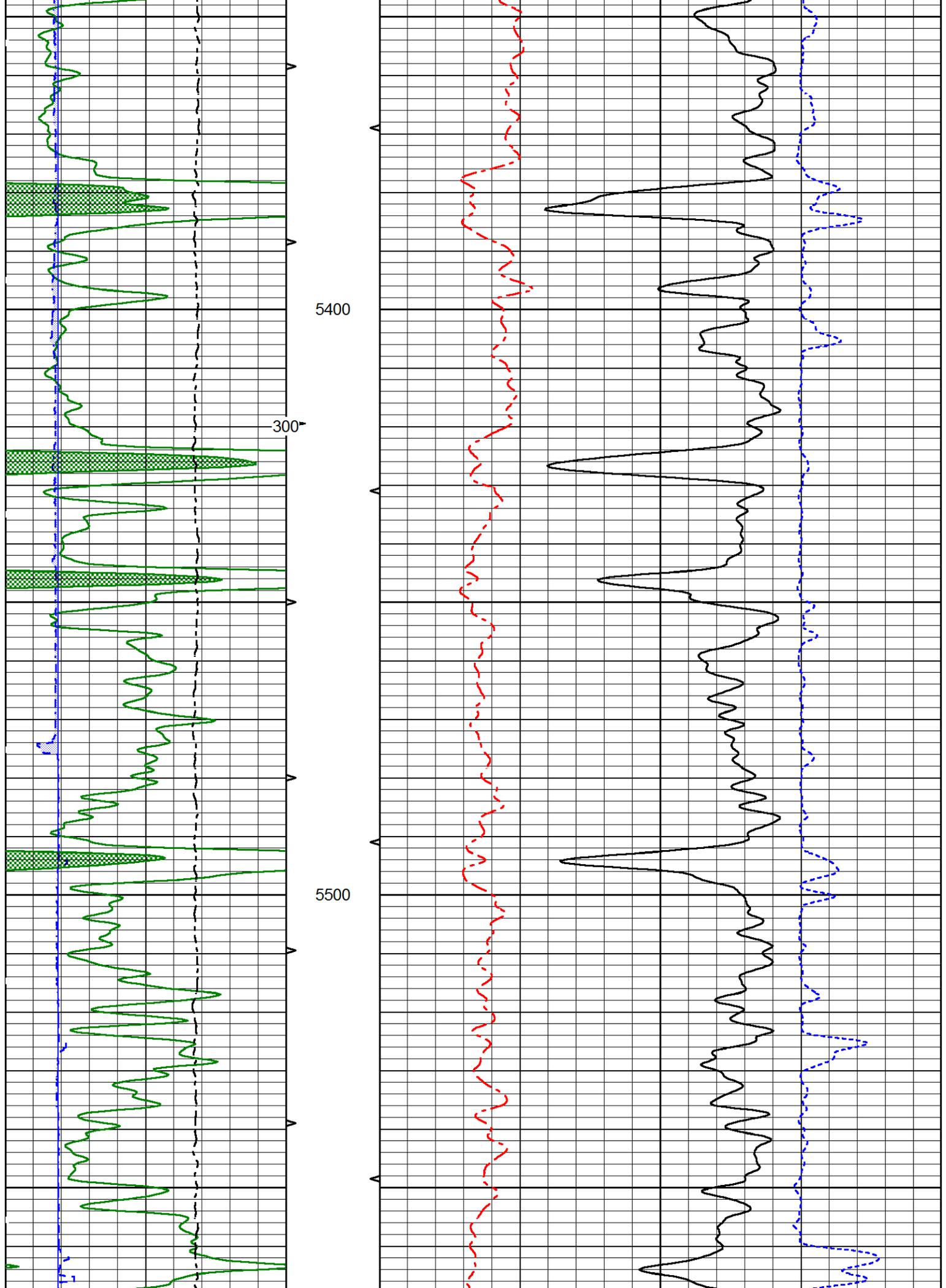


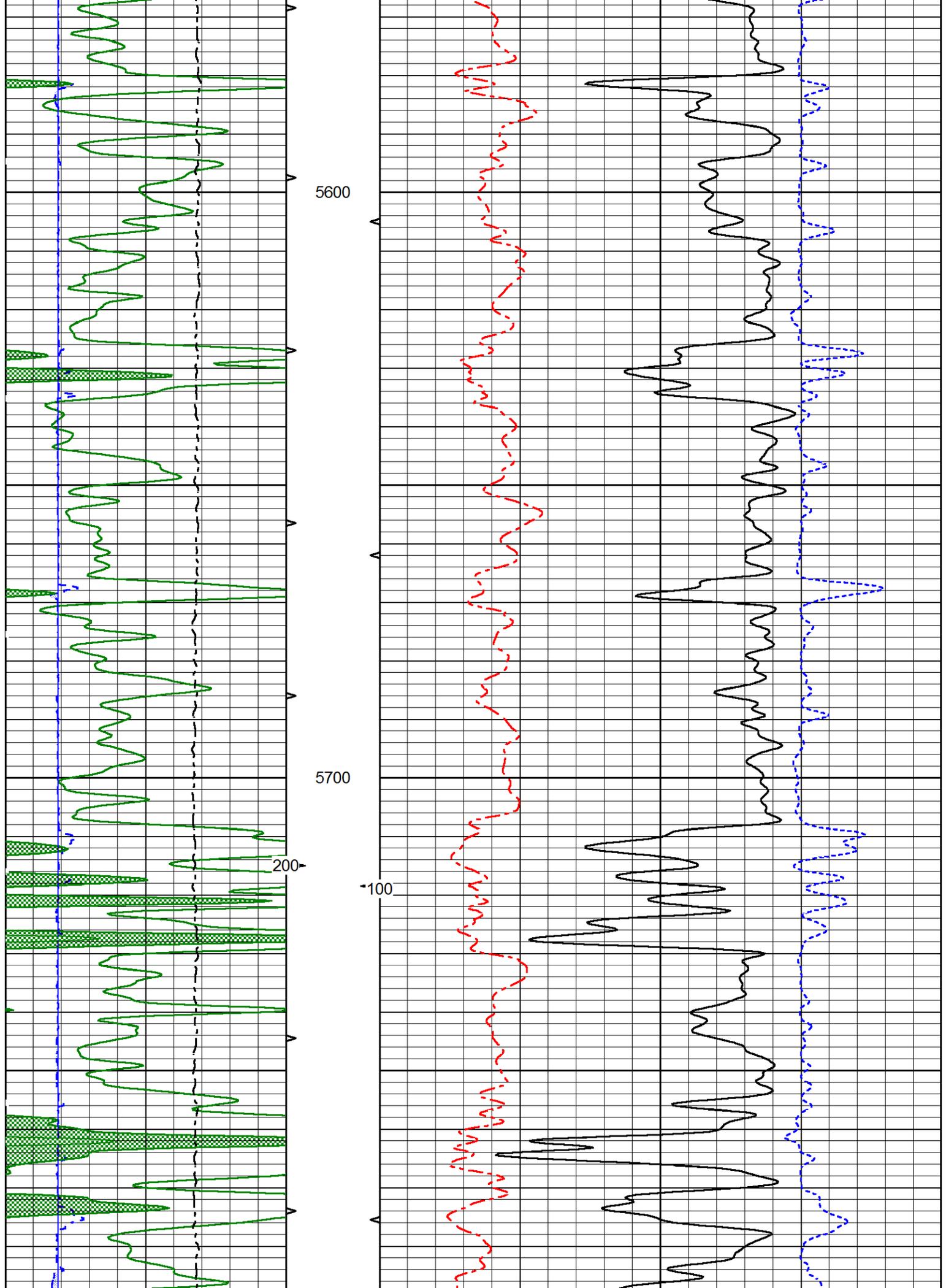


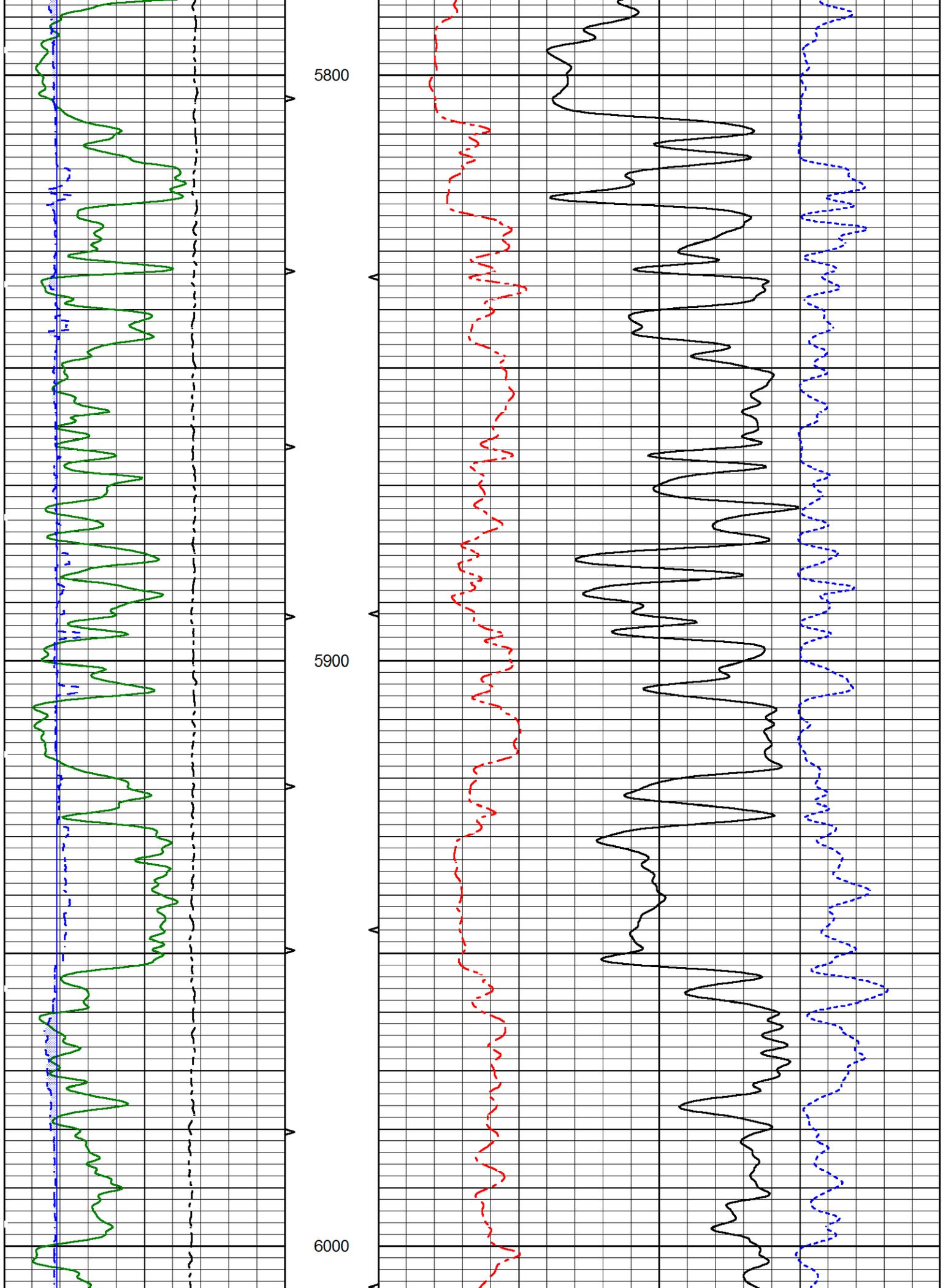


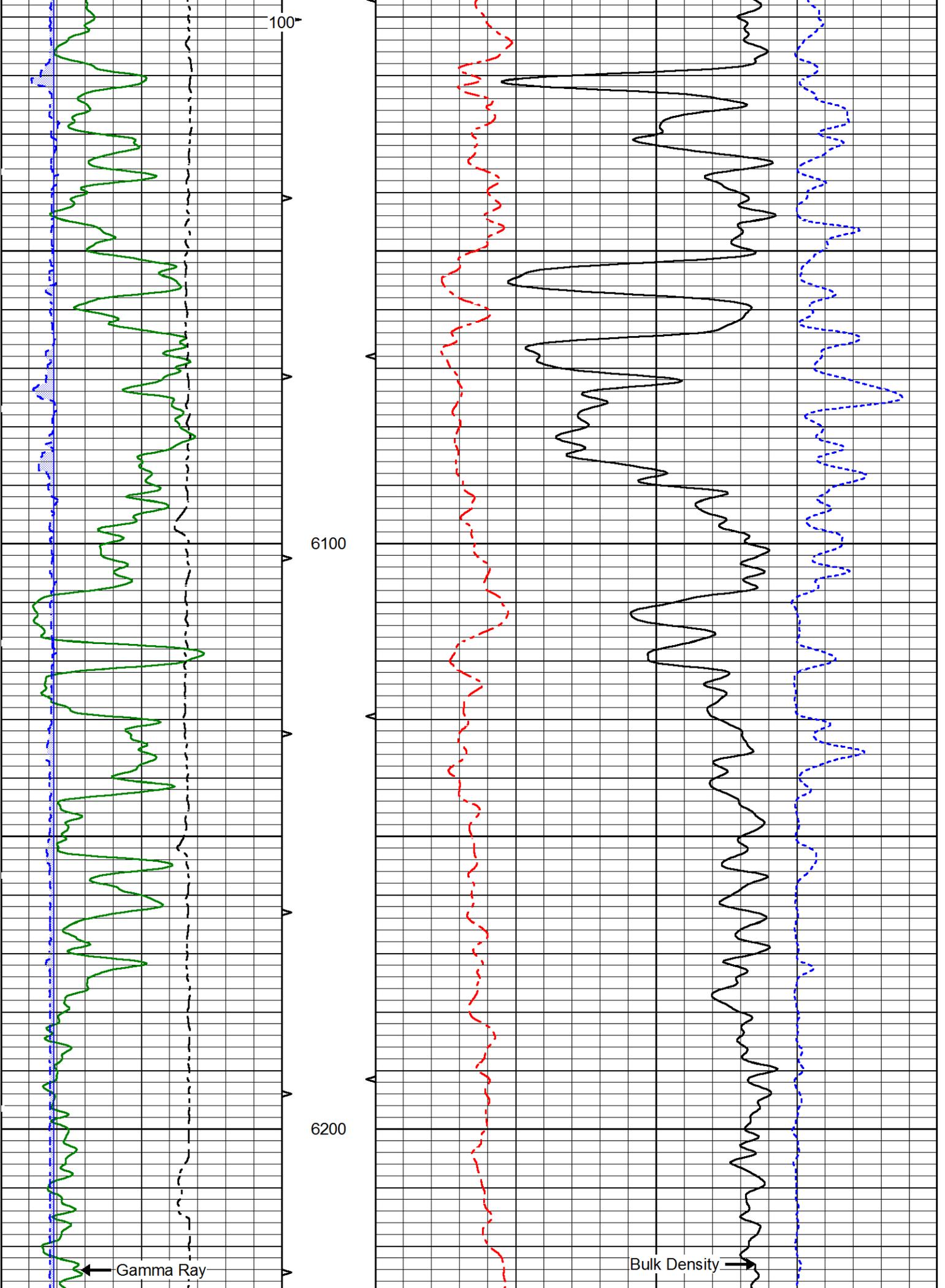


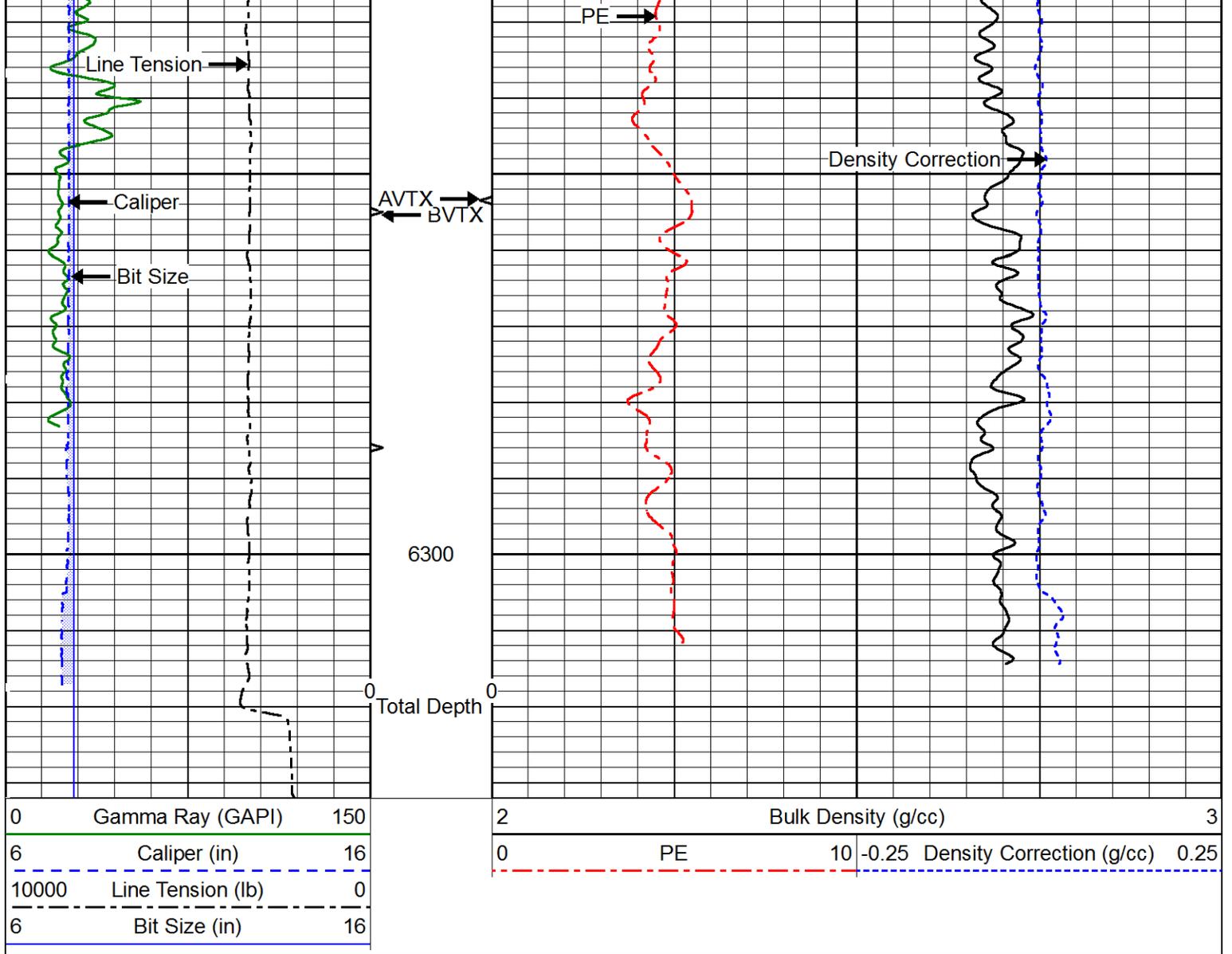












## Log Variables

DatabaseC:\Sondex\Sondex Warrior\Data\obrien-preedy east 1a-10.db  
Dataset field/well/run1/pass5/\_vars\_

### Top - 1572.00 ft

MAGDEC deg 0	FRMSALIN kppm 75	MUDSALIN kppm 0	DEVI deg 0	SRFTEMP degF 55	SO in 0.25	DE-CENT Yes	CASED? Yes
CASEWGHT lb/ft 24	NPORSEL Limestone	AIR_HOLE? No	MudWgt lb/gal 9.1	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0.264
CASEOD in 8.625	PERFS 0	TDEPTH ft 1572	BOTTEMP degF 125	BOREID in 12.25			

### 1572.00 ft - Bottom

MAGDEC deg 0	FRMSALIN kppm 75	MUDSALIN kppm 0	DEVI deg 0	SRFTEMP degF 55	SO in 0.25	DE-CENT Yes	<b>CASED?</b> <b>No</b>
<b>CASEWGHT</b> lb/ft 17	NPORSEL Limestone	AIR_HOLE? No	MudWgt lb/gal 9.1	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	<b>CASETHCK</b> in 0.264

17	Limestone	No	9.1	1	2.71	0	0.304
<b>CASEOD</b> in 5.5	PERFS 0	<b>TDEPTH</b> ft 6320	BOTTEMP degF 125	<b>BOREID</b> in 7.875			

Calibration Report

Database File obrien-preedy east 1a-10.db  
Dataset Pathname pass5  
Dataset Creation Mon Apr 12 22:21:50 2021 by Log Sondex

Induction Array Tool Calibration Report

Serial Number: B10110  
Tool Model: 002

Master Calibration Performed: Fri Jun 19 15:42:19 2020  
Temperature: 106.4 degF

Sonde Error:

Array	1	2	3	4	5	6	7	
Real	192.3	-12.8	-40.5	-15.8	-2.7	3.4	1.1	mmho/m
Imaginary	37.3	-19.3	-5.4	-21.0	-27.8	3.2	-1.2	mmho/m

Loop Gain:

Array	1	2	3	4	5	6	7	
Loop (real)	537.7	678.5	1295.3	1394.1	1144.8	712.8	404.8	mmho/m
Loop (imaginary)	73.3	92.5	389.8	419.5	344.5	214.5	121.8	mmho/m
Real	754.7	724.6	1228.1	1358.7	1147.9	734.9	415.9	mmho/m
Imaginary	105.1	80.9	380.2	394.1	318.0	223.9	123.9	mmho/m
Gain (real)	0.956	0.920	1.021	1.014	0.995	0.974	0.976	
Gain (imaginary)	1.081	0.923	1.011	1.011	0.996	0.972	0.974	

Before Survey Verification Performed: Fri Jun 19 15:59:35 2020  
Sonde 1 Temperature: 109.7 degF  
Sonde 2 Temperature: 106.7 degF  
Array 1 Temperature: 111.1 degF

Array	1	2	3	4	5	6	7
TxIR	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TxIX	0.0	0.0	0.2	0.2	0.2	0.2	0.2
Tx Magnitude	0.0	0.0	0.2	0.2	0.2	0.2	0.2
Gain	122.5	170.7	190.0	190.0	183.8	185.8	190.0
RxCR	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
RxCX	0.2	0.1	0.2	0.2	0.2	0.2	0.2
RxC Magnitude	0.2	0.1	0.2	0.2	0.2	0.2	0.2

Tool Module Parameters

Software Version: 8.0.0.4  
Borehole Size Source: CALI  
Mud Resistivity Source: MUDRES  
Mud Resistivity At Surface: N/A  
Mud Resistivity Surface Temperature: N/A  
Borehole Corrections: Automatic  
Minimum Standoff: 0.4 in

Litho Density Tool Calibration Report

Serial Number: B10110S70997B  
Tool Model: B10110

Caliper Calibration Performed: Mon Apr 12 10:43:16 2021

	Diameter		Reading	
Small Ring:	9.000	in	1745.500	cps
Large Ring:	13.000	in	2090.600	cps
Gain:	0.0116			
Offset:	-11.2318			

Master Calibration Performed: Mon Apr 12 10:03:46 2021

Source Number: S70997B  
 Medium: Water  
 Al Block Density: 2.6018 g/cc

	Background	Al Block	Al Block + Fe	
SS1	704.6	4177.6	3606.5	cps
SS2	1986.7	28467.4	24577.7	cps
SSTOTAL	4654.7	45568.2	39008.7	cps
LITH	88.3	486.4	298.1	cps
LL	175.8	806.8	724.2	cps
LU	496.0	1036.1	973.2	cps
LS	671.8	1842.9	1697.4	cps
LSTOTAL	1263.5	4518.5	3736.7	cps
SSHV	1464.1	1466.3	1468.1	V
LSHV	1311.8	1313.9	1314.8	V
SSFF	-0.001	0.009	0.003	
LSFF	0.004	-0.002	0.005	

Before Survey Verification Performed: Mon Apr 12 10:20:57 2021  
 After Survey Verification Performed: Mon Apr 12 10:27:19 2021

	Master Background	Before Survey Background	After Survey Background	
SS1	704.6	706.3	700.5	cps
SS2	1986.7	1986.9	1985.8	cps
SSTOTAL	4654.7	4662.7	4651.8	cps
LITH	88.3	87.7	86.1	cps
LL	175.8	173.3	174.9	cps
LU	496.0	497.0	491.0	cps
LS	671.8	670.3	665.9	cps
LSTOTAL	1263.5	1259.3	1254.1	cps
SSHV	1464.1	1470.0	1469.7	V
LSHV	1311.8	1315.8	1315.8	V
SSFF	-0.001	-0.006	-0.007	
LSFF	0.004	0.003	-0.006	

Tool Module Parameters

Software Version: 8.0.0.6  
 Borehole Size Source: CALI  
 Pad Type: 2

Compensated Neutron Tool Calibration Report

Serial Number: C10071S1414NC  
 Tool Model: 009

Master Calibration Performed: Mon Apr 12 11:06:22 2021

Source Number: 1414NC

Short Spacing Counts: 5574.20 cps  
 Long Spacing Counts: 200.36 cps  
 High Voltage: 1363.95 V

High Voltage: 1303.95 V  
Target Ratio: 27.2000  
Ratio: 27.8204  
K-Factor: 0.9777

Before Survey Verification Performed: Mon Apr 12 11:24:08 2021  
After Survey Verification Performed: Mon Apr 12 11:25:20 2021

Verifier Number: 6489

Verifier Values	Master Cal	Before Survey	After Survey	
Short Spacing Counts:	251.96	249.10	251.53	cps
Long Spacing Counts:	238.16	236.70	236.61	cps
High Voltage:	1363.94	1363.94	1363.94	V
Ratio:	1.0579	1.0524	1.0631	

#### Tool Module Parameters

Software Version: 8.0.0.5  
Borehole Size Source: CALI  
Clip Crossplot Porosity: YES  
Lithology Identification Parameters:  
Uma: Calcite Quartz Dolomite barns/cc  
RHOMA: 13.77 4.79 9.03 g/cc  
2.71 2.65 2.88

#### Micro Electric Log Calibration Report

Serial Number: 10020666  
Tool Model: 001

Caliper Calibration Performed: Wed Mar 27 13:54:25 2019

	Pad Arm			Backup Arm		
	Radius		Reading	Radius		Reading
Small Jig:	4.000	in	1079.500	4.000	in	1216.600
Large Jig:	6.000	in	1483.400	6.000	in	1590.500
Gain:			0.0050			0.0053
Offset:			-1.3454			-2.5076

#### Pad Calibration

	Inverse	Normal
Gain:	1.0000	1.0000
Offset:	0.0000	0.0000

#### Tool Module Parameters

Software Version: 8.0.0.4

#### Gamma Ray Calibration Report

Serial Number: C10049  
Tool Model: 001

Performed: Mon Apr 12 11:47:33 2021

Calibrator Value: 156.0 GAPI  
Background Reading: 70.5 cps  
Calibrator Reading: 494.1 cps  
Sensitivity: 0.3683 GAPI/cps

#### Borehole Fluid Resistivity Calibration Report

Serial Number: P004  
 Tool Model: 002

Master Calibration Performed: Wed May 25 15:17:37 2016

Resistivity Polynomial Equation:

$$0.1429x^3 - 0.4495x^2 + 1.2097x - 0.2854$$

Temperature Calibration:

Reference		Reading	
71.60	degF	559.80	bits
167.00	degF	659.50	bits

Head Tension Unit Calibration Report

Serial Number: 00001  
 Tool Model: 011

Performed: Mon Mar 04 10:52:43 2013

Point #	Reference		Reading	
1	-19894.000	lb	8957.860	cps
2	-15010.000	lb	13965.100	cps
3	-9998.000	lb	19079.100	cps
4	-5007.000	lb	24133.000	cps
5	-1009.000	lb	28232.100	cps
6	1017.000	lb	30185.400	cps
7	5040.000	lb	34439.700	cps
8	9970.000	lb	39346.900	cps
9	14955.000	lb	44466.000	cps
10	19770.000	lb	49397.800	cps

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)	
HTEN	53.95		CHD-WFT (WFT01) Weatherford Cable Head	2.67	2.25	15.00	
			X-Over-WFT (0001) Weatherford X-Over	1.13	3.38	5.00	
			XTU-008 (C10068) Crossover Ultrawire Toolbus to Ultralink	2.08	3.38	47.00	
			HTU-011 (00001) Head Tension Unit	2.18	3.38	55.00	
BFR	50.31			BFR-002 (P004) Borehole Fluid Resistivity Tool	4.39	3.38	94.00
GR	47.54			GRT-001 (C10049) Gamma Ray Tool	3.22	3.38	69.00
				Overbody-Over-cen Overbody Centralizer	3.00	3.38	10.00
MEL	37.55			MEL-001 (10020666) Micro Electric Log	9.17	3.38	190.00
				CEN-001 (000029) Inline OH Springbow Centraliser	4.27	3.38	66.00
				KJT-001 (10010515) Knuckle Joint	2.86	3.38	72.00

CNLSC	25.59		CNL-009 (C10071S1414NC) Compensated Neutron Logging Tool	5.28	3.38	100.00
CNSSC	25.09		LDT-B10110 (B10110S70997B) Litho Density Tool	9.75	4.50	310.00
LDT	15.44		Overbody-Standoff Standoff (Rubber)	1.00	4.50	4.00
IAT	8.44		IAT-002 (B10110) Induction Array Tool	13.22	3.88	196.00
SP	0.43		Shorty-Short Short Hole Finder	0.38	3.88	6.00
Dataset: obrien-preedy east 1a-10.db: field/well/run1/pass5 Total length: 60.59 ft Total weight: 1239.00 lb O.D.: 4.50 in						

	Company	O'Brien Energy Resources Corporation
	Well	Preedy East 1A-10
	Field	Borchers Northwest
	County	Meade
	State	Kansas